FORCED ENTRY REPORT

Purpose

Whenever the Fire Department forces entry into a building, or tenant space and an occupant of that area is not on the premises, the fire personnel are responsible for its security. The person in charge of the fire department personnel on the scene should attempt to notify the occupant or resident that the department forced the door and entered. If no owner or occupant arrives on the scene the building must be turned over to the police department.

1. Forcible Entry Notification Report

1.1 The Shift Officer or Senior Firefighter involved in the forcible entry operation is responsible for completing this report, along with notifying the Police Department that forcible entry has taken place.

1.2 The report is to be completed and attached onto the access door to the building that was forced or inside the building in a conspicuous place.

1.3 The purpose of the notification form is to simply communicate to the occupant why the Fire Department forced entry and that the damage involved was not done indiscriminately.

H:\Fire Dept Policies\
OPERATIONS - 0200\

Fire Department
630/736-6800

HANOVER PARK FIRE DEPARTMENT
FORCED ENTRY REPORT

Date of Incident _____ Time of Incident _____

The Hanover Park Fire Department responded to: _____
(street address)

At the request of our dispatchers on the report to them of a _____

_____ in progress.
(nature of request)

In order to insure the status of this emergency request, the Firefighter/paramedics forced entry into this unit. There was/was not evidence of a fire or other emergency situation found in this occupancy while Fire Department Personnel were present. The Hanover Park Police Department was notified and Officer _____ Badge No._____ remained on the scene.

Officer/Firefighter in charge: _____

Remarks:

_____

_____

_____

_____

Hazard Communication

Purpose

As part of the overall safety and health program of the Hanover Park Fire Department, this chemical hazard communication program has been established. The Hazard Communication Program is designed to comply with the Occupational Safety and Health Administration (OSHA) Hazard Communication Standard, Title 29 Code of Federal Regulations 1910.1200.

This program applies to all work operations within the organization where an employee may be exposed to hazardous substances under normal working conditions or during an emergency.

Scope

Under this program, employees will be informed of the contents of the Hazard Communication Standard, the hazardous properties of the chemicals with which they work, and safe handling procedures and measures employees can take to protect themselves from these chemicals. Employees will also be informed of the chemical hazards associated with non-routine tasks.

Hanover Park Fire Department has established a list of all known hazardous chemicals within the organization, and will update the list as necessary. Corresponding Safety Data Sheets (SDS) are also maintained for each chemical.

1. Hazardous Chemicals Definition

1.1. The definition of "hazardous chemicals" as provided by OSHA is "any chemical which is a physical hazard or health hazard."

1.2. Chemical physical hazard characteristics include substances which are:

- 1.2.1. Explosive
- 1.2.2. Flammable
- 1.2.3. Oxidizers
- 1.2.4. Self-reactive
- 1.2.5. Pyrophoric
- 1.2.6. Self-heating
- 1.2.7. Organic peroxides
- 1.2.8. Corrosive to metal
- 1.2.9. Gas under pressure
- 1.2.10. Emits flammable gas

1.3. Chemical health hazards include substances which may cause:

- 1.3.1. Acute toxicity
- 1.3.2. Skin corrosion or irritation
- 1.3.3. Serious eye damage or eye irritation
- 1.3.4. Respiratory or skin sensitization
- 1.3.5. Germ cell mutagenicity
- 1.3.6. Carcinogenicity

1.3.7. Reproductive toxicity
1.3.8. Specific organ toxicity
1.3.9. Aspiration hazards

1.4. Further explanation can be found within the OSHA Hazard Communication Standard.

2. Hazard Communication Program

2.1. The Hanover Park Fire Department Hazard Communication Program includes the following information:

2.1.1. A list of hazardous chemicals known to be present in the workplace.
2.1.2. Information on precautionary labels and other forms of warning for known hazardous chemicals in the workplace.
2.1.3. Safety Data Sheets (SDS) for known hazardous chemicals in the workplace.
2.1.4. Methods used to provide employee information and training.
2.1.5. Methods used to inform employees of hazards of non-routine work.
2.1.6. Methods used to when contractors are on-site and/or when contractors bring chemicals on-site.

2.2. The Hazard Communication Program is available for review by all employees upon request.

3. Labeling

3.1. Supervisors have the responsibility to identify all known hazardous chemicals present in their respective work areas and these chemicals must display, in English, a precautionary label stating:

3.1.1. Product identifier
3.1.2. Signal word(s)
3.1.3. Hazard statement(s)
3.1.4. Pictogram(s)
3.1.5. Precautionary statement(s)
3.1.6. The name and address of the manufacturer, importer, or other responsible party

3.2. In the event of an improperly labeled hazardous chemical container, a proper label will be requested from the supplier. Failure of a supplier to correct labeling deficiencies within 60 days may result in suspension of use of the product.

3.3. No labels on incoming chemicals shall be defaced in any way. Any employee identifying defaced or illegible labels must immediately report the information to a supervisor so that appropriate labels can be applied.

4. Portable Containers

4.1. All portable containers of hazardous chemicals require labeling (a portable container is one that is used to hold a chemical that has been transferred from its original container). The exception to this policy is that portable containers of hazardous chemicals do not have to be labeled if they contain chemicals transferred from a labeled container and are intended only for the immediate use by and remain in the constant control of the employee who performs the transfer. All other portable containers and usage will require labeling. Employees who have questions about portable container labeling should contact

their immediate supervisor. The employee who uses the portable container is responsible for placing the label on the container, and the supervisor is responsible to see that labeling is completed.

5. Labeling Updates and Review

5.1. Supervisors are responsible for reviewing the labeling system periodically and updating if necessary. Changes to the labeling system will be communicated to affected employees.

5.2. Employees who have questions about the precautionary labeling system should contact their supervisor.

6. Safety Data Sheets (SDS)

6.1. SDS are written or printed material concerning product hazard determination, which are prepared and distributed with chemicals by chemical manufacturers and distributers. SDS are written in English and contain the following sections:

6.1.1. Product Identification;
6.1.2. Hazard(s) identification;
6.1.3. Composition/information on ingredients;
6.1.4. First-aid measures;
6.1.5. Fire-fighting measures;
6.1.6. Accidental release measures;
6.1.7. Handling and storage;
6.1.8. Exposure controls/personal protection;
6.1.9. Physical and chemical properties;
6.1.10. Stability and reactivity;
6.1.11. Toxicological information;
6.1.12. Ecological information;
6.1.13. Disposal considerations;
6.1.14. Transport information;
6.1.15. Regulatory information; and
6.1.16. Other information, including date of preparation or last revision.

6.2. Each Department Supervisor is responsible for obtaining SDS for their department. A SDS should be available for every hazardous chemical listed on the inventory list. In the event a SDS is not available, the supervisor will use the following procedures to obtain SDS:

6.2.1. The supplier will be contacted and all correspondence and communication documented as proof of effort to comply.
6.2.2. If a supplier does not satisfy the request within 30 days, a second request for a SDS should be sent to the supplier.
6.2.3. If the supplier does not satisfy the second request within 30 days, the supervisor will remove the chemical from use until the SDS is obtained.

6.3. Supervisors are responsible for reviewing all incoming data sheets for new and significant health/safety information. Any new information will be communicated so appropriate measures can be taken to properly inform affected employees.

6.4. If deficiencies exist or additional information is needed concerning SDS, the chemical manufacturer or supplier will be contacted to obtain necessary information.

6.5. Supervisors are responsible for maintaining the SDS.

6.6. The SDS for chemicals and the chemical inventory lists shall be maintained in a binder or file titled "Safety Data Sheets". These shall be accessible to employees during each work shift.

6.7. If SDS are not available or new chemicals in use do not have SDS, employees should immediately contact their supervisor.

6.8. Supervisors will maintain a master copy of the SDS and inventory list.

6.9. Where hazardous materials are generated as by-products of operations, such as carbon monoxide in excess of 50 PPM (TWA), an SDS will be provided in the appropriate SDS files.

6.10. Supervisors must approve all new/trial chemicals before use by employees. SDS must be reviewed before the chemical is used. All employees must inform their supervisor upon ordering or receiving new chemicals.

6.11. Hanover Park Fire Department relies upon the hazard determination and SDS supplied by the chemical manufacturer or distributor to determine the hazards of all chemicals bought, used or stored in the facility.

6.12. Supervisors will evaluate the hazard of consumer products.

6.13. Employees who have questions about SDS should contact their supervisor.

7. Employee Training

7.1. Effective employee training and education is the most critical component of a hazard communication program. A properly conducted training program will ensure that employees are aware of hazards in the workplace and the appropriate control measures to protect them. Department Supervisors will coordinate the employee training and education program for their department.

7.2. The training plan will emphasize these items:

7.2.1. A summary of the OSHA Hazard Communication Standard.
7.2.2. Methods and observations that may be used to detect the presence or release of a hazardous chemical in the work area, such as visual appearance, odor, or other monitoring.
7.2.3. A chemical's physical properties (i.e.; flash point, reactivity), methods that can be used to detect the presence or release of chemicals, and the potential for mishandling of chemicals (i.e.; potential for fire, explosion, etc.)
7.2.4. Health hazards, including signs and symptoms associated with exposure to chemicals and any medical condition known to be aggravated by exposure to the chemical.
7.2.5. Procedures to protect against hazards (i.e.; personal protective equipment required, work practices and methods to ensure proper use in handling of chemicals and procedures for emergency response) and work procedures to follow to ensure protection when cleaning hazardous chemical spills and leaks.

7.2.6. The location of SDS, how to read and interpret the information on both labels and SDS and how employees may obtain additional hazard information.

7.3. Department Supervisors or their designee will periodically review the employee training program. Retraining is required when a hazard changes or when a new hazard is introduced into the workplace, but it will be the organization's policy to provide training as needed to ensure the effectiveness of the program.

7.4. Employees that are re-assigned or transferred to other work areas will undergo a review of specific hazard training in their new work area. Supervisors are responsible for scheduling and ensuring that these retraining sessions are conducted and initiated in a new work area.

7.5. New employees will be trained at the time of initial employment and prior to handling hazardous chemicals.

8. Non-Routine Work

8.1. Occasionally employees will be asked to preform non-routine work, which can be defined as work not normally performed by an employee during the normal course of job duties. Example of non-routine work may include but are not limited to:

8.1.1. Welding and cutting operations;
8.1.2. Tank/container cleaning;
8.1.3. Accident scene clean-up;
8.1.4. Intensive maintenance activities;
8.1.5. Using internal combustion engines in enclosed areas.

8.2. The following procedures will be used when employees perform non-routine work:

8.2.1. The supervisor will determine the need for non-routine work and the hazards associated with the work.
8.2.2. The supervisor will train the employees performing the non-routine work of the hazard associated with the work and of procedures to follow.
8.2.3. Employees share in the responsibility by ensuring their supervisor knows that non-routine work will be performed.
8.2.4. Employees should contact their supervisor with questions concerning non-routine work.

9. Contractors

9.1. Hanover Park Fire Department on occasion may enlist the services of an outside contractor. In these instances, Hanover Park Fire Department shall communicate the potential chemical exposures to the contractor working at the Hanover Park Fire Department owned site and the contractor must communicate the chemical exposures that may expose the Hanover Park Fire Department employees to during contractor directed projects. Furthermore, Hanover Park Fire Department and contractor shall provide each other with access to the SDS and labeling information for these chemicals.

9.2. Hanover Park Fire Department shall communicate to the contractor that the contractor must meet the requirements of 29 CFR 1910.1200 as a condition of the project.

10. Program Review

10.1. Hanover Park Fire Department will periodically review the Hazard Communication Program and update the program as needed.

NFPA® OSHA® QUICK CARD

Comparison of NFPA 704 and HazCom 2012 Labels

	NFPA 704	HazCom 2012
Purpose	Provides basic information for emergency personnel responding to a fire or spill and those planning for emergency response.	Informs workers about the hazards of chemicals in workplace under normal conditions of use and foreseeable emergencies.
Number System: NFPA Rating and OSHA's Classification System	0-4 0-least hazardous 4-most hazardous	1-4 1-most severe hazard 4-least severe hazard • The Hazard category numbers are NOT required to be on labels but are required on SDSs in Section 2. • Numbers are used to CLASSIFY hazards to determine what label information is required.
Information Provided on Label	• Health-Blue • Flammability-Red • Instability-Yellow • Special Hazards*-White *OX Oxidizers W Water Reactives SA Simple Asphyxiants	• Product Identifier • Signal Word • Hazard Statement(s) • Pictogram(s) • Precautionary statement(s); and • Name address and phone number of responsible party.
Health Hazards on Label	Acute (short term) health hazards ONLY. Acute hazards are more typical for emergency response applications. Chronic health effects are not covered by NFPA 704.	Acute (short term) and chronic (long term) health hazards. Both acute and chronic health effects are relevant for employees working with chemicals day after day. Health hazards include acute hazards such as eye irritants, simple asphyxiants and skin corrosives as well as chronic hazards such as carcinogens.
Flammability/ Physical Hazards on Label	NFPA divides flammability and instability hazards into two separate numbers on the label. Flammability in red section Instability in yellow section	A broad range of physical hazard classes are listed on the label including explosives, flammables, oxidizers, reactives, pyrophorics, combustible dusts and corrosives.
Where to get information to place on label	Rating system found in NFPA Fire Protection Guide to Hazardous Materials OR NFPA 704 Standard System for Identification of the Hazards of Materials for Emergency Response 2012 Edition. Tables 5.2, 6.2, 7.2 and Chapter 8 of NFPA 704	OSHA Hazard Communication Standard 29 CFR 1910.1200 (2012). 1) Classify using Appendix A (Health Hazards) and Appendix B (Physical Hazards) 2) Label using Appendix C
Other	The hazard category numbers found in section 2 of the HC2012 compliant SDSs are NOT to be used to fill in the NFPA 704 diamond.	Supplemental information may also appear on the label such as any hazards not otherwise classified, and directions for use.
website	www.nfpa.org/704	www.osha.gov OR www.osha.gov/dsg/hazcom/index.html

For more information:

National Fire Protection Association
www.nfpa.org | 800.344.3555

OSHA®
Occupational Safety and Health Administration
U.S. Department of Labor
www.osha.gov | 800.321.OSHA (6742)

NFPA® OSHA® QUICK CARD

The substance: "NOMIXUP 7042012"

To create an OSHA label per HazCom 2012:

Step 1: Perform the classification in accordance with Appendix A: Health Hazards & Appendix B Physical Hazards of 29 CFR 1910.1200 - this is where you find the criteria for each hazard class and hazard category.

Class: Flammable Gas, Category 1

Class: Carcinogen, Category 1B

Class: Specific Target Organ Toxicity (Single Exposure), Category 3

Class: Substances and Mixtures Which, in Contact with Water, Emit Flammable Gases, Category 3

Step 2: Gather labeling information (Pictograms, Signal Word, Hazard Statements) from Appendix C of 29 CFR 1910.1200 based on the chemical's hazard class and category.

Step 3: Create the Label

Identifier: NOMIXUP 7042012

DANGER!

Hazard Statements: Extremely Flammable Gas
May Cause Cancer
May Cause Respiratory Irritation
In Contact with Water Releases Flammable Gas

Precautionary Statements: Keep away from heat/sparks/open flames/hot surfaces. -No Smoking
Obtain special instructions before use.
Do not handle until all safety precautions have been read and understood.
Avoid breathing vapors and mists.
Wear protective gloves and eye protection.
If inhaled: Remove person to fresh air and keep comfortable for breathing.
Call poison center/doctor if you feel unwell.
Leaking Gas Fire: Do not extinguish unless leak can be stopped safely.
Eliminate all ignition sources if safe to do so.
Store in tightly closed container in a well-ventilated place, locked up.
Use outdoors or use in a well-ventilated place.
Dispose of contents in accordance with local/regional/national regulations.

XYZ Chemical Company 123 Main St. Anywhere , NY, USA 1-800-000-1111

To Create NFPA 704 label:

Step 1: Collect information on hazards from applicable sections of SDS. Some SDSs may provide the NFPA diamond symbol with hazard rating numbers filled in already. Note: Do NOT use the hazard category numbers given in section 2 of HazCom 2012 compliant SDS on 704 label!

If the diamond is not provided on the SDS you can obtain the information under the following sections of the SDS. Note that additional information may be provided in other sections of the SDS.

- Health hazard information under Section 11
- Flammability information under Section 9
- Instability information under Section 10
- Special information under Section 9, 10, 11

Step 2: Obtain current edition copy of NFPA 704 or view on line at *www.nfpa.org/704.* Compare the criteria on the SDS sections as shown above with the criteria shown in Tables 5.2 (Health), 6.2 (Flammability), 7.2(Instability) and 8.2(Special Hazards)

Step 3: Place numbers for the degree of hazard associated with the criteria obtained in Step 2 in the correct quadrant of NFPA 704 placard.

NFPA Label for NOMIXUP 7042012

For more information:

National Fire Protection Association
www.nfpa.org | 800.344.3555

OSHA®

Occupational Safety and Health Administration
U.S. Department of Labor
www.osha.gov | 800.321.OSHA (6742)

OSHA® QUICK CARD™

Hazard Communication Standard Pictogram

As of June 1, 2015, the Hazard Communication Standard (HCS) will require pictograms on labels to alert users of the chemical hazards to which they may be exposed. Each pictogram consists of a symbol on a white background framed within a red border and represents a distinct hazard(s). The pictogram on the label is determined by the chemical hazard classification.

HCS Pictograms and Hazards

Health Hazard	Flame	Exclamation Mark
• Carcinogen • Mutagenicity • Reproductive Toxicity • Respiratory Sensitizer • Target Organ Toxicity • Aspiration Toxicity	• Flammables • Pyrophorics • Self-Heating • Emits Flammable Gas • Self-Reactives • Organic Peroxides	• Irritant (skin and eye) • Skin Sensitizer • Acute Toxicity (harmful) • Narcotic Effects • Respiratory Tract Irritant • Hazardous to Ozone Layer (Non-Mandatory)
Gas Cylinder	**Corrosion**	**Exploding Bomb**
• Gases Under Pressure	• Skin Corrosion/ Burns • Eye Damage • Corrosive to Metals	• Explosives • Self-Reactives • Organic Peroxides
Flame Over Circle	**Environment** (Non-Mandatory)	**Skull and Crossbones**
• Oxidizers	• Aquatic Toxicity	• Acute Toxicity (fatal or toxic)

For more information:

OSHA® Occupational Safety and Health Administration

U.S. Department of Labor

www.osha.gov (800) 321-OSHA (6742)

OSHA 3491-02 2012

OSHA® DATOS RÁPIDOS

Pictograma para la norma sobre la comunicación de peligros

A partir del 1.° de junio de 2015, la norma de comunicación de peligros (HCS, por sus siglas en inglés) exigirá pictogramas en las etiquetas para advertir a los usuarios de los peligros químicos a los que puedan estar expuestos. Cada pictograma representa un peligro definido y consiste en un símbolo sobre un fondo blanco enmarcado con un borde rojo. La clasificación del peligro químico determina el pictograma que muestra la etiqueta.

Pictogramas y peligros según la HCS

Peligro para la salud • Carcinógeno • Mutagenicidad • Toxicidad para la reproducción • Sensibilización respiratoria • Toxicidad especifica de órganos diana • Peligro por aspiración	**Llama** • Inflamables • Pirofóricos • Calentamiento espontáneo • Desprenden gases inflamables • Reaccionan espontáneamente (autorreactivas) • Peróxidos orgánicos	**Signo de exclamación** • Irritante (piel y ojos) • Sensibilizador cutáneo • Toxicidad aguda (dañino) • Efecto narcótico • Irritante de vías respiratorias • Peligros para la capa de ozono (no obligatorio)
Botella de gas • Gases a presión	**Corrosión** • Corrosión o quemaduras cutáneas • Lesion ocular • Corrosivo para los metales	**Bomba explotando** • Explosivos • Reaccionan espontáneamente (autorreactivas) • Peróxidos orgánicos
Llama sobre círculo • Comburentes	**Medio ambiente** (No obligatorio) • Toxicidad acuática	**Calavera y tibias cruzadas** • Toxicidad aguda (mortal o tóxica)

Para más información:

OSHA® Administración de Seguridad y Salud Ocupacional

Departamento de Trabajo de los EE. UU.

www.osha.gov (800) 321-OSHA (6742)

OSHA® QUICK CARD™

Hazard Communication Standard Labels

OSHA has updated the requirements for labeling of hazardous chemicals under its Hazard Communication Standard (HCS). As of June 1, 2015, all labels will be required to have pictograms, a signal word, hazard and precautionary statements, the product identifier, and supplier identification. A sample revised HCS label, identifying the required label elements, is shown on the right. Supplemental information can also be provided on the label as needed.

For more information:

OSHA® Occupational Safety and Health Administration

(800) 321-OSHA (6742)
www.osha.gov

SAMPLE LABEL

CODE _____
Product Name _____

Product Identifier

Company Name _____
Street Address _____
City _____ State _____
Postal Code _____ Country _____
Emergency Phone Number _____

Supplier Identification

Hazard Pictograms

Signal Word
Danger

Hazard Statements

Highly flammable liquid and vapor.
May cause liver and kidney damage.

Precautionary Statements

Keep container tightly closed. Store in a cool, well-ventilated place that is locked.
Keep away from heat/sparks/open flame. No smoking.
Only use non-sparking tools.
Use explosion-proof electrical equipment.
Take precautionary measures against static discharge.
Ground and bond container and receiving equipment.
Do not breathe vapors.
Wear protective gloves.
Do not eat, drink or smoke when using this product.
Wash hands thoroughly after handling.
Dispose of in accordance with local, regional, national, international regulations as specified.

In Case of Fire: use dry chemical (BC) or Carbon Dioxide (CO_2) fire extinguisher to extinguish.

First Aid
If exposed call Poison Center.
If on skin (or hair): Take off immediately any contaminated clothing. Rinse skin with water.

Supplemental Information

Directions for Use
_____
_____
_____

Fill weight: _____ Lot Number: _____
Gross weight: _____ Fill Date: _____
Expiration Date: _____

OSHA 3492-02 2012

OSHA® DATOS RÁPIDOS

Etiquetas para la norma sobre la comunicación de peligros

De acuerdo con su norma de comunicación de peligros (HCS, por sus siglas en inglés), la OSHA ha actualizado los requisitos para las etiquetas de los productos químicos peligrosos. A partir del 1.° de junio de 2015, se exigirá que todas las etiquetas incluyan pictogramas, una palabra de advertencia, indicaciones de peligro, consejos de prudencia, identificación del producto y la identificación del proveedor. A la derecha se presenta la muestra de una etiqueta modificada de acuerdo con la HCS, que indica los elementos obligatorios. La etiqueta puede contener también información suplementaria según sea necesario.

Para más información:

OSHA® Administración de Seguridad y Salud Ocupacional

(800) 321-OSHA (6742)
www.osha.gov

ETIQUETA DE MUESTRA

CÓDIGO _____
Nombre del producto _____

Identificación del producto

Nombre de la empresa _____
Dirección_____
Ciudad_____ Estado_____
Código postal_____ País_____
Número de teléfono de emergencia_____

Identificación del proveedor

Pictogramas de peligro

Palabra de advertencia

Peligro

Líquido y vapores muy inflamables.
Puede provocar daños al hígado y a los riñones.

Indicaciones de peligro

Mantener el contenedor herméticamente cerrado.
Guardar en un lugar fresco, bien ventilado y cerrado bajo llave.
Mantener alejado de fuentes de calor, chispas o llama abierta. No fumar.
Usar sólo con herramientas que no generen chispas.
Usar equipo eléctrico a prueba de explosiones.
Tomar medidas de precaución contra descargas estáticas.
Fijar y conectar a tierra el equipo contenedor y receptor.
No respirar los vapores.
Usar guantes protectores.
Abstenerse de comer, beber o fumar cuando se usa este producto.
Lavarse muy bien las manos después de manejar este producto.
Desechar el producto según las especificaciones y los reglamentos locales, regionales, nacionales e internacionales.

En caso de incendio: usar un extintor de polvo químico (tipo BC) o de bióxido de carbono (CO_2).

Primeros auxilios
Si hay exposición a este producto, llamar al Centro de Control de Intoxicaciones.
En caso de contacto con la piel o el cabello: quitarse de inmediato toda la ropa contaminada. Lavarse la piel con agua.

Consejos de prudencia

Información suplementaria

Instrucciones de uso
_____
_____
_____

Peso lleno:_____ Número de lote:_____
Peso bruto:_____ Fecha de llenado:_____
Fecha de caducidad:_____

OSHA® QUICK CARD™

Hazard Communication Safety Data Sheets

The Hazard Communication Standard (HCS) requires chemical manufacturers, distributors, or importers to provide Safety Data Sheets (SDSs) (formerly known as Material Safety Data Sheets or MSDSs) to communicate the hazards of hazardous chemical products. As of June 1, 2015, the HCS will require new SDSs to be in a uniform format, and include the section numbers, the headings, and associated information under the headings below:

Section 1, Identification includes product identifier; manufacturer or distributor name, address, phone number; emergency phone number; recommended use; restrictions on use.

Section 2, Hazard(s) identification includes all hazards regarding the chemical; required label elements.

Section 3, Composition/information on ingredients includes information on chemical ingredients; trade secret claims.

Section 4, First-aid measures includes important symptoms/effects, acute, delayed; required treatment.

Section 5, Fire-fighting measures lists suitable extinguishing techniques, equipment; chemical hazards from fire.

Section 6, Accidental release measures lists emergency procedures; protective equipment; proper methods of containment and cleanup.

Section 7, Handling and storage lists precautions for safe handling and storage, including incompatibilities.

(Continued on other side)

For more information:

OSHA® Occupational Safety and Health Administration

U.S. Department of Labor

www.osha.gov (800) 321-OSHA (6742)

OSHA 3493-02 2012

OSHA® QUICK CARD™

Hazard Communication Safety Data Sheets

Section 8, Exposure controls/personal protection lists OSHA's Permissible Exposure Limits (PELs); Threshold Limit Values (TLVs); appropriate engineering controls; personal protective equipment (PPE).

Section 9, Physical and chemical properties lists the chemical's characteristics.

Section 10, Stability and reactivity lists chemical stability and possibility of hazardous reactions.

Section 11, Toxicological information includes routes of exposure; related symptoms, acute and chronic effects; numerical measures of toxicity.

Section 12, Ecological information*
Section 13, Disposal considerations*
Section 14, Transport information*
Section 15, Regulatory information*

Section 16, Other information, includes the date of preparation or last revision.

*Note: Since other Agencies regulate this information, OSHA will not be enforcing Sections 12 through 15 (29 CFR 1910.1200(g)(2)).

Employers must ensure that SDSs are readily accessible to employees.
See Appendix D of 29 CFR 1910.1200 for a detailed description of SDS contents.

For more information:

OSHA® Occupational Safety and Health Administration

U.S. Department of Labor

www.osha.gov (800) 321-OSHA (6742)

OSHA 3493-02-2012

DUCOMM PROCEDURE MANUAL

Purpose

The effective assignment of appropriate manpower and apparatus is essential in effective emergency service operations. In order to complete the mission, embers of the Department both on duty and off must be rapidly and accurately notified on the requests for our service received by DuComm.

To accomplish the stated purpose, the DuComm Procedure Manual is included by reference as Operations Policy 003.

RADIO COMMUNICATIONS PROCEDURE

Purpose

This policy establishes procedures to be used when operating fire department radios for communications necessary for the sharing of vital information between companies and personnel.

Scope

This policy applies to all fire department personnel and at all times. Incidents of an emergency nature are particularly sensitive to prompt, concise and understandable communications in order to provide the safest possible incident scene. This policy applies to all radios, including mobile, base and portables and applies to all frequencies operated under licensure of the Hanover Park Fire Department, DuPage Public Safety Communications (DuComm) or MABAS.

1. Equipment

1.1. The fire department operates fixed, mobile and portable radios operating on both VHF and UHF frequencies. All frequencies are licensed by the FCC through DuComm.

1.2. The fire department regularly operates on the following VHF frequencies:

1. Fire West
2. IFERN
3. Fireground Red
4. Fireground White
5. Fireground Blue
6. Fireground Gold
7. Fireground Black
8. Fireground Gray
9. IREACH
10. Public Works
11. MERCI 340
12. MERCI 400
13. Fire North
14. Fire East
15. Fire South
16. South Elgin

1.3. In addition, the fire department operates 800Mhz portable radios used for communicating with mutual aid agencies.

1.4. Interoperability with the Village of Hanover Park Police Department is accomplished using UHF mobile radios in selected apparatus and incident command vehicles.

2. Procedure

2.1. Apparatus radios, portable radios, and base stations are to be used for emergency communications only. Brief messages of an important nature may be broadcast when other means of notification would not be advantageous.

2.2. All radio traffic is to be in plain English; 10-codes are not to be used. When referencing the Hanover Park Fire Department equipment or personnel always use the term “Hanover Park” and not just “Hanover”. Any other slang or abbreviated references are prohibited.

2.3. All radio dispatches and communications are to be in accordance and compliance with the DuComm Procedure Manual, specifically Fire Desk Procedures, Section 8.1 through 8.14 and any

subsequent amendments or additions. The DuComm Procedure Manual, and all future modifications or editions, shall be Appendix A of this policy.

2.4. Items not contained in the DuComm Procedure Manual (Appendix A) because they are unique to Hanover Park shall be included in the DuComm Channel Guide for Hanover Park Fire Department and shall be Appendix B of this policy.

2.5. All equipment is to be referred to by their assigned apparatus radio identifier. All personnel will be identified using their individual radio identifier when not working as a member of an assigned company. Proper names are not to be used when communicating over open radio frequencies.

2.6. All issues involving DuComm shall be submitted to the Operations Assistant Chief on a DuComm Incident Clarification Form

Appendix A DuComm Procedure Guide

Refer to the DuComm Policy Book

Appendix B Hanover Park Fire Channel Guide

I. Station Information

Station #1
6850 Barrington
736-6800
Speed Dial ***#051***
Districts 1, 3, 5, 7
PL # 4161

365 ALS Engine
361 Engine (Reserve)
370 Squad (Hazmat)
371 Tower Ladder (Jump)

381 ALS Medic (Jump)
383 ALS Medic (Reserve)

Station #2
3855 County Farm
736-6880
Speed Dial ***#052***
Districts 2, 4, 6, 8, 99
PL #4163

362 ALS Engine
364 Engine (Reserve)
382 ALS Medic
352 Investigation Van (Reserve Command Van)

Haz Mat Trailer
MABAS Div 12 HazMat Trailer 2
374 Rehab Vehicle

Manpower:

Station 1:	1 Fire Crew	1 Medic Crew	Shift Commander
		(Medic and Truck are a Jump Crew)	
Station 2:	1 Fire Crew	1 Medic Crew	
		(Engine and Squad are a Jump Crew)	

MABAS (Tower 371 Staffing)

- MABAS request for the tower will be staffed by the ambulance jump company; the officer in charge will assign the third firefighter.
- MABAS request for the tower when the ambulance is on a request for service will be staffed by the engine company; the officer in charge may ask for an additional tone out for station standby.
- MABAS request for the tower shall be denied when the ambulance and engine at station one are not available.
- Request for the MABAS Division 12 Hazmat Trailer shall be dispatched using the Full Still tone and will be staffed by the on-duty staff from Station 1.

IN TOWN (Tower 371 Staffing)

- **FULL STILL** - DO NOT Replace TOWER 371 if it's not available.
- **GENERAL** - Replace TOWER 371 if it's not available.

II. EMS Call Responses

**** All 2nd and higher Calls, EMS and/or FIRE, are a FULL STILL tone ****

1st Call	***Z26 EMSAlert and STILL Tone***	Name district Medic (and Engine if appropriate)
2nd Call	***Z26 EMSAlert and FULL STILL***	Name district Engine and other Medic
3rd Call	***Z26 EMSAlert and FULL STILL***	Name available Engine and Mutual Aid Medic

Breathing Problems ***(6M)***	Medic and Engine
Burns / Explosions ***(7M)***	Medic and Engine
Carbon Monoxide / Inhalation / Hazmat ***(8M)***	Medic and Engine
Cardiac / Respiratory Arrest ***(9M)***	Medic and Engine
Chest Pains ***(10M)***	Medic and Engine
Convulsions / Seizures ***(12M)***	Medic and Engine
Diabetic Problems ***(13M)***	Medic and Engine
Drowning (near) / Diving Accidents ***(14M)***	Medic and Engine
Electrocution ***(15M)***	Medic and Engine
Falls / Back Injuries Traumatic ***(17M)***	Medic and Engine
Heart Problems ***(19M)***	Medic and Engine
Inaccessible Incident/ Other Entrapments (non-vehicle) ***(22M)***	Medic, Engine and Shift Commander
Overdose / Ingestion / Poisoning ***(23M)***	Medic and Engine
Pregnancy / Childbirth / Miscarriage ***(24M)***	Medic and Engine
Psychiatric / Suicide Attempt ***(25M)***	Medic and Engine
Stab / Gunshot Wound ***(27M)***	Medic, Engine and Shift Commander
Stroke (CVA) ***(28M)***	Medic and Engine
Traffic Accident w/ Injuries ***(29M)***	Medic, Engine and Shift Commander
Injury From An Accident (PD on the scene) ***(29PD)***	Medic and Engine
Unconscious / Fainting (Non-Traumatic) ***(31M)***	Medic and Engine
Unknown Problem / Man Down ***(32M)***	Medic and Engine

Traffic Accident w/ Extrication ***(F800)*** — ***FULL STILL***. Name No One. Engine, Medic, Squad and Shift Commander will respond.

Mutual Aid Ambulance Procedures by District

District ONE	District TWO	District THREE	District FOUR	District FIVE
Streamwood	BR M2	Streamwood	Bloomingdale	BR M1
BR M1	Bloomingdale	Roselle	Roselle	Streamwood
Hoffman Estates	Roselle	Hoffman Estates	BR M2	Bloomingdale
Schaumburg	CR 230	Schaumburg	CR 230	Elgin

District SIX	District SEVEN	District EIGHT
CR 230	Bloomingdale	CR 230
BR M2	Roselle	Bloomingdale
Bloomingdale	BR M1	BR M2
GS 710	Streamwood	GS 710
WG 820	CR230	WG 820

III. Incident Responses (Fire Calls)

**** All 2nd and higher Calls, EMS and/or FIRE, are a FULL STILL tone ****

Still Alarms

1st Call	***Z26 Station Still and STILL Tone***	Name district Engine.
2nd Call	***Z26 Station Still and FULL STILL Tone***	Name other Engine. *(Announce as a 2nd Still)*
3rd Call	***Z26 Station Still and FULL STILL Tone***	Advise Shift Commander and see if they want Auto Aid. *(Announce as a 3rd Still)*

Full Still Alarms

Use the ***Z26 Station Still and FULL STILL*** tones and any Auto Aid tones. Name any Auto Aid companies due. Two Engines, One Truck, Medic and Shift Commander are due.

(Keeping in mind that off-duty personnel may respond in un-manned equipment during call backs)

General Alarms

General Alarms will always include Bartlett and Streamwood, and may also include other Auto Aid.

Use ***Z26 Station Alert and GENERAL*** (3 Dept stacked) tones. Name any Auto Aid (including Bartlett and Streamwood) companies due.

Special District Information

County Farm/Army Trail - Dual District with ***CRFD*** EMS and FIRE. ***** District 99 *****

Special Responses

Major Incidents/Working Fires- Off duty shift commanders may respond to assist incident command on these types of incidents. When they do please advise command they are responding. Their radio signatures are:
303 (B/C Pikora), **304** (B/C Ames) and **305** (B/C Larsen).

Call Backs When requested use the ***Z26 Station Still and FULL STILL*** tones for a station/stations standby.

Box 998 - Strategic National Stockpile Request

Bomb Threats -***Z26 Station Still and STILL*** tones. Dispatch as ***"Code-1."*** The Shift Commander will respond non-emergency.

Special Responses

Request for Chief Requests for the Chief will be dispatched using the CHIEF TONE

Public Works Response Emergency Traffic Control (Barricade Trailer) – Page PW Supervisor Scott Weber at 630.878.7027. If no answer call the HP Police Desk at 630.372.4400 and ask that the on-call public works employee be paged.

When ***HAFD Incident Command*** requests DU-COMM to page the ***Chief's***, page them to the Commander's Nextel (306) by sending "306" as the return number.

Chief Craig Haigh ***Nextel:*** 630.675.0267
A/C Ken Zaccard ***Nextel:*** 630.675.1672

Extrication/Rescue Procedures

Extrications are toned using the ***FULL STILL*** & ***CHIEF*** tones.

Rescues are toned using the ***FULL STILL*** & ***CHIEF*** tones.

Auto/Mutual Aid Toning Procedures

Ambulances are toned using the ***STILL*** tones.

Automatic Aid Fire Equipment are toned using the ***FULL STILLS*** tones.

Mutual Aid and Change of Quarters Fire Equipment are toned using the ***FULL STILL*** tones.

Mutual/Auto Aid requests for Chiefs are to be dispatched using the **CHIEF** tone.

IV. Special Departmental Information

Special Teams

Hazmat Techs are due on any MABAS Division 2 request for Hazmat Techs
Requests for Hazmat Techs or Hazmat Teams shall be dispatched using the Full Still & CHIEF Tone as “Callback for HazMat Technicians, Repeat, follow with ‘all Hazmat techs should report to Station 1.” Squad 370 will be utilized, for the call out.

V. Fire Department Personnel/Contact Information

Chief

Craig Haigh (300) ***Home:*** 630.540.1209 ***Nextel:*** 630.675.0267

Assistant Chief

Ken Zaccard (301) ***Home:*** 630.830.7351 ***Nextel:*** 630.675.1672

Officer Information

B/C Pikora (303)	*Shift Commander St#1*	***Home:*** 630.736.9683	***Nextel:*** 630.675.1076
B/C Ames (304)	*Shift Commander St#1*	***Home:*** 630.830.0798	***Nextel:*** 630.675.2846
B/C Larsen (305)	*Shift Commander St#1*	***Home:*** 847.683.7858	***Nextel:*** 630.675.2756
Lt. Hish	*St#2 Lieutenant*	***Home:*** 630.830.0313	
Lt. Nocks	*St#2 Lieutenant*	***Home:*** 815.728.9277	
Lt. Hite	*St#2 Lieutenant*	***Home:*** 847.841.7924	***Cell***: 224.659.8536
Lt. John Doubek	*St#1 Lieutenant*	***Home:*** 847.717.6490	***Cell:*** 847.652.1077
Lt. Roger Bayne	*St#1 Lieutenant*	***Home:*** 847.488.9138	***Cell:*** 847.902.4100
Lt. Paul Rosenthal	*St#1 Lieutenant*	***Home:*** 630.213.0611	

Shift Commander will use radio designator 306, all other officers will use the apparatus designator.

Shift Assignments

	Black	**Red**	**Gold**
Station #1	B/C Jeannine Ames (Training Ofcr) Lt. Roger Bayne	B/C Pikora (Prev) Lt. John Doubek	B/C Jim Larsen (EMS Ops) Lt. Paul Rosenthal
Station #2	Lt. James Hite	Lt. Richard Hish	Lt. Darren Nocks

**** Lieutenant at Station One is Shift Commander ****

Departmental Cell Phone Numbers

Chief Craig Haigh (300)	630.675.0267
A/C Ken Zaccard (301)	630.675.1672
Shift Commander (306)	630.675.1077
Engine 365	630.675.1846
Engine 361	630.675.1891
Medic 381	630.675.1922
Medic 382	630.675.1923

Fire Prevention Bureau Information

FAX number for the weekly alarm board Follow Up: ***630.736.6810***

Chaplain Contact Information

Radio ID is 399
Request for tone out use Chief Tone as “Fire Dept Chaplain contact…”
Chaplain Jennie Swanson 630.479.1970

Fire Investigator/Group Paging Information

See page 6 for instructions.

VI. Emergency Weather Procedures

- DuComm will activate the Hanover Park General tones for any Severe Weather Warnings.
- Refer to procedure 7.5 (Emergency Weather Activation - Fire Desk) for severe weather handling guidelines.

VII. ESDA

ESDA is handled through the Hanover Park Police Department.

Fire Investigator Call Out Instructions

The order in which fire investigators are called is based on a rotating schedule determined by the shift the incident occurs on. Investigators from the shift previous to the incident will be contacted first. Investigators from the next on coming shift will be contacted second.

A fire scene photographer should be contacted for all investigation call outs.

Incident Shift	First Call Out	Second Call Out
First Shift (BLACK)	Third Shift (GOLD)	Second Shift (RED)
Second Shift (RED)	First Shift (BLACK)	Third Shift (GOLD)
Third Shift (GOLD)	Second Shift (RED)	First Shift (BLACK)

(For each Investigator, the phone number in **BOLD** should be called first)

DUTY SHIFT	NAME	HOME	CELL
1st (B)	B/C Jeannine Ames (304)	630.830.0798	630.675.2846
1st (B)	Anthony Welnowski (392)		630.669.4554
1st (B)	Marc Montalbano (369)	630.855.3199	630.514.9645
1st (B)	Lt.Jim Hite (358)	847.841.7924	224.659.8536
2nd (R)	Dean Deldin (391)	630.830.1987	
2nd (R)	John Doubek (393)	847.717.6490	847.652.1070
2nd (R)	B/C Larry Pikora	630.736.9683	630.965.3434
3rd (G)	Dana Valentino (395)	847.531.5953	630.853.5160

Fire Scene Photographer

Incident Shift	Name	Duty Shift	Home	Cell
All	A/C Ken Zaccard (303)	M-F	630.830.7351	630.675.1672

INITIAL TACTICAL HOSE LAYS

Purpose

This tactical plan will provide the first arriving company a tactical framework to operate within and to allow late arriving companies an understanding of what they may be expected to do and or how to support the operations that are underway.

1. Definition

1.1 Tactical Plan 1

1.1.1 Tactical Plan 1 is a 1 ¾" 200' pre-connected attack line. This line is used when the incident commander is confident that a 1 ¾" hose line will supply an appropriate fire flow for the planned attack and the water carried on the apparatus is sufficient to handle the incident.

1.1.2 It must be understood that if this plan is chosen the second engine may be expected to drop a supply line and proceed to a hydrant. (This will include backing down the street to the engineer operating at the scene. Backing down makes it easier for the second engine to lead out if the incident grows.). If the first engine is operating alone (no second engine following) the engineer may have to lay a hydrant line from the engine to the nearest hydrant by hand. This procedure will insure a continued water supply should it become necessary.

2.1 Tactical Plan 2

2.1.1 Tactical Plan 2 is a 2 ½" attack line with 300' of 2 ½" and 300' of 3". This line has a solid stream shut off pipe and 100' of 1 ¾" hose with an adjustable steam nozzle attached (or smooth bore based on officer selection). A Plan 2 allows the company to attack the incident with a highly maneuverable line capable of flowing in excess of 180-200 gpm. The attack line can be rapidly converted to a single heavy stream hand line capable of applying 320 gpm for rapid knock down should the situation require. The playpipe should be located as close as advantageously possible to the area of involvement and enough 2 ½" line available to allow advancement to the seat of fire if necessary.

2.1.2 In a Plan 2, the pump operator must be prepared to assist with the lead out, and then drive from the incident to a hydrant. Firefighters should expect to use this plan in any heavily involved structure fire. When given the order to lead out (after the firefighters have taken sufficient hose from the bed) the operator drives the engine to the hydrant and attaches the attack line to the appropriate pump discharge and sends tank water. After sending tank water, the operator attaches the 4" soft sleeve to the hydrant to insure a water supply sufficient to sustain the attack. Prior to connecting to the hydrant, it is highly recommended that the pump operator flush it to remove any possible debris collected inside the barrel. This lead out will allow truck and squad companies to have immediate access to the building (the front) making their operations in support of the engines attack more efficient.

2.2 "Minute Man"

2.2.1 The "Minute Man" is 400' of 2 ½" hose loaded in a modified minuteman with the couplings exposed at the back of the bed. The hose is stacked in four 100' bundles with a solid stream shut off pipe attached to the first bundle.

2.2.2 The "Minute Man" allows a 400' stretch of 2½" line from a supply source (engine, gated wye, standpipe, etc.). It also allows the line to be broken into individual 100' sections that can be used for supplying sprinkler and or standpipe connections and as an attack line.

2.3 Tactical Plan 3

2.3.1 Tactical Plan 3 is a 4" line 650' long with a 2 ½" gated wye attached.

2.3.2 The Tactical Plan 3 normally is used to either feed multiple 3" lines connected to a master stream or ladder pipe or feed two 2 ½" handlines. When utilizing the Plan 3, the second due engine will bring at a minimum of 100' of 2 ½" line for a second 2 ½" inch stretch to the wye.

2.3.3 In a Plan 3, the incident requires that a heavier attack be mounted to confine the fire. A Plan 3 is appropriate whenever the incident involves large buildings or heavy spreading fire exposing other structures.

2.3.4 It should be understood that the engine initiating a Plan 3 will have to attach appropriate attack lines to the gated wye; these lines must be removed from either the Minute Man bed or the Plan 2 bed and attached to the wye to begin their attack on the fire. The next arriving engine will also attach their Minute Man line or Plan 2 line to the gated wye. The first engine pump operator must drive to a hydrant to insure a water supply sufficient for this plan. The second engine pump operator may be included in the attack team or utilized in some other capacity if command determines the need.

2.4 Tactical Plan 4

2.4.1 Tactical Plan 4 is a combination of Plan 2 and 3. This lead out is used in those situations requiring at least three heavy streams or a combination of a heavy streams and a master stream.

GENERAL FIRE GROUND TACTICAL OPERATIONS

Purpose: To provide a basic tactical outline for common fire emergencies.

1. Typical Structure Fire Procedures:

1.1 During interior attack operations, the principle of coordinated fire attack using "vent and enter" shall be applied whenever feasible.

1.1.1 Crews entering the structure for an offensive attack should coordinate with an outside vent crew to assure that appropriate widows are opened to serve as an exhaust vent for products of combustion and steam being pushed ahead of the flowing nozzle.

1.1.2 Outside ventilation crews need to normally delay the opening of windows and / or doors until the interior crew is in position in an attempt to control the oxygen flow into the structure.

1.2 Size-up will be conducted in accordance with the provisions of the acronym: COAL WAS WEALTH:

C Construction
O Occupancy
A Apparatus & Manpower
L Life Hazard

W Water Supply
A Auxiliary Appliances
S Street Conditions

W Weather
E Exposures
A Area of Structure
L Location & Extent of Fire
T Time of Day
H Height of Structure

1.2.1 The decision on which tactical hose lay to implement must be based on the size-up.

1.2.1.1 "Rapid Attack" is normally accomplished using the Tactical Plan 1.

1.2.1.2 The second due engine must be notified of this operation so they can prepare to secure a positive water source.

1.2.2 A Tactical Plan 2, 3, or 4 will be used at the discretion of the company officer when the volume of fire is such that an expected sustained fire flow greater than 200 gallons per minute is expected.

1.3 First Line Objectives:

1.3.1 Generally advanced through the unburned portion of the structure and/or regular entry doorway into the building.

1.3.2 Typical lead-out for an involved structure is a Tactical Plan 2. The 2 ½" Playpipe should be positioned near the entrance of the structure with sufficient 2 ½" in reserve to allow advancement if necessary.

1.3.3 The objectives of the first line are:
1.3.3.1 Confine the fire to support crews performing the Primary Search.
1.3.3.2 Protect and control the stairway (if present).
1.3.3.3 Position the line between any possible victims and the fire.
1.3.3.4 Attack and extinguish the fire if no need exists to perform the above functions.

1.3.4 Second Line Objectives:

1.3.4.1 Pass the first line (confinement line) and attack and extinguish the fire.

1.3.4.2 Back-up to the first line if it is inadequate for the main body of the fire, or if multiple fires.

1.3.4.3 Position at an upper floor to cut off fire extension and/or overhaul.

1.3.4.4 Position the line at an entrance to the basement to back-up and protect the first line during a basement fire.

1.3.5 Third Line Objectives:

1.3.5.1 Purpose and objective usually determined by the incident commander. Use extreme caution to avoid opposing streams.

1.3.5.2 Extinguish numerous concealed space fires or multiple fires throughout the structure.

1.3.5.3 To cover exposures as necessary.

1.4 Exterior Attack

1.4.1 Objectives of an exterior line are:

1.4.1.1 Effect an obvious rescue by rapidly knocking down heavy fire involvement on the interior of a structure (nozzle should be operated in a straight stream pattern to avoid pushing the fire onto the trapped victims).

1.4.1.2 Rapidly knock down heavy fire involvement before making an offensive interior attack. An exterior attack should never be implemented when crews are operating inside the structure.

1.4.1.3 Protect any involved exposures

1.4.1.4 Exterior attack on the structure when it is totally involved or too dangerous to support interior operations.

1.4.2 Second exterior line objectives:

1.4.2.1 Additional high volume water flow required to extinguish fire.
1.4.2.2 Concentration on another part of the exposure, or a second exposure
1.4.2.3 Concentration on the fire building while the first line is protecting exposures

1.5 Deck Gun "Blitz Attack"

1.5.1 Used as initial rapid exterior attack:

1.5.1.1 Immediate high water flow on a fast spreading interior fire

1.5.1.2 Used to slow or stop a fast spreading fire

1.5.1.3 Provides a rapid flow of water on an involved exposure

1.5.1.4 Used in conjunction with adequate hose lines to further confine and extinguish the fire.

1.5.2 Precautions of the "Deck Gun Blitz Attack":

1.5.2.1 May "push" fire into uninvolved areas or spaces. Hand lines must be prepared to enter rapidly after knockdown.

1.5.2.2 No hydrants in the immediate area

1.5.2.3 Must be used with a solid stream tips or on straight stream – no fog patterns.

1.5.2.4 ENGINE COMPANY MUST BE ALERT TO INTERIOR ATTACK COMPANIES. (WARN BEFORE APPLICATION)

2. **Multi-family Dwellings**:

2.1 Defined as any multiple housing structure no greater than 3 stories in height. (Any structure greater than 3 stories may require high rise operations)

2.2 Duplex, condominium, townhouse, quad style home, and apartment structures are considered multiple family dwellings.

2.3 In most cases, multi-family dwelling fires will require multiple hose lines and multiple truck company operations

2.4.1 Consideration should be given to the deployment of a Tactical Plan 4 if the size-up indicates heavy fire involvement or extension into adjoining units.

2.5 Size Up:

2.5.1 The initially arriving officer should attempt an exterior size-up of all sides of the structure. In most cases due to the size of many multiple-family dwellings, a complete exterior size-up may not be possible.

2.5.2 Information sources are occupants, neighbors, maintenance people, and police officers concerning the location, extent of fire, and any trapped victims.

2.6 A Tactical Plan that utilizes a hydrant lead-out will be used in most situations involving multi-family structures. The “Quick Water” operation will only be employed during unusual situations such as:

2.6.1 “Dead” hydrants in the complex (broken water mains)
2.6.2 Inoperable hydrants (frozen or damaged)
2.6.3 No available hydrants in the complex

2.7 Interior size-up should be attempted if practical or possible. During an interior size-up the following should be checked:

2.7.1 Most accessible means to the fire area
2.7.2 Most appropriate stairwell to reach the fire area
2.7.3 Length of the lead-out
2.7.4 The smoke, heat and fire conditions

3. Industrial and Commercial Fires

3.1 Size Up

3.1.1 The initial arriving officer and then the incident commander should attempt to see all exterior sides of the structure. In many cases this may not be possible due to the size of the structure. If pre-plans are available they should be utilized.

3.1.2 The officer of the first due engine will obtain any available information from civilians, maintenance people, building engineers, fire brigade personnel, or police concerning the location, extent of the fire, and any trapped victims.

3.2 A Tactical Plan that utilizes a hydrant lead-out will be used in most situations involving multi-family structures. The "Quick Water" operation will only be employed during unusual situations such as:

3.2.1 "Dead" hydrants in the complex (broken water mains)
3.2.2 Inoperable hydrants (frozen or damaged)
3.2.3 No available hydrants in the complex

3.3 Interior size-up should be attempted if practical or possible. During an interior size-up the following should be checked:

3.3.1 Most accessible means to the fire area
3.3.2 Most appropriate stairwell to reach the fire area
3.3.3 The smoke, heat and fire conditions
3.3.4 The length of the lead-out or availability of standpipes
3.3.5 The condition of the roof:

3.3.5.1 If possible from interior,
- Visual signs of weakness
- Fire in contact with roof support

3.5.5.2 Size-up from the truck operations on the roof
- Signs of fire break through
- Signs of roof structural weakness

3.4 First Due Engine:

3.4.1 Committed to an attack using hand lines or heavy caliber streams

3.4.1.1 First due engine typically will position on the side of the structure that is most advantageous for the fire attack and in sprinkler or stand piped buildings connect to the Siamese if possible.

3.5 Second Due Engine

3.5.1 If the first due engine has connected to the Siamese, ensure the first due engine has a secure water source and / or be prepared to reverse from the first due to the municipal water system hydrant.

3.5.2 If the first due has not connected to the installed system, connect to system and ensure a water positive water source from a municipal water system.

3.5.3 Once the building system has been supplied:

3.5.1.1 Assist with the first line or heavy caliber stream
3.5.1.2 Relieve manpower on the first interior line
3.5.1.3 Provide a second line to:

3.5.1.3.1 Backup the first line
3.5.1.3.2 Provide another point of vantage for the fire attack

3.6 Third and Fourth Due Engines:

3.6.1 Positions and assignments will be made at the discretion of the incident commander.

4. **Vehicle Fires**

4.1 Fires in vehicles outside of structures. Tactical considerations and safety precautions to be addressed

4.1.1 Inherent dangers of a burning vehicle
4.1.2 Passing traffic during extinguishment
4.1.3 Possible electrical hazards
4.1.4 Exposure to Buildings
4.1.5 Officer to determine safest approach for extinguishment based on:
4.1.5.1 Position of burning vehicle
4.1.5.2 Direction and closeness of passing traffic

4.2 Overall volume of water needed will be based on
4.2.1 Type of vehicle burning (compact car as opposed to moving van)
4.2.2 Extent of fire
4.2.3 Spillage of fuel
4.2.4 Magnesium parts involved
4.2.5 Hazardous materials being carried on the vehicle

4.3 If vehicle is well involved in fire, the initial stream should be directed from a distance as a straight stream.

4.4 After initial knockdown the vehicle should be approached for extinguishment and overhaul.

5. **Rubbish and Dumpster Fires**:

5.1 Tactical considerations and safety precautions to be addressed:

5.1.1 Area of fire:

5.1.1.1 Construction area
5.1.1.2 Roadway
5.1.1.3 Closeness to structures of other combustibles

5.1.2 Contents of rubbish (consider haz-mat potential)

5.1.2.1 Medical waste
5.1.2.2 Industrial waste
5.1.2.3 Chemical waste

ENGINE COMPANY OPERATIONS

Purpose

An engine company is the foundation that fire department operations are built upon. The engine provides the extinguishing capability. All other options or apparatus work to assist the engine company with fire extinguishment. The purpose of standard apparatus manning is to ensure that we can meet the goals established by our mission at all times and that equipment has sufficient manpower to operate efficiently and safely at an emergency incident. Minimum manning assignments should always consider time for off duty and P.O.C. to respond unless first due response. Our mutual aid agreements establish a minimum level of manning to respond on a mutual aid request. In general this manpower commitment is three on an engine, truck or squad, two on an ambulance or less on specialty vehicle designed to require two or fewer people to place it in operation.

Scope

To accomplish the stated purpose it is necessary that all members assigned to engines understand the basic strategies involved in the tactics that will be applied.

The protection of life and property is the objective of an Engine Company at the scene of the emergency. The number one priority of safeguarding life applies equally to the general public and firefighting personnel. These standards will address procedures for command and company personnel.

1. Responsibility

1.1. The engine company's first general responsibility is life safety. An engine company may have a secondary role to support other companies' activities while working to accomplish their general responsibilities of:

Rescue – Exposure – Confinement – Extinguishment

1.2. The normal staffing of three personnel per engine company shall consist of: One Company Officer, one Engineer or driver and one Firefighter

1.3. The apparatus and all of its equipment and supplies shall be checked daily after morning roll call and subsequently after each use to ensure a state of readiness.

1.4. SCBA shall be checked according to daily inspection procedures.

1.5. All personnel will be familiar with both the operation of and locations of all tools and equipment carried on all apparatus.

1.6. Nozzles will be checked as follows:

1.7. Nozzles and tips to be securely hand tightened to the hose.

1.8. Combination nozzles are to be checked to ensure that they are not clogged by debris and are set in a straight stream pattern. All nozzles (except 1 ¼ playpipe on Plan 2) should be in a shut off position.

1.9. Configuration of hose and nozzle on the apparatus shall be uniform throughout the department.

1.10. The following information will describe the hose and nozzle configurations for the rear hose beds, pre-connects and high rise packs.

1.11. Left Bed consists of 4 – 100' stacks of 2 ½" hose with a combination fog nozzle attached and configured so as to allow access to each set of couplings. This hose can be used for fire attack or water supply.

1.12. Middle Bed consists of 100' of 1 ¾" hose with a combination fog nozzle and connected to a playpipe with a shut-off and 1 ¼" smooth bore nozzle and then connected to 600' of 2 ½" hose. This is an attack hose line.

1.13. Right Bed consists of 800' of 4" supply hose connected to a 4" X 2 ½" X 2 ½" gated wye.

1.14. Cross Lays (2) left lay and right lay consist of 200" 1 ½" pre-connected attack line, bedded as two shoulder loads.

1.15. Hose Packs 1 – 2 ½" and 1 - 1 ¾" hose pack each 100' carried in designated compartment.

2. Crew Responsibilities:

2.1. All engine company personnel are responsible for:
- 2.1.1. Receiving all information concerning the condition of the apparatus and equipment
- 2.1.2. The completing of the daily maintenance check forms, noting any maintenance problems and reporting same to the shift officer immediately
- 2.1.3. The routine cleaning of the apparatus
- 2.1.4. All other items as may be required on the daily work schedule as may from time to time be posted
- 2.1.5. Condition of hose bed, hose packs and nozzles
- 2.1.6. Condition of EMS equipment and hand tools

2.2. Company Officer
- 2.2.1. SCBA, hand light, keys and portable radio, halogen tool
- 2.2.2. Take command in accordance with policy
- 2.2.3. Announce size up
- 2.2.4. Order initial attack/assist with lead out
- 2.2.5. Maintain accountability of company personnel

2.3. Engineer:
- 2.3.1. Ensure location and proper operation of hydrant
- 2.3.2. Prepare the engine for pump operations as necessary

2.3.3. Be prepared to relay any radio information that may be necessary
2.3.4. Keep an inventory of all equipment removed from the apparatus during operations
2.3.5. Be prepared to assist with hose lead outs

2.4. Nozzleman (jump man):
2.4.1. SCBA, hand light, pick head ax
2.4.2. Hand pump or portable extinguisher as the situation dictates
2.4.3. Lead out hose as ordered
2.4.4. Other duties as assigned by the company officer

2.5. Hoseman:
2.5.1. SCBA, hand light
2.5.2. Assist with lead out (making certain hose is played out correctly)
2.5.3. Other duties as assigned by the company officer

3. Response Considerations

3.1. Still: The knowledge that one engine company must control the incident should prepare the company to request assistance as necessary.

3.2. Full Still Response: The knowledge that your company is first or second due for certain responses prepares the personnel for particular tactics on arrival.

3.3. First Due Engine:
3.3.1. Initiate attack plan according to conditions and size up
3.3.2. Responsible for preliminary radio reports
3.3.3. Provide initial hose lines

3.4. Second Due Engine:
3.4.1. Approach scene to ensure correct direction of lead out in support for first engine's attack plan (drive in, back in). Evaluate position and tactics taken by the first engine, then assist and/or back up
3.4.2. Supply fire sprinkler system
3.4.3. Supply attack lines or engine as required

3.5. General Alarm:
3.6. This response should alert the engine company to anticipate
3.6.1. Long hose lead outs
3.6.2. Relay operations
3.6.3. Supply master stream operations
3.6.4. May require double line lead out

4. Apparatus Placement:

4.1. The apparatus (engine) will be placed in a position advantageous to the attack chosen for the fire situation but should not block access to the fireground. Apparatus should be positioned on a corner of the building after completing a 3-sided size-up.

4.2. When operating at non-fire incidents, the apparatus will be placed in such a location as to not impede any other equipment from their proper location.

4.3. Factors to be considered when placing the apparatus are
- 4.3.1. Orders of the incident commander
- 4.3.2. Type of incident
- 4.3.3. Availability of water
- 4.3.4. Type of structure
- 4.3.5. Installed fire protection systems
- 4.3.6. Extent and travel of fire
- 4.3.7. Extent, travel and type of hazardous material
- 4.3.8. Life hazard
- 4.3.9. Truck company/squad company placement

5. Emergency Scene Operations:

5.1. All members must be familiar with and be prepared to implement incident commander in accordance with their duty assignment.

5.2. The prime objectives of fire fighting are; to protect life and property by performing rescues, locating, confining and extinguishing fires.

5.3. Strategy is the plan or course of action decided upon to reach the objectives decided upon for a particular incident.

5.4. Tactics are the operations or actions of companies to implement the strategy.

5.5. Size-up is an evaluation of the incident and its on-going process of evaluation of the situation and changes in the incidents priorities throughout the incident. Size-up starts upon receipt of the alarm and continues until the incident is completed. The responsibility for size-up lies with the officer of the first arriving company, and is transmitted by a preliminary communications report to DuComm (dispatch)

5.6. Life saving operations are placed ahead of property preservation particularly when sufficient firefighters are not available. (Reduced manpower, no truck or second engine on the scene), it should be kept in mind that an aggressive fire attack may reduce or eliminate the risk to life.

5.7. A life hazard, visible upon arrival must be dealt with immediately. However, immediate rescue without simultaneous and coordinated fire attack should be attempted only in very extreme cases. A hose line protects the rescuers.

5.8. Engine company actions to protect occupants:
- 5.8.1. Position hose line between the occupants and the fireProvide cross ventilation to draw fire, heat, smoke away from the occupants.
- 5.8.2. Remove victims using building exits
- 5.8.3. Provide visual and verbal contact to instruct occupants.

6. Locating the Fire:

6.1. Information gathered on the exterior can be made quickly upon arrival at the scene and will be part of making a size-up:
- 6.1.1. Type of occupancy
- 6.1.2. Building construction and dimensions
- 6.1.3. Building entrances and exits
- 6.1.4. Location of smoke and/or fire
- 6.1.5. Obtaining information from evacuees
- 6.1.6. Exposures
- 6.1.7. What is visible (smoke, flame, etc.)

6.2. Information gathered on the interior upon entry to the building:
- 6.2.1. Visible smoke, heat and/or fire
- 6.2.2. Sensed heat or sound of fire (concealed areas of a structure)
- 6.2.3. Information from evacuees
- 6.2.4. Stairways leading to that part of the building in which the fire is known or believed to be located

7. Confinement of the Fire:

7.1. Confining the fire means to “stop” any further advance and is the first step in the control and extinguishment of a fire.

7.2. Confinement must take into account the intensity and direction of travel of the fire. Closing a door or window may act to confine the fire allowing escape or trapped occupants.

7.3. An engine arriving alone should consider the fact that ventilation (horizontal) if done properly can confine the fire or limit its spread.

7.4. The first line stretched and operated is not necessarily the line that extinguishes the fire. The first line in a serious fire may be committed to confining the fire and preventing its extension throughout the building involved or nearby exposures.

7.5. Stream Positioning:

- 7.5.1 When human life is endangered the first stream is positioned between the fire and the occupants.
- 7.5.2 When human life is not endangered the first stream is positioned between the fire and the most severe exposure.

7.6. Additional hose lines:

7.6.1. A back up for the first line
7.6.2. Other directed positioning may be required, such as attack at another site or on another floor or in a common stairwell
7.6.3. Covers a secondary means of escape threatened by fire
7.6.4. To prevent extension into other areas
7.6.5. Covers other priorities as determined by the officer or incident commander

7.7. Rapid Exterior Attack (blitz)

7.7.1. Defined as directing a solid stream into the structure from an outside position. This attack can be useful when the fire has vented from a window or door through which firefighters must enter.

7.7.2. Attack on the interior of a heavily involved occupied building might be facilitated with this type of attack to gain access to the building for rescue and confinement. However, central considerations must be made before this attack is decided upon.

7.7.3. Can this attack be done and effect a rapid knockdown without pushing the fire into other areas.

7.7.4. Will it knock the fire down sufficiently to make an interior attack.

7.7.5. Will this attack endanger any occupants by exposure to stream, or “pushing” fire into unexposed areas.

Weekly Vehicle Checks

Purpose

This guideline serves to specify the minimum performance requirements for the operation, maintenance and inspection of Fire Department vehicles and equipment. To ensure that vehicles and equipment are ready for any emergency and daily use.

Scope

It is the responsibility of Fire Department personnel to perform a weekly check of department vehicles and equipment. Document its completion under its appropriate inventory field in Firehouse software. Complete a maintenance request and notify the appropriate division, if a need for repair/replacement is found.

1. **General checks** (all vehicles)

   1.1. Fluids: Assure all fluids are within the safe operating range as per the manufactures specification.
   Obtain only through normal means (open hood or removable panel. DO NOT TILT CAB'S.)
   1.2. Tires: Ensure proper inflation, as per the manufactures specification. (found on plate or sticker usually in the vehicles driver's door frame)
   1.3. Lights: ensure the vehicles manufacturers and emergency lighting work properly.
   1.4. Gauges: fuel, temp, battery, air, etc.
   1.5. Wash Exterior (weather permitting)
   1.6. General Inventory:
      1.6.1. Firefighting Equipment: As defined by the Operations Division.
      1.6.2. EMS Equipment: As defined by the EMS Division.
      1.6.3. Haz-Mat Equipment: As defined by the Haz-mat Division.
      1.6.4. Support/Command Vehicles: As per individual vehicle.

2. **Pumps**

   2.1. Pump engages
   2.2. Exercise all valves and drains
   2.3. Proper operation of electro-governor
   2.4. Monitor controls (panel, hand held, turntable, or basket)
   2.5. Transfer valve & relief valve if applicable

3. Ladders

3.1. Ground ladders: Inspect rungs, rails, locks, pulleys, halyards, and hooks for proper operation and damage
3.2. Tower Ladder:
3.2.1. Inspect for damage
3.2.2. Clean and lubricate ladder slides, rams, waterway pipe, and outriggers.
3.2.3. Check SCBA air supply

4. Out of service vehicles

4.1. Short Term: Vehicle out for service on its scheduled day should be done upon its return or next shift when possible.
4.2. Long Term: Vehicles that have been stripped and will be gone for an extended period will still have its equipment checked and maintained as usual. Enter the weekly check as usual and enter under the note tab "vehicle was out for service - equipment checked."

5. Miscellaneous

5.1. Allow gas power equipment (generators, Hurst pumps) to run for 10 minutes. Fuel only after cooled.
5.2. Check tightness of saws blades and chains

6. Schedule

Day of Week	Station one	Station two
Monday	300,301,306,350	362
Tuesday	381, 383	382
Wednesday	371	384
Thursday	361	364
Friday	351, MABAS trailer, Haz-mat trailer #375	352, 353, 354
Saturday	365	
Sunday	370, 374	

Weekly checks of the ambulances will include a thorough cleaning and disinfecting of the cab and patient compartment (including cot).

Inspectional service's vehicles will be brought to Station two for their weekly checks Friday afternoons. Follow normal procedures as stated above. Vehicle drivers are to assist.

Weekly check of the Engines, Tower and Squad will include cleaning of the cab, compartments and equipment, based on the following schedule.

Week of the month

First – Driver's side compartments, Pull out MABAS trailer (Floor cleaning)
Second – Officer's side compartments, Pull out Haz-Mat trailer #375 (Floor cleaning)
Third- Vehicle Cab
Fourth – Tower & Engines - Ladders inspected, cleaned and lubed

Vehicles will be waxed twice a year on the following schedule - All Engines, Tower, Squad 370, Ambulances, Car 300 and 301 – 1st week of April and October, Squad 306, 351 and 350, 374, MABAS trailer, Haz-Mat trailer #375 2nd week of April and October.

TRUCK COMPANY OPERATIONS

Purpose

Generally, the term truck is used in reference to an apparatus with an aerial ladder device. There are times when other apparatus types, i.e., engines or squads, may be given truck responsibilities. Truck operations are one of the essential elements in the success of fire ground operations. The truck must working coordinated effort with the engine or other companies to accomplish the specific objectives necessary to handle an incident.

This policy will address strategic and tactical procedures for command of truck company operations.

Overhaul is the operation that insures that an incident is completely mitigated. It is the systematic search of debris, or opening of hidden areas and structural components to locate any hidden fire or penetration of substances. Overhaul should eliminate the risk of re-ignition or material exposure that would cause the department to return to the scene to complete the original assignment. Salvage attempts to protect the property that remains in the areas from further damage.

Scope

Responsibilities

1. The primary responsibilities of a truck company are to directly support the attack plan decided on by command:

    1.1 To force entry for other companies operating at an incident. To gain access into involved structures.
    1.2 Complete a primary and secondary search and ventilate the building.

2. At the beginning of each shift or response the personnel assignments to the truck will be made.

    2.1 Assignments are to include: Officer, Driver, Third Man*, Fourth Man* (*when available)
    2.2 The apparatus and associated equipment will be thoroughly checked and inspected at the start of each shift.
    2.3 Personnel protective clothing should be checked and inventoried by all personnel while placing it on the apparatus.
        2.3.1 SCBA shall be checked at this time according to daily inspection procedures
    2.4 All personnel assigned will be familiar with both the operation and locations of all tools and equipment carried on the apparatus.
    2.5 Teamwork is a key to successful truck work. Only through a concerted effort can a truck company become a highly efficient unit. Members, may at times, be required to operate alone. Whenever operating alone, the members must remain in contact by radio. It is imperative that everyone is aware of their own duties, the duties of other company members and overall responsibilities of their unit.

3. General areas of responsibility:
    3.1 First due truck

        3.1.1 Immediate rescue

3.1.2 Operations in the fire area and fire floor
3.1.2.1 Forcible entry
3.1.2.2 Search/Rescue
3.1.2.3 Interior Ventilation (horizontal)
3.1.3 Roof ventilation (if necessary), visual check of the rear and sides
3.1.4 Make an interior search of the floor above the fire
3.1.5 Laddering as needed
3.1.5.1 For rescue
3.1.5.2 For access

3.2 Second due truck company
3.2.1 Operations on floors above the fire floor
3.2.1.1 Forcible entry
3.2.1.2 Ventilation
3.2.1.3 Examine for extension, etc.
3.2.1.4 Search/Rescue

3.2.2 Roof ventilation (assist first truck)
3.2.3 Reinforce actions of the first truck company as needed

4. Personnel Responsibilities
4.1 Officer/lead firefighter
4.1.1 Tools: SCBA , portable radio hand light and halogen tool
4.1.2 Placement of apparatus
4.1.3 Order rescue via aerial, tower or ground ladders
4.1.4 Ventilation communicate to Fire Command
4.1.5 Directly supervise company operations
4.1.5.1 Forcible entry
4.1.5.2 Search for occupants
4.1.5.3 Locate fire
4.1.5.4 Ventilation
4.1.5.5 Examination for fire extension
4.1.5.6 Notify engine company officer and/or incident commander of fire location and any unusual layout which may hamper operations.

4.1.6 Notify command of:

4.1.6.1 Fire location
4.1.6.2 Rescue attempts
4.1.6.3 Victims
4.1.6.4 Area involved
4.1.6.5 Fire extension
4.1.6.6 Need for another line, etc.

4.1.7 Coordinate actions of company members
4.1.8 Assemble members for overhaul after fire is under control
4.1.9 Size-up for overhaul/salvage operations. Supervisor overhaul/salvage

4.1.10 Secure building
4.1.11 Check tools and equipment

4.2 Apparatus Operator
4.2.1 Tools: SCBA, portable radio, hand light, splitting maul, and 6” pike pole. In some cases, specialized tools, i.e., bolt cutter, K-Tool, etc.
4.2.2 Positions apparatus
4.2.3 Raises aerial, ground ladders with officer/lead firefighter
4.2.4 Effects immediate rescues by:
4.2.4.1 Aerial remains at turntable controls if necessary
4.2.4.2 Ground ladders
4.2.5 Gains access to roof for ventilation as directed
4.2.6 Causes roof ventilation by:
4.2.6.1 Removing skylights
4.2.6.2 Cutting the roof
4.2.7 If roof/exterior ladder operation is not initially required the driver checks exterior of the building for:
4.2.7.1 Access points
4.2.7.2 Checks for victims – especially in multi-family dwellings

4.3 Third man/Fourth man
4.3.1 Tools: SCBA, hand light 6’ pike poke, and fire ax or flat head ax. In some cases a power saw.
4.3.2 Part of attack team:
4.3.2.1 Assist in forcible entry
4.3.2.2 Search for and remove victims
4.3.2.3 Locate the fire
4.3.2.4 Ventilate as required
4.3.3 Assists the driver in roof operations

5. Functions of the Truck Company

5.1 Apparatus placement (general)
5.1.1 Communications while responding will be monitored for information that will directly affect placement of the apparatus, (check the pre-plan)
5.1.2 Approach fire building after first engine company. Important, when street width or parked cars would prevent the engine from passing to reach the hydrant.
5.1.2.1 Exception is a small court. It may be necessary for the truck to precede the engine. Allows engine access back to street and to a hydrant.
5.1.3 First due truck shall be placed at the front of the building.
5.1.4 Second due truck to the rear of the building, if accessible.
5.1.5 This may be changed due to factors of the situation, or by order of the officer in command.

5.2 Immediate rescue
5.2.1 By aerial ladder apparatus
5.2.1.1 Line up center of turntable with the window

5.2.1.2 If more than one endangered, and not in vertical alignment, place the turntable midway between them
5.2.1.3 Remove the seriously exposed first
5.2.1.4 Placement will be affected by wind direction, heat or flame present below the rescue effort
5.2.1.5 When numerous people are to be rescued, the officer shall assign as many additional fire fighters to the rescue effort as necessary
5.2.1.6 Proper placement of the ladder is the responsibility of company officer. If a rescue is to be attempted, he should order the driver and the third man to do so. He proceeds to the fire area and directs an interior rescue attempt, if possible, as this is preferable to remove of the victim by aerial ladder. An exterior rescue does not relieve the officer (first truck to arrive) of his responsibility to force entry into the fire area for search, and to provide access for the engine crew.

5.3 Severe fire – no people showing
5.3.1 Aerial ladder apparatus
5.3.2 Place turntable in the center of the building as a precaution or place apparatus in a position so that the ladder can maneuver if it has to go to work.

5.4 Aerial Pipe operations
5.4.1 Operators of aerial apparatus must be thoroughly familiar with the manufacturer's recommendations on this type of operation. Apparatus placement will not be specifically addressed, as each apparatus will be different. However, initial placement is generally similar to that addressed in Section 5 and following.

5.5 Laddering

5.5.1 Ground ladders, aerial and tower ladders generally operate at the front of the building. Ground ladders compliment this equipment with their flexibility, ease of handling, and ease of movement where powered ladders cannot be raised. Ground ladders are standard use at building three stories or less when apparatus is unable to be maneuvered into position due to obstructions or buildings distance from a street.

5.5.1.1 Ground ladder placement is very important, they should be placed on firm ground and generally raised to the center. Left or right of a window or other opening into a building or operational entry. Ground ladders are used at locations around the building that cannot be reached by other means.
5.5.1.2 When aerial devises are used to access a roof or overhead area ground ladders should be placed to provide a secondary means of escape for those firefighters working there.
5.5.1.3 When being used to remove unconscious people or people that will have difficulty climbing onto or down the ladder it is advisable to place a second ladder next to th4e first to allow firefighters to assist the person down the ladder.
5.5.1.4 Ground ladders may be used to bridge trenches, gangways between buildings and over holes in floors and roofs to provide a passage over the obstacle.

5.6 Aerial Ladders
- 5.6.1 Generally raised in the front of the building, to windows, roofs, etc. They are used to rescue, entry, search, and ventilation or as a means of egress for operating crews.
- 5.6.2 Preferable to remove people via interior stairwells or horizontal exits. It must be remembered that most people are not familiar with ladders, and they may be in a state of shock or incapacitated.
- 5.6.3 Be aware of manufacturer's recommendations as to weather.
- 5.6.4 If the ladder cannot be utilized in the exact position due to balconies, obstructions, etc., then the best alternative position would be utilized.
- 5.6.5 Safety is a priority. Proper angles must be utilized and the location of the fire, in proximity to the ladder must be recognized.

5.7 Tower Ladders
- 5.7.1 Ladder functions the same for aerials. The advantage of operating from a stable platform must be recognized.
- 5.7.2 Tools and equipment are easily raised for roof and upper floor operations.
- 5.7.3 In extreme cases and for life saving purposes only, a portable ladder can be tied into the basket to extend its height capability.

5.8 Ground Ladders
- 5.8.1 Functions that can normally be expected to be performed from a ground ladder include:
  - 5.8.1.1 Rescue access, or ventilation
  - 5.8.1.2 Replace damaged or missing interior stairs
  - 5.8.1.3 Access to higher or lower levels of a roof
  - 5.8.1.4 As bridging to span shafts or other openings
  - 5.8.1.5 Bridging a fence by lashing two ladders together
  - 5.8.1.6 Ventilation by dropping it against window glass
  - 5.8.1.7 As a platform for the operation of nozzles, fans or other equipment
  - 5.8.1.8 As a fence, barrier or for stability on a spongy roof
  - 5.8.1.9 As part of a water chute, or collector during salvage operations.
  - 5.8.1.10 Supports to hold overhead doors.

Note: All metal ladders (aerial and ground) conduct electricity and can jump a gap if a ladder is raised near to a high voltage source. Safety is a key factor in their use near overhead power lines or in electrical storms.

6. Forcible Entry
- 6.1 Forcible entry is the procedure of gaining access to buildings, individual occupancies, enclosed areas, vehicles, etc.
- 6.2 Classified as one of two categories
  - 6.2.1 Immediate
  - 6.2.2 Delayed
- 6.3 Immediate forcible entry should be initiated in the following situations:
  - 6.3.1 Fore or smoke showing
  - 6.3.2 Life hazard
  - 6.3.3 As circumstances dictate

6.4 Cardinal rule in forced entry is “try before you pry”. If door must be forced, size up the door to determine entry method to use.

6.4.1 Ax, halogen, or other forcible entry tool
6.4.2 Through the lock method
6.4.3 Saw or other power tool
6.4.4 Keep damage to a minimum. This not only preserves the integrity of the door, but shows professionalism as well.

6.5 In some cases, forcible entry can be delayed. This happens when:
6.5.1 No apparent smoke or fire
6.5.2 A chronic automatic alarm
6.5.3 No apparent threat to life or structural integrity is present

6.6 In some cases, forcible entry can be delayed. This happens when:

6.6.1 No apparent smoke or fire
6.6.2 A chronic automatic alarm
6.6.3 No apparent threat to life or structural integrity is present

6.7 When forcible entry can be delayed, alternative means can be utilized which may be more efficient and less damaging. Examples are:
6.7.1 Ladder to window or balcony
6.7.2 Keys obtained from maintenance personnel
6.7.3 Access via adjacent patio or balcony

6.8 When forcing entry into a building or occupancy, the fire department is responsible for the contents until:
6.8.1 Building is secured
6.8.2 Building is turned over to owner, manager, occupant or their representative
6.8.3 Building is turned over to the police department

6.9 Members must notify the Shift Officer of all forced entries. The officer must inform incident command. This is necessary for proper security and accountability.

7. Communications
7.1 The initial on arrival size up report is the responsibility of the engineer company officer. See Engine Company Operations Policy.
7.2 It will be the responsibility of the truck company to convey the report if not given by the engine officer.
7.3 Truck companies carry two radios. The designations are as follows:
7.3.1 371 “A”
7.3.2 371 “B”
7.4 The officer shall maintain radio contact with the driver, if separated.
7.5 Important information must be conveyed to the company officer, other officers, or the incident commander to coordinate fire ground activity. This information may include:

7.5.1 Fire Location
7.5.2 Rescues made or in progress
7.5.3 Victims found
7.5.4 Ventilation profile in progress
7.5.5 Need for medical attention
7.5.6 Building characteristics, which may hamper the ability to perform truck company operations
7.5.7 Need for additional lines or assistance
7.5.8 Exposures
7.5.9 Anything that appears odd or different that may need to be known to other companies, officers, or to the incident commander

8. Search
8.1 Two general categories:
8.1.1 Primary search – The immediate search for life. It is rapid and systematic.
8.1.2 Secondary search – A thorough and painstaking search to insure that no possible victims are overlooked. The secondary search must include the entire perimeter of the building and all areas of the interior.
8.2 Search is a planned operation. The following factors must be considered:
8.2.1 Type of occupancy
8.2.2 Time of day
8.2.3 Information already received
8.2.4 Building layout
8.3 Determine an alternate escape route. When searching an area above the fire, do not hesitate to force an additional door to provide an escape route or area of refuge.

9. Ventilation
9.1 Systematic release of fire, smoke, heat and toxic gases from a building or fire area. Proper ventilation can provide survival time for occupants, facilitate easier search and rescue operations and allow for advancement of hose lines by the engine companies.
9.2 Categorized in two ways:
9.2.1 Ventilation for life safety – Assists in the removal of a toxic atmosphere where there is a known or suspected life hazard.
9.2.2 Ventilation for fire suppression – Facilitates the advancement of hose lines by the engine companies for fire extinguishment. This must be coordinated so that the engine company has water and is ready to advance to the fire.
9.3 Two types of ventilation
9.3.1 Vertical Ventilation
9.3.1.1 Prevents the byproducts of combustion from accumulating at upper levels and prevents mushrooming or lateral extension.
9.3.1.2 Allows easier access to upper floors for search operations.
9.3.1.3 Increases survival time of victims
9.3.1.4 Allows for rapid hose line advancement
9.4 Examples of vertical ventilation include:
9.4.1 Removal of sky lights
9.4.2 Opening of scuttle hatches, bulkhead doors, etc.

9.4.3 Cutting a large hole in the roof over the seat of the fire

9.5 Horizontal ventilation

9.5.1 Horizontal ventilation provides openings at the same level as the fire (most common type of ventilation)

9.5.1.1 Relieves the room/area/floor of toxic atmospheres.

9.5.1.2 Permits access for search

9.5.1.3 Allows for hose line advancement

9.6 Problems associated with ventilation

9.6.1 Premature or random ventilation can extend or accelerate the fire (i.e., back draft, flashover)

9.6.2 Uncontrolled ventilation can create untenable conditions for occupants or fire fighting crews

9.6.3 Improper ventilation can create excessive property damage

9.7 Safety considerations

9.7.1 Do not ventilate when people or members above the fire may be place din jeopardy or may unnecessarily extend the fire

9.7.2 Falling glass from window or sky light removal can cause injury to those below, especially in high rise buildings

9.7.3 Be aware of wind conditions. Wind conditions can negate ventilation operations if it creates acceleration or unwanted fire spread

9.7.4 When operating on roofs, safe practices dictate that fire crews operate from the windward siding while opening ventilation holes

10. Examining for extension

10.1 The opening of walls, ceilings, partitions, etc., is necessary to check for fire extension and to completely extinguish the fire. In examining for extension, the fire officer must have prior knowledge of construction features and the known extent of the fire.

10.2 Examination for extension should begin as soon as possible. Manpower would be augmented as the need arises.

10.3 Fire extension can be placed in two categories:

10.3.1 Vertical extension

10.3.1.1 Walls – especially in boxed out areas

10.3.1.2 Plumbing recesses – usually found in kitchens and bathrooms

10.3.1.3 Shafts – Elevators, dumbwaiters, stairwells, ducts, etc.

10.3.1.4 Fire spreading up the outside of the building

10.3.2 When hot spots are found in walls, an opening should be made above the areas to cut off extension. If vertical extension is found or suspected in any area, the top and bottom of the area must be examined. Remember, fire can spread downwards by falling members.

10.3.3 Firefighters who are going to examine these areas should be shown the problem in the fire area and send OT open up those areas. It is good practice to have these firefighters equipped with a portable radio so that fire extension can be immediately reported.

10.3.4 Horizontal extension
10.3.4.1 Attics and cocklofts – the space between the ceiling and roof.
10.3.4.2 Common cocklofts – Found in strip malls, storefronts and in some multi-family dwellings.

Note: If fire is found in a ceiling, other than at the top floor, holes should be made in that area or adjoining areas until the outer edge of the fire is determined. The ceiling is then opened toward the fire to limit horizontal extension. When fire is found in a wall, that joist run and adjoining runs should be opened.

Fire can spread horizontally at the beam, allowing fire to spread to adjoining areas or buildings. If there is any indication of fire at beam ends, examine the ceiling on the other side of the wall and open up if necessary.

If fire has extended into a cockloft or attic, one method of limiting horizontal extension is by cutting a large hole in the roof directly over the fire and pushing the ceiling down. Another method is by pulling in situations where there may be long, open and undivided attic or cockloft areas.

If fire enters a shaft expect both vertical and horizontal extension. In a closes shaft, the key is to immediately ventilate the shaft at the top. The bottom of the shaft and any openings must be checked for extension. In an open shaft, fire can extend vertically and enter windows on upper levels. It can also extend horizontally by radiating heat to other windows adjacent to the shaft.

Fire stops. Building codes require fire stopping of various kinds as a deterrent to fire spread. However, openings area made to run pipes or wire. Many times, these holes are not resealed. Also the joint at walls and floors may not be tight due to settling or poor workmanship.

(old overhaul and salvage operations)

11. Overhaul procedure
11.1 Overhaul includes the opening up of walls, ceiling, partitions, etc. to identify and expose hidden fire or embers for final extinguishment and to prevent rekindling. Overhaul is performed after the fire is under control.
11.1.1 The primary differenence between examining for extension and overhauling is when it occurs. When examining for extension the fire was not under control and the fire dictates your actions. In overhaul, the company officer is in control and dictates the actions of the company.

11.1.2 Before beginning the overhaul operation, survey the situation and establish a plan:
11.1.2.1 Will overhaul interfere with the fire investigation
11.1.2.2 What has to be done
11.1.2.3 How many men are needed
11.1.2.4 Who is to do what overhaul duties

11.1.2.5 If items have to be moved, where are they going to be placed? (try to move items one time if possible

11.1.3 Operational considerations

11.1.3.1 It is good practice to take care of smoldering mattresses and upholstered furniture early. If they are not removed before ceilings are pulled, it will be more difficult to remove them because of the accumulation of debris on them.

11.1.3.2 Mattresses should be wet down, rolled and removed from the building

11.1.3.3 Determine the location where burned debris will be moved

11.1.3.4 There is no need to rush during overhaul operations. Safety is a prime consideration.

11.1.3.5 Observe proper rehabilitation procedures

11.1.4 Note – During overhaul safety can be improved by:

11.1.4.1 Ventilation which improves visibility and rids the area of toxic gases. Open doors, clear out windows, or use mechanical ventilation as necessary.

11.1.4.2 Utilize adequate lighting in the area. Using building lights or set up portable lights to create a safe working environment.

11.1.4.3 Identify and protect hazardous areas such as holds in floors or roofs, open shafts, missing stairs, etc. Isolate these areas by using rope, boards, lighting, barricade, etc.

11.1.4.4 Recognize signs of exhaustion and spell firefighters as necessary

11.1.4.5 Members shall wear the proper protective equipment while overhauling. SCBA will be worn.

11.1.5 Protection of property – remember that the building and contents are someone's property. How we handle the property will make a lifelong impression on it's' owners. Some ways to reduce property damage are:

11.1.5.1 Place unburned contents found on top of dressers and desks in drawers

11.1.5.2 Unburned furniture can be placed in another room

11.1.5.3 Expensive and hard to replace items should be treated with care

11.1.5.4 Excess water can be channeled or removed from the building

11.1.5.5 Use salvage covers as soon as needed

11.1.6 Overhaul can destroy important evidence needed to determine the cause and origin of the fire.

11.1.6.1 Before overhaul is initiated, check for the presence of anything suspicious such as trailers (used to spread the fire), cans of or a smell similar to a flammable liquid, or any item which may even be remotely considered as the possible cause of the fire.

11.1.6.2 If possible, items should not be disturbed. If they must be removed, handle them as little as possible.

11.1.6.3 The incident commander must be informed so that he can give proper notification to the fire investigator.

11.1.7 Lighting

11.1.7.1 Consider the use of existing lighting first

11.1.7.2 The use of lighting can make the difficult and dangerous job of fighting fires easier and safer

11.1.7.3 Each member should bring a properly operating hand light

11.1.7.4 One the fire ground, apparatus spot lights can be used to pinpoint victims at windows. This will facilitate rescues and may help to calm the victim as they know that they have been seen. Spotlights can also be used to pinpoint dangerous conditions such as loose or hanging building sections, loose signs, electric wires, etc.

11.1.7.5 Portable lights will be used to light up the exterior of the fire building, facilitating rescue, identifying the fire building, and generally providing greater visibility in which to conduct operations.

11.1.7.6 Portable lighting shall be in place prior to starting overhaul operations and will be used to provide general illumination as well as highlight unsafe areas such as missing stairs or holes in the floor.

11.1.7.7 Adequate lighting will be provided when working in areas without natural lighting such as windowless buildings, below grade levels, elevator shafts, etc.

12. Salvage Operations

12.1 Salvage work consists of those methods and procedures that further reduce fire, water, and smoke damage during and after fires. A portion of these damages are caused by the application of water, ventilating the building and checking for fire extension. Although these damages cannot be eliminated, good salvage procedures can help to minimize these losses.

12.2 The company officer must include a salvage size-up while conducting the overhaul step. Not what is heavily damaged by fire is partially damaged and might be salvageable. What will be damaged if something is not done before opening the walls and ceiling.

12.3 Although something may appear to have little value, it might have great value to the owner. The protection of property by care, use of salvage covers, etc., will require little additional time. However, your consideration may be remembered for the lifetime of the owner or occupant.

12.4 Utilities control

12.4.1 Systems that may be required to be shut down are:

12.4.1.1 Gas

12.4.1.2 Electricity

12.4.1.3 Water

12.4.1.4 Air Handling Systems

12.4.2 A firefighter with a portable radio will be assigned to shut down these systems. He will notify the company officer in the event of problems. Controls should not be indiscriminately shut down, find out what each valve or control is for. Make a note of

what was shut down so that the building representative and the incident commander can be notified.

12.4.3 Once utilities have been shut down only the utility companies involved may turn them back on.
12.4.4 When shutting down electricity, attempt to isolate the affected areas by the use of breakers or fuses. The removal of electric meters is dangerous and will not be attempted by fire department personnel.
12.4.5 Water supplies will be shut down to prevent damage caused by broken pipes.
12.4.6 When shutting down an automatic sprinkler system a firefighter will be assigned to that location to turn it on should the fire flare up.
12.4.7 Air handling systems will not be reactivated until consulting with the building engineer and/or incident commander.

SQUAD COMPANY OPERATIONS

Purpose

The purpose of this policy is to maximize the effectiveness of squad operations on any incident by creating an organized, safe, and efficient set of operating procedures. Many functions of squad companies are similar to responsibilities associated with truck companies.

Scope

Responsibilities

1. Support of all operations at an incident. The squad carries special equipment for use in specialized incidents. Use of these tools and equipment are a high priority in squad operations.

2. These duties are not listed in order of importance, nor is it intended that they be performed in the order listed. The course of action will be determined by the company officer or incident commander based upon his size up of the situation.

   2.1 The functions and responsibilities of the squad company are many and varied, typically the following are functions of the squad:

      2.1.1 Search and rescue
      2.1.2 Size up
      2.1.3 Forcible entry
      2.1.4 Communications
      2.1.5 Extinguishment
      2.1.6 Overhaul
      2.1.7 Salvage
      2.1.8 Lighting and electrical power
      2.1.9 Utilities control
      2.1.10 Extrication (vehicular, industrial and construction)
      2.1.11 TRS above and below grade rescue
      2.1.12 Trenching and shoring operations
      2.1.13 Water rescue and recovery
      2.1.14 Hazardous material response
      2.1.15 Hazardous atmosphere and confined space air monitoring
      2.1.16 EMS support
      2.1.17 Breathing air support
      2.1.18 Support of command functions (command center)

   2.2 Driver

      2.2.1 Tools: SCBA, portable radio (squad 371A), hand light, Halogen tool and flat-head ax or any specialized tool that may be needed.
      2.2.2 Apparatus placement
         2.2.2.1 Effective utilization of tools and equipment
         2.2.2.2 Provide scent lighting and power
         2.2.2.3 To function as a command post

2.2.2.4 Personnel protection from vehicular traffic
2.2.2.5 Breathing apparatus support
2.2.2.6 Avoid blinking incoming apparatus

2.2.3 Place Apparatus and special tools into operation
2.2.4 Support of suppression or special operations as directed
2.2.5 Maintain radio contact with company officer as necessary
2.2.6 Checks and maintains all tools and equipment

2.3 Second firefighter

2.3.1 Tools: SCBA, portable radio (Squad 371B) hand light, splitting maul and pike pole, or other hand tools as deemed necessary
2.3.2 Support of suppression or special operations as directed
2.3.3 Assist driver with set up and operation of vehicle and equipment

2.4 Third Firefighter

2.4.1 Tools: SCAB, hand light, fire ax and pike pole, or other hand tools as deemed necessary
2.4.2 Support of suppression or special operations as needed
2.4.3 Assist with set up and operation of vehicle and equipment
2.4.4 Assist driver with check of tools and equipment

2.5 Rescue

2.5.1 A life hazard, visible upon arrival, must be dealt with immediately. Immediate rescue without simultaneous and coordinated fire attack should be attempted only in extreme cases.
2.5.2 Rescue decisions for squad company operations:
2.5.2.1 Are occupants endangered by being in the immediate vicinity of the fire?
2.5.2.2 How many people are trapped?
2.5.2.3 Are occupants threatening to jump?
2.5.2.4 Are exits cut off by smoke, heat and/or fire?
2.5.2.5 Can they be removed by ladders or aerial devices?

2.5.3 Interior Search

2.5.3.1 Defined as the systematic and orderly examination of a building or area for the person of locating persons in order to save lives
2.5.3.2 Priorities when searching
2.5.3.3 Fire area and fire floor
2.5.3.4 All floors above the fire floor

2.5.4 Search Categories

2.5.4.1 Primary search – the immediate search for life. It is rapid and systematic.

2.5.4.2 Secondary search – a thorough search to insure that no possible victims are overlooked. The secondary search must include the entire perimeter of the building and all areas of the interior.

2.5.5 Search is a planned operation. The following factors must be considered:
2.5.5.1 Type of occupancy
2.5.5.2 Time of day
2.5.5.3 Information already received
2.5.5.4 Building layout

2.6 Ventilation

2.6.1 A systematic release of fire, smoke, heat and toxic gases from a building or fire area. Proper ventilation can provide survival time for occupants, facilitate easier search and rescue operations, and allow for advancement of hose lines for the engine companies.

2.7 Overhaul

2.7.1 Overhaul includes the opening up of walls, ceilings, partitions, etc. to identify and expose hidden fire and embers for final extinguishment and in order to prevent rekindling. Overhaul is performed after the fire is under control.

2.7.2 Before beginning the overhaul operation, plan and re-evaluate the situation. Survey the situation and plan:

2.7.2.1 Will overhaul interfere with the fire investigation?
2.7.2.2 What has to be done?
2.7.2.3 How many men are needed?
2.7.2.4 What tools are needed?
2.7.2.5 Who is to do what overhaul duties?
2.7.2.6 Items must be moved, where are they going to be placed? (try to move them one time if possible)

2.8 Lighting and electrical power

2.8.1 Lighting and electrical power are provided by the PTO-driven generator and both fixed and portable power and lighting equipment carried on the apparatus.

2.8.2 The fixed equipment includes the built-in quart lights as well as the telescoping and rotating light bar.

2.8.3 Portable equipment includes cord reels, cords and portable quartz lights that are able to be taken where needed.

2.8.4 Lighting and power is available to be used in a wide variety of situations.

2.8.4.1 Scene lighting on the fireground, accident scenes, and special events
2.8.4.2 To assist in arson and traffic accident investigations
2.8.4.3 To provide power for electrical tools and equipment
2.8.4.4 To provide power for operations when the apparatus is employed as a command center

2.9 Utilities Control

2.9.1 An important function that may be assigned to a squad or truck company is that a systems or utilities control. These systems may include:

2.9.1.1 Gas
2.9.1.2 Electricity
2.9.1.3 Domestic water systems
2.9.1.4 Fire protection systems
2.9.1.5 HVAC systems

2.9.2 A firefighter with a portable radio will be assigned to shut down these systems, and will notify the company officer if a problem occurs. Controls should not be indiscriminately shut down. Make note of what was shut down so that the building representative and the incident commander can be notified.

2.9.3 Once the utilities have been shut down, only the utility company involved may restore them to service.

2.9.4 When shutting down electricity, attempt to isolate the affected areas by the use of breakers or fuses. The removal of electric meter is dangerous and will not be attempted by fire personnel. Water supplies may be shut down to prevent damage caused by broken pipes or open sprinkler heads.

2.9.5 When shutting down a sprinkler system, a firefighter will be assigned to remain at the controls so that the system can be returned to service, if it is needed.

2.9.6 HVAC Systems shall not be reactivated until consulting with the building engineer and/or the Incident Commander

2.9.6.1 TRS is comprised of three divisions

2.9.6.1.1 Vertical Rescue operations may involve the rescue of a victim from a disabled platform or rigging such as those used by window washers and workers on water towers, signs, etc.
2.9.6.1.2 Confined space rescue involves the rescue of victims who may be trapped as a result of a collapse of a building or part of a structure.
2.9.6.1.3 Below grade rescue trapped in a trench or other below grade area.

2.9.6.2 These operations shall be performed by personnel who are properly trained and equipped and shall be conducted within the guidelines of S.O.P. 0216 (Technical Rescue Specialties or other rules as established).

2.10 Water rescue and recovery

2.10.1 The Squad Company may be called upon to perform rescue operations in a side variety of conditions and circumstances, including water-related rescue and recovery operations. Due to the large number of ponds and water retention areas within the village limits, it is important to maintain a high level of readiness, adequately trained personnel, and proper equipment to perform water rescues.

2.10.2 The department's commitment to the member communities of the Mutual Aid Box Alarm Systems (MABAS) requires that water rescue and recovery personnel obtain and maintain a certain level of certification and training.

2.10.3 All water-related and recovery operations shall be conducted within the guidelines as established by OOPS Policy 002 (Underwater recovery operations) or other rules as established.

2.11 Hazardous materials response

2.11.1 The Squad Company serves as to command center for the department's hazardous materials mitigation operations. As a result, all department members are trained to either the hazardous materials responder level.

2.11.2 The apparatus is equipped with certain personal protective equipment, reference materials, and mitigation equipment and supplies that are necessary to safely and effectively contain and control specified situations.

2.11.3 The safe and successful handling of a hazardous materials incident requires thorough, timely attention to many factors not normally dealt with at other emergency scenes. To assist company and command officers with their decision making at haz-mat incidents, (hazardous materials operation) was adopted as the standard operating procedure to be followed).

FOAM

Purpose

This policy serves as a guideline for the application and use of firefighting chemical foam during emergency operations.

Scope

This policy applies to all fire department personnel and applies to all situations where chemical firefighting foam is used as an extinguishing agent or as a vapor suppressant to prevent ignition.

1. Procedures

1.1. Firefighting foam may be used at the direction of the incident commander when and where vapor suppression is desired in order to prevent ignition. When used in this manner it must be understood that ignition may occur anytime the foam blanket is disturbed or weakened. When used to suppress vapors a secondary means of extinguishment should be made available.

1.2. All firefighters shall be trained in the proper use and care of foam application equipment. All firefighters shall be trained in the proper and safe methods for applying foam, including the direct, indirect and roll-over methods. All firefighters shall be trained in the different types of foams and their uses, including but not limited to, AFFF, Alcohol Foams, and Hydrocarbon Foams.

1.3. All firefighting personnel shall wear full personnel protective equipment when using firefighting foam.

1.4. Each first response fire engine shall carry a minimum of twenty (20) gallons of foam concentrate, a proportioner, and an applicator that can apply no less than 100 gallons per minute of foam. Foam containers should be protected from direct sunlight.

1.5. Foam concentrate containers shall be checked by _____ no less weekly for the expiration date of the product. Foam that has expired shall be removed from the apparatus and boldly and permanently labeled “For Training Only” and replaced with in-date product of the same type.

1.6. Since foam is greater than 90% water, fire apparatus operating at any incident where foam is being used shall be parked uphill of the incident. Since foam may become very slippery firefighters should avoid walking through any areas that had foam applied.

1.7. Foam run-off should be controlled whenever possible since it may contain products of a hazardous nature.

2. Class A Fires

2.1. When used on Class A type fires (normal combustibles) the desired extinguishing feature is total smothering and foam should only be used when that can be achieved.

2.2. Situations that may warrant foam application for Class A fires may include basements, large dumpsters or refuse containers, baled or bound combustibles, or any other normal combustible

where it may be difficult or risky to approach the seat of the fire and smothering will extinguish the fire.

3. Class B Fires

3.1. When used on Class B fires (flammable liquids) the desired extinguishing feature is total smothering. Chemical foam should only be used on static pools of liquids and should not be used on liquids that are running or pressurized.

3.2. A dry chemical extinguishing agent should be used to extinguish fires in conjunction with chemical foam applications.

3.3. Care must be taken to avoid disrupting a foam blanket used to extinguish a Class B fire or suppress vapors as the foam does not alter the chemical make-up of the product and the hazard will remain until the product is properly disposed.

3.4. Application of foam on a Class B fire should be from an area where the firefighter is not in or proximate to the product should ignition occur. Multiple points of application should be considered and a safe exit from the area is always required.

3.5. Multiple layers and applications should be expected in order to completely suppress vapors or extinguish fires.

4. Class C Fires

4.1. Since foam is mostly water it is not recommended for Class C (electrical) fires or fires involving energized equipment.

5. Class D Fires

5.1. Fire involving Class D materials (metals) may be extinguished with foam only after the material is known and it is certain that it will not react with water.

6. Incident Command Considerations

6.1. Identification of the product is paramount since not all foams will extinguish all types of fires.

6.2. Additional resources should be requested early since multiple hose lines will likely be used. A back-up firefighting team should always be used.

6.3. A sustained water supply is always needed for any foam operation.

6.4. Each engine carries a limited amount of foam; additional foam should be requested early by using the Hazardous Materials Foam MABAS Alarm Card and requesting additional alarms.

6.5. When using foam to suppress vapors, the areas containing vapors shall be considered an IDLH and full PPE with SCBA is required.

6.6. Consideration should be given to activating a Hazardous Materials Box when dealing with any flammable liquid or metal.

6.7. The hazard area or hot zone around any foam incident will expand as the foam is applied. A large enough area should be secured from non-firefighting personnel and evacuations downhill should be initiated prior to adding hundreds of gallons of foam liquid.

6.8. It is permissible to replenish foam used by mutual aid companies at the scene of an incident if sufficient stock remains and it is of the type desired by the mutual aid department.

7. Documentation

7.1. The use of foam during an incident shall be documented in the narrative portion of the NFIRS Basic Incident Report. If a Class B or D fire or incident occurred the Hazardous Materials Report shall also be completed.

7.2. The Hazardous Materials Coordinator, or the Fire Operations Chief, shall be notified in order to replenish the foam stock or order replacement foam. A copy of the incident report shall be forwarded to the Administrative Assistant to the Fire Chief for billing purposes.

PERSONAL PROTECTIVE CLOTHING

Purpose

For the physical safety of the members of the fire department, the Village provides its members with firefighting clothing as described in this policy. This policy shall serve as a guide for the use of Personal Protective Equipment (PPE). There may be certain circumstances when the full turnout gear may be abbreviated and still maintain efficient and safe operations at a particular incident.

Scope

This policy applies to all firefighting personnel and to all incidents where there is, or is likely to be, products of combustion, excessive heat, explosion, or an Immediately Dangerous to Life or Health (IDLH) atmosphere, or any other time when directed by a supervisor.

1. Structure Fires

1.1. All firefighters working at any fire involving a structure or enclosed building shall wear full protective clothing, including SCBA.

1.2. All firefighters working on the scene of an incident that has a toxic, superheated, or oxygen deficient atmosphere shall wear full protective clothing, including SCBA.

1.3. All firefighters shall wear full protective clothing when instructed to do so by the company officer.

Full Turnout Gear:	Helmet, hood, fire coat, gloves, fire pants with boots and self-contained breathing apparatus, rescue belt (optional rope bag)
Full Fire Clothes:	Helmet, fire coat, gloves, fire pants with boots and may include hood
Low Risk/non-fire gear:	Helmet fire pants with boots and gloves or helmet, coat, uniform pants, and steel toe duty boots when approved by incident command.
Work Uniform Station Wear:	As specified by command when no risk or emergency
HazMat Incidents	As determined by HazMat Safety Officer

1.4. The incident commander may, in limited situations where there is reduced risk to personnel, deviate from this policy and allow less than full turnout gear. Examples include when investigation is complete and no evidence of risk is present, SCBA and/or turnout may be removed – or when firefighting is completed and there is no risk of toxic gas or smoke exposure and the atmosphere has been tested and is less than 50ppm carbon monoxide, SCBA's may be removed.

1.5. Whenever operating at a scene, engineers or pump operators must wear gloves, fire pants with boots and keep a fire coat, hood, helmet and SCBA nearby for immediate use.

2. Non-Structure Fires

2.1. Full turnout gear shall be worn whenever a vehicle is involved in a fire.

2.2. Full turnout gear shall be worn whenever firefighters will be operating in smoke or exposed to potentially toxic gases or dusts.

2.3. Full fire clothes shall be worn when operating at a field fire, brush fire, grass fire or forest fire.

2.4. The incident commander may authorize less than full fire clothes if the firefighters will be working away from harm and are exposed to little risk.

3. Accidents

3.1. Vehicle with Entrapment, with no fire or possibility of rapid deterioration of operational safety. Full fire clothes for all rescue workers, backed by firefighters in full turnouts with fire attack line.

3.2. Construction accidents. Full fire clothes for all rescue workers.

3.3. Structural damage to buildings. Full fire clothes for all rescue workers.

3.4. Special Incidents as determined by the Incident Safety Officer.

3.5. When operating at incidents involving specialty teams such as dive, trench rescue, hazardous materials, etc. the firefighters shall wear protective clothing as proscribed by the specialty team leader or incident command.

4. Damage

4.1. Any damage to personal protective equipment must be reported to the company officer upon completion of the incident. The company officer will investigate to determine cause and extent of damage. Equipment determined to be serviceable will remain in service. Out of service equipment will be taken out of service and the employee will be issued a replacement item.

5. Inspection

5.1. Inspection of personal protective equipment shall be done no less than annually by the quartermaster. Intermediate inspections should be done no less than quarterly by the company officer. All inspections, cleanings, and repairs of personal protective equipment shall be documented in the item's record in the inventory module of FIREHOUSE Software.

RESOURCE CARD MANAGEMENT

1. Purpose

The Hanover Park Fire Department is a member of MABAS Divisions XII and II. MABAS Divisions use the Incident Management System (IMS) which provides that all apparatus shall have a Resource Management Card (RMC) that clearly indicates the specific capabilities of that apparatus. This policy outlines the procedures to be used when Resource Management Cards are requested.

2. Scope

This policy applies to all fire department personnel and at all incidents of a MABAS Box level of alarm or greater, including alarms and incidents in MABAS divisions other than MABAS XII or MABAS II.

3. Procedures

3.1. Each vehicle shall be equipped with a Resource Management Card (RMC). The card, similar to a vehicle Passport, will contain information about the apparatus and what, if any, specialized equipment it carries.

3.2. Each RMC shall contain the same major components, in the same order, with specialized equipment always located at the bottom of the list.

3.3. If a vehicle is not equipped with the specified major component(s) that line is left blank. The Resource Management System assumes that equipment which is typically carried on a particular type of apparatus is there, i.e., ladders carried on trucks.

3.4. The RMC shall be kept in the vehicle cab, within reach of the Company Officer

3.5. When a vehicle enters the staging area or base, the Company Officer will provide the Staging Officer/Base Manager with the RMC. The Staging Officer will retain the Resource Management Card for as long as the apparatus is in the staging area.

3.6. In the event that Command requests a specific piece of equipment or type of apparatus for a particular function, the Staging Officer/Base Manager will have that information immediately available. This will result in assignments being filled quicker.

3.7. When the Staging Officer or Base Manager gives a Company an assignment, the RMC will be returned to the Company Officer for future use.

3.8. The Resource Management Card may be requested by other IMS personnel such as Logistics Officers, Sector Officers, or Incident Command. The Company Officer should be ready to present the RMC at any time when requested.

4. Responsibilities

4.1. The Company Officer shall be responsible for the RMC and shall ensure its presence at the morning vehicle check.

4.2. Missing or outdated Resource Management Cards shall be reported to the Equipment Coordinator for replacement. The Equipment Coordinator shall maintain duplicate cards.

4.3. The Company Officer shall be responsible for the return of the RMC prior to leaving the incident scene.

Carbon Monoxide Incidents

Purpose

The purpose of this Standard Operating Guideline is to describe actions and safety procedures to be undertaken during an incident where Carbon Monoxide monitors are activated and/or exposures are suspected. This guideline serves as the fire department's compliance with NFPA 1500 *Standard on Fire Department Occupational Safety and Health Program* and OSHA 29 CFR 1910.134.

Scope

This guideline pertains to all employees at all times, whether or not carbon monoxide is actually present. In all responses the Incident Command System shall be utilized.

1. Carbon Monoxide Properties

1.1. Carbon Monoxide has some commercial uses but is typically seen as a product of combustion from the burning of fossil fuels such as natural gas, gasoline, wood and other organic materials
1.2. Carbon Monoxide (CO) is a odorless, colorless, tasteless gas at room temperature
1.3. The vapor density of Carbon Monoxide is 0.97, making it slightly lighter than air
1.4. The Flammable Range in air of Carbon Monoxide is 12.5 to 74 per cent by volume
1.5. Carbon Monoxide will auto-ignite at 609 degrees F and will react with oxidizers
1.6. In shipment Carbon Monoxide is placarded as UN 1016, flammable gas or poison gas
1.7. Carbon Monoxide affects the body by blocking the blocking the oxygen from the blood hemoglobin but may also be a simple asphyxiant by displacing air
1.8. Symptoms of Carbon Monoxide inhalation include headache, nausea, vomiting, dizziness, confusion, flushed skin, seizure, coma, or death

2. Responses

2.1. Activated CO Alarm with no reported illness

2.1.1. Single engine shall respond and shall investigate to verify the activation as a CO alarm and to attempt to determine the cause
2.1.2. All members investigating a Carbon Monoxide alarm shall wear full protective gear and have SCBA readily available
2.1.3. The Company Officer shall meet with the occupants to verify their denial of illness. If the occupants do not deny illness or injury then an ALS ambulance shall be requested
2.1.4. If no Carbon Monoxide is found and the detector is thought to be defective, the Company Officer shall meet with the occupant(s) and explain steps to either repair or replace the detector and shall refer the occupants to the manufacturer's recommendation

2.1.5. If Carbon Monoxide is found at levels below 35ppm and no alarm on the fire department monitor is sounding, the Company Officer shall continue to investigate and attempt to determine the source

2.1.6. If Carbon Monoxide is found at levels that activate the monitor alarm, or at levels above 35ppm, all occupants shall be evacuated to an environment that is well-ventilated and free of Carbon Monoxide for further evaluation

2.1.6.1. All personnel in the area where Carbon Monoxide is detected shall be utilizing SCBA in addition to full PPE. The Company Officer shall notify dispatch that harmful levels of Carbon Monoxide have been found and request an ambulance to the scene. Upon arrival, the ambulance crew shall re-evaluate the occupants and, if appropriate, document a refusal of medical care. Any occupant not refusing care shall be treated in accordance with GEAMIC protocols, including monitoring Carbon Monoxide levels using the RAD-57 monitors.

2.2. CO alarm activation with illness

2.2.1. For reports of Carbon Monoxide detector activation with illness and ambulance shall be dispatched with the first engine

2.2.2. Upon arrival, the Company Officer shall establish command and priority shall be given to patient care. Additional ambulances shall be requested as needed

2.2.3. Additional Carbon Monoxide monitors and/or RAD-57 should be requested as needed

2.2.4. If any occupants are symptomatic, monitoring should be done using at least two monitors, either single Carbon Monoxide monitors, 4-gas monitors or a combination of monitors

2.2.5. If the building has an installed and working Carbon Monoxide monitor with a digital read-out, it may substitute for a monitor as stated above

2.2.6. Actions should be based upon the monitor with the highest reading

2.2.7. All personnel in the area where Carbon Monoxide is detected shall be utilizing SCBA in addition to full PPE. Any occupant not refusing care shall be treated in accordance with GEAMIC protocols, including monitoring Carbon Monoxide levels using the RAD-57 monitors.

3. Remediation

3.1. Secondary to patient care, the Company Officer shall attempt to determine the source of any Carbon Monoxide

3.2. Likely sources of Carbon Monoxide in residential properties include kitchen stoves/ovens, laundry areas having gas-fired dryers, water heaters, furnaces and garages. Portable appliances and equipment such as generators, lawnmowers and space heaters may also be a source of Carbon Monoxide

3.3. Particular attention should be given to any appliance venting system and flue system for continuity and proper installation/operation

3.4. Since fuel-burning appliances are often on the lower levels and Carbon Monoxide is slightly lighter than air, all floors of residents shall be checked with fire department monitors for the presence of Carbon Monoxide
3.5. If the occupants have ventilated the building prior to the arrival of the first company, it may be necessary to close the building up to recreate the environment that activated the Carbon Monoxide detector or alarm
3.6. If all sources of Carbon Monoxide can be identified and secured, the building should be well ventilated and occupants may be allowed to return after Carbon Monoxide levels drop below 10ppm
3.7. Appliances found to be defective and emitting Carbon Monoxide shall be considered secured when the fuel supply has been shut off. Running automobiles in enclosed areas, such as garages or car ports, are considered secured when they are moved from the enclosed area and the motor has been shut off
3.8. If the source(s) of Carbon Monoxide can not be identified then all potential sources of Carbon Monoxide must be secured and ambient levels reduced to 10ppm before the occupants may return
3.9. If the source of Carbon Monoxide is not found, but is suspected of being an appliance that is fueled by natural gas, NICOR should be considered as an additional investigative resource. NICOR is also qualified to re-light secured appliances
3.10. The occupant and/or owner should be referred to an authorized repair service to correct an defective/deficient appliance
3.11. At no time should a fire department employee attempt to re-light or re-start an appliance that had been secured by shutting off the fuel supply

4. Documentation

4.1. All actions taken by the fire department shall be documented within the NFIRS Incident Report in FIREHOUSE Software®
4.2. Carbon Monoxide levels shall be documented in the appropriate user fields
4.3. Occupants exposed to Carbon Monoxide and subsequently treated or refused care shall be documented as patients and not as Civilian Casualties
4.4. All occupants complaining of being exposed to Carbon Monoxide shall be treated as patients and a GEAMIC report completed
4.5. All incidents involving Carbon Monoxide or Carbon Monoxide detectors shall have a *Carbon Monoxide Detector Activation Notice of Findings* form (Appendix A) completed and signed by the occupant. A copy of which shall be given to the occupant/owner
4.6. The U.S. Consumer Product Safety Commission pamphlet *The Invisible Killer* (English or Spanish) should also be distributed whenever a Carbon Monoxide leak is suspected (Attachments)

Appendix A

Hanover Park Fire Protection District

Carbon Monoxide Detector Activation

Notice of findings

Carbon Monoxide is an odorless, tasteless, colorless gas that is deadly. It is a by-product of a fuel burning process. It can cause symptoms that can mimic a flu to unconsciousness and even death. Many appliances around the home are capable of producing Carbon Monoxide when a fault or unusual condition exists. Since the source may be transient in nature, the source may not always be detectable.

The Hanover Pk. Fire Department responded to your building at _____, (Location)

on _____. (Date) The incident number is _____. (Number)

Carbon Monoxide at the highest level of ____ P.P.M. was found.

P.P.M. = Parts Per Million

	What does this reading mean?
Less than 10 P.P.M.	Our instruments did not detect elevated levels at this time. Check your carbon monoxide detector per the manufacturer's recommendations. Call the manufacturer for additional information (number may be on back of unit). Install a replacement detector/sensor module. If it activates again, call the Fire Department back.
10 or more P.P.M.	We have detected potentially dangerous levels of carbon monoxide. We are recommending you leave your home immediately! It is not safe until repairs are made and a replacement detector/sensor module is installed.
100 P.P.M. or greater	We have detected a potentially lethal level of carbon monoxide in your home. Leave your home immediately! It is not safe until repairs are made or the source is found and corrected. The building is not suitable for occupancy.

Carbon Monoxide affects individuals differently depending on the side and medical history of the occupant. Therefore, families with young children or members with medical conditions should take extra precautions in the event that carbon monoxide was detected.

Issued by: _____ of the Hanover Park Fire Dept.

Received by: _____ Date _____.

MATERIAL SAFETY DATA SHEET

Prepared to U.S. OSHA, CMA, ANSI and Canadian WHMIS Standards

1. PRODUCT IDENTIFICATION

CHEMICAL NAME; CLASS: NON-FLAMMABLE GAS MIXTURE

Containing One or More of the Following Components in a Nitrogen Balance Gas: Carbon Monoxide, 0.0005-1.0%; Hydrogen, 0-2.0%; Methane, 0-2.5%; Oxygen, 0-23.5%

SYNONYMS: Not Applicable
CHEMICAL FAMILY NAME: Not Applicable
FORMULA: Not Applicable
Document Number: 50009

Note: The Material Safety Data Sheet is for this gas mixture supplied in cylinders with 33 cubic feet (935 liters) or less gas capacity (DOT - 39 cylinders). This MSDS has been developed for various gas mixtures with the composition of components within the ranges listed in Section 2 (Composition and Information on Ingredients). Refer to the product label for information on the actual composition of the product.

PRODUCT USE:	Calibration of Monitoring and Research Equipment
SUPPLIER/MANUFACTURER'S NAME:	CALGAZ, LLC
ADDRESS:	821 Chesapeake Drive Cambridge, MD 21613
EMERGENCY PHONE:	CHEMTREC: 1-800-424-9300
BUSINESS PHONE:	1-410-228-6400
General MSDS Information	1-713-868-0440
Fax on Demand:	1-800-231-1366

2. COMPOSITION and INFORMATION ON INGREDIENTS

CHEMICAL NAME	CAS #	mole %	EXPOSURE LIMITS IN AIR					
			ACGIH-TLV		OSHA-PEL		NIOSH IDLH	OTHER
			TWA ppm	STEL ppm	PEL ppm	STEL ppm		ppm
Carbon Monoxide	630-08-0	0.0005-1.0%	25	NE	50 35 (Vacated 1989 PEL)	200 [ceiling] (Vacated 1989 PEL)	1200	NIOSH RELs:TWA = 35 STEL = 200 ceiling DFG MAKs:TWA = 30 PEAK = 2•MAK, 15 min., average value, 1 hr interval DFG MAK Pregnancy Risk Classification: B
Hydrogen	1333-74-0	0-2.0%	There are no specific exposure limits for Hydrogen. Hydrogen is a simple asphyxiant (SA). Oxygen levels should be maintained above 19.5%.					
Methane	74-82-8	0-2.5%	There are no specific exposure limits for Methane. Methane is a simple asphyxiant (SA). Oxygen levels should be maintained above 19.5%.					
Oxygen	7782-44-7	0-23.5%	There are no specific exposure limits for Oxygen. Oxygen levels should be maintained above 19.5%.					
Nitrogen	7727-37-9	Balance	There are no specific exposure limits for Nitrogen. Nitrogen is a simple asphyxiant (SA). Oxygen levels should be maintained above 19.5%.					

NE = Not Established. See Section 16 for Definitions of Terms Used.

NOTE (1): ALL WHMIS required information is included in appropriate sections based on the ANSI Z400.1-1998 format. This product has been classified in accordance with the hazard criteria of the CPR and the MSDS contains all the information required by the CPR.

3. HAZARD IDENTIFICATION

EMERGENCY OVERVIEW: This product is a colorless, odorless gas. Carbon Monoxide, a component of this gas mixture, is a chemical asphyxiant and can produce significant, adverse health effects at relatively low concentrations. Over-exposure to Carbon Monoxide can cause nausea, dizziness, headaches, and collapse. Additionally, releases of this product may produce oxygen-deficient atmospheres (especially in small confined spaces or other poorly-ventilated environments); individuals in such atmospheres may be asphyxiated.

SYMPTOMS OF OVER-EXPOSURE BY ROUTE OF EXPOSURE: The most significant route of over-exposure for this product is by inhalation.

INHALATION: Due to the small size of an individual cylinder of this product, no unusual health effects from over-exposure to the product are anticipated under routine circumstances of use. Inhalation over-exposures to atmospheres containing more than the Threshold Limit Value of Carbon Monoxide (25 ppm) can result in serious health consequences. Carbon Monoxide is classified as a chemical asphyxiant, producing a toxic action by combining with the hemoglobin of the blood and replacing the available oxygen. Through this replacement, the body is deprived of the required oxygen, and asphyxiation occurs.

Since the affinity of carbon monoxide for hemoglobin is about 200-300 times that of oxygen, only a small amount of Carbon Monoxide will cause a toxic reaction to occur. Carbon Monoxide exposures in excess of 50 ppm will produce symptoms of poisoning if breathed for a sufficiently long time. If this product is released in a small, poorly ventilated area (i.e. an enclosed or confined space), symptoms which may develop include the following:

CONCENTRATION OF CARBON MONOXIDE	OBSERVED EFFECT
All exposure levels:	Over-exposure to Carbon Monoxide can be indicated by the lips and fingernails turning bright red.
200 ppm:	Slight symptoms (headache, discomfort) after several hours of exposure.
400 ppm:	Headache and discomfort experienced within 2-3 hours of exposure.
1,000 -2000 ppm:	Within 30 minutes, slight palpitations of the heart occurs. Within 1.5 hours, there is a tendency to stagger.
2000-2500 ppm:	Within 2 hours, there is mental confusion, headaches, and nausea. Unconsciousness within 30 minutes.
> 2500 ppm:	Potential for collapse and death before warning symptoms are produced.

Additionally, releases of this product may produce oxygen-deficient atmospheres (especially in small confined spaces or other poorly-ventilated environments); individuals in such atmospheres may be asphyxiated.

HAZARDOUS MATERIAL IDENTIFICATION SYSTEM

HEALTH HAZARD	(BLUE)	2
FLAMMABILITY HAZARD	(RED)	0
PHYSICAL HAZARD	(YELLOW)	0

PROTECTIVE EQUIPMENT

EYES	RESPIRATORY	HANDS	BODY
See Section 8			

For Routine Industrial Use and Handling Applications

3. HAZARD IDENTIFICATION (continued)

HEALTH EFFECTS OR RISKS FROM EXPOSURE: An Explanation in Lay Terms. Over-exposure to this gas mixture may cause the following health effects:

ACUTE: Due to the small size of the individual cylinder of this product, no unusual health effects from exposure to the product are anticipated under routine circumstances of use. However, Carbon Monoxide (a component of this gas mixture) is toxic to humans. Symptoms of Carbon Monoxide poisoning can develop gradually, or can arise suddenly, depending on the concentration and duration of exposure. Lips and fingernails will turn bright red, which is a significant sign of Carbon Monoxide over-exposure. Other symptoms of over-exposure can include respiratory difficulty, headaches, shortness of breath, wheezing, headache, blurred vision, memory loss, dizziness, indigestion, nausea, unconsciousness, and death.

CHRONIC: Chronic exposure to oxygen-deficient atmospheres (below 18% oxygen in air) may effect the heart and nervous system. Clinical studies indicate that there is a relationship between exposure to Carbon Monoxide in specific occupations (i.e. fire-fighters, foundry workers) and an increased incidence of cardiovascular problems. Carbon Monoxide is a reproductive toxin. Refer to Section 11 (Toxicological Information) of this MSDS for further information.

TARGET ORGANS: ACUTE: Respiratory system, blood system. CHRONIC: Heart, cardiovascular system, central nervous system, reproductive system.

4. FIRST-AID MEASURES

RESCUERS SHOULD NOT ATTEMPT TO RETRIEVE VICTIMS OF OVER-EXPOSURE TO THIS PRODUCT WITHOUT ADEQUATE PERSONAL PROTECTIVE EQUIPMENT. At a minimum, Self-Contained Breathing Apparatus and Fire-Retardant Personal Protective equipment should be worn. Adequate fire protection must be provided during rescue situations. Victim(s) must be taken for medical attention. Rescuers should be taken for medical attention, if necessary. Take copy of label and MSDS to physician or other health professional with victim(s).

No unusual health effects are anticipated after exposure to this product, due to the small cylinder size. If any adverse symptom develops after over-exposure to this product, remove victim(s) to fresh air, as quickly as possible. Only Trained personnel should administer supplemental oxygen and/or cardio-pulmonary resuscitation, if necessary. Only trained personnel should administer supplemental oxygen.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: Pre-existing respiratory conditions may be aggravated by over-exposure to this product. The Carbon Monoxide component of this gas mixture can aggravate some diseases of the cardiovascular system, such as coronary artery disease and angina pectoris.

RECOMMENDATIONS TO PHYSICIANS: Treat symptoms and reduce over-exposure. Provide oxygen. Hyperbaric oxygen is the most efficient antidote to Carbon Monoxide poisoning, the optimum range being 2-2.5 atm. A special mask, or, preferably, a compression chamber to utilize oxygen at these pressures is required. Avoid administering stimulant drugs.

5. FIRE-FIGHTING MEASURES

FLASH POINT: Not applicable.

AUTOIGNITION TEMPERATURE: Not applicable.

FLAMMABLE LIMITS (in air by volume, %):

Lower (LEL): Not applicable.

Upper (UEL): Not applicable.

FIRE EXTINGUISHING MATERIALS: Non-flammable gas mixture. Use extinguishing media appropriate for surrounding fire.

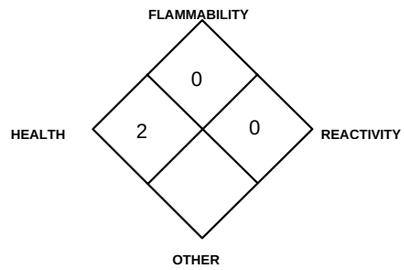
UNUSUAL FIRE AND EXPLOSION HAZARDS: This gas mixture is not flammable; however, containers, when involved in fire, may rupture or burst in the heat of the fire.

Explosion Sensitivity to Mechanical Impact: Not Sensitive.

Explosion Sensitivity to Static Discharge: Not Sensitive.

SPECIAL FIRE-FIGHTING PROCEDURES: Structural firefighters must wear Self-Contained Breathing Apparatus and full protective equipment.

NFPA RATING



6. ACCIDENTAL RELEASE MEASURES

LEAK RESPONSE: Due to the small size and content of the cylinder, an accidental release of this product presents significantly less risk of an oxygen deficient environment and other safety hazards than a similar release from a larger cylinder. However, as with any chemical release, extreme caution must be used during emergency response procedures. In the event of a release in which the atmosphere is unknown, and in which other chemicals are potentially involved, evacuate immediate area. Such releases should be responded to by trained personnel using pre-planned procedures. Proper protective equipment should be used. In case of a leak, clear the affected area, protect people, and respond with trained personnel.

For emergency disposal, secure the cylinder and slowly discharge the gas to the atmosphere in a well-ventilated area or outdoors. Allow the gas mixture to dissipate. If necessary, monitor the surrounding area (and the original area of the release) for oxygen and Carbon Monoxide. Carbon Monoxide level must be below exposure level listed in Section 2 (Composition and Information on Ingredients) before non-emergency personnel are allowed to re-enter area.

If leaking incidentally from the cylinder or its valve, contact your supplier.

7. HANDLING and USE

WORK PRACTICES AND HYGIENE PRACTICES: Be aware of any signs of dizziness or fatigue; exposures to fatal concentrations of this product could occur without any significant warning symptoms, due to oxygen deficiency. Do not attempt to repair, adjust, or in any other way modify the cylinders containing Carbon Monoxide. If there is a malfunction or another type of operational problem, contact nearest distributor immediately.

STORAGE AND HANDLING PRACTICES: Cylinders should be firmly secured to prevent falling or being knocked-over. Cylinders must be protected from the environment, and preferably kept at room temperature)approximately 21°C, 70°F). Cylinders should be stored in dry, well-ventilated areas, away from sources of heat, ignition, and direct sunlight. Protect cylinders against physical damage. Full and empty cylinders should be segregated. Use a first-in, first-out inventory system to prevent full containers from being stored for long periods of time. These cylinders are not refillable. **WARNING! Do not refill DOT 39 cylinders. To do so may cause personal injury or property damage.**

SPECIAL PRECAUTIONS FOR HANDLING GAS CYLINDERS: WARNING! Compressed gases can present significant safety hazards. During cylinder use, use equipment designed for these specific cylinders. Ensure all lines and equipment are rated for proper service pressure.

PROTECTIVE PRACTICES DURING MAINTENANCE OF CONTAMINATED EQUIPMENT: Follow practices indicated in Section 6 (Accidental Release Measures). Make certain that application equipment is locked and tagged-out safely. Always use product in areas where adequate ventilation is provided.

8. EXPOSURE CONTROLS - PERSONAL PROTECTION

VENTILATION AND ENGINEERING CONTROLS: No special ventilation systems or engineering controls are needed under normal circumstances of use. As with all chemicals, use this product in well-ventilated areas. If this product is used in a poorly-ventilated area, install automatic monitoring equipment to detect the levels of Carbon Monoxide and oxygen.

RESPIRATORY PROTECTION: No special respiratory protection is required under normal circumstances of use. Use supplied air respiratory protection if Oxygen levels are below 19.5%, or unknown, during emergency response to a release of this product. If respiratory protection is needed, use only protection authorized in the U.S. Federal OSHA Standard (29 CFR 1910.134), applicable U.S. State regulations, or the Canadian CSA Standard Z94.4-93 and applicable standards of Canadian Provinces. Oxygen levels below 19.16.33% are considered IDLH by OSHA. In such atmospheres, use of a full-facepiece pressure/demand SCBA or a full facepiece, supplied air respirator with auxiliary self-contained air supply is required under OSHA's Respiratory Protection Standard (1910.134-1998). In the event that exposure limits may be exceeded for Carbon Monoxide, the following NIOSH respiratory protection equipment guidelines should be consulted.

8. EXPOSURE CONTROLS - PERSONAL PROTECTION (continued)

CARBON MONOXIDE CONCENTRATION	RESPIRATORY PROTECTION
Up to 350 ppm:	Any Supplied-Air Respirator (SAR).
Up to 875 ppm:	Any SAR operated in a continuous-flow mode.
Up to 1200 ppm:	Any Air-Purifying, Full-Facepiece respirator (gas mask) with a chin-style, front- or back-mounted canister providing protection against Carbon Monoxide, or any Self-Contained Breathing Apparatus(SCBA) with a full facepiece, or any SAR with a full facepiece.
Emergency or Planned Entry into Unknown Concentrations or IDLH Conditions:	Any SCBA that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode, or any SAR that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary SCBA operated in pressure-demand or other positive-pressure mode.
Escape:	Any Air-Purifying, Full-Facepiece respirator (gas mask) with a chin-style, front- or back-mounted canister providing protection against Carbon Monoxide, or any appropriate escape-type, SCBA.

EYE PROTECTION: Safety glasses. If necessary, refer to U.S. OSHA 29 CFR 1910.133 or appropriate Canadian Standards.
HAND PROTECTION: No special protection is needed under normal circumstances of use. If necessary, refer to U.S. OSHA 29 CFR 1910.138 or appropriate Standards of Canada.
BODY PROTECTION: No special protection is needed under normal circumstances of use. If a hazard of injury to the feet exists due to falling objects, rolling objects, where objects may pierce the soles of the feet or where employee's feet may be exposed to electrical hazards, use foot protection, as described in U.S. OSHA 29 CFR 1910.136.

9. PHYSICAL and CHEMICAL PROPERTIES

The following physical property values are for the main component, Nitrogen:

GAS DENSITY @ 32°F (0°C) and 1 atm: .072 lbs/ ft^3 (1.153 kg/m^3)
BOILING POINT: -320.4°F (-195.8°C)
FREEZING/MELTING POINT @ 10 psig -210°C (-345.8°F)
SPECIFIC GRAVITY (air = 1) @ 70°F (21.1°C): 0.906
SOLUBILITY IN WATER vol/vol @ 32°F (0°C) and 1 atm: 0.023
EVAPORATION RATE (nBuAc = 1): Not applicable.
ODOR THRESHOLD: Not applicable. Odorless.
VAPOR PRESSURE @ 70°F (21.1°C) psig: Not applicable.
COEFFICIENT WATER/OIL DISTRIBUTION: Not applicable.
pH: Not applicable.
MOLECULAR WEIGHT: 28.01
EXPANSION RATIO: Not applicable.
SPECIFIC VOLUME (ft^3/lb): 13.8

The following values are for the gas mixture:

APPEARANCE, ODOR AND COLOR: This product is a colorless, odorless gas mixture.
HOW TO DETECT THIS SUBSTANCE (warning properties): There are no unusual warning properties associated with a release of this product.

10. STABILITY and REACTIVITY

STABILITY: Stable at normal temperature and pressure.
DECOMPOSITION PRODUCTS: The thermal decomposition products of Methane include carbon oxides. The other components of this gas mixture do not decompose, per se, but can react with other compounds in the heat of a fire.
MATERIALS WITH WHICH SUBSTANCE IS INCOMPATIBLE: Titanium will burn in Nitrogen (the main component of this product). Lithium reacts slowly with Nitrogen at ambient temperatures. Components of this product (Hydrogen, Carbon Monoxide, Methane) are also incompatible with strong oxidizers (i.e. chlorine, bromine pentafluoride, oxygen, oxygen difluoride, and nitrogen trifluoride). Carbon Monoxide is mildly corrosive to nickel and iron (especially at high temperatures and pressures).
HAZARDOUS POLYMERIZATION: Will not occur.
CONDITIONS TO AVOID: Contact with incompatible materials. Cylinders exposed to high temperatures or direct flame can rupture or burst.

11. TOXICOLOGICAL INFORMATION

TOXICITY DATA: The following toxicology data are available for the components of this product:

CARBON MONOXIDE:

LC_{50} (Inhalation-Rat) 1807 ppm/4 hours
LC_{50} (Inhalation-Mouse) 2444 ppm/4 hours
LC_{50} (Inhalation-Guinea Pig) 5718 ppm/4 hours
LC_{50} (Inhalation-wild bird species) 1334 ppm
LCLo (Inhalation-Human) 4 mg/m^3/12 hours: Behavioral: coma; Vascular: BP lowering not characterized in autonomic section; Blood: methemoglobinemia-carboxyhemoglobin
LCLo (Inhalation-Man) 4000 ppm/30 minutes
LCLo (Inhalation-Human) 5000 ppm/5 minutes
LCLo (Inhalation-Dog) 4000 ppm/46 minutes
LCLo (Inhalation-Rabbit) 4000 ppm
LCLo (Inhalation-Mammal-species unspecified) 5000 ppm/5 minutes
TCLo (Inhalation-Human) 600 mg/m^3/10 minutes: Behavioral: headache
TCLo (Inhalation-Man) 650 ppm/45 minutes: Blood: methemoglobinemia-carboxyhemoglobin; Behavioral: changes in psychophysiological tests
TCLo (Inhalation-Rat) 1800 ppm/1 hour/14 days-intermittent: Cardiac: other changes
TCLo (Inhalation-Rat) 30 mg/m^3/8 hours/10 weeks-intermittent: Brain and Coverings: other degenerative changes;
Behavioral: muscle contraction or spasticity
TCLo (Inhalation-Rat) 96 ppm/24 hours/90 days-continuous: Blood: pigmented or nucleated red blood cells, other changes
TCLo (Inhalation-Rat) 250 ppm/5 hours/20 days-intermittent: Blood :pigmented or nucleated red blood cells, changes in other cell count (unspecified), changes in erythrocyte (RBC) count
TDLo (Subcutaneous-Rat) 5983 mg/kg/18 weeks-intermittent: Blood: changes in serum composition (e.g. TP, bilirubin, cholesterol)
TCLo (Inhalation-Mouse) 50 ppm/30 days-intermittent: Lungs, Thorax, or Respiration: structural or functional change in trachea or bronchi

TCLo (Inhalation-Monkey) 200 ppm/24 hours/90 days-continuous: Blood: pigmented or nucleated red blood cells, other changes
TCLo (Inhalation-Rabbit) 200 mg/m^3/3 hours/13 weeks-intermittent: Brain and Coverings: other degenerative changes; Cardiac: other changes; Blood: hemorrhage
TCLo (Inhalation-Rabbit) 50 ppm/24 hours/8 weeks-continuous: Blood: changes in platelet count
TCLo (Inhalation-Guinea Pig) 200 mg/m^3/5 hours/4 weeks-intermittent: Endocrine: hyperglycemia
TCLo (Inhalation-Guinea Pig) 200 mg/m^3/5 hours/30 weeks-continuous: Cardiac: arrhythmias (including changes in conduction),
EKG changes not diagnostic of specified effects, pulse rate increase, without fall in BP
TCLo (Inhalation-Guinea Pig) 200 ppm/24 hours/90 days-continuous: Blood: pigmented or nucleated red blood cells, other changes
TCLo (Inhalation-Rat) 75 ppm/24 hours: female 0-20 day(s) after conception: Reproductive: Maternal Effects: other effects; Effects on Newborn: behavioral
TCLo (Inhalation-Rat) 150 ppm/24 hours: female 1-22 day(s) after conception: Reproductive: Specific Developmental Abnormalities: cardiovascular (circulatory) system
TCLo (Inhalation-Rat) 150 ppm/24 hours: female 1-22 day(s) after conception: Reproductive: Effects on Newborn: growth statistics (e.g.%, reduced weight gain), behavioral
TCLo (Inhalation-Rat) 1 mg/m^3/24 hours: female 72 day(s) pre-mating: Reproductive: Maternal Effects: menstrual cycle changes or disorders, parturition; Fertility: female fertility index (e.g. # females pregnant per # sperm positive females; # females pregnant per # females mated)
TCLo (Inhalation-Rat) 150 ppm/24 hours: female 0-20 day(s) after conception: Reproductive: Effects on Newborn: behavioral
TCLo (Inhalation-Rat) 75 ppm/24 hours: female 0-20 day(s) after conception: Reproductive: Specific Developmental Abnormalities: immune and reticuloendothelial system
TCLo (Inhalation-Mouse) 65 ppm/24 hours: female 7-18 day(s) after conception: Reproductive: Effects on Newborn: behavioral
TCLo (Inhalation-Mouse) 250 ppm/7 hours: female 6-15 day(s) after conception: Reproductive: Fertility: post-implantation mortality (e.g. dead and/or resorbed implants per total number of implants); Specific Developmental Abnormalities: musculoskeletal system
TCLo (Inhalation-Mouse) 125 ppm/24 hours: female 7-18 day(s) after conception: Reproductive: Effects on Embryo or Fetus: fetotoxicity (except death, e.g., stunted fetus)
TCLo (Inhalation-Mouse) 8 pph/1 hour: female 8 day(s) after conception: Reproductive: Fertility: litter size (e.g. # fetuses per litter; measured before birth); Effects on Embryo or Fetus: fetotoxicity (except death, e.g., stunted fetus), fetal death
TCLo (Inhalation-Mouse) 8 pph/1 hour: female 8 day(s) after conception: Reproductive: Specific Developmental Abnormalities: Central Nervous System
TCLo (Inhalation-Rabbit) 180 ppm/24 hours: female 1-30 day(s) after conception: Reproductive: Effects on Newborn: stillbirth, viability index (e.g., # alive at day 4 per # born alive)
Micronucleus Test (Inhalation-Mouse)1500 ppm/10 minutes
Sister Chromatid Exchange (Inhalation-Mouse) 2500 ppm/10 minutes

HYDROGEN:
There are no specific toxicology data for Hydrogen. Hydrogen is a simple asphyxiant (SA), which acts to displace oxygen in the environment.

METHANE:
There are no specific toxicology data for Methane. Methane is a simple asphyxiant, which acts to displace oxygen in the environment.

NITROGEN:
There are no specific toxicology data for Nitrogen. Nitrogen is a simple asphyxiant, which acts to displace oxygen in the environment.

11. TOXICOLOGICAL INFORMATION (continued)

OXYGEN:
The toxicity data for Oxygen are related to exposures in a hyperbaric environment and are not likely to occur in industrial exposure situations.

SUSPECTED CANCER AGENT: The components of this gas mixture are not found on the following lists: FEDERAL OSHA Z LIST, NTP, CAL/OSHA, and IARC; therefore are not considered to be, nor suspected to be, cancer-causing agents by these agencies.

IRRITANCY OF PRODUCT: Contact with rapidly expanding gases can be irritating to exposed skin and eyes.

SENSITIZATION OF PRODUCT: The components of this gas mixture are not sensitizers.

REPRODUCTIVE TOXICITY INFORMATION: Listed below is information concerning the effects of this gas mixture on the human reproductive system.

Mutagenicity: The components of this gas mixture are not reported to cause mutagenic effects in humans.

Embryotoxicity: The components of this gas mixture are not reported to cause embryotoxic effects in humans.

Teratogenicity: This gas mixture is not expected to cause teratogenic effects in humans due to the small cylinder size and small total amount of all components. The Carbon Monoxide component of this gas mixture, which exists up to 1%, can cause teratogenic effects in humans. Severe exposure to Carbon Monoxide during pregnancy has caused adverse effects and the death of the fetus. In general, maternal symptoms are an indicator of the potential risk to the fetus since Carbon Monoxide is toxic to the mother before it is toxic to the fetus.

Reproductive Toxicity: The components of this gas mixture are not reported cause adverse reproductive effects in humans.

A mutagen is a chemical which causes permanent changes to genetic material (DNA) such that the changes will propagate through generation lines. An embryotoxin is a chemical which causes damage to a developing embryo (i.e. within the first eight weeks of pregnancy in humans), but the damage does not propagate across generational lines. A teratogen is a chemical which causes damage to a developing fetus, but the damage does not propagate across generational lines. A reproductive toxin is any substance which interferes in any way with the reproductive process.

BIOLOGICAL EXPOSURE INDICES (BEIs): Biological Exposure Indices (BEIs) have been determined for the Carbon Monoxide component, as follows:

CHEMICAL DETERMINANT	SAMPLING TIME	BEI
CARBON MONOXIDE • Carboxyhemoglobin in blood • Carbon monoxide in end-exhaled air	 • End of shift • End of shift	 • 3.5% of hemoglobin • 20 ppm

12. ECOLOGICAL INFORMATION

ENVIRONMENTAL STABILITY: The components of this gas mixture occur naturally in the atmosphere. The gas will be dissipated rapidly in well-ventilated areas.

EFFECT OF MATERIAL ON PLANTS or ANIMALS: No evidence is currently available on the effects of this gas mixture on plant and animal life. The Carbon Monoxide component of this gas mixture can be deadly to exposed animal life, producing symptoms similar to those experienced by humans. Carbon Monoxide may also be harmful to plant life.

EFFECT OF CHEMICAL ON AQUATIC LIFE: No evidence is currently available on this product's effects on aquatic life. The presence of more than a trace of the Carbon Monoxide component of this product is a hazard to fish.

13. DISPOSAL CONSIDERATIONS

PREPARING WASTES FOR DISPOSAL PREPARING WASTES FOR DISPOSAL: Waste disposal must be in accordance with appropriate U.S. Federal, State, and local regulations and those of Canada and its Provinces. Cylinders with undesired residual product may be safely vented outdoors with the proper regulator. For further information, refer to Section 16 (Other Information)

14. TRANSPORTATION INFORMATION

THIS GAS MIXTURE IS HAZARDOUS AS DEFINED BY 49 CFR 172.101 BY THE U.S. DEPARTMENT OF TRANSPORTATION.

PROPER SHIPPING NAME: Compressed gases, n.o.s. (*Oxygen, Nitrogen)*or the gas component with the next highest concentration next to Nitrogen.

HAZARD CLASS NUMBER and DESCRIPTION: 2.2 (Non-Flammable Gas)

UN IDENTIFICATION NUMBER: UN 1956

PACKING GROUP: Not applicable.

DOT LABEL(S) REQUIRED: Class 2.2 (Non-Flammable Gas)

NORTH AMERICAN EMERGENCY RESPONSE GUIDEBOOK NUMBER (2000): 126

MARINE POLLUTANT: The components of this gas mixture are not classified by the DOT as Marine Pollutants (as defined by 49 CFR 172.101, Appendix B)

SPECIAL SHIPPING INFORMATION: Cylinders should be transported in a secure position, in a well-ventilated vehicle. The transportation of compressed gas cylinders in automobiles or in closed-body vehicles can present serious safety hazards. If transporting these cylinders in vehicles, ensure these cylinders are not exposed to extremely high temperatures (as may occur in an enclosed vehicle on a hot day). Additionally, the vehicle should be well-ventilated during transportation.

Note: DOT 39 Cylinders ship in a strong outer carton (overpack). Pertinent shipping information goes on the outside of the overpack. DOT 39 Cylinders do not have transportation information on the cylinder itself.

TRANSPORT CANADA TRANSPORTATION OF DANGEROUS GOODS REGULATIONS: This gas mixture is considered as Dangerous Goods, per regulations of Transport Canada.

PROPER SHIPPING NAME: Compressed gases, n.o.s. (*Oxygen, Nitrogen)*or the gas component with the next highest concentration next to Nitrogen.

HAZARD CLASS NUMBER and DESCRIPTION: 2.2 (Non-Flammable Gas)

UN IDENTIFICATION NUMBER: UN 1956

PACKING GROUP: Not Applicable

HAZARD LABEL: Class 2.2 (Non-Flammable Gas)

SPECIAL PROVISIONS: None

EXPLOSIVE LIMIT AND LIMITED QUANTITY INDEX: 0.12

ERAP INDEX: None

PASSENGER CARRYING SHIP INDEX: None

PASSENGER CARRYING ROAD VEHICLE OR PASSENGER CARRYING RAILWAY VEHICLE INDEX: 75

NORTH AMERICAN EMERGENCY RESPONSE GUIDEBOOK NUMBER (2000): 126

NOTE: Shipment of compressed gas cylinders via Public Passenger Road Vehicle is a violation of Canadian law (Transport Canada Transportation of Dangerous Goods Act, 1992)

15. REGULATORY INFORMATION

ADDITIONAL U.S. REGULATIONS:

U.S. SARA REPORTING REQUIREMENTS: The components of this gas mixture are not subject to the reporting requirements of Sections 302, 304 and 313 of Title III of the Superfund Amendments and Reauthorization Act., as follows:

U.S. SARA THRESHOLD PLANNING QUANTITY: There are no specific Threshold Planning Quantities for the components of this gas mixture. The default Federal MSDS submission and inventory requirement filing threshold of 10,000 lb (4,540 kg) may apply, per 40 CFR 370.20.

15. REGULATORY INFORMATION (Continued)

U.S. TSCA INVENTORY STATUS: The components of this gas mixture are listed on the TSCA Inventory.
U.S. CERCLA REPORTABLE QUANTITIES (RQ): Not applicable.
U.S. STATE REGULATORY INFORMATION: The components of this gas mixture are covered under the following specific State regulations:

Alaska - Designated Toxic and Hazardous Substances: Carbon Monoxide, Methane, Hydrogen.
California - Permissible Exposure Limits for Chemical Contaminants: Carbon Monoxide, Nitrogen, Methane, Hydrogen.
Florida - Substance List: Oxygen, Carbon Monoxide, Hydrogen.
Illinois - Toxic Substance List: Carbon Monoxide, Hydrogen.
Kansas - Section 302/313 List: No.
Massachusetts - Substance List: Oxygen, Carbon Monoxide, Methane, Hydrogen.
Michigan - Critical Materials Register: No.
Minnesota - List of Hazardous Substances: Carbon Monoxide, Methane, Hydrogen.
Missouri - Employer Information/Toxic Substance List: Methane, Hydrogen
New Jersey - Right to Know Hazardous Substance List: Oxygen, Carbon Monoxide, Nitrogen, Methane, Hydrogen.
North Dakota - List of Hazardous Chemicals, Reportable Quantities: No.
Pennsylvania - Hazardous Substance List: Oxygen, Carbon Monoxide, Nitrogen, Methane, Hydrogen.
Rhode Island - Hazardous Substance List: Oxygen, Carbon Monoxide, Nitrogen, Methane, Hydrogen.
Texas - Hazardous Substance List: No.
West Virginia - Hazardous Substance List: No.
Wisconsin - Toxic and Hazardous Substances: No.

CALIFORNIA SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT (PROPOSITION 65): Carbon Monoxide is on the California Proposition 65 lists. WARNING: This gas mixture contains a chemical known to the State of California to cause birth defects or other reproductive harm.

OTHER U.S. FEDERAL REGULATIONS:

- Carbon Monoxide is subject to the reporting requirements of CFR 29 1910.1000. Carbon Monoxide is listed on Table Z.1.
- Hydrogen and Methane are subject to the reporting requirements of Section 112(r) of the Clean Air Act. The Threshold Quantity for each of these gases is 10,000 pounds and so this mixture will not be affected by the regulation.
- This gas mixture does not contain any Class I or Class II ozone depleting chemicals (40 CFR part 82).
- Nitrogen and Oxygen are not listed as Regulated Substances, per 40 CFR, Part 68, of the Risk Management for Chemical Releases. Carbon Monoxide, Methane, and Hydrogen are listed under this regulation in Table 3 as Regulated Substances (Flammable Substances), in quantities of 10,000 lbs (4,553 kg) or greater, and so this mixture will not be affected by the regulation.

ADDITIONAL CANADIAN REGULATIONS:
CANADIAN DSL/NDSL INVENTORY STATUS: The components of this gas mixture are on the DSL Inventory.
CANADIAN ENVIRONMENTAL PROTECTION ACT (CEPA) PRIORITIES SUBSTANCES LISTS: The components of this gas mixture are not on the CEPA Priorities Substances Lists.
OTHER CANADIAN REGULATIONS: This gas mixture is categorized as a Controlled Product, Hazard Classes A and D2A, as per the Controlled Product Regulations.

16. OTHER INFORMATION

INFORMATION ABOUT DOT-39 NRC (Non-Refillable Cylinder) PRODUCTS

DOT 39 cylinders ship as hazardous materials when full. Once the cylinders are relieved of pressure (empty) they are not considered hazardous material or waste. Residual gas in this type of cylinder is not an issue because toxic gas mixtures are prohibited. Calibration gas mixtures typically packaged in these cylinders are Nonflammable n.o.s., UN 1956. A small percentage of calibration gases packaged in DOT 39 cylinders are flammable or oxidizing gas mixtures.

For disposal of used DOT-39 cylinders, it is acceptable to place them in a landfill if local laws permit. Their disposal is no different than that employed with other DOT containers such as spray paint cans, household aerosols, or disposable cylinders of propane (for camping, torch etc.). When feasible, we recommended recycling for scrap metal content. CALGAZ, LLC will do this for any customer that wishes to return cylinders to us prepaid. All that is required is a phone call to make arrangements so we may anticipate arrival. Scrapping cylinders involves some preparation before the metal dealer may accept them. We perform this operation as a service to valued customers who want to participate.

MIXTURES: When two or more gases or liquefied gases are mixed, their hazardous properties may combine to create additional, unexpected hazards. Obtain and evaluate the safety information for each component before you produce the mixture. Consult an Industrial Hygienist or other trained person when you make your safety evaluation of the end product. Remember, gases and liquids have properties which can cause serious injury or death.

Further information about the handling of compressed gases can be found in the following pamphlets published by: Compressed Gas Association Inc. (CGA), 1725 Jefferson Davis Highway, Suite 1004, Arlington, VA 22202-4102. Telephone: (703) 412-0900.

P-1 *"Safe Handling of Compressed Gases in Containers"*
AV-1 *"Safe Handling and Storage of Compressed Gases"*
"Handbook of Compressed Gases"

PREPARED BY: CHEMICAL SAFETY ASSOCIATES, Inc.
PO Box 3519, La Mesa, CA 91944-3519
619/670-0609
Fax on Demand: 1-800/231-1366

AIR LIQUIDE™

This Material Safety Data Sheet is offered pursuant to OSHA's Hazard Communication Standard, 29 CFR, 1910.1200. Other government regulations must be reviewed for applicability to this product. To the best of CALGAZ, LLC knowledge, the information contained herein is reliable and accurate as of this date; however, accuracy, suitability or completeness are not guaranteed and no warranties of any type, either express or implied, are provided. The information contained herein relates only to this specific product. If this product is combined with other materials, all component properties must be considered. Data may be changed from time to time. Be sure to consult the latest edition.

The "Invisible" KILLER

Carbon Monoxide (CO) is the "invisible" killer. Carbon monoxide is a colorless and odorless gas. Every year more than 100 people in the United States die from unintentional exposure to carbon monoxide associated with consumer products.

What is carbon monoxide?

Carbon monoxide is produced by burning fuel. Therefore, any fuel-burning appliance in your home is a potential CO source.

When cooking or heating appliances are kept in good working order, they produce little CO. Improperly operating appliances can produce fatal CO concentrations in your home.

Running a car or generator in an attached garage can cause fatal CO poisoning in the home. So can running a generator or burning charcoal in the basement, crawlspace, or living area of the home.

Symptoms of CO poisoning

The initial symptoms of CO poisoning are similar to the flu (but without the fever) They include:

- Headache
- Fatigue
- Shortness of breath
- Nausea
- Dizziness

If you suspect that you are experiencing CO poisoning, get fresh air immediately. Leave the home and call for assistance from a neighbor's home. You could lose consciousness and die from CO poisoning if you stay in the home.

Get medical attention immediately and inform medical staff that CO poisoning is suspected. Call the Fire Department to determine when it is safe to reenter the home.

To report a dangerous product or a product related injury, call CPSC's hotline at (800) 638-2772 or CPSC teletypewriter at (800) 638-8270. Consumers can obtain recall information at CPSC's web site at *http://www.cpsc.gov*. Consumers can report product hazards to *info@cpsc.gov*.

U.S. Consumer Product Safety Commission
Washington, DC 20207

What should you do?

Proper installation, operation, and maintenance of fuel-burning appliances in the home is the most important factor in reducing the risk of CO poisoning.

Make sure appliances are installed according to the manufacturer's instructions and the local codes. Most appliances should be installed by professionals.

Always follow the appliance manufacturer's directions for safe operation.

Have the heating system (including chimneys and vents) inspected and serviced annually by a trained service technician.

Examine vents and chimneys regularly for improper connections, visible cracks, rust or stains.

Look for problems that could indicate improper appliance operations:

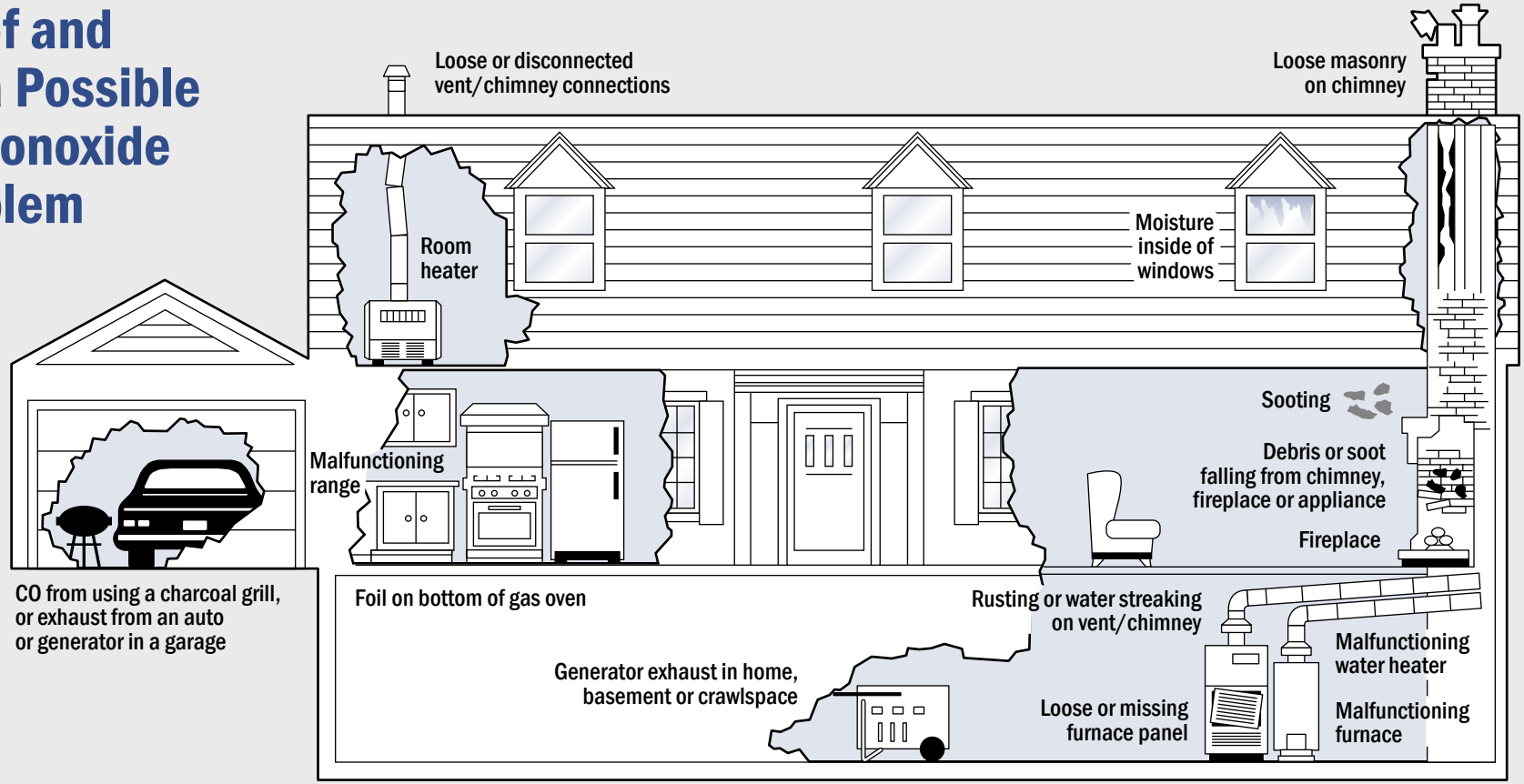
- Decreased hot water supply
- Furnace unable to heat house or runs continuously
- Sooting, especially on appliances and vents
- Unfamiliar, or burning odor
- Increased moisture inside of windows

Operate portable generators outdoors and away from open doors, windows, and vents that could allow CO to come indoors.

In addition, install battery-operated CO alarms or plug-in CO alarms with battery back-up in your home. Every home should have a CO alarm in the hallway near the bedrooms in each separate sleeping area. The CO alarms should be certified to the requirements of the most recent UL, IAS, or CSA standard for CO alarms. Test your CO alarms frequently and replace dead batteries. A CO alarm can provide added protection, but is no substitute for proper installation, use and upkeep of appliances that are potential CO sources.

CPSC-464

Sources of and Clues to a Possible Carbon Monoxide (CO) Problem



Carbon monoxide clues you can see...

- Rusting or water streaking on vent/chimney
- Loose or missing furnace panel
- Sooting
- Debris or soot falling from chimney, fireplace, or appliances
- Loose or disconnected vent/chimney, fireplace or appliance
- Loose masonry on chimney
- Moisture inside of windows

Carbon monoxide clues you cannot see...

- Internal appliance damage or malfunctioning components
- Improper burner adjustments
- Hidden blockage or damage in chimneys

Only a trained service technician can detect hidden problems and correct these conditions!

- CO poisoning symptoms have been experienced when you are home, but they lessen or disappear when you are away from home.

Warnings...

- Never leave a car running in a garage even with the garage door open.
- Never run a generator in the home, garage, or crawlspace. Opening doors and windows or using fans will NOT prevent CO build-up in the home. When running a generator outdoors, keep it away from open windows and doors.
- Never burn charcoal in homes, tents, vehicles, or garages.
- Never install or service combustion appliances without proper knowledge, skills, and tools.
- Never use a gas range, oven, or dryer for heating.
- Never put foil on bottom of a gas oven because it interferes with combustion.
- Never operate an unvented gas-burning appliance in a closed room or in a room in which you are sleeping.

¿Qué es lo que debe usted hacer?

El factor más importante en la reducción del riesgo de envenenamiento por monóxido de carbono en su hogar, es la adecuada instalación, operación y mantenimiento de los aparatos de combustión.

Asegúrese que los aparatos de combustión sean instalados de acuerdo a las instrucciones del fabricante y del reglamento o códigos locales. La gran mayoría de los aparatos deben ser instalados por técnicos calificados.

Para un funcionamiento seguro, siempre siga las instrucciones del fabricante.

Haga que un contratista calificado inspeccione y dé servicio anualmente, al sistema de calefacción (incluyendo chimeneas y elementos de ventilación) en su hogar.

Examine los elementos de ventilación y las chimeneas regularmente por conexiones sueltas, grietas visibles, oxidación o manchas.

Busque evidencia que indique mal funcionamiento del aparato:

- Disminución del abastecimiento del agua caliente
- La calefacción no logra calentar la casa, o funciona constantemente
- Existencia de hollín; especialmente en los aparatos de calefacción y elementos de ventilación
- Olor extraño, o a quemado
- Aumento de la condensación dentro de ventanas

Los generadores de electricidad portátiles deben usarse al aire libre, alejados de puertas, ventanas y tomas de aire que pudiesen permitir el ingreso del CO a un área encerrada.

Además, instale alarmas de detección de CO que funcionen con pilas o alarmas de CO eléctricas con pilas de respaldo en caso de una falla eléctrica. Cada hogar debe contar con una alarma de CO en el pasillo cerca de cada dormitorio y en cualquier otra habitación donde la gente duerma. Las alarmas de CO deben contar con la certificación de cumplimiento con los más recientes requisitos de seguridad para alarmas de CO (UL, IAS o CSA). Verifique el funcionamiento de sus alarmas de CO frecuentemente y cámbieles las pilas que ya no sirvan. Una alarma de detección de CO puede proveer protección adicional, pero no substituye la adecuada instalación, uso y mantenimiento de los aparatos de combustión en sus hogares que son fuentes potenciales de CO.

Síntomas de Intoxicación

Los síntomas iniciales son parecidos a los de la gripe, pero sin la fiebre. Estos incluyen:

- Dolor de cabeza
- Fatiga
- Respiración irregular
- Nausea
- Mareos

Si sospecha que está sufriendo intoxicación por CO, salga a tomar aire fresco inmediatamente. Salga de su hogar y vaya a la casa de un vecino para llamar a los servicios de emergencia médica. Si permanece dentro de la casa, una persona pudiera perder el conocimiento o morir de envenenamiento por CO.

Consulte a un médico inmediatamente e infórmele al personal médico sobre su sospecha de estar sufriendo intoxicación por CO. Llame al departamento de bomberos para que determinen cuando sea seguro volver a entrar a la casa.

Para reportar un producto peligroso o una lesión ocurrida a causa de un producto de consumo, llame a la línea de urgencia gratuita de la Comisión para la Seguridad de los Productos de Consumo de los EE.UU. (U.S. Consumer Product Safety Commission, por su nombre en inglés) al 800-638-2772, mande un teletexto al número (TTY) 800-638-8270, escriba un correo electrónico a info@cpsc.gov, ó envíe una carta a U.S. CPSC, Washington, D.C., 20207. Los consumidores pueden obtener gratuitamente, información de seguridad y sobre productos retirados del mercado visitando la página Web de la CPSC www.cpsc.gov.

El ASESINO "Invisible"

El Monóxido de Carbono (CO) es el asesino "invisible". El CO es un gas incoloro e inodoro. Cada año, más de 100 personas en los Estados Unidos, mueren por exposición involuntaria al monóxido de carbono relacionado con productos para el consumidor.

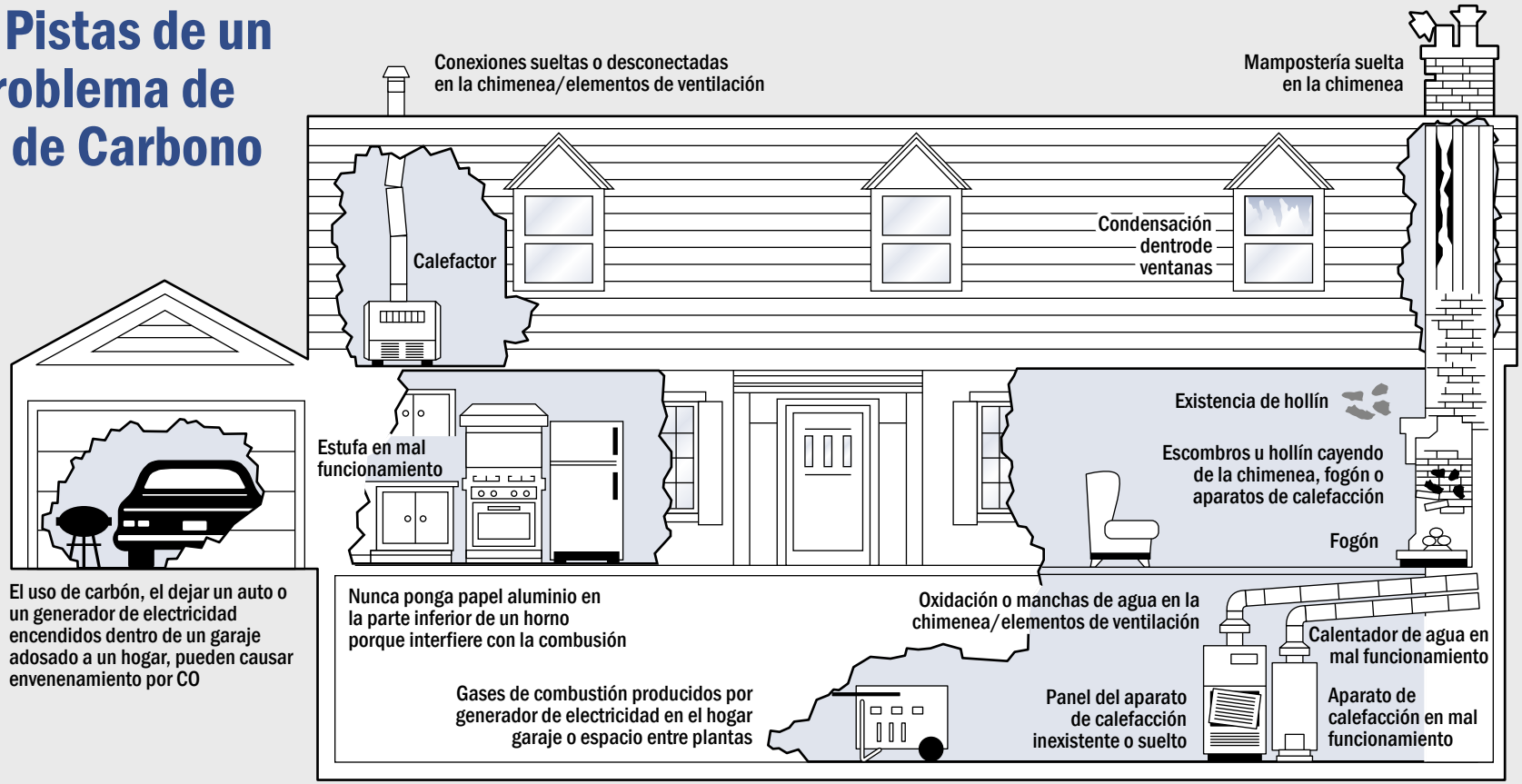
¿Qué es el monóxido de carbono?

El monóxido de carbono se produce al quemar combustible por lo que los aparatos de combustión que se encuentran en su hogar, como estufas, hornos, secadoras de ropa, calefactores, calentadores de agua, etc., son una fuente potencial de CO.

Cuando los aparatos de combustión son mantenidos en buen estado producen poco CO. Los aparatos que no funcionan adecuadamente, pueden producir concentraciones de CO letales en su hogar.

Además del uso de carbón dentro de una casa, el dejar un auto o un generador de electricidad encendidos dentro de un garaje adosado a un hogar, pueden causar envenenamiento por CO. Se corre el mismo riesgo al quemar carbón o usar un generador de electricidad en interiores, ya sea en sótanos, en espacios entre plantas, o en cualquier área de estar, aunque estén ventiladas.

Fuentes y Pistas de un Posible Problema de Monóxido de Carbono



Pistas de CO que usted puede ver...

- Oxidación o manchas de agua en la chimenea/ elementos de ventilación
- Panel del aparato de calefacción inexistente o suelto
- Existencia de hollín
- Escombros u hollín cayendo de la chimenea, fogón o aparatos de calefacción
- Conexiones sueltas o desconectadas en la chimenea/elementos de ventilación, fogón o aparatos de calefacción
- Mampostería suelta en la chimenea
- Condensación dentro de ventanas

Pistas de CO que usted NO puede ver...

- Daño interno o mal funcionamiento de los componentes de los aparatos de combustión
- Quemadores inadecuadamente ajustados
- Obstrucción oculta o daño en las chimeneas

¡Recuerde que solamente un técnico calificado puede detectar y corregir condiciones problemáticas de CO existentes en su hogar!

- Las personas sufren síntomas de intoxicación por CO al estar en casa, pero los síntomas disminuyen o desaparecen fuera de la casa.

Advertencias...

- Nunca deje un automóvil encendido en el garaje, aún con la puerta abierta.
- Nunca utilice un generador de electricidad en interiores, en áreas encerradas o parcialmente encerradas, ya sea en garajes, sótanos, o en espacios entre plantas, aunque estén ventilados.

  El abrir puertas y ventanas, o usar ventiladores, no prevendrá la acumulación de CO dentro del hogar. Coloque la unidad al aire libre, alejada de puertas, ventanas y tomas de aire que pudiesen permitir el ingreso del CO a un área encerrada.
- Nunca queme carbón dentro de su hogar, casas de campaña, vehículos o garajes.
- Nunca instale o dé servicio a aparatos de combustión sin contar con el conocimiento, habilidades y herramientas necesarias.
- Nunca use una estufa, un horno o una secadora de ropa para calentarse.
- Nunca ponga papel aluminio en la parte inferior de un horno porque interfiere con la combustión.
- Nunca use aparatos de combustión, que no cuenten con un sistema de ventilación, en áreas encerradas o en habitaciones donde la gente duerma.

ELEVATOR OPERATIONS

Purpose

The purpose of this guideline is to establish a safe, organized, and efficient plan of operation when using elevators in response to incidents of stalled elevators, and to establish an operational course of action and effective level of response when dealing with elevator accidents involving personal injury. This policy does not cover the usage of elevators during firefighting operations as high rise operations are not needed due to building heights located in Hanover Park.

1. Background

1.1. As with all mechanical devices, there is a probability of failure (power outage, motor control damage, etc.) and the fire department will most certainly be called upon to affect a rescue.

1.2. Most elevators are similar in operating features, however enough discrepancies exist that it is imperative that all fire and EMS personnel should thoroughly familiarize themselves with the operation of elevators located in their still district. This is accomplished by in-service company inspections and preplans.

1.3. The key to using elevators is to understand how they operate and the basic cautions necessary in using them.

2. General Information

2.1. Opening any hoistway door on a functioning elevator will stop the elevator car in whatever position it is currently in, including between floors. The power to the car however will remain on and once the hoistway door is shut the elevator should function normally.

2.2. Elevators that go into “Fire Service” generally return to the first floor, unless that is where the alarm originated, upon arrival the doors will open and stay open. The only way to operate the elevator is with the fire service key. The public should not be allowed to enter/use elevators in the event of an emergency.

2.3. Elevator shafts may have detection devices (heat and/or smoke) installed based on various codes and standards. Elevator shafts equipped with sprinkler systems will have both a smoke and heat detector installed in the shaft. If the smoke detector activates, the car will go into fire service and return to the first floor. If the heat detector activates, the motor control will automatically shut down and the car will stop wherever it is, including between floors.

2.4. If there is a smoke hatch in the elevator shaft, it may open via the smoke detector, heat detector or both. As there are a variety of releasing mechanisms for these hatches, the building manager must ensure the hatch is properly reset.

2.5. At the bottom of each hoistway is the pit, which has buffers designed to cushion an over speeding elevator (not a fall). These are either spring or oil filled.

2.6. Each hoistway has a terminal switch at the top and bottom that will cut power to the operating system if the car exceeds its normal travel distance. It must be reset when tripped, which can be caused by a car, a short, water, flames, etc.

2.7. All elevators have a machine room that can be anywhere, usually above, but can be beneath or to the side of the hoistway. The machine room houses the controller (brain) which operates with up to 500 volts, main disconnect (by number), motor/generator (AC to DC) and speed governor, or hydraulic pump.

2.8. Although new elevator shafts are required to have a protected (crush) zone at the bottom of the elevator pit, **never** allow firefighters to enter the pit without securing the power to elevator and the elevator car has been shored.

2.9. An elevator shall never be jacked or moved in an upward position. The only exception to this is when the elevator car has entrapped a victim.

2.10. Forcible entry on an elevator car or hoistway doors is a last resort.

2.11. All elevators that have been released shall be placed out of service and management notified. Management shall be advised that it is necessary to have a service company check the car before placing that elevator back in service.

3. Definitions

3.1. An elevator **incident** would include a “stuck” elevator with trapped occupants who are not in immediate danger, have suffered no evidence of injury and are not experiencing any problems due to an existing medical condition (i.e. cardiac related, diabetes, etc.).

3.2. An elevator **emergency** would include, a fire endangering occupants in a “stuck” elevator, an injured/ill person in a “stuck” elevator and elevator accidents involving personal injury.

4. Procedure

4.1. Upon arrival the officer in charge shall locate the elevator car and determine if the situation is an elevator incident or an elevator emergency.

4.2. Notification of service mechanic
   4.2.1. If a responsible person is present (building engineer, superintendent, owner, etc.) find out if the building is under contract with an elevator service contractor.
   4.2.2. Determine if the responsible person has keys to the elevator machine room, as access to this room will most likely be necessary.
   4.2.3. The officer in charge shall notify DuComm to contact the elevator service contractor and try to get an estimate of their response time and relay this information to the IC.

4.3. Unless there is a medical emergency, an excessively long estimated response time or other extreme conditions, whenever possible, leave passengers in the car until the elevator service mechanic arrives. Under normal conditions, twenty to thirty minutes is a reasonable amount of time to wait for the elevator service mechanic.

4.4. If an emergency bell is ringing, instruct the occupant to silence the bell by deactivating the emergency stop button. The occupant may have to pull the button from the on position.

4.5. It is essential to calmly explain to the occupant(s) what the situation is and what actions will be taken to affect a rescue. It will probably be necessary to continue this dialogue throughout the rescue attempt or until a firefighter accesses the passenger compartment.

4.6. The IC shall send at least two members to the elevator machine room.
   4.6.1. The members shall be equipped with a hand light, halligan bar, hydraulic forcible entry tool, flathead axe, portable radio and a lock-out/tag-out kit.
   4.6.2. If keys to the elevator machine room are not available, forcible entry will be necessary.
   4.6.3. The members shall locate the elevator machine room and standby for specific orders from the IC. **Forcible entry shall be performed only on the orders of the IC.**

4.7. Unless there is a medical emergency, an excessively long estimated response time or other extreme condition, it is always best to wait for the elevator service mechanic. It is recognized that the preferred safe practice in evacuating passengers is to move the elevator car to a landing level. **The movement of elevator cars by other than normal operation by members of this department is expressly forbidden.**

4.8. Movement of the elevator car by any other means shall be attempted by experienced licensed elevator mechanics only. If there is an unreasonably long estimated response time for the elevator service contractor or if a medical emergency exists, the following procedure shall be attempted **in this order.**

5. *STUCK ELEVATOR – NO IMMEDIATE RESCUE REQUIRED*

5.1. Ensure the elevator is not in fire service mode. If so, attempt to operate the elevator with the fire service key.

5.2. Instruct the occupant(s) to push the first floor (lobby) button.

5.3. The occupant(s) shall be given specific instructions to apply force against the car door in the direction of closing. This action attempts to close the car door safety circuit which may be out of alignment. At the same time a member of the rescue team should apply closing force to the hoistway door. This action may be all that is necessary to re-energize the car. The occupant(s) should then be directed to press a floor button.

5.4. The IC shall order the members standing by at the machine room to gain entry and shut down and lock out/tag-out the power to the stalled elevator. If they are unable to determine which switch controls the elevator or if they are unable to lock-out/tag-out any main power disconnect switch they shall immediately notify the IC. Both members with a portable radio shall remain at the door to the machine room to provide security. Their further services will be lost for the duration of the incident. **No one is authorized to reestablish power to any elevator without the express consent of the IC.**

5.5. No further operations are to be attempted until the IC has received confirmation from the members in the elevator machine room that power has been shut down.

6. *ELEVATOR INCIDENT – RESCUE REQUIRED*

6.1. Ensure elevator door key and fire service keys are available.

6.2. If the elevator car is stuck at a floor, not between floors, open the hoistway door and attempt to open the elevator car door. Generally speaking, there is push bar toward the upper left hand side of the elevator car door. DO NOT FORCE THE DOOR UNLESS AN EXTREME EMERGENCY EXISTS.

6.3. If this method fails or the elevator car is stopped between floors, access top of elevator car by opening the nearest hoistway door. The hoistway door must be propped to remain open. This must be done at the floor above the stuck car. Note - Use care as car may be quite a distance from the hoistway door opening. It may be necessary to access the top of the car via a ladder.

6.4. Access the top of the elevator car, locate the maintenance controls and place the switch in the maintenance mode.

6.5. Open the emergency access door located on the roof of the car. This will require tools as the doors are secured via screws or bolts.

6.6. Use care when accessing the elevator roof. Attempt to stay off of the sheet metal roof, step on support members. No more than two firefighters shall access the elevator car roof.

6.7. Once access is gained, carefully remove ceiling panels. Advise the occupants that the panels are going to be removed and have them go to a corner near the front of the car and protect their heads.

6.8. Move a second ladder into the car and make entry. Assist each occupant out of the elevator, onto the roof and out the hoistway door.

6.9. Ensure EMS checks all occupants.

6.10. Secure the roof access panel and ensure hoistway doors are secured.

6.11. Any elevator that has been released shall be placed out of service and management notified. Management shall be advised that it is necessary to have a service company check the car before placing that elevator back in service.

HANDLING SUSPECT ENVELOPES – PACKAGES

Purpose

To provide a safe response, investigation, and mitigation of packages which are possible threats.

1. Procedure

1.1 Notification and Response

1.1.1 The Police Department will be the first response to all calls for suspect envelopes/packages.

1.1.2 The Police Department will conduct the investigation and determine the need for the HazMat team.

1.1.2.1 Upon notification to the Hanover Park Fire Dispatch of a package considered "suspect", dispatch will first call the Shift Commander at the station by telephone and give any pertinent information to the Shift Commander over the telephone regarding the incident.

1.1.2.2 The Chief and HazMat team members will be notified by the Shift Commander for an "investigation" at the location where suspicious mail or package is located and will meet at a designated location.

1.2.2.3 Responding apparatus should be low key, low profile, no lights, and siren except when there is an immediate life threatening medical condition.

1.2 Companies will give response, arrival, and return information over the radio. At no time are personnel to ask questions or broadcast information about the nature of the incident over Main Fire two-way radio. Cell phones and or Nextel phones should be used to transfer information. The Entry Term will use Fireground "280" for entry information when necessary.

2. General Handling Procedures

2.1 Possible Explosive Device

2.1.1 In all cases, the situation should be surveyed to determine if there is a possibility that the package might contain an explosive device. If there is a question whether the package may contain an explosive device, the DuPage County Sheriff's Office Hazardous Device unit should be requested to respond to the scene by telephone. The DuPage County Hazardous Device team has portable x-ray equipment that they can use to determine if there are any potential explosives or other material in a package. They should not be requested for routine situations.

2.2 No Apparent Explosive Device

2.2.1 Refer to the procedures outlined in other sections for more detailed information on specific types of incidents and recommended handling procedures.

2.3 Suspicious Mail, Letter – Unopened

2.3.1 Response as indicated in Section 1.

2.3.2 Material can be handled using Nitril or Neoprene gloves.

2.3.3 Information sheet shall be completed and placed with the report.

2.3.4 Suspected mail or letter shall be triple bagged using large plastic zip locks, or plastic bags if articles such as clothing are too large.

2.3.5 Nitril or Neoprene gloves used during packages should be removed and place din the second bag prior to sealing the bag then disposed of appropriately per FBI direction dated 10/16/01.

2.3.6 No medical attention or decontamination is necessary.

2.4 Suspicious Mail, Letter – Opened with no material present (no dust, powder or residue present):

2.4.1 Material can be handled using Nitril or Neoprene gloves.

2.4.2 Information sheet shall be completed and placed with the report.

2.4.3 Suspected mail or letter should be triple bagged using plastic bags.

2.4.4 Nitril or Neoprene gloves used during packaging should be removed and placed in the second bag prior to sealing the bag and then disposed of appropriately per FBI directive.

2.4.5 No medical attention or decontamination is necessary.

2.4.6 Information Sheet shall be completed and placed with the report.

2.5 Suspicious Mail, Letter, or Package – Opened with small amount of material present (dust, powder, or residue present).

2.5.1 Response as indicated above.

2.5.2 Determine Zones and establish a safe location for staging.

2.5.3 Upon arrival, determine risk/hazard and level of personal protection (usually level "B" and SCBA)

2.5.4 Restrict access to area involved.

2.5.5 Determine the presence of any persons exposed.

2.5.6 Remove and isolate victims and exposed personnel.

2.5.7 Notification should be made to the Chicago FBI Office by the Police for any situation listed below. Determine if FBI will be sending representative to the scene and how soon.

- Illness due to the contents of the package involved
- Reason or motive, such as package sent to:
  - A Mosque
  - A Temple
  - A Department of Defense Contractor
- The package contains a public threat
- The package contains a powdery substance marked "Anthrax"
- The package contains a substance believed to be "Anthrax"
- Laboratory test results indicate the presence of "Anthrax"

2.5.8 Decontaminate victims and personnel.

2.5.9 Notify hospital of situation.

2.5.10 Request the appropriate level of HazMat response for operations necessary to the situation.

2.5.11 Material may be handled using appropriate level of protection (suits, SCBA, proper Nitril or Neoprene gloves, see "Recommended Personal Protection" section at end of document). Suspected mail, letter or package should be placed in an evidence bag or clear plastic bag, and then triple bagged, and placed in a clean container or over-pack drum of sufficient size to hold the article. Decontamination procedures should be followed. Any materials used during handling or packaging that are unable to be decontaminated should be removed and placed in the container prior to sealing the container with the lid.

2.5.12 Follow appropriate decontamination procedures.

2.5.13 Container should be labeled using labels provided by the police department, indicating the date, time, incident number and location where the material was found.

2.5.14 Once packaged, the container will be placed in the police vehicle and transported to the specified laboratory, where it will be secured as evidence.

2.5.15 Information sheet shall be completed and placed with the report.

2.6 Suspicious Mail, Letter or Package – Opened with large amount of material present (dust, powder or residue present) or Illness reported.

2.6.1 Police Department and Fire Department response.

2.6.2 On arrival, determine scope of incident.

2.6.3 Establish joint Command Post.

2.6.4 Establish a safe location for staging.

2.6.5 Restrict access to area involved.

2.6.6 Request the appropriate level of HazMat response for operations necessary to the situation. Entry should be limited to rescue and shutting down HVAC systems as indicated only.

2.6.7 Determine hazard and level of personal protection required. (See Personal Protection in Section 3 at end of document).

2.6.8 Determine the presence of any persons exposed.

2.6.9 Remove and isolate victims and exposed personnel.

2.6.10 Decontaminate victims and personnel.

2.6.11 Notify hospital of situation.

2.6.12 Notification should be made to the Chicago FBI office by the police for any situation listed below. Determine if FBI will be sending representative to the scene and how soon.

- Illness due to the contents of the package involved
- Reason or motive, such as package sent to:
  - A Mosque
  - A Temple
  - A Department of Defense Contractor
- The package contains a public threat
- The package contains a powdery substance marked “Anthrax”
- The package contains a substance believed to be “Anthrax”
- Laboratory test results indicate the presence of “Anthrax”

2.6.13 Site should be considered a crime scene. Lock/Secure and provide continuous security (police) to deny entry to building until FBI arrives and can test suspected materials.

2.6.14 Notify a cleanup company to respond to and mitigate the problem.

2.6.15 Information Sheet shall be completed and placed with the report.

3. Personal Protection

3.1 Responders at a scene of 2.5 or 2.6 event shall wear splash protection. Nitril or Neoprene gloves, and a full face respirator with high efficiency particulate sir filters (HEPA) (level c) or self-contained breathing apparatus (SCBA) (level-b).

3.2 Additional protection will be determined by hazard/risk assessment.

4. Decontamination Procedures

4.1 Individuals should be instructed to wash their hands and any other exposed body areas or clothes.

4.2 Victims who may be in the immediate areas and potentially contaminated should be decontaminated with soap and water; no bleach solutions are required. A 1:10 dilution of household bleach should only be used if there is confirmation of the agent and an inability to remove the materials through soap and water decontamination. Additionally, the use of bleach decontamination is only recommended after soap and water decontamination, and should be rinsed off after 10 to 15 minutes.

5. Personnel should consult "Emergency Response to Terrorism" job aid guidebook for additional information.

6. Envelopes, Packaging received at a fire station shall be left outside and the police department notified.

RESPONSE OF ON-CALL DUTY CHIEF FOR MABAS ASSISTANCE

Purpose

To provide an on-call duty chief available to respond as outlined via the MABAS mutual aid box cards. To provide on-scene assistance to our MABAS neighbors.

1. Policy

1.1 An on-call schedule shall be maintained by the chief officers of the department.

1.2 When a request for a chief officer is made via the MABAS system, the on-call duty chief will immediately respond.

1.3 In the event that the on-call duty chief is unable to respond due to administrative functions wthin the department, he/she will immediately make contact with his/her counterpart to ascertain if they are able to respond. If that chief officer is unable to respond, then immediately the shift commander will be notified and the shift commander will respond in place of that chief officer.

1.3.1 In the event that the shift commander has responded to the request for assistance as the chief officer, then the chief officer will immediately make him/herself available and shall assume the duties of acting shift commander while the shift commander is out of town.

1.4 While the responding chief is on the scene within the MABAS community, he/she shall assume the functions assigned by the command operating at the incident and shall perform as directed within the guideline of the respective MABAS Division's Standard Operating Guidelines.

FIRE INVESTIGATIONS

Purpose

To ensure that all fire incidents are investigated by the Fire Chief and/or their designee as required by local, state and federal law. A fire incident is any incident involving damage that was created by direct flame, smoldering, smoke or explosion, or any incident that may have resulted in a fire or explosion.

Scope

This guideline shall apply to all members of the Hanover Park Fire Department (HPFD).

It shall be the policy of the Hanover Park Fire Department to fully investigate all fire incidents involving real property, personal property, vehicles and equipment that are brought to its attention. Some investigations may be brought to a successful conclusion by an Incident Commander, Fire Officer or a Fire Investigator. However, some investigations may require additional resources and/or personnel. To that end, Village, County, State and Federal Authorities shall be utilized as necessary when fire scenes exceed the resources and/or authority of the fire department.

1. Authority

1.1 Incident Commander – The Incident Commander (IC) shall have the responsibility and the authority to initiate a fire investigation for all fire related incidents. The Incident Commander shall determine the initial personnel and resources necessary which may include: fire department officers and investigators, police officers trained in fire investigation and other county, state and federal investigative authorities.

1.2 Fire Investigator – A Fire Investigator is any employee holding a Fire Investigator certification from the Office of the Illinois State Fire Marshall (OSFM). The fire investigator shall have the authority to conduct origin and cause investigations as assigned by the Incident Commander.

2. Fire Scene Responsibilities and Actions

2.1 The Incident Commander shall initiate a fire investigation based on the circumstances of each fire related incident and make available the level of fire department personnel and resources necessary to conduct an initial fire investigation as early into the incident as possible.

The IC must use the following guidelines:

2.1.1 An Incident Commander or Fire Officer may investigate origin and cause of fire incidents unless otherwise specified by policy.

2.1.2 A Fire Investigator **must** be used to investigate any fire origin and cause that cannot be determined by the Incident Commander or Fire Officer, any fire

incident where the IC feels a Fire Investigator is warranted, all fires where there are fire related injuries and/or fire fatalities, all fires involving $10,000.00 or more in fire loss, and all structure fires in Governmental, Target Hazard or High Hazard Buildings.

2.1.3 In addition to a Fire Investigator, the police department **must** be contacted by the IC for all fires of suspected incendiary origin or where incendiary devices are found, and all fires suspected of criminal involvement.

2.1.4 In the event of a fire fatality, the Fire Chief or Incident Commander **must** notify the Office of the Illinois State Fire Marshall at the time of the incident.

2.2 Fire Investigators - Personnel meeting the requirements of a Fire Investigator will primarily receive their assignments from the Incident Commander and may be called for any fire related incident. They will only conduct investigations as assigned by the Incident Commander.

A Fire Investigator shall:

2.2.1 Act under the supervision and report directly to the Incident Commander.

2.2.2 Follow the guidelines set forth in the qualified texts/training manuals received during training courses and supplied by the fire department.

2.2.3 Assure the scene is properly secured.

2.2.4 Process fire scenes including but not limited to: photographs, scene sketches/diagrams and witness interviews.

2.2.5 Protect any evidence found in determining origin and cause.

2.2.6 Act as Lead Investigator when assigned by the Incident Commander.

2.2.7 Work with other investigative agencies when required.

2.2.8 Submit a timely written report of their actions and witness interviews. Investigators shall enter required reports into the fire departments database.

2.2.9 The Lead Investigator shall submit a summary report of the entire investigation with a cause determination. The cause of the fire shall be classified as one of four categories: Accidental, Natural, Incendiary (Arson) or Undetermined. The Lead Investigator is also responsible for overseeing that all required documentation and reports are properly entered into the fire department database.

2.3 Company Officers and Fire Fighters – Company Officers and Fire Fighters should be cognitive of evidence used in origin and cause investigations and shall take

reasonable care to minimize damage and to protect evidence as they conduct their fire suppression and overhaul activities.

2.4 Unless deterred by unforeseen circumstances, the Incident Safety Officer shall remain on the scene until the Fire Investigator(s) arrive and shall brief them on conditions of the structure.

2.5 Fire Investigators shall exercise due caution when moving or removing debris, evidence, furnishings, or structure components and shall advise those in the building of said removals.

2.6 All Fire Investigators shall be afforded respiratory protection in the form of either an Air Purifying Respirator (APR) or a self-contained breathing apparatus (SCBA). APRs shall only be worn when the atmosphere in the work area contains greater than 19.5% oxygen, has been monitored for explosive gases, and is not an IDLH environment as defined by OSHA.

2.6.1 All Fire Investigators shall be trained in the use of self-contained breathing apparatus and Air Purifying Respirators.

2.6.2 The Fire Investigators shall properly clean and maintain the APRs and shall replace cartridges as needed in accordance with the manufacturer's recommendation.

3. Call-out of "Off-duty" Fire Investigators

3.1 Normally, on-duty Fire Investigators should be used for most fire investigations. However, due to the nature of the incident, multiple incidents and personnel availability, the use of off duty Fire Investigators may be required.

3.2 All Fire Investigators must submit a current contact number that will be placed on a call list. At the request of the Incident Commander, DuComm will contact investigators from that call list. The rotation of investigators will be based on the shift cycle with the following shift's investigators being contacted first. A minimum of two Fire Investigators should be called for any incident requiring a Fire Investigator. The total number of investigators should be dictated by the size of the incident and the complexity of the investigation. Fire Investigators who continually miss call outs may have their investigator duties suspended or revoked at the discretion of the Fire Chief.

3.3 Off-duty fire investigators may be called at the discretion of the Incident Commander for multiple or large scale incidents, when no on-duty fire investigators are available, when use of on-duty personnel will make units unavailable for extended periods of time, when on-duty investigators have had significant incident involvement or participated in exhaustive fire suppression activities, or at the request of fire and police investigators.

4. Outside Investigation Agencies

4.1 Outside investigation agencies may be requested by the Fire Chief or Incident Commander for any of the following:

4.1.1 Fires suspected to be of incendiary origin.

4.1.2 Fire suspect of criminal involvement.

4.1.3 Large fire incidents.

4.1.4 Multiple fire incidents.

4.1.5 Investigations beyond the resources of the fire department.

4.1.6 Incidents involving injuries/fatalities.

4.1.7 At the request of fire and police fire investigators.

4.2 The Incident Commander shall notify the Lead Fire Investigator of any agencies contacted. Fire department investigators shall work in conjunction with and/or under the direction of outside agencies as necessary. Investigators shall not act outside of their level of training.

5. Fire Scenes of Suspected Incendiary Origin

Upon discovery of evidence of suspected incendiary origin:

5.1 The Incident Commander shall:

5.1.1 Secure the perimeter of the scene.

5.1.2 Contact the police department for a police investigator.

5.1.3 Minimizing if not suspend overhaul operations to only what is require to make the scene safe.

5.1.4 Assign a Fire Investigator to the Overhaul Sector Officer to protect any evidence of fire origin and cause.

5.1.5 Consult with police investigators for calling out of additional investigative resources.

5.2 The Fire Investigator shall:

5.2.1 Immediately notify the Incident Commander and request a police investigator.

5.2.2 Delay processing the fire scene until the arrival of a police investigator(s).

5.2.3 Protect any discovered evidence of origin and cause.

6. Digital Photographic Documentation

6.1 Before using the digital camera make sure that the camera's memory has been cleared (reformatted) of any prior photos. It is the responsibility of the previous user to download photos and reformat the camera.

6.2 When using digital photography for fire scene documentation, it is important to preserve the integrity of the images by burning them directly onto a CD-Rom immediately upon returning to the station. A supply of blank CD's with pre-printed labels will be available in the Shift Commander's office.

6.3 When taking digital photos, never delete an image regardless of the quality or subject matter; all images taken at the incident must be burned onto a CD-Rom in an unaltered state. Title the disk with the incident number, address and the words (master file) in parenthesis, example: 05-1234, 111 Main St. (master file).

6.4 After burning the CD-Rom, use a black permanent marker to write the incident number, date, address and lead investigator's name on the face of the disk and place it in the incident envelope with the investigation report. Once the image has been saved, the image may then be altered (rotated, enlarged, contrast, etc.) as necessary to clarify the image only (NEVER manipulate the contents of the image). When altering an image, save it with the original phone number and include the following information in parentheses: (Altered, date and employee's initials), example: DSC01234 (Altered 2-19-05 jgd).

6.5 It is not necessary to save all photos to the hard drive. Employees may save several reference photos (address side, area of origin, etc.) embedded to FIREHOUSE Software® as a reminder but do not link all of the photos (saving all of the photos to the hard drive will only use unnecessary hard drive space). Saving linked images to a private file will allow only that person to access the images.

AUTOMATIC FIRE DEPARTMENT INCIDENT SAFETY OFFICER RESPONSE

Purpose

The dispatch and assignment of a dedicated and automatic response of a Fire Department Incident Safety Officer (FDISO) is a proactive approach to firefighter safety during the early stages of an incident when environmental conditions, fireground activity, and the risks are the greatest.

1. Departmental Implementation

1.1 The Hanover Park Fire Department has implemented a dedicated and automatic Fire Department Incident Safety Officer (FDISO) response to emergency incidents using an automatic aid assigned FDISO.

1.2 The assignment allows the department to have a pre-arranged trained FDISO from an automatic-aid department respond with the sole purpose of firefighter safety.

1.3 The FDISO reports to command and functions within the incident management system as a safety officer.

HELICOPTER POLICY

Purpose

The purpose of this Standard Operating Guideline is to ensure the safety of all personnel working in or around helicopters used for medical transport or other aerial operations and to provide for quick deployment of medical resources.

Scope

The fire department may from time to time work with several different agencies utilizing rotary wing or non-fixed wing aircraft. This policy is applicable to all situations involving any agency and all personnel of the fire department at any time.

1. Authority

1.1 The authority to call for assistance that would include a helicopter lies with the Incident Commander.

1.2 A helicopter may be called when the Incident Commander has information from medical personnel on the scene that one or more patients meet the criteria for air transport as established by the Project Medical Director of Region IX: Greater Elgin Area Mobile Intensive Care Program.

1.3 A helicopter may be called when instructed to by the resource hospital.

1.4 A helicopter can be placed on “Standby” by the Incident Commander at any time at his/her discretion prior to notifying the resource hospital.

2. Procedure

2.1 Upon determining the need for a helicopter, the Incident Commander shall notify DuComm of the request. The Incident Commander shall give DuComm: the incident type; the incident location; the number of patients; and an assigned radio frequency. Do not ask DuComm for wind direction or speed unless the helicopter is landing at DuComm.

2.2 After requesting a helicopter, the Incident Commander shall assign a Landing Zone Officer (LZO). The Landing Zone Officer shall be responsible for establishing a safe landing zone and communicating landing information to the flight crew. The Incident Commander shall provide the Landing Zone Officer with sufficient personnel to establish a safe Landing Zone.

2.3 The Landing Zone Officer shall maintain an accurate time-line of activities. The Landing Zone Officer shall also provide updates of patient information to the flight crew.

2.4 The Landing Zone Officer shall then assign a Tail Rotor Observer whose responsibility shall be to protect against and prevent personnel from approaching the aircraft from the rear.

2.5 Both the Landing Zone Officer and the Tail Rotor Observer shall be identified using a Sector Officer vest. Neither the Landing Zone Officer nor the Tail Rotor Observer shall act as or replace the Incident Safety Officer.

2.6 No other assignments shall be given to either the Landing Zone Officer or Tail Rotor Observer until the helicopter operation is completed in full and the helicopter has lifted off. The Landing Zone Officer and Tail Rotor Observer shall remain at the Landing Zone until the conclusion of the take-off.

2.7 The Landing Zone Officer and the Tail Rotor Observer shall have the authority and responsibility to cancel or modify the air/ground operation at any time when either deems the operation unsafe.

3. Communications

3.1 All communications between the Incident Commander and the Landing Zone Officer shall be on a fireground frequency selected by the IC. Communications between the Landing Zone Officer and the medical personnel shall use a separate frequency such as a secondary fireground or MERCI frequency.

3.2 All communications between the helicopter and the ground shall be with the Landing Zone Officer **only**. The Landing Zone Officer shall communicate with the helicopter using the IREACH frequency or an available MERCI channel.

IREACH	155.0550	Channel 14
MERCI 340	155.3400	Channel 13 (Use statewide PL)
MERCI 400	155.4000	Channel 12

3.3 Typically, communications will cease when the pilot has completed at least one fly over to determine the landing site and approximately 1 minute prior to touch down. Any communication during the final approach should be initiated by the pilot except in an emergency and then the emergency should be declared by the Landing Zone Officer by repeating “Go Around” three (3) times. Air-to-ground communication capability should be maintained while the helicopter is on the ground and for at least 2-3 minutes after take-off.

3.4 Communications between the Landing Zone Officer and the Tail Rotor Observer should normally be by visual hand signals or by radio using the fireground frequency.

3.5 IFERN or other MABAS radio channels are not an acceptable alternative and, if used by the aircraft, the pilot should be instructed by the Landing Zone Officer as to which channel to use.

4. Establishing a Landing Zone (LZ)

4.1 The selection of a Landing Zone is critically important and shall be made by the Landing Zone Officer.

4.2 The Landing Zone must be a relatively flat surface free of obstructions and debris measuring at least 100' x 100' for each helicopter used. The Landing Zone should be approachable into the wind. Approach and departure paths should not be over the incident. The selected Landing Zone shall be accessible by ambulance and does not necessarily need to be adjacent to the incident. A remote area is often safer for both the flight crew as well as ground personnel.

4.3 The Landing Zone shall be clearly marked by using marker cones, marker lights, flags, vehicles or other easily identifiable markers and then described to the pilot along with any possible hazards.

4.4 If a roadway is used for a Landing Zone, the roadway shall be closed to **all** traffic for 300 feet in each direction. The police department should be made aware of distances required when seeking assistance to close a roadway; be specific, using identifiable markers or cross streets when available.

4.5 Spectators and non essential personnel should be kept back from the Landing Zone at least 200 feet.

4.6 Appendix A is an example of a Landing Zone.

5. Operating Around the Helicopter

5.1 All approaches shall be done from the front of the aircraft after the pilot has signaled that it is safe to do so. Approaches should be made from the downhill side if the Landing Zone is on a sloping grade and should be made in a crouching position. **NEVER APPROACH AN AIRCRAFT FROM THE REAR. STAY CLEAR OF THE TAIL ROTOR.**

5.2 Fire department personnel shall not operate or attempt to operate any equipment, mechanical devices or doors of the aircraft.

5.3 Fire department personnel shall only assist the flight crew in the loading of the patient and stretcher unless specifically instructed to do so by the flight crew.

5.4 Fire department personnel shall immediately leave the Landing Zone after completing the patient transfer and loading.

6. Personnel Protective Equipment

6.1 Personnel Protective Equipment (PPE) shall be utilized by all personnel while operating at the incident. When operating at or near the Landing Zone all personnel shall wear a turnout

coat and pants, gloves, eye shields and a helmet with the chin strap securely fastened. Hearing protection should be used when available.

7. Safety Considerations

7.1 Smoking at or near the Landing Zone is strictly prohibited.

7.2 Personnel shall not run near the Landing Zone. Vehicles shall not be parked closer than 100' to the Landing Zone

7.3 Approaching the aircraft from the rear is strictly prohibited.

7.4 Talking to, mingling with or distracting the Tail Rotor Observer is prohibited.

7.5 Items used to mark the Landing Zone should be weighted or securely fasten to the ground.

7.6 Always be mindful of rotor wash; never chase anything that is blown around or onto the Landing Zone.

7.7 All distances should be increased 20% for night-time operation.

7.8 Avoid using flood lights unless to illuminate a hazard, in which case the light should be shining to the ground to where the hazard is located.

7.9 Take-offs and landings are generally not vertical…allow for upwind approach paths.

7.10 Cross winds generally should not be greater than 45 degrees.

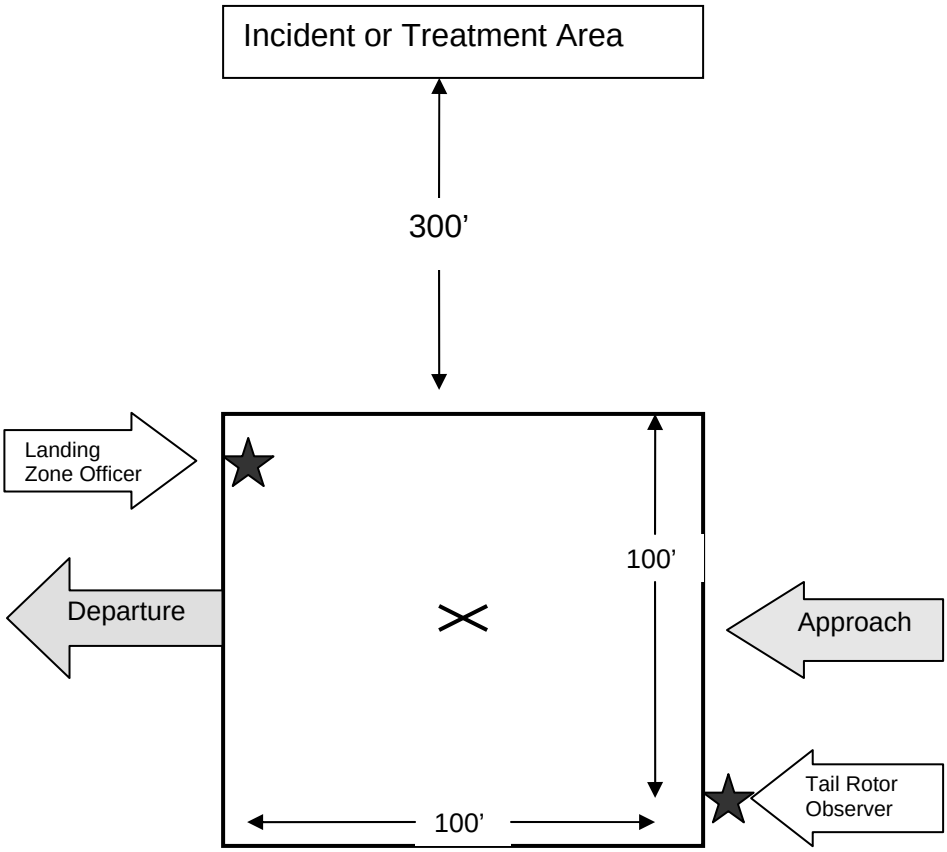
7.11 Do not use police officers for Landing Zone operations.

8. Termination

8.1 The Landing Zone Officer shall notify the Incident Commander upon take-off of the helicopter. The Landing Zone Officer shall stand-down all personnel involved and shall make certain that the Landing Zone is returned to its previous condition and document any damage.

8.2 After the Landing Zone is restored, all remaining personnel shall report to the Incident Commander for re-assignment.

Appendix A


Incident or Treatment Area
300'
Landing Zone Officer
Departure
100'
Approach
Tail Rotor Observer
100'

EMERGENCY RADIO PROTOCOL

Purpose

This operational guideline establishes the proper application of emergency radio protocol and procedures

Scope

This guideline shall be applicable to all members of the department when operating at any emergency incident. If any procedures established by MABAS Division XII are inconsistent with this guideline, the procedure established by MABAS shall be utilized only when operating at a MABAS level incident outside of Hanover Park.

1. Emergency

1.1 Emergency shall be defined as any condition, circumstance or event that may be life-threatening to personnel beyond the scope of the original incident, will affect the outcome of the incident and requires immediate action. These conditions or events may include, but are not limited to:

1.1.1 A collapse, or potential collapse of a structure
1.1.2 Rapidly deteriorating fire conditions
1.1.3 A loss of water supply during interior or offensive fire attack
1.1.4 Any other situation where the Incident Commander deems an Emergency

1.2 An Emergency may be declared for circumstances, events or situations that have already occurred or that are imminent or probable.

1.3 The Incident Commander shall declare an Emergency by notifying DuComm that they have "Emergency Traffic" and then stating the nature of the Emergency, what actions are to be taken and on what channels the message is to be transmitted.

Example: *"DuComm from Main Street Command emergency traffic"*
"The building has collapsed, order an emergency evacuation on Fire West and IFERN"

1.4 DuComm will then activate the Emergency Alert Tone and broadcast the emergency message. DuComm will broadcast the Emergency on all radio channels that are operating at the incident scene for which they have the necessary capabilities.

1.5 Any other personnel may request an Emergency by directing radio traffic to the Incident Commander and repeating the word "Emergency" three (3) times. No other radio traffic will be sent until the nature, location and type of Emergency is transmitted.

1.6 The Incident Commander shall have all units not involved in the Emergency switch to a separate channel for the duration of the Emergency.

1.7 Any/all declared or broadcast Emergency shall be followed by a complete Personnel Accountability Report (PAR).

1.8 All personnel operating at the incident during an emergency shall limit radio traffic to only that which is necessary to resolve the emergency unless a back-up channel is assigned by the incident Commander.

1.9 An emergency evacuation order will be accompanied by 5 two-second blasts from all apparatus air horns.

1.10 The word "Urgent" may be used in those situations when the message is of significant importance, but an emergency is not being declared or requested.

1.11 The Incident Commander may duplicate the Emergency Message on other frequencies, including Fireground Red and Fireground White by utilizing the following procedure:

Using the key pad microphone:

- Press "*****"quickly, then press "#" for two seconds (opens tone-activated portables)
- Short pause for radios to complete activation tones
- Press for one full second "#", "#", "#" (mimics DuComm tone)
- Key the microphone and broadcast the message

This procedure should only be used on non-DuComm operated or monitored channels.

2. Mayday

2.1 The term "Mayday" will only be used when a firefighter(s) is in immediate peril. The following situations warrant the term "Mayday":

2.1.1 Lost or missing firefighter
2.1.2 Injured firefighter needing immediate assistance
2.1.3 Trapped or downed firefighter
2.1.4 Out or low on SCBA air supply
2.1.5 Situations where rescue of a firefighter is necessary
2.1.6 When a firefighter is found by another firefighter in circumstances listed above

2.2 A "Mayday" may be initiated by any personnel by radioing "Mayday, Mayday, Mayday" over any frequency or channel. The channel on which the Mayday was received will be secured for the Mayday only and all other radio traffic will cease until an alternate channel is assigned.

2.3 The Incident Commander shall respond to the "Mayday" and determine the necessary course of action.

2.4 The Incident Commander shall assign a dedicated radio operator at the command post to operate only the "Mayday" channel.

2.5 All personnel not involved or assigned to the “Mayday” will switch to and operate on the alternate channel. Immediately upon switching, all units shall conduct a PAR on the alternate channel.

2.6 All other operations shall continue during the “Mayday” and only units so designated by the Incident Commander shall participate in the “Mayday” event and operate on the “Mayday” channel.

2.7 The Incident Commander shall release the “Mayday” channel for other use at the conclusion of the Mayday incident.

THERMAL IMAGING CAMERA

Purpose

The purpose of the Thermal Imaging Camera Standard Operating Guideline is to establish a procedure to facilitate the most effective method for deploying the thermal imaging camera in a way that provides the most protection for our personnel. This Standard Operating guideline may also be used as a reference document for training personnel in the issues, limitations, operation, and care and maintenance of the Thermal Imaging Camera (TIC).

It shall be the policy of this department to utilize the thermal imaging camera in every structure fire and any other situations as identified, where it will enhance the safety of the fire department personnel.

Scope

The Thermal Imaging Camera will be used to enhance firefighter safety and efficiency during search, rescue, investigation, firefighting, overhaul, and other fire-rescue-/-EMS operations.

1. Applications and Advantages

1.1 Provides safer navigation in a space, where there is reduced visibility due to smoke.

1.2 Allows rescue teams to reduce the amount of time necessary to complete a primary search.

1.3 Enables suppression crews to execute a faster, more efficient interior attack. Navigation to the seat of the fire can be accomplished in a safer, more efficient manner.

1.4 Allows R.I.T. or “two out” teams to quickly locate downed firefighters.

1.5 May be used to determine fluid levels in containers.

1.6 May be used as a search tool to locate lost persons in open out-door areas.

1.7 May be used in overhaul to determine “hot spots”.

1.8 Allows the Incident Commander to observe and assess what is gong on inside of the building.

1.9 May be used as part of the “size up”. Viewing the building with the Thermal Imaging Camera can sometimes give clues as to which part of the building is most heavily involved in fire.

2. Deployment

The Thermal Imaging Camera shall be carried in the command vehicle. The assignment and general deployment procedure of the TIC is as follows:

2.1 Shift Commander

2.1.1 The Shift Commander may use the TIC as part of the size up process. Through the use of the TIC on the exterior, the shift commander may determine construction type, areas of a structure that are warmer than others, and potential back-draft conditions. Generally, the first arriving engine will deploy, therefore, the Shift Commander should move into close proximity of the first arriving engine in order to aid in this endeavor. However, the deployment of the TIC may be deferred to as a subsequent arriving unit at the discretion of the Incident Commander. If a firefighter "May Day" is called, the TIC shall be given to the "two out" personnel assigned or to the RIT Company.

2.1.2 The TIC will be deployed at the scene of a fire or any other incident where smoke will or could hamper visibility.

2.2 First Arriving Engine Company

2.2.1 The first arriving engine will generally deploy the Thermal Imaging Camera.

2.2.2 The officer in charge of the engine shall be responsible for the deployment of the TIC. If conditions warrant the use of the TIC, the company officer shall be the camera operator. Command shall be notified by the Company Officer that the TIC is in use and transmitting.

2.3 Outside Party Request for Thermal Imaging Camera

2.3.1 If a request is made by an outside party, such as the local police, county sheriff, or mutual aid fire department, the Shift Commander shall determine if the request is reasonable, given the capabilities of the thermal imaging camera. The Shift Commander may consult the on-call Chief if the request is unusual. Based on the request, the Shift Commander will assign personnel to respond to the request.

2.3.2 Generally, the only personnel to operate the thermal imaging camera are Hanover Park Fire Department personnel trained in its use. However, the Shift Commander may use his/her judgment if the situation is very unusual.

2.3.3 The Shift Commander shall notify the on-call Chief if the thermal imaging camera leaves the Hanover Park Fire Department.

2.4 Firefighter May-Day Situation

"Two out" personnel assigned to RIT Company:

2.4.1 Retrieve the TIC from the Engine assigned to the Thermal Imaging Camera.

2.4.2 The firefighter or officer in charge of the "two out" or RIT Company shall be responsible for deployment of the TIC. The Company Officer shall be the operator of the camera. The Incident Commander shall be notified by the Company Officer that the TIC is in use and transmitting.

3. Cautions When Using the TIC

The most efficient operation of the camera is realized when the operator's view is not obstructed by other firefighters. Camera operators must be aware that they have a tendency to move faster than the rest of the team. The camera operator shall not lose contact with the rest of the team. The Fire Department policy is when firefighters must enter a hostile fire environment, a two-person team is the minimum size of the entry team, and this shall be adhered to at all times. Do not overlook or underestimate the typical hazards on the fire ground because the camera operator has greater "vision" in a particular area of a structure.

Firefighters should remember that they must stay low even if the camera allows them to see that the majority of the heat is at the ceiling. The possibility of a flashover in a hostile atmosphere is possible.

The TIC allows a two dimensional view of a smoke filled environment. Therefore, depth perception is limited. When scanning an area with the TIC begin at the ceiling and conclude at the floor area immediately in front of you. Walking with the TIC is discouraged as trip hazards may be overlooked.

Remember that the TIC is not intrinsically safe.

4. Secondary Uses of the TIC

4.1 Overhaul use – the camera can also serve as a tool for detecting heat during the overhaul phase of an incident. It must be remembered, however, that the TIC cannot penetrate most construction materials including drywall, plaster and lathe, glass, or plastics. Also, the TIC cannot penetrate water. Due to the fact that the imager displays black and white images, it is sometimes difficult to differentiate between what is heat or fire trapped in a wall and what is radiant heat.

5. Thermal Imaging Camera – Operation

The TIC is stored in a plastic, waterproof case. The camera, including its carrying strap and accessories, must be completely dry before returning them to the case.

In order to deploy the camera, remove it from the case, and firmly grasp the pistol grip handle. The shoulder strap shall be utilized.

5.1 To turn the unit on, push the green button marked "power" on the unit. It will take approximately 15 seconds for the unit to warm up, self check, and become operational.

5.2 Once the camera is active, an image will be visible on the screen. Cool areas appear dark while sources of heat appear white.

5.3 On the display screen a battery indicator light in the upper right hand corner of the unit allows the operator to see the amount of energy reserve that remains in the battery pack.

6. Thermal Imaging Camera - Transmitting the Image Remotely

The Thermal Imaging Camera has the ability to transmit the image that is seen on its screen to a remote site, such as the Command vehicle. The camera can transmit this real time feed by depressing the blue button marked “Transmitter.”

7. Thermal Imaging Camera – Inspection

The TIC shall be checked as part of the daily equipment check by the driver assigned to the Command Vehicle.

7.1 The Camera should be inspected for cleanliness. If any part of the camera is dirty, a clean rag dampened with glass cleaner shall be used to clean the camera.

7.2 The camera and its carrying strap must be thoroughly dry before returned to the case.

7.3 The camera should be turned on, checked for proper operation and then turned off.

7.4 The battery shall be replaced if the charge indicator displays the need to be charged. The battery should then be recharged.

7.5 Problems with the unit should be immediately reported to the Shift Commander.

BOARD–UP OF DAMAGED BUILDING

Purpose

To close openings in structures to prevent weather or vandals from doing more damage to the property and to secure the valuables left inside the structure.

1. Procedure

1.1 After the incident has been mitigated and the investigators have completed their investigation of cause and origin, the Incident Command (IC) will:

1.1.1 Have Du-Comm notify a Board-up company off their list to board-up the structure. Du-Comm will notify the IC the name of the Board-up company that will be coming out.

1.1.2 Notify Community Development Department to have the on call inspector report to the address to inspect it for occupancy.

1.1.3 Notify Police that the Fire Department is turning the incident over to them until the structure is secured or turned over to the owner.

1.2 Community Development inspector will fill out paperwork on occupancy or no-occupancy.

2.2.1 Community Development Department will enter this incident into the Land Management Process for repair or Demolition of structure.

REHABILITATION POLICY

Purpose

To ensure that the physical and mental condition of employees operating at the scene of an emergency, training exercise, or other fire department activity does not deteriorate to a level that affects the safety or well-being of each employee or that jeopardizes the safety and integrity of the operation.

Scope

This guideline shall apply to all activities of the fire department, including, but not limited to, fire ground operations, EMS operations, training exercises and drills where strenuous mental and physical activities or exposure to heat or cold exist.

1. Responsibilities

1.1 Incident Commander - The Incident Commander (IC) shall have the responsibility and authority to implement and monitor all provisions of this operational guideline. The Incident Commander is to consider circumstances of each incident and make adequate provisions early in the incident for the rest and rehabilitation for all members operating at the incident. These provisions are to include: medical evaluation, treatment and monitoring; food and fluid replenishment; physical and mental rest; relief from extreme climatic conditions; relief from other extreme environmental factors caused by the incident. The rehabilitation shall include provisions for Emergency Medical Services (EMS) at the Advanced Life Support (ALS) level.

1.2 Division/Group Supervisors and Company Officers - Division/Group Supervisors and Officers (CO) shall maintain an awareness of each member operating within his/her span of control and ensure adequate steps are taken to provide for each member's health and safety. The Incident Command System (ICS) shall be utilized to request relief and/or reassignment of working crews.

1.3 Line Personnel - Each member is responsible for his/her preparedness prior to an incident, including sufficient rest prior to reporting for duty, pre-hydration during hot days, proper dress during cold days and ensuring that protective clothing and equipment is present and in good working order. During any emergency incident or training activity, all members are to advise their supervisor when they believe that their level of fatigue or exposure to heat or cold is approaching a level that could affect themselves, their crew, or the operation in which they are involved. Members shall remain aware of the health and safety of other members of their working crew.

2. Establishment of Rehabilitation Sector/Division/Group

2.1 Responsibility - The Incident Commander shall establish Rehab when conditions indicate that rest and rehabilitation is needed for personnel working at an incident scene or training exercise. The IC shall designate a Licensed Paramedic as Rehab Manager. The Rehab manager shall then act within the ICS and report to the Medical Unit Leader or Logistics Section Chief if assigned. If no Medical Unit Leader or Logistics Section Chief is designated, the Rehab manager is to report to the IC.

2.2 Rehabilitation should consider the scope of the incident, including the following:

2.2.1 Time. Extended use of turnout gear; extended exposure to weather conditions.

2.2.2 Complexity. Crime scenes, standoffs, search operations, mass gathering/public events, hazardous materials incidents and so on.

2.2.3 Intensity. Mental and/or physical stress on a members such as major extrications, actual fire attack, or interior search and rescue.

2.2.4 Climatic conditions such as hot or cold weather.

2.3 The Incident Commander may establish a Rehab Manager during any other fire department activities at his/her discretion; climatic and environmental factors need not be the sole criteria or justification for establishing Rehabilitation.

2.3.1 Location

2.3.1.1 The Incident Commander will normally designate the location for the Rehabilitation. If a specific location has not been designated, the Rehab Manager shall select an appropriate location based on the site characteristics listed below.

2.3.1.2 Multiple Rehab locations may be necessary if the incident is large or divided. In the event there is more than one Rehab location, they shall be designated Rehab 1 and Rehab 2, etc. Each Rehab will have its own Rehab Manager who shall report to the Medical Unit Leader or Logistics Officer if established. Each Rehab Manager shall be a certified Paramedic.

2.3.2 Site Characteristics

2.3.2.1 It shall be in a location that will provide physical rest by allowing the personnel to recuperate from the demands and hazards of the emergency operation or training evolution.

2.3.2.2 It shall be far enough away from the scene that personnel may safely remove their turnout gear and SCBA and be afforded mental rest from the stress and pressure of the emergency operation or training evolution.

2.3.2.3 It shall provide suitable protection from the prevailing environmental conditions. During hot weather, it should be in a cool, shaded area. During cold weather, it should be in a warm, dry area.

2.3.2.4 It shall enable personnel to be free of exhaust fumes from apparatus, vehicles, or equipment (including those used in the Rehab Sector).

2.3.2.5 It shall be large enough to accommodate several crews, based upon the incident size.

2.3.2.6 It shall be easily accessible by EMS vehicles.

2.2.3.7 It shall allow prompt re-entry to the incident.

2.3.3 Site Designations

2.3.3.1 Fire Department Tents/Shelters
2.3.3.2 Ambulance(s) not available for transporting patients
2.3.3.3 School buses, Pace buses or Metra train cars.
2.3.3.4 Nearby buildings, stores or other structures.
2.3.3.5 If in a high-rise, several floors (3 min.) below the incident.
2.3.3.6 An open area where tarps, fans, heaters, etc can be set up.

2.3.4 Resources

2.3.4.1 Medical Equipment – The Rehab Manager shall maintain at least one Advanced Life Support Ambulance for every 15 people undergoing rehabilitation in the Rehab location.

2.3.4.2 Medical Personnel - The Rehab Manager shall maintain one Licensed Paramedic for every 10 people undergoing rehabilitation in the Rehab location.

2.3.4.3 Fluids/Food - The Rehab Manager shall provide, or have provided sufficient potable water, oral electrolyte solution, ice and food as may be necessary. Outside resources such as the Salvation Army Mobile Canteen should be notified early into an incident to allow for travel time.

2.3.4.4 Other Equipment –The Rehab Manager shall secure from the Medical Unit Leader or Logistics Section Chief any other needed items such as, tarps, lights, fans, blankets, towels, traffic cones, fire-line tape, etc.

3. General Operational Principles

3.1 Establishment

3.1.1 Climatic or environmental conditions that indicate the need to establish Rehab are a heat stress index above 90 degrees Fahrenheit or wind-chill index below 10 degrees Fahrenheit.

3.2 Hydration

3.2.1 During heat stress, each personnel should replace at least one quart of water per hour. Plain water should be used for the first hour of the operations and then supplemented with a commercially prepared beverage such as Gatorade™. Carbonated beverages, coffee, tea or alcoholic beverages should be avoided.

3.3 Nourishment

3.3.1 If food is required or provided, it shall be soups, broths, fruits (bananas, apples, oranges) or other easily digested foods. Fast food sandwiches, fatty or salty foods should be avoided.

3.4 Rest

3.4.1 Rest shall be provided after the “two bottle rule” or 45 minutes, which ever comes first.

3.4.2 Personnel should re-hydrate at least 16 ounces during SCBA bottle change.

3.4.3 Rest shall be no less than 10 minutes and may in some cases exceed 30 minutes as determined by the Rehab Manager. Personnel requiring rest periods of greater than 30 minutes should be closely monitored for medical conditions. Those who exhibit problems with their baseline medical assessment after 30 minutes should be treated under EMS protocol and transported to a medical facility.

3.4.4 Personnel requiring more than one hour of rest should be released from duty and transported to a medical facility.

3.4.5 Personnel released by the Rehab Manager are to report to the Staging Area, Planning and/or Operations as determined.

3.5 Medical Evaluation

3.5.1 Rehab shall be staffed with a Personnel/Paramedic ratio of no less than 10:1.

3.5.2 Rehab medical evaluation shall consist of a minimum of a) visual exam, b) blood pressure, c) pulse, d) temperature.

3.5.3 Any member who exhibits a body temperature of > 100.6F, a consistent pulse rate of > 110bpm shall not be permitted to wear full protective clothing, including SCBA and shall require additional rehabilitation.

3.5.4 Any member(s) who receives any treatment(s) other than fluid, food, and/or rest shall be treated and documented as an injury to personnel. As an example, ice for sprains or strains shall be considered injuries rather than rehabilitation.

3.5.5 All Rehab evaluations shall be documented on the Fire Department Rehab Form (See Appendix A) and shall become a permanent record attached to the incident report.

3.5.6 All injury reports shall remain part of the employee's protected medical file and treated as other confidential medical records.

3.5.7 Any/all Rehab reports involving Mutual or Auto Aid personnel shall be made available to their respective departments.

4. Accountability

4.1 Personnel assigned to Rehab shall enter and exit the Rehabilitation Area as a crew. The crew designation, number of crew personnel, and the times of entry/exit shall be documented by the Rehab Manager, or his/her designee on the Fire Department Rehab Form (Appendix A).

4.2 Crews shall not leave the Rehabilitation Area unless authorized to do so by the Rehab Manager.

5.

HEAT STRESS INDEX

TEMPERATURE	Relative Humidity 10%	20%	30%	40%	50%	60%	70%	80%	90%
104	98	104	110	120	132				
102	97	101	108	117	125				
100	95	99	105	110	120	132			
98	93	97	101	106	110	125			
96	91	95	98	104	108	120	128		
94	89	93	95	100	105	111	122		
92	87	90	92	96	100	106	115	122	
90	85	88	90	92	96	100	106	114	122
88	82	86	87	89	93	95	100	106	115
86	80	84	85	87	90	92	96	100	109
84	78	81	83	85	86	89	91	95	99
82	77	79	80	81	84	86	89	91	95
80	75	77	78	79	81	83	85	86	89
78	72	75	77	78	79	80	81	83	85
76	70	72	75	76	77	77	77	78	79
74	68	70	73	74	75	75	75	76	77

Note: Add 10F when protective clothing is worn and add 10F when in direct sunlight.

Humidity Index F	Danger Category	Injury or Threat
Below 60 F	None	Little or no danger under normal circumstances
80 – 90 F	Caution	Fatigue possible if exposure is prolonged and there is physical activity
90 – 105 F	Extreme Caution	Heat cramps and heat exhaustion possible if exposure is prolonged and there is physical activity
105 – 130 F	Danger	Heat cramps or exhaustion likely, heat stroke possible if exposure is prolonged and there is physical activity
Above 130 F	Extreme Danger	Heat Stroke Imminent!!

WIND CHILL INDEX

Temperature Degrees Fahrenheit

		45	40	35	30	25	20	15	10	5	0	-5	-10	-15
W	5	43	37	32	27	22	16	11	6	0	-5	-10	-15	-21
I	10	34	28	22	16	10	3	-3	-9	-15	-22	-27	-34	-40
N	15	29	23	16	9	2	-5	-11	-18	-25	-31	-38	-45	-51
D	20	26	19	12	4	-3	-10	-17	-24	-31	-39	-46	-53	-60
S	25	23	16	8	1	-7	-15	-22	-29	-36	-44	-51	-59	-66
P	30	21	13	6	-2	-10	-18	-25	-33	-41	-49	-56	-64	-71
E	35	20	12	4	-4	-12	-20	-27	-35	-43	-52	-58	-67	-75
E	40	19	11	3	-5	-13	-21	-29	-37	-45	-53	-60	-69	-76
D	45	18	10	2	-6	-14	-22	-30	-38	-46	-54	-62	-70	-78

	Wind Chill Temperature ^{o}F	Danger
A	Above –25 F	Little danger for properly clothed personnel
B	-25F / -75F	Danger, flesh may freeze
C	Below –75F	Flesh may freeze in 30 seconds

MABAS
DIVISION XII

REHAB
Forms

These documents are to be filed with final incident report.

These documents are to be considered confidential medical records.

MEDICAL ASSESSMENT CRITERIA

MENTAL STATUS:

- Alert and oriented on arrival at rehab

If any alteration in mental status – Provide Immediate Transport

HEART RATE:

- < 110 BPM = Within normal limits
- > 110 BPM = Close monitoring required by medical personnel

Normal = < 100 BPM five minutes after arrival in Rehab

SKIN CONDITION:

- May be somewhat flushed on arrival. Should be improved five minutes after arrival in Rehab.
- If skin remains flushed or is unusually dry, monitor patient for signs of heat stress/stroke.

BLOOD PRESSURE:

- Systolic Pressure < 150 and Diastolic Pressure < 100
- Systolic Pressure > 150 and Diastolic Pressure ≥ 100 = Close monitoring by medical personnel

Normal: Systolic Pressure < 140 and Diastolic Pressure < 90 five minutes after arrival in Rehab

Abnormal: Systolic Pressure >140 or Diastolic > 90 after 15 minutes in Rehab – Consider Transport

RESPIRATIONS:

- < 26 = Within normal limits
- < 20 = Five minutes after arrival in Rehab

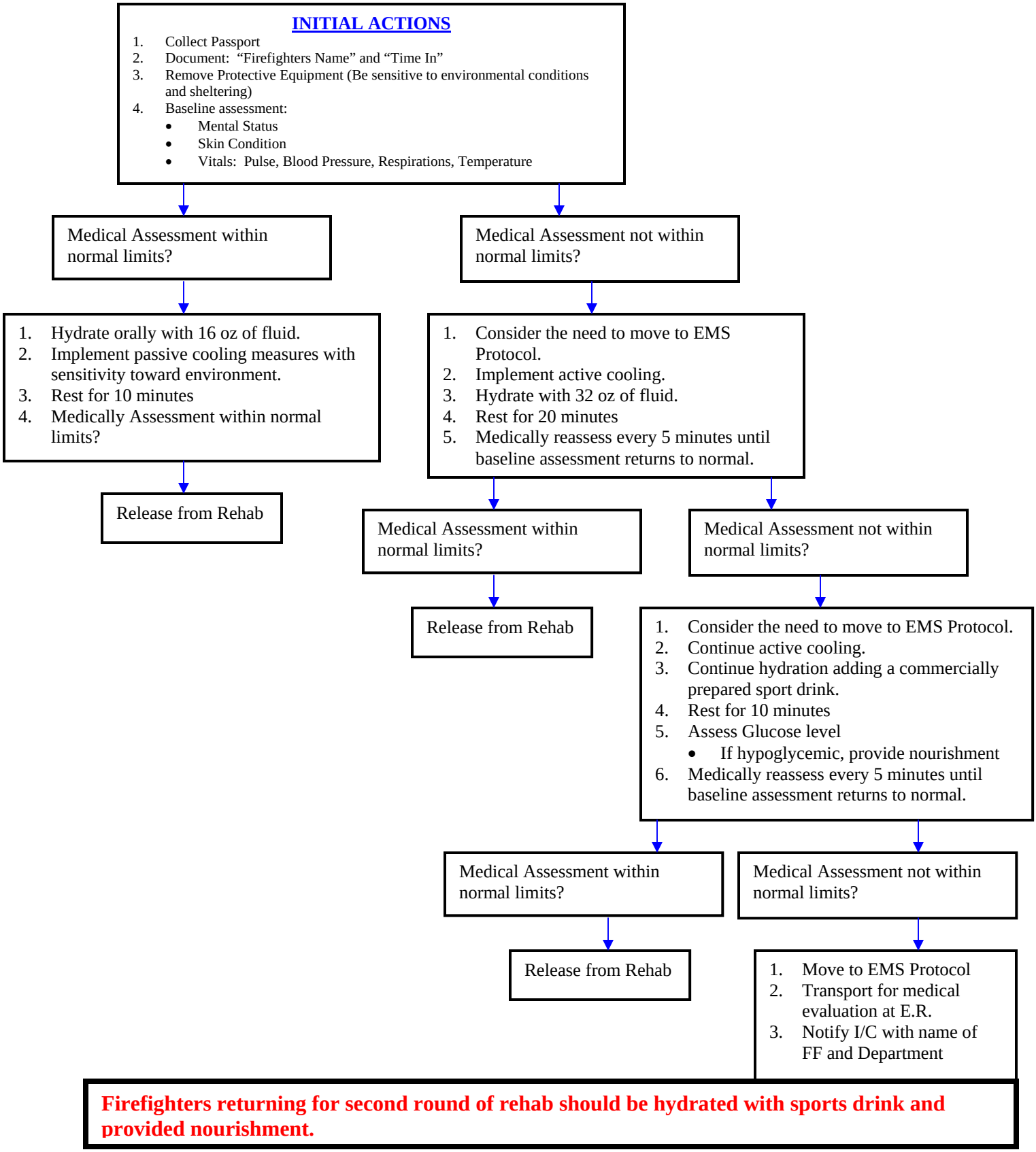
Abnormal: ≥ 26 after 5 minutes in Rehab

TEMPERATURE:

- < 100.6 = Within normal limits
- > 100.6 up to 100.9 = Close monitoring required by medical personnel

> 101 = Transport to – Provide Immediate Transport

REHAB FLOW CHART



Firefighters returning for second round of rehab should be hydrated with sports drink and provided nourishment.

MABAS DIVISION XII

Incident Rehab

Company Level Check In/Out Document

Incident Location _____ Incident Date _____
Rehab Manager _____

Dept	Unit Type	Crew Size	Time In	Time Out		Dept	Unit Type	Crew Size	Time In	Time Out

MABAS DIVISION XII

Incident Rehab - Individual Rehabilitation Report

Incident Location _____ **Date** _____ **Time** _____**Rehab Manager** _____

Name Age/Height/Weight	Time In/Out	# SCBA Cylinders	Exam Period	BP	Pulse	Resp	SpO_2	SPCO	Temp	Skin	COOLING/ HEATING	HYDRATION / NOURISHMENT	MEDICAL COMPLAINTS	Transport Y / N
			INITIAL											
			10 Min.											
			20 Min.										(Glucose _____)	
			30 Min.										(Glucose _____)	
	Prior Activity:													
			INITIAL											
			10 Min.											
			20 Min.										(Glucose _____)	
			30 Min.										(Glucose _____)	
	Prior Activity:													
			INITIAL											
			10 Min.											
			20 Min.										(Glucose _____)	
			30 Min.										(Glucose _____)	
	Prior Activity:													
			INITIAL											
			10 Min.											
			20 Min.										(Glucose _____)	
			30 Min.										(Glucose _____)	
	Prior Activity:													

N O T E S

SELF CONTAINED BREATHING APPARATUS

Purpose

It is the policy of the Hanover Park Fire Department that all personnel are expected to respond and function in areas of atmospheric contamination, or diminished oxygen concentration, shall be equipped with the proper respiratory equipment and shall be trained in its proper use and maintenance. This guideline establishes minimum acceptable practices in the care and use of respiratory equipment. All personnel should be cognizant of their surroundings and should practice avoidance of hazardous atmospheres whenever and wherever practicable. This Standard Operating Guideline shall serve as the Fire Department's compliance with applicable laws and standards.

Scope

This guideline applies to all Fire Department personnel at all times. Additionally, personnel from mutual or automatic aid departments must also be afforded the same high level of protection as the incident may warrant. This guideline is a part of, and in addition to the Fire Department Respiratory Protection Program as may be in effect. This guideline shall not conflict with any collective bargaining agreement that may be in effect from time to time, except to the extent that no part of this guideline nor any collective bargaining agreement may conflict or be contrary to any Occupational Safety and Health Administration regulation or standard.

Regulations and Standards

The following regulations, laws and standards shall be considered part of the policy and shall be adhered to when applicable:

Code of Federal Regulations 29 CFR 1910.134 – OSHA Respiratory Protection
Code of Federal Regulations 42 CFR part 84- NIOSH SCBA Design & Performance
NFPA 1981 – Open-Circuit Self Contained Breathing Apparatus
NFPA 1982 – Personal Alert Safety Systems (PASS)
NFPA 1852 – Selection, Care, and Maintenance of SCBA
NFPA 1404 – Respiratory Protection Training
NFPA 1500 – Occupational Safety & Health
NFPA 1989 – Breathing Air Quality

1. **Responsibilities**

1.1. The Fire Department shall establish a Respiratory Protection Program (RPP) which shall contain all mandatory parts of OSHA standards as required under 29 CFR 1910.134. The Fire Chief shall appoint a Respiratory Protection Program Administrator (RPPA) to oversee all components of the program and have the authority to administer all components of the program.

1.2. Company Officers shall be responsible for the readiness of the Self-Contained Breathing Apparatus (SCBA) and the Air Purifying Respirators (APR) that are assigned to his/her apparatus.

1.3. Each crew member shall be responsible for the readiness and cleanliness of the SCBA assigned to them as well as their assigned spare air cylinder(s). A ready air cylinder shall have no less than 95% of the maximum operating pressure (4500psi cylinders shall not have < 4000psi).

1.4. Each member of the department who has been assigned a personal facepiece shall be responsible for its condition and maintain it in a ready state at all times.

1.5. Readiness checks shall be performed on all breathing apparatus at the start of each shift, after each use and whenever there is a question of its readiness condition. Readiness checks shall include facepieces, cylinders, regulators, PASS devices, and harnesses.

2. **Maintenance**

2.1. Each member shall maintain his/her own facepiece(s) for cleanliness, sanitation and minor adjustments. If the facepiece needs additional maintenance it should be brought to the Shift Commander or the RPPA for replacement.

2.2. Maintenance of all other components of the SCBA shall be done by a trained technician chosen by the RPPA. Equipment needing repair should be tagged and placed in an area designated by the RPPA. Any report requested by the RPPA shall be completed and given to the company officer for forwarding to RPPA.

2.3. All cleaning and maintenance shall be done according to the manufacturer's specification.

2.4. All records involving the maintenance, testing or repair of any harness, regulator or cylinder shall be documented in the appropriate area of FIREHOUSE Software®.

2.5. The latest Air Quality Report shall be posted by each air compressor used to refill SCBA cylinders.

3. **Uses**

3.1. The Fire Department shall place in service and use only NIOSH certified and NFPA approved Self-Contained Breathing Apparatus (SCBA). No 3rd party components shall be allowed as part of the SCBA assembly.
3.2. The intent of this guideline is to avoid any circumstance that may cause a member to have respiratory contact with products of combustion, super heated gases, toxic products or other hazardous contaminants.
3.3. Each member shall be trained in the use of all types of breathing apparatus used on the fire department and shall have demonstrated a proficiency in there uses.
3.4. Each member shall perform a facepiece seal test before each and every use.
3.5. The use of breathing apparatus means that all personnel shall have facepieces in place, breathing air from the supply provided. Where appropriate, Supplied Air Respirators (SAR) may be used in lieu of SCBA.
3.6. Self-Contained Breathing Apparatus shall be used by all personnel operating in or near:
3.6.1. A contaminated atmosphere
3.6.2. An atmosphere which may suddenly become contaminated

3.6.3. An atmosphere which is oxygen deficient (<19.5%)
3.6.4. An atmosphere which is suspected of being deficient or contaminated
3.6.5. Any Immediately Dangerous to Life and Health (IDLH) atmosphere

3.7. This includes personnel operating in or around:
3.7.1. An active fire area
3.7.2. Directly above a fire area
3.7.3. A potential explosion or fire area, including gas or fuel leaks
3.7.4. An area where products of combustion are visible in the air, including vehicle fires, dumpster fires and other outside fires.
3.7.5. Any confined space where the atmosphere has not been tested for oxygen levels or contaminants
3.7.6. Any fire area that is below ground

3.8. The proper use of SCBA shall be monitored by all company officers.
3.9. Hazardous Materials Team members and Decon Team members shall wear SCBA according to this guideline as a minimum and may be subject to additional requirements as may be dictated by Hazardous Materials Response Team protocols.
3.10. Premature removal of SCBA equipment must be avoided at all times. The decision to remove SCBA shall be made by the company officer with the approval and consent of the Sector Officer or the Incident Safety Officer.
3.11. In a fire situation within an enclosed building, structure or confined area, the SCBA shall not be removed until the atmosphere has been monitored for oxygen levels above 19.5%. The Safety Officer shall determine whether other contaminants are present and determine acceptable levels.
3.12. The Incident Safety Officer shall guide the overall SCBA use at an emergency incident.
3.13. In the event of a catastrophic failure of any breathing apparatus, the member, and his/her team, shall immediately exit the contaminated area and notify the Sector Officer. The apparatus shall be removed from service immediately and replaced with a functioning unit. The failed unit shall be secured so as not to be accidentally used by another member.

4. Emergency Procedures

4.1. SCBA users shall not work in an oxygen depleted or contaminated atmosphere (IDLH) past the sounding of the End-of-Service Time Indicator (EOSTI), otherwise known as the low-air alarm.
4.2. No SCBA user shall enter an IDLH atmosphere while on reserve air.
4.3. Emergency Breathing Procedures (Buddy Breathing) may be accomplished in one of the following ways:
4.3.1. Sharing of the mask Mounted Regulator (MMR).
4.3.2. Transfer of air between cylinders so long as the ‘donor’ cylinder is greater than 600 liters of air (about 1/3)

5. Care and Cleaning

5.1. All breathing apparatus shall be stored in a safe manner so as to protect the apparatus from external damage.
5.2. SCBA equipment placed on vehicles shall be secured in their approved holders or cases.

5.3. SCBA facepieces shall be stored in their protective pouches when not in use in order to prevent damage.
5.4. SCBA equipment doffed at emergency incidents shall be placed in a designated area free from potential damage and in a manner that will not cause a tripping hazard to others.
5.5. SCBA equipment doffed at emergency incidents shall be segregated into filled and unfilled areas.
5.6. All breathing apparatus shall be cleaned according to manufacturer's recommendations using approved cleaning solutions supplied by the RPPA.

6. **General Provisions**

6.1. Each member shall be fit tested annually for each model of respirator issued to that member.
6.2. Each member may be required to undergo medical evaluations as required by the RPPA.
6.3. No member may have a beard, facial hair, side burns or other facial growth that may affect the seal of the facepiece and shall test the seal prior to each use.
6.4. The failure of any breathing apparatus during emergency use shall be immediately reported to the RPPA for apparatus confiscation and documentation.

*****See Hanover Park Fire Department Respiratory Protection Program***

Respiratory Protection Program

Developed for the

HANOVER PARK FIRE DEPARTMENT

October 2004

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Respiratory Protection Program: General Information

The Occupational Safety and Health Act of 1970 was established to ensure that "each RPPA shall furnish to each of his firefighters employment and a place of employment which are free from recognized hazards that are causing or are likely to cause death or serious physical harm to his firefighters." At the same time the OSH Act describes obligations for the firefighter: "each firefighter shall comply with occupational safety and health standards and all rules, regulations, and orders issued pursuant to the Act which are applicable to his own actions and conduct."

Avoidance of a hazard is the preferred practice set forth by the Occupational Safety and Health Administration (OSHA). When effective environmental controls (for example, enclosure or confinement of the operation, general and local ventilation, and substitution of lese toxic materials) are not feasible, or while they are being instituted, appropriate respirators shall be used (29 CFR 1910.134 (a)).

Respiratory Protection Program Scope

OSHA, under the provisions of 29 CFR 1910.134 and appendices, requires the Fire Department to develop and implement a written respiratory protection program with required worksite-specific procedures and elements for required respirator use (29 CFR 1910.134(c)).

In any workplace where respirators are necessary to protect the health of the firefighter or whenever respirators are required by the Fire Department, OSHA requires the Fire Department to establish and implement this required respiratory protection program.

In addition, certain program elements may be required for voluntary use of respirators. These elements are designed to manage potential hazards associated with the use of respirators. The program shall be updated as necessary to reflect those changes in workplace conditions that affect respirator use (29 CFR 1910.134(c)(2), 29 CFR 1910.134 Appendix D).

Respiratory Protection Program Administrator

The respiratory protection program, designed in compliance with 29 CRF 1910.134, must be administered by a suitably trained program administrator (29 CFR 1910.134(c)(3)). The Fire Chief shall designate a program administrator who is qualified by appropriate training or experience that is commensurate with the complexity of the program to administer or oversee the respiratory protection program and conduct the required evaluations of program effectiveness (29 CFR 1910.134(c)).

See accompanying form: Appointment of a Respiratory Protection Program Administrator.

Appointment of a Respiratory Program Administrator

_____ (name) has been appointed as the Respiratory Protection Program Administrator (RPPA) for the Hanover Park Fire Department.

This appointment has been made by Fire Chief Craig A. Haigh, the Chief Executive Officer of the Fire Department. This appointment was made effective on the _____ (date) _____ (month) 20____ (year).

This appointment shall remain in effect until revoked by the Fire Chief. Appointment of a new Respiratory Protection Program Administrator shall be considered revocation of this stated appointment.

The Respiratory Protection Program Administrator is responsible for and carries authority to implement all facets of the Fire Department's respiratory protection program as specified in 29 CFR 1910.134 and other regulations as applicable.

The Respiratory Protection Program Administrator will develop detailed written standard operating procedures in compliance with the Respiratory Protection Program.

_____ _____

Fire Chief Date

Respiratory Protection Program General Provisions

The following provisions, as applicable, shall be included by the Respiratory Protection Program Administrator in the written respiratory protection program (29 CFR 1910.134(c)(1)(i-ix)):

- Procedures for selecting respirators for use in the workplace (included in Section 1);
- Medical evaluations of firefighters required to use respirators (included in Section 2);
- Fit testing procedures for tight-fitting respirators (included in Section 3);
- Procedures for proper use of respirators in routine and reasonably foreseeable emergency situations (included in Section 4);
- Procedures and schedules for cleaning, disinfecting, storing, inspecting, repairing, discarding, and otherwise maintaining respirators (included in Section 5);
- Procedures to ensure adequate air quality, quantity, and flow of breathing air for atmosphere-supplying respirators (included in Section 6);
- Training of firefighters in the respiratory hazards to which they are potentially exposed during routine and emergency situations (included in Section 7);
- Training of firefighters in the proper use of respirators, including putting on and removing them, any limitations on their use, and their maintenance (included in Section 8); and
- Procedures for regularly evaluating the effectiveness of the program (included in Section 9)

Firefighter Use of Respirators Not Required by RPPA

Where respirator use is not required, the Respiratory Protection Program Administrator may provide respirators at the request of firefighters or permit firefighters to use their own respirators if the Respiratory Protection Program Administrator determines that such respirator use will not in itself create a hazard (29 CFR 1910.134(c)(2)).

If the Respiratory Protection Program Administrator determines that any voluntary respirator use is permissible, the Respiratory Protection Program Administrator shall provide the respirator users with the information contained in 29 CFR 1910.134 Appendix D: *Information for Firefighters Using Respirators When Not Required Under the Standard* (available at http://www.osha.gov).

The Respiratory Protection Program Administrator must establish and implement those elements of a written respiratory protection program necessary to ensure the following.

- that any firefighter using a respirator voluntarily is medically able to use that respirator, and
- that the respirator is cleaned, stored, and maintained so that its use does not present a health hazard to the user.

The Respiratory Protection Program Administrator is not required, however, to include in a written respiratory protection program those firefighters whose only use of respirators involves the voluntary use of filtering face pieces (dust masks) (29 CFR 1910.134(c)(2)(ii)).

Fees/Costs to RPPA/Firefighters

29 CFR 1910.134 states: *When respirator use is required or indicated, the Fire Department shall provide respirators, training, and medical evaluations at no cost to the firefighter* (29 CFR 1910.134(c)(4)).

Section 1: Procedures for Selecting Respirators for Use in the Workplace

The Respiratory Protection Program Administrator shall evaluate respiratory hazard(s) in the workplace, identify relevant workplace and user factors, and base respirator selection on these factors. The RPPA shall also specify appropriate protective respirators for IDLH atmospheres (29 CFR 1910.134 (d)).

The RPPA shall identify and evaluate the respiratory hazard(s) in the workplace; this evaluation shall include a reasonable estimate of firefighter exposures to respiratory hazard(s) and an identification of the contaminant's chemical state and physical form. Where the RPPA cannot identify or reasonably estimate the firefighter exposure, the RPPA shall consider the atmosphere to be IDLH.

The RPPA shall select and provide an appropriate respirator and related supplies based on the respiratory hazard(s) to which the worker is exposed or has risk of exposure and workplace and user factors that affect respirator performance and reliability.

The RPPA shall select a National Institute of Occupational Safety and Health (NIOSH) certified respirator that shall be used in compliance with the conditions of the certification. A list of NIOSH certified respirators and the conditions of the certification can be obtained from NIOSH (http://www.niosh.gov).

The RPPA shall select respirators from a sufficient number of respirator sizes so that the respirator is acceptable to and correctly fits the user.

The NIOSH decision logic for respirator selection has been incorporated as a useful tool in the RPPA's assessment. Recommendations in the decision logic for respirator selection are based primarily on the physical, chemical, and toxicological properties of the contaminant and on the limitations of each class of respirators, including filtration efficiency, air supply capability, and face seal characteristics and leakage. See Assessment Tool: NIOSH Decision Logic for Respirator Selection which follows Assessment Tool: Respiratory Hazards in the Workplace both included in this Section 1.

Respirators for IDLH Atmospheres

IDLH (immediately dangerous to life and health) atmospheres are those atmospheres that pose an immediate threat to life, would cause irreversible adverse health effects, or would impair an individual's ability to escape from a dangerous atmosphere.

Oxygen deficient atmospheres (less than 19.5% oxygen) shall be considered IDLH. Exception to this includes a RPPA's ability to demonstrate that, under all foreseeable conditions, the oxygen concentration can be maintained within the ranges specified in Table II (altitude and oxygen concentration) of 29 CFR 1910.134, then the atmosphere-supplying respirator may be used.

The RPPA shall provide the following respirators for firefighters in IDLH atmospheres (29 CFR 1910.134(d)(2)):

- a full facepiece demand self-contained breathing apparatus (SCBA) certified by NIOSH for a minimum service life of thirty (30) minutes, or
- a combination full facepiece pressure demand supplied-air respirator (SAR) with auxiliary self-contained air supply.

Respirators provided only for escape from IDLH atmospheres shall be NIOSH-certified for escape from the atmosphere in which they will be used.

Respirators for Atmospheres That Are Not IDLH

The Fire Department shall provide a respirator that is adequate to protect the health of the firefighter and ensure compliance with all other OSHA statutory and regulatory requirements, under routine and reasonably foreseeable emergency situations (29 CFR 1910.134(d)(3)).

The respirator selected shall be appropriate for the chemical state and physical form of the contaminant.

Respirator Selection

For protection against gases and vapors when a SCBA is not mandated, the RPPA shall provide:

- an atmosphere supplying respirator (SAR), or
- an air-purifying respirator (APR)

provided that the respirator is equipped with an end-of service-life indicator (ESLI) certified by NIOSH for the contaminant or if there is no ESLI appropriate for conditions in the workplace, the RPPA implements a change schedule for canisters, cartridges, and/or filters that is based on objective information or data that will ensure that canisters, cartridges, and filters are changed before the end of their service life.

For protection against particulates when a SCBA is not mandated, the RPPA shall provide:

- an atmosphere-supplying respirator (SAR), or
- an air-purifying respirator (APR) equipped with a filter certified by NIOSH under 30 CFR Part 11 as a high efficiency particulate air (HEPA) filter, or an air-purifying respirator (APR) equipped with a filter certified for particulates by NIOSH under 42 CFR Part 84, or
- for contaminants consisting primarily of particles with mass median aerodynamic diameters (MMAD) of at least 2 micrometers, an air-purifying respirator (APR) equipped with any filter certified by NIOSH.

Non-powered air purifying particulate respirators (APR) are classified into three series: N-, R-, and P-series and are classified according to the efficiency level of the filter(s) as tested according to the requirements of 42 CFR 84.170.

- The N-series filters are restricted to use in those workplaces free of oil aerosols.
- The R- and P-series filters are intended for removal of any particulate that includes oil-based liquid particulates.
- N100, R100, and P100 filters demonstrate a minimum efficiency level of 99.97%;
- N99, R99, and P99 filters demonstrate a minimum efficiency level of 99%;
- N95, R95, and P95 filters demonstrate a minimum efficiency level of 95%.

All filters, cartridges, canisters, and/or filters used in the workplace shall be labeled and color coded with the NIOSH approval label and that label will not to be removed and must remain legible. American National Standards Institute (ANSI) Standard 13.1-67 describes the required color coding scheme.

Atmospheric contaminants to be protected against	Color assigned
Acid gases	White
Hydrocyanic acid gas	White with 1/2-inch green stripe completely around the canister near the bottom.
Chlorine gas	White with 1/2-inch yellow stripe completely around the canister near the bottom.
Organic vapors	Black
Ammonia gas	Green
Acid gases and ammonia gases	Green with 1/2-inch white stripe completely around the canister near the bottom.
Carbon Monoxide	Blue
Acid gases and organic vapors	Yellow
Hydrocyanic acid gas and chloropicrin vapor	Yellow with 1/2-inch blue stripe completely around the canister near the bottom.
Acid gases, organic vapors, and ammonia gases	Brown
Radioactive materials, excepting tritium and noble gases	Purple (Magenta)
Particulates (dusts, fumes, mists, fogs, or smokes) in combination with any of the above gases or vapors	Canister color for contaminant, as designated above, with 1/2-inch gray stripe completely around the canister near the top
All of the above atmospheric contaminants	Red with 1/2-inch gray stripe completely around the canister near the top

Respirators with air-purifying sorbent elements shall be used with caution and with recognition of the wide variability of service lives under differing use conditions. Factors known to affect the service lives of sorbent elements include, but are not limited to,

- the make and model of sorbent element(s),
- airborne concentrations of contaminant(s), and
- relative humidity through each sorbent element.

Classes of respirators offering greater protection can usually be used in place of the minimum acceptable class of respirators. Respirator classes are consistent with respirator certification groupings as specified in 30 CFR 11.

Change Schedule for Canisters, Cartridges, and Filters

A cartridge's useful service life is how long it provides adequate protection from harmful chemicals in the air. The service life of a cartridge depends upon many factors, including environmental conditions, breathing rate, cartridge filtering capacity, and the amount of contaminants in the air.

Tools used in the assessment of canister, cartridge, and filter use includes such information as the RPPA's exposure assessment and information based on manufacturer's and/or NIOSH breakthrough test data, mathematically based estimates, and/or reliable use recommendations from the Fire Department's respirator and/or chemical suppliers.

Reliance on odor thresholds and other warning properties will not be permitted as the primary basis for determining the service life of gas and vapor cartridges and canisters.
OSHA emphasizes that a conservative approach is recommended when evaluating service life testing data. Temperature, humidity, air flow through the filter, the work rate, and the presence of other potential interfering chemicals in the workplace all can have a serious effect on the service life of an air-purifying cartridge or canister.

Canisters, cartridges, and filters shall be changed when

- the canister, cartridge, and/or filter has been used in a hazardous environment (refer to manufacturer's recommendations for length of service in specific hazardous environments), or
- the canister, cartridge, and/or filter becomes wet, or
- the user notices increased resistance, or
- the user detects an odor or taste while using the canister or cartridge, or
- the cartridge, canister, and/or filter reaches the manufacturer's expiration date on the canister, cartridge, and/or filter.

In the absence of any of the aforementioned factors, canisters, cartridges, and/or filter shall be discarded and destroyed no later than five (5) years after date of purchase of the canister, cartridge, or filter if unopened.

Chemical Contaminant Migration: The RPPA and user should be aware that some contaminants have a tendency to migrate through cartridge/canister sorbent material during periods of storage or non-use. This is characteristic of the contaminant-carbon bed interaction for organic chemicals with boiling points below 65^0 centigrade and would predictably shorten breakthrough times. In cases where respirators are used for multiple days this could present an additional exposure to the respirator user. Where contaminant migration is possible, respirator cartridges/canisters should be changed after every workshift where exposure occurs unless the RPPA has specific objective data to the contrary (desorption studies) showing the performance of the cartridge in the conditions and schedule of use/non-use found in the workplace (Source: OSHA Instruction, Inspection Procedures for the Respiratory Protection Standard, September 28, 1995).

The Gerry O. Wood Mathematical Model and the Yoon Nelson Mathematical Model may also be used. These mathematical models may be referenced on the OSHA web site in the e-tools section (http://www.osha.gov).

Assessment Tool: Respiratory Hazards in the Workplace

Hazards that Fire Department firefighters are likely to be exposed to may include irritants (for example, riot control agents), toxic industrial chemicals/compounds (TIC), contagious and infectious diseases, and weapons of mass destruction (WMD). Due to the nature of emergency response work, the firefighter may approach a hazardous environment without his or her immediate knowledge. **Where the firefighter cannot identify or reasonably estimate the potential exposure, the firefighter shall consider the atmosphere to be IDLH.** (Respiratory standards for exposure to *M. tuberculosis* are found in 29 CFR 1910.139.)

In addition, other factors include the following:

- Outside (open-air) environments;
- Changing wind condition(s) including direction, speed, temperature ;
- Thermal environmental conditions: heat conditions, cold conditions;
- Humidity, dew point;
- Precipitation: rain, snow, ice;
- Confined space environments; enclosed buildings may be included as confined spaces based on the hazards (known, unknown, or reasonably potential) presented.

Potential Respiratory Hazards

Biological Hazards

The Centers for Disease Control (http://www.cdc.gov) classifies biological agents in the following ways:

Category A Diseases/Agents

The U.S. public health system and primary healthcare providers must be prepared to address various biological agents, including pathogens that are rarely seen in the United States. High-priority agents include organisms that pose a risk to national security because they can be easily disseminated or transmitted from person to person; result in high mortality rates and have the potential for major public health impact; might cause public panic and social disruption; and require special action for public health preparedness.

Category B Diseases/Agents

Second highest priority agents include those that are moderately easy to disseminate; result in moderate morbidity rates and low mortality rates; and
require specific enhancements of CDC's diagnostic capacity and enhanced disease surveillance.

Category C Diseases/Agents

Third highest priority agents include emerging pathogens that could be engineered for mass dissemination in the future because of

availability; ease of production and dissemination; and potential for high morbidity and mortality rates and major health impact.

Some biological agents are naturally respiratory hazards effecting humans. Other agents that may not normally be considered to be respiratory hazards to humans may be weaponized, genetically modified, or enhanced with other materials to make them a respiratory hazards. For this purpose a comprehensive list of biological agents is listed below.

Potential Biological Agents include:

Anthrax (Bacillus anthracis) _____ Category A
Bacillus anthracis (anthrax) _____ Category A
Botulism (Clostridium botulinum toxin) _____ Category A
Brucella species (brucellosis) _____ Category B
Brucellosis (Brucella species) _____ Category B
Burkholderia mallei (glanders) _____ Category B
Burkholderia pseudomallei (melioidosis)
Chlamydia psittaci (psittacosis)
Cholera (Vibrio cholerae)
Clostridium botulinum toxin (botulism) _____ Category B
Clostridium perfringens (Epsilon toxin)
Coxiella burnetii (Q fever) _____ Category B
E. coli O157:H7 (Escherichia coli) _____ Category B
Emerging infectious diseases _____ Category C
such as Nipah virus and
hantavirus
Epsilon toxin of Clostridium perfringens
Escherichia coli O157:H7 (E. coli) _____ Category B
Food safety threats
(e.g., Salmonella species,
Escherichia coli O157:H7, Shigella)
Francisella tularensis (tularemia) _____ Category A
Glanders (Burkholderia mallei) _____ Category B
Melioidosis (Burkholderia pseudomallei)
Plague (Yersinia pestis) _____ Category A
Psittacosis (Chlamydia psittaci)
Q fever (Coxiella burnetii) _____ Category B
Ricin toxin from Ricinus communis _____ Category B
(castor beans)
Rickettsia prowazekii (typhus fever) _____ Category B
Salmonella species (salmonellosis)
Salmonella Typhi (typhoid fever)
Salmonellosis (Salmonella species)
Shigella (shigellosis) _____ Category B
Shigellosis (Shigella) _____ Category B
Smallpox (variola major) _____ Category A
Staphylococcal enterotoxin B _____ Category B
Tularemia (Francisella tularensis) _____ Category A
Typhoid fever (Salmonella Typhi) _____ Category B

Typhus fever (Rickettsia prowazekii) _____Category B
Variola major (smallpox) _____Category A
Vibrio cholerae (cholera)
Viral encephalitis (alphaviruses) _____Category A
[e.g., Venezuelan equine encephalitis, eastern equine encephalitis, western equine encephalitis])
Viral hemorrhagic fevers _____Category A
(filoviruses [e.g., Ebola, Marburg] and arenaviruses [e.g., Lassa, Machupo])
Water safety threats
(e.g., Vibrio cholerae, Cryptosporidium parvum)
Yersinia pestis (plague) _____Category A

Chemical Hazards

Abrin
Adamsite (DM)
Agent 15
Ammonia
Arsenic
Arsine (SA)
Benzene
Bromobenzylcyanide (CA)
BZ
Cannabinoids
Chlorine (CL)
Chloracetophenone (CN)
Choropicrin (PS)
CNB (CN in Benzene and Carbon Tetrachloride)
CNC (CN in Chloroform)
CNS (CN in Chloropicrin in Chloroform)
CR
CS
Cyanide
Cyanogen Chloride (CK)
Cyclohexyl Sarin (GF)
Diphenylchloroarsine (DA)
Diphenylcyanoarsine (DC)
Diphosgene (DP)
Distilled Mustard (HD)
Ethyldichlorarsine (ED)
Ethylene Glycol
Fentanyls and Other Opioids
Hydrofluoric Acid
Hydrogen Chloride
Hydrogen Cyanide (AC)
Lewisite (L, L-1, L-2, L-3)
LSD
Mercury
Methyldichloroarsine (MD)
Mustard (H) (Sulfur Mustard)
Mustard/Lewisite (HL)
Mustard/T
Nitrogen Mustard (HN-1, HN-2, HN-3)
Nitrogen Oxide (NO)
Paraquat
Perflurorisobutylene (PHIB)
Phenodichlorarsine (PD)
Phenothiazines
Phosgene (CG)
Phosgene Oxime (CX)
Phosphine
Potassium Cyanide (KCN)
Red Phosphorous (RP)
Ricin
Sarin (GB)
Sesqui Mustard
Sodium Azide
Sodium Cyanide (NaCN)
Soman (GD)
Sulfur Mustard (H)
Super Warfarin
Sulfur Trixide-Chlorosulfonic Acid (FS)
Tabun (GA)

Teflon and Perfluorisobutylene (PHIB)
Titanium Tetrachloride (FM)
Unidentified Chemical
VX (Methylphosphonothioic Acid)
White Phosphorus
Zinc Oxide (HC)

Radiological Hazards

Alpha Particles
Beta Particles
Gamma Rays
X-Rays

Assessment Tool: NIOSH Decision Logic for Respirator Selection

To use this decision logic questionnaire, the user must first assemble the necessary toxicologic, safety, and other relevant information for each contaminant, including the following:

- general use conditions, including determination of contaminant(s)
- physical, chemical, and toxicologic properties of the contaminant(s)
- odor threshold data;
- NIOSH recommended exposure limit (REL) or when no REL exists, OSHA permissible exposure limit (PEL) or other applicable exposure limit;
- immediately dangerous to life or health (IDLH) concentration;
- eye irritation potential; and
- any service life information available (for cartridges, canisters, and/or filters).

1. Is the respirator intended for use during fire fighting?

   a. If yes, only a self-contained breathing apparatus (SCBA) with a full facepiece operated in pressure demand or other positive pressure is recommended.
   b. If no, proceed to Step 2.

2. Is the respirator intended for use in an oxygen-deficient atmosphere (i.e., less than 19.5% oxygen at sea level)?

   a. If yes, any type of SCBA or supplied-air respirator (SAR) with an auxiliary SCBA is recommended. Auxiliary SCBA must be of sufficient duration to permit escape to safety if the air supply is interrupted. If additional contaminants are present, proceed to Step 3.

   b. If no, proceed to Step 3.

3. Is the respirator intended for use during emergency situations?

   a. If yes, two types of respirators are recommended:

- an SCBA with a full facepiece operated in pressure demand or other positive pressure mode or
- an SAR with a full facepiece operated in pressure demand or other positive pressure mode in combination with an auxiliary SCBA operated in pressure demand or other positive pressure mode.

Auxiliary SCBA must be of sufficient duration to permit escape to safety if the air supply is interrupted.

b. If no, proceed to Step 4.

4. Is the contaminant regulated by the Department of Labor as a potential occupational carcinogen or identified by NIOSH as a potential human carcinogen in the workplace, and is the contaminant detectable in the atmosphere?

   a. If yes, two types of respirators are recommended:

      - An SCBA with a full facepiece operated in pressure demand or other positive pressure mode or
      - An SAR with a full facepiece operated in pressure demand or other positive pressure mode in combination with an auxiliary SCBA operated in pressure demand or other positive pressure mode.

      Auxiliary SCBA must be of sufficient duration to permit escape to safety if the air supply is interrupted.

   b. If no, proceed to Step 5.

5. Is the exposure concentration of the contaminant, as determined by acceptable industrial hygiene methods, less than the NIOSH Recommended Exposure Limit (REL) or other applicable exposure limits?

   a. If yes, a respirator would not be required except for an escape situation. Proceed to Step 7.

   b. If no, proceed to Step 6.

6. Are conditions such that a worker who is required to wear a respirator can escape from the work are and not suffer loss of life or immediate or delayed irreversible health effects is the respirator fails, i.e., are the conditions <u>not</u> immediately dangerous to life or health (IDLH)?

   a. If yes, conditions are not considered to be IDLH. Proceed to Step 7.

   b. If no, conditions are considered to be IDLH. Two types of respirators are recommended:

- An SCBA with a full facepiece operated in pressure demand or other positive pressure mode or
- An SAR with a full facepiece operated in pressure demand or other positive pressure mode in combination with an auxiliary SCBA operated in pressure demand mode.
- The auxiliary SCBA must be of sufficient duration to permit escape to safety if the air supply is interrupted.

7. Is the contaminant an eye irritant, or can the contaminant cause eye damage at the exposure concentration?

   a. If yes, a respirator equipped with a full facepiece, helmet, or hood is recommended. Proceed to Step 8.

   b. If no, an orinasal respirator may still be an option, depending on the exposure concentration. Proceed to Step 8.

8. Divide the 8-hour time-weighted average (TWA) exposure concentration for the contaminant (or maximum exposure concentration for a contaminant with a ceiling limit) determined in Step 5 by the NIOSH Recommended Exposure Limit (REL) or other applicable exposure limit to determine the minimum protection factor required.

   For escape respirators, determine the potential for generation of a hazardous condition caused by an accident or equipment failure. If a potentially hazardous condition could occur or a minimum protection factor has been calculated, proceed to Step 9.

9. If the physical state of the contaminant is a particulate (solid or liquid) during periods of respirator use, proceed to Step 10.

   If the physical state of the contaminant is a gas or vapor, proceed to Stop 11.

   If the physical state of the contaminant is a combination of gas or vapor and particulate, proceed to Step 12.

10. Particulate Respirators

    10.1. Is the particulate respirator intended only for escape purposes?

a. If yes: escape devices have a single function—to allow a person working in a normally safe environment sufficient time to escape from suddenly occurring respiratory hazards.

When selecting escape-only apparatus, careful consideration must be given to potential eye irritation. This consideration is important for determining whether a gas mask or SCBA equipped with a full facepiece should be selected rather than a device equipped with a half-mask or mouthpiece.

b. If no, the particulate respirator is intended for use during normal work activities. Proceed to Step 10.2

10.2. A filter medium that will provide protection against exposure to the particulate in question is recommended.

MSHA/NIOSH respirators are certified according to seven (7) basic categories. The categories consist of the following types of exposures:

- Dusts: Airborne exposure limit not less than 0.05 mg/m^3 or 2 mppcf;
- Fumes: Airborne exposure limit not less than 0.05 mg/m^3 or 2 mppcf;
- Mists: Airborne exposure limit not less than 0.05 mg/m^3 or 2 mppcf;
- Dusts, fumes, and Mists: Airborne exposure limit is less than 0.05 mg/m^3 or 2 mppcf and radionuclide;
- Radon daughters;
- Asbestos-Containing Dusts and Mists; and
- Single-Use Dust and Mist Respirators.

Proceed to Step 10.3.

10.3. Respirators that have Assigned Protection Factors (APFs) equal to or greater than the minimum protection factor determined in Step 8 are recommended.

11. Gas/Vapor Respirators

11.1 Is the gas/vapor respirator intended for "escape only" purposes?

a. If yes: escape devices have a single function—to allow a person working in a normally safe environment sufficient time to escape from suddenly occurring respirator hazards.

When selecting escape apparatus, careful consideration must be given to potential eye irritation. The majority of gas masks or escape gas masks can be used in situations involving gas(es) and

vapor(s), or particulates. For escape from particulate-contaminated environments, and air-purifying element must be selected that will provide protection against the given type of particulate. NIOSH provides guidance on the selection of escape respirators.

b. If no, the gas/vapor respirator is intended for use during normal work activities. Proceed to Step 11.2.

11.2 Are the warning properties for the gas/vapor contaminant adequate at or below the NIOSH Recommended Exposure Limit (REL) or other applicable exposure limit?

a. If yes, proceed to Step 11.3.

b. If no, an air-purifying respirator equipped with an effective end-of-service-life (ESLI) indicator, a supplied-air respirator, or a self-contained breathing apparatus is recommended. Proceed to Step 11.4.

11.3 An air-purifying chemical cartridge/canister respirator is recommended that has a sorbent suitable for the chemical properties of the anticipated gas/vapor contaminant(s) and for the anticipated exposure levels.

11.4. Respirators that have Assigned Protection Factors (APFs) equal to or greater than the minimum protection factor determined in Step 8 are recommended. (Refer to subparagraph 8

12. Combination particulate and Gas/Vapor Respirators

12.1 Is the combination respirator intended for "escape-only" purposes?

a. If yes: escape devices have a single function—to allow a person working in a normally safe environment sufficient time to escape from suddenly occurring respirator hazards.

When selecting escape apparatus, careful consideration must be given to potential eye irritation. The majority of gas masks or escape gas masks can be used in situations involving gas(es) and vapor(s), or particulates. For escape from particulate-contaminated environments, and air-purifying element must be selected that will provide protection against the given type of particulate. NIOSH provides guidance on the selection of escape respirators.

b. If no, the combination respirator is intended for use during normal work activities. Proceed to Step 12.2.

12.2 Does the gas/vapor contaminant have adequate warning properties at or below the NIOSH Recommended Exposure Limit (REL) or other exposure limit?

a. If yes, proceed to Step 12.3.

b. If no, either an air-purifying respirator (ARP) equipped with an effective ESLI , a supplied-air respirator (SAR), or a self –contained respirator is recommended. Proceed to Step 12.4.

12.3 An air-purifying chemical cartridge/canister is recommended that has a particulate prefilter suitable for the specific type(s) of gas /vapor and particulate contaminants

Respirator Issuing Record

Firefighter Name	Respirator Issued	Date Issued (Month/Day/Year)
	Manufacturer: _____ Model: _____ Serial Number: _____ Size: _____	
	Manufacturer: _____ Model: _____ Serial Number: _____ Size: _____	
	Manufacturer: _____ Model: _____ Serial Number: _____ Size: _____	
	Manufacturer: _____ Model: _____ Serial Number: _____ Size: _____	
	Manufacturer: _____ Model: _____ Serial Number: _____ Size: _____	
	Manufacturer: _____ Model: _____ Serial Number: _____ Size: _____	
	Manufacturer: _____ Model: _____ Serial Number: _____ Size: _____	

Section 2: Medical Evaluations of Firefighters Required to Use Respirators

Using a respirator may place a physiological burden on firefighters that varies with the type of respirator worn, the job and workplace conditions in which the respirator is used, and the medical status of the firefighter.

The RPPA shall provide a medical evaluation (29 CFR 1910.134(c)) to determine the firefighter's ability to use a respirator before the firefighter is fit tested or required to use the respirator in the workplace. The RPPA may discontinue an firefighter's medical evaluations when the firefighter is no longer required to use a respirator.

Medical Evaluation - 1910.134(e): The RPPA must provide a medical evaluation to determine each firefighter's fitness to wear a respirator. The evaluation must be provided before the **initial fit-testing** [emphasis added] and before the respirator is used for the first time. Medical evaluations consist of the administration of a medical questionnaire, which is found in the mandatory Appendix C of the standard, **or** provision of a physical examination that elicits the same information as the questionnaire for the firefighter. A RPPA, who opts to provide physical examinations to firefighters, need not also administer the medical questionnaire. These evaluations are required for all respirator users except for firefighters who voluntarily use dusts masks and for those whose only respirator would be the use of escape-only respirators. SCBA's are not considered escape-only respirators. Firefighters who refuse to be medically evaluated cannot be assigned to work in areas where they are required to wear a respirator (Source: OSHA Instruction, Inspection Procedures for the Respiratory Protection Standard, September 28, 1995).

The RPPA shall identify a physician or other licensed health care professional (PLHCP) to perform medical evaluations using a medical questionnaire **or** an initial medical examination that obtains the same information as the medical questionnaire.

The medical questionnaire and examinations shall be administered confidentially during the firefighter's own normal working hours or at a time and place convenient to the firefighter. The medical questionnaire shall be administered in a manner that ensures that the firefighter understands its contents. The RPPA shall provide the firefighter with an opportunity to discuss the questionnaire and examination results with the PLHCP.

The following information must be provided to the PLHCP before the PLHCP makes a recommendation concerning an firefighter's ability to use a respirator (29 CFR 1910.134(e)(5)):

- the type and weight of the respirator to be used by the firefighter;
- the duration and frequency of respirator use (including use for rescue and escape);
- the expected physical work effort;

- additional protective clothing and equipment to be worn; and
- temperature and humidity extremes that may be encountered.

The RPPA shall ensure that a follow-up medical examination is provided for a firefighter who gives a positive response to any question among questions 1 through 8 in Section 2, Part A of Appendix C of 29 CFR 1910.134 (Respirator Medical Evaluation Questionnaire) or whose initial medical examination demonstrates the need for a follow-up medical examination. The follow-up medical examination shall include any medical tests, consultation, or diagnostic procedures that the PLHCP deems necessary to make a final determination (29 CFR 1910.134(e)(3)).

The medical evaluation questionnaire is described in 29 CFR 1910.134 Appendix C: OSHA Respirator Medical Evaluation Questionnaire (Mandatory). The medical evaluation questionnaire is included at the end of this section.

Subject to 29 CFR 1910.134(m)(1) and 1910.1020(d)(1)(i)(A,C), the medical evaluation for each firefighter shall be preserved and maintained for at least the duration of employment plus thirty (30 years). The medical evaluation for an firefighter who worked less than one (1) year is exempt from this requirement providing that the medical evaluation is provided to the firefighter upon termination of employment.

Medical Determination

In determining the firefighter's ability to use a respirator, the RPPA shall obtain a written recommendation (29 CFR 1910.134(e)(6)) regarding the firefighter's ability to use the respirator from the PLHCP. The recommendation shall provide only the following information:

- any limitations on respirator use related to the medical condition of the firefighter, or relating to the workplace conditions in which the respirator will be used, including whether or not the firefighter is medically able to use the respirator;
- the need, if any, for follow-up medical evaluations; and
- a statement that the PLHCP has provided the firefighter with a copy of the PLHCP's written recommendation.

A sample form for the PLHCP Written Recommendation for Respirator Use is included at the end of this section.

If the respirator is a negative pressure respirator and the PLHCP finds a medical condition that may place the firefighter's health at risk if the respirator is used, the RPPA shall provide a Powered Air Purifying Respirator (PAPR) if the PLHCP's medical evaluation finds that the firefighter can use such a respirator. If a subsequent medical

evaluation finds that the firefighter is medically able to use a negative pressure respirator, then the RPPA is no longer required to provide a PAPR.

Additional Medical Evaluations

At a minimum, the RPPA shall provide additional medical evaluations (29 CFR 1910.134(e)(7)) that comply with the requirements of 29 CFR 1910.134 if:

- a firefighter reports medical signs or symptoms that are related to ability to use a respirator,
- a PLHCP, supervisor, or the respirator program administrator informs the RPPA that a firefighter needs to be reevaluated,
- information from the respiratory protection program, including observations made during fit testing and program evaluation, indicates a need for firefighter reevaluation, or
- a change occurs in workplace conditions (e.g., physical work effort, protective clothing, temperature) that may result in a substantial increase in the physiological burden placed on a firefighter.

Medical Evaluation Questionnaire

Source: Appendix C to Sec. 1910.134: OSHA Respirator Medical Evaluation Questionnaire (Mandatory)

To the RPPA and the physician or other licensed health care professional (PLHCP):

Answers to questions in Section 1, and to question 9 in Section 2 of Part A, do not require a medical examination. A "yes" answer to any of the questions numbered 1-8 in Section 2 of Part A requires a follow-up medical evaluation.

Subject to 29 CFR 1910.134(m)(1) and 1910.1020(d)(1)(i)(A,C), the medical evaluation for each firefighter shall be preserved and maintained for at least the duration of employment plus thirty (30 years). The medical evaluation for a firefighter who worked less than one (1) year is exempt from this requirement providing that the medical evaluation is provided to the firefighter upon termination of employment.

To the firefighter:

Can you read? ..... Yes No

Your Name: _____

Your RPPA must allow you to answer this questionnaire during normal working hours, or at a time and place that is convenient to you.

To maintain your confidentiality, your RPPA or supervisor must not look at or review your answers, and your RPPA must tell you how to deliver or send this questionnaire to the health care professional who will review it.

Part A, Section 1 (Mandatory)

The following information must be provided by every firefighter who has been selected to use any type of respirator (please print).

1. Today's date: _____

2. Your name: _____

3. Your age (to nearest year): _____

4. Sex: _____ Male _____ Female

5. Your height: _____ feet _____ inches

6. Your weight: _____ pounds

7. Your job title: _____

8. A phone number where you can be reached by the health care professional who reviews this questionnaire: _____ (Area Code) _____-_____

9. The best time to phone you at this number: _____

10. Has your RPPA told you how to contact the health care professional who will review this questionnaire (circle one): ..... Yes No

11. Check the type of respirator you will use (you can check more than one category):

    a. _____ N, R, or P disposable respirator (filter-mask, non- cartridge type only).

    b. _____ Other type (for example, half- or full-facepiece type, powered-air purifying, supplied-air, self-contained breathing apparatus).

12. Have you worn a respirator (circle one): ..... Yes No

    If "yes," what type(s):_____

    _____

Part A, Section 2 (Mandatory)

Questions 1 through 9 below must be answered by every firefighter who has been selected to use any type of respirator (please circle "yes" or "no").

1. Do you **currently** smoke tobacco, or have you smoked tobacco in the last month: ..... Yes No

2. Have you **ever had** any of the following conditions?

   a. Seizures (fits): ..... Yes No

   b. Diabetes (sugar disease): ..... Yes No

   c. Allergic reactions that interfere with your breathing: ..... Yes No

   d. Claustrophobia (fear of closed-in places): ..... Yes No

   e. Trouble smelling odors: ..... Yes No

3. Have you **ever had** any of the following pulmonary or lung problems?

   a. Asbestosis: ..... Yes No

   b. Asthma: ..... Yes No

   c. Chronic bronchitis: ..... Yes No

   d. Emphysema: ..... Yes No

   e. Pneumonia: ..... Yes No

   f. Tuberculosis: ..... Yes No

   g. Silicosis: ..... Yes No

   h. Pneumothorax (collapsed lung): ..... Yes No

   i. Lung cancer: ..... Yes No

   j. Broken ribs: ..... Yes No

   k. Any chest injuries or surgeries: ..... Yes No

   l. Any other lung problem that you've been told about: ..... Yes No

4. Do you **currently** have any of the following symptoms of pulmonary or lung illness?

   a. Shortness of breath: ..... Yes No

   b. Shortness of breath when walking fast on level ground or walking up a slight hill or incline: ..... Yes No

c. Shortness of breath when walking with other people at an ordinary pace on level ground: .... Yes No

d. Have to stop for breath when walking at your own pace on level ground: .... Yes No

e. Shortness of breath when washing or dressing yourself: ..... Yes No

f. Shortness of breath that interferes with your job: .... Yes No

g. Coughing that produces phlegm (thick sputum): .... Yes No

h. Coughing that wakes you early in the morning: ..... Yes No

i. Coughing that occurs mostly when you are lying down: ..... Yes No

j. Coughing up blood in the last month: ..... Yes No

k. Wheezing: ..... Yes No

l. Wheezing that interferes with your job: ..... Yes No

m. Chest pain when you breathe deeply: ..... Yes No

n. Any other symptoms that you think may be related to lung problems: ..... Yes No

5. Have you **ever had** any of the following cardiovascular or heart problems?

a. Heart attack: ..... Yes No

b. Stroke: ..... Yes No

c. Angina: ..... Yes No

d. Heart failure: ..... Yes No

e. Swelling in your legs or feet (not caused by walking): ..... Yes No

f. Heart arrhythmia (heart beating irregularly): ..... Yes No

g. High blood pressure: ..... Yes No

h. Any other heart problem that you've been told about: ..... Yes No

6. Have you **ever had** any of the following cardiovascular or heart symptoms?

a. Frequent pain or tightness in your chest: ..... Yes No

b. Pain or tightness in your chest during physical activity: ..... Yes No

c. Pain or tightness in your chest that interferes with your job: . Yes No

d. In the past two years, have you noticed your heart skipping or missing a beat: ..... Yes No

e. Heartburn or indigestion that is not related to eating: ..... Yes No

f. Any other symptoms that you think may be related to heart or circulation problems: ..... Yes No

7. Do you **currently** take medication for any of the following problems?

a. Breathing or lung problems: ..... Yes No

b. Heart trouble: ..... Yes No

c. Blood pressure: ..... Yes No

d. Seizures (fits): ..... Yes No

8. If you've used a respirator, have you **ever had** any of the following problems? (If you've never used a respirator, check the following space _____ and go to question 9:)

a. Eye irritation: ..... Yes No

b. Skin allergies or rashes: ..... Yes No

c. Anxiety: ..... Yes No

d. General weakness or fatigue: ..... Yes No

e. Any other problem that interferes with your use of a respirator: ..... Yes No

9. Would you like to talk to the health care professional who will review this questionnaire about your answers to this questionnaire: ..... Yes No

---

Questions 10 to 15 below must be answered by every firefighter who has been selected to use either a full-facepiece respirator or a self-contained breathing apparatus (SCBA).

For firefighters who have been selected to use other types of respirators, answering these questions is voluntary.

10. Have you **ever lost** vision in either eye (temporarily or permanently): ..... Yes No

11. Do you **currently** have any of the following vision problems?

a. Wear contact lenses: ..... Yes No

b. Wear glasses: ..... Yes No

c. Color blind: ..... Yes No

d. Any other eye or vision problem: ..... Yes No

12. Have you **ever had** an injury to your ears, including a broken eardrum: ..... Yes No

13. Do you **currently** have any of the following hearing problems?

a. Difficulty hearing: ..... Yes No

b. Wear a hearing aid: ..... Yes No

c. Any other hearing or ear problem: ..... Yes No

14. Have you **ever had** a back injury: ..... Yes No

15. Do you **currently** have any of the following musculoskeletal problems?

a. Weakness in any of your arms, hands, legs, or feet: ..... Yes No

b. Back pain: ..... Yes No

c. Difficulty fully moving your arms and legs: ..... Yes No

d. Pain or stiffness when you lean forward or backward at the waist: ..... Yes No

e. Difficulty fully moving your head up or down: ..... Yes No

f. Difficulty fully moving your head side to side: ..... Yes No

g. Difficulty bending at your knees: ..... Yes No

h. Difficulty squatting to the ground: ..... Yes No

i. Climbing a flight of stairs or a ladder carrying more than 25 lbs: ..... Yes No

j. Any other muscle or skeletal problem that interferes with using a respirator: ..... Yes No

---

Part B

Any of the following questions, and other questions not listed, may be added to the questionnaire at the discretion of the health care professional who will review the questionnaire.

1. In your present job, are you working at high altitudes (over 5,000 feet) or in a place that has lower than normal amounts of oxygen: ..... Yes No

   If "yes," do you have feelings of dizziness, shortness of breath, pounding in your chest, or other symptoms when you're working under these conditions: ..... Yes No

2. At work or at home, have you ever been exposed to hazardous solvents, hazardous airborne chemicals (e.g., gases, fumes, or dust), or have you come into skin contact with hazardous chemicals: ..... Yes No

   If "yes," name the chemicals if you know them:_____

   _____

   _____

3. Have you ever worked with any of the materials, or under any of the conditions, listed below:

   a. Asbestos: ..... Yes No

   b. Silica (e.g., in sandblasting): ..... Yes No

   c. Tungsten/cobalt (e.g., grinding or welding this material): ..... Yes No

   d. Beryllium: ..... Yes No

   e. Aluminum: ..... Yes No

   f. Coal (for example, mining): ..... Yes No

   g. Iron: ..... Yes No

   h. Tin: ..... Yes No

   i. Dusty environments: ..... Yes No

   j. Any other hazardous exposures: ..... Yes No

   If "yes," describe these exposures:_____

   _____

   _____

4. List any second jobs or side businesses you have:

   _____

5. List your previous occupations:_____

_____

6. List your current and previous hobbies:_____

_____

7. Have you been in the military services?..... Yes No

   If "yes," were you exposed to biological or chemical agents (either in training or combat): ..... Yes No

8. Have you ever worked on a HAZMAT team? ..... Yes No

9. Other than medications for breathing and lung problems, heart trouble, blood pressure, and seizures mentioned earlier in this questionnaire, are you taking any other medications for any reason (including over-the-counter medications): ..... Yes No

   If "yes," name the medications if you know them:_____

10. Will you be using any of the following items with your respirator(s)?

    a. HEPA Filters:..... Yes No

    b. Canisters (for example, gas masks):..... Yes No

    c. Cartridges:..... Yes No

    d. Other filters..... Yes No

11. How often are you expected to use the respirator(s) (circle "yes" or "no" for all answers that apply to you)?:

    a. Escape only (no rescue):..... Yes No

    b. Emergency rescue only:..... Yes No

    c. Less than 5 hours **per week:** ..... Yes No

    d. Less than 2 hours **per day:**..... Yes No

    e. 2 to 4 hours per day: ..... Yes No

    f. Over 4 hours per day: ..... Yes No

12. During the period you are using the respirator(s), is your work effort:

    a. **Light** (less than 200 kcal per hour):..... Yes No

       If "yes," how long does this period last during the average shift:
       _____hours and _____minutes

Examples of a light work effort are **sitting** while writing, typing, drafting, or performing light assembly work; or **standing** while operating a drill press (1-3 lbs.) or controlling machines.

b. **Moderate** (200 to 350 kcal per hour): ..... Yes No

If "yes," how long does this period last during the average shift:
_____hours and _____minutes

Examples of moderate work effort are **sitting** while nailing or filing; **driving** a truck or bus in urban traffic; **standing** while drilling, nailing, performing assembly work, or transferring a moderate load (about 35 lbs.) at trunk level; **walking** on a level surface about 2 mph or down a 5-degree grade about 3 mph; or **pushing** a wheelbarrow with a heavy load (about 100 lbs.) on a level surface.

c. **Heavy** (above 350 kcal per hour):..... Yes No

If "yes," how long does this period last during the average shift:
_____hours and _____minutes

Examples of heavy work are **lifting** a heavy load (about 50 lbs.) from the floor to your waist or shoulder; working on a loading dock; **shoveling; standing** while bricklaying or chipping castings; **walking** up an 8-degree grade about 2 mph; climbing stairs with a heavy load (about 50 lbs.).

13. Will you be wearing protective clothing and/or equipment (other than the respirator) when you're using your respirator: ..... Yes No

If "yes," describe this protective clothing and/or equipment:_____

_____

14. Will you be working under hot conditions (temperature exceeding 77°F): ..... Yes No

15. Will you be working under humid conditions:..... Yes No

16. Describe the work you'll be doing while you're using your respirator(s):

_____

_____

17. Describe any special or hazardous conditions you might encounter when you're using your respirator(s) (for example, confined spaces, life-threatening gases):

_____

_____

18. Provide the following information, if you know it, for each toxic substance that you'll be exposed to when you're using your respirator(s):

Name of the first toxic substance:_____

Estimated maximum exposure level per shift:_____
Duration of exposure per shift: _____
Name of the second toxic substance:_____
Estimated maximum exposure level per shift:_____
Duration of exposure per shift: _____
Name of the third toxic substance: _____
Estimated maximum exposure level per shift:_____
Duration of exposure per shift: _____
The name of any other toxic substances that you'll be exposed to while using your respirator: _____
_____
_____

Describe any special responsibilities you'll have while using your respirator(s) that may affect the safety and well-being of others (for example, rescue, security): _____
_____

Supplemental Information for the PLHCP for Review of Medical Questionnaire

Firefighter Name	Type of Respirator to be Used (Circle Those Appropriate)	Duration and Frequency of Use of Respirator	Expected Physical Work Effort During Respirator Use (Circle as Appropriate)	Additional PPE to be Worn While Using Respirator	Temperature, Humidity Extremes Encountered During Respirator Use
	SCBA PAPR APR (Full) APR (Half) Dust Mask		High Medium Low		
	SCBA PAPR APR (Full) APR (Half) Dust Mask		High Medium Low		
	SCBA PAPR APR (Full) APR (Half) Dust Mask		High Medium Low		
	SCBA PAPR APR (Full) APR (Half) Dust Mask		High Medium Low		
	SCBA PAPR APR (Full) APR (Half) Dust Mask		High Medium Low		

PLHCP Written Recommendation for Respirator Use

Firefighter Name: _____

Employed by the Hanover Park Fire Department, 1661 Maple Avenue Hanover Park, IL

Limitations on respirator use related to the medical condition of the firefighter or relating to the workplace conditions in which the respirator will be used, including whether or not the firefighter is medically able to use the respirator:

_____

_____

_____

Does a need exist for follow-up medical evaluations for this firefighter? _____

The PLHCP has provided the firefighter (name stated above) with a copy of the PLHCP's written recommendation.

_____ _____

Signature, PLHCP Date

Section 3: Fit Testing Procedures for Tight-Fitting Respirators

Before a firefighter may be required to use any respirator with a negative or positive pressure tight-fighting facepiece, the firefighter must be fit tested with the same make, model, style, and size of respirator that will be used (29 CFR 1910.134(f)).

The RPPA shall ensure any firefighter using a tight-fitting facepiece respirator passes an appropriate qualitative fit test (QLFT) or quantitative fit test (QNFT) as stated in 29 CFR 1910.134 (29 CFR 1910.134(f)(1)).

The RPPA shall ensure that any firefighter using a tight-fighting facepiece respirator is fit tested (1910.134(f)(2)):

- prior to initial use of the respirator,
- whenever a different respirator facepiece (size, style, model, or make) is used, and
- at least annually thereafter.

The RPPA shall conduct an additional fit test whenever the firefighter reports, or the RPPA, PLHCP, supervisor, or program administrator makes visual observations of, changes in the firefighter's physical condition that could affect respirator fit. Such conditions include, but are not limited to, facial scarring, dental changes, cosmetic surgery, or an obvious change in body weight (29 CFR 1910.134(f)(3)).

A record of fit testing worksheet in included at the end of this section.

The fit test shall be administered using an OSHA-accepted qualitative fit test (QLFT) or quantitative fit test (QNFT) protocol (29 CFR 1910.134(f)(5), 29 CFR 1910.134 Appendix A). The OSHA-accepted QLFT and QNFT protocols are listed in this section.

QLFT may be used only to fit test negative pressure air-purifying respirators that must achieve a fit factor of 100 or less (29 CFR 1910.134(f)(6)).

If the fit factor, as determined through an OSHA-accepted QNFT protocol, is equal to or greater than 100 for tight-fitting half facepieces, or equal to or greater than 500 for tight-fitting full facepieces, the QNFT has been passed with that respirator (29 CFR 1910.134(f)(7)).

Fit testing of tight-fitting atmosphere-supplying respirators (SAR) and tight-fitting powered air-purifying respirators (PAPR) shall be accomplished by performing qualitative or qualitative fit testing in the negative pressure mode, regardless of the mode of operation (negative or positive pressure) that is used for respiratory protection (29 CFR 1910.134(f)(8)).

- Quantitative fit testing of these respirators shall be accomplished by temporarily converting the respirator user's actual facepiece into a negative pressure respirator with appropriate filters, or by using an identical negative pressure air-purifying respirator facepiece with the same sealing surfaces as a surrogate for the atmosphere-supplying or powered air-purifying respirator facepiece.
- Quantitative fit testing of these respirators shall be accomplished by modifying the facepiece to allow sampling inside the facepiece in the breathing zone of the user, midway between the nose and mouth. This requirement shall be accomplished by installing a permanent sampling probe onto a surrogate facepiece, or by using a sampling adapter designed to temporarily provide a means of sampling air from inside the facepiece.
- Any modifications to the respirator facepiece for fit testing shall be completely removed, and the facepiece restored to NIOSH-approved configuration, before that facepiece can be used in the workplace.

Fit Testing Procedures

Source: Appendix A to § 1910.134: Fit Testing Procedures (Mandatory)

Part I: OSHA-Accepted Fit Test Protocols

A. Fit Testing Procedures -- General Requirements

The RPPA shall conduct fit testing using the following procedures. The requirements in this appendix apply to all OSHA-accepted fit test methods, both qualitative fit test (QLFT) and quantitative fit test (QNFT).

1. The firefighter shall be allowed to pick the most acceptable respirator from a sufficient number of respirator sizes so that the respirator is acceptable to, and correctly fits, the user.

2. Prior to the selection process, the firefighter shall be shown how to put on a respirator, how it should be positioned on the face, how to set strap tension and how to determine an acceptable fit. A mirror shall be available to assist the firefighter in evaluating the fit and positioning of the respirator. This instruction may not constitute the firefighter's formal training on respirator use, because it is only a review.

3. The firefighter shall be informed that he/she is being asked to select the respirator that provides the most acceptable fit. Each respirator represents a different size and shape, and if fitted and used properly, will provide adequate protection.

4. The firefighter shall be instructed to hold each chosen facepiece up to the face and eliminate those that obviously do not give an acceptable fit.

5. The more acceptable facepieces are noted in case the one selected proves unacceptable; the most comfortable mask is donned and worn at least five minutes to assess comfort. Assistance in assessing comfort can be given by discussing the points in the following item A.6. If the firefighter is not familiar with using a particular respirator, the firefighter shall be directed to don the mask several times and to adjust the straps each time to become adept at setting proper tension on the straps.

6. Assessment of comfort shall include a review of the following points with the firefighter and allowing the firefighter adequate time to determine the comfort of the respirator:

    a. Position of the mask on the nose
    b. Room for eye protection

c. Room to talk
d. Position of mask on face and cheeks

7. The following criteria shall be used to help determine the adequacy of the respirator fit:

   a. Chin properly placed;
   b. Adequate strap tension, not overly tightened;
   c. Fit across nose bridge;
   d. Respirator of proper size to span distance from nose to chin;
   e. Tendency of respirator to slip;
   f. Self-observation in mirror to evaluate fit and respirator position.

8. The firefighter shall conduct a user seal check, either the negative and positive pressure seal checks described in Appendix B-1 of this section or those recommended by the respirator manufacturer which provide equivalent protection to the procedures in Appendix B-1.

   Before conducting the negative and positive pressure checks, the firefighter shall be told to seat the mask on the face by moving the head from side-to-side and up and down slowly while taking in a few slow deep breaths. Another facepiece shall be selected and retested if the firefighter fails the user seal check tests.

9. The test shall not be conducted if there is any hair growth between the skin and the facepiece sealing surface, such as stubble beard growth, beard, mustache or sideburns which cross the respirator sealing surface. Any type of apparel which interferes with a satisfactory fit shall be altered or removed.

10. If a firefighter exhibits difficulty in breathing during the tests, she or he shall be referred to a physician or other licensed health care professional, as appropriate, to determine whether the firefighter can wear a respirator while performing her or his duties.

11. If the firefighter finds the fit of the respirator unacceptable, the firefighter shall be given the opportunity to select a different respirator and to be retested.

12. Exercise regimen. Prior to the commencement of the fit test, the firefighter shall be given a description of the fit test and the firefighter's responsibilities during the test procedure. The description of the process shall include a description of the test exercises that the firefighter will be performing.

    The respirator to be tested shall be worn for at least 5 minutes before the start of the fit test.

13. The fit test shall be performed while the firefighter is wearing any applicable safety equipment that may be worn during actual respirator use which could interfere with respirator fit.

14. Test Exercises.

a. The following test exercises are to be performed for all fit testing methods prescribed in this appendix, except for the CNP method. A separate fit testing exercise regimen is contained in the CNP protocol.

The firefighter shall perform exercises, in the test environment, in the following manner:

1. Normal breathing. In a normal standing position, without talking, the firefighter shall breathe normally.
2. Deep breathing. In a normal standing position, the firefighter shall breathe slowly and deeply, taking caution so as not to hyperventilate.
3. Turning head side to side. Standing in place, the firefighter shall slowly turn his/her head from side to side between the extreme positions on each side. The head shall be held at each extreme momentarily so the firefighter can inhale at each side.
4. Moving head up and down. Standing in place, the firefighter shall slowly move his/her head up and down. The firefighter shall be instructed to inhale in the up position (i.e., when looking toward the ceiling).
5. Talking. The firefighter shall talk out loud slowly and loud enough so as to be heard clearly by the test conductor. The firefighter can read from a prepared text such as the Rainbow Passage, count backward from 100, or recite a memorized poem or song.

> ***Rainbow Passage*** When the sunlight strikes raindrops in the air, they act like a prism and form a rainbow. The rainbow is a division of white light into many beautiful colors. These take the shape of a long round arch, with its path high above, and its two ends apparently beyond the horizon. There is, according to legend, a boiling pot of gold at one end. People look, but no one ever finds it. When a man looks for something beyond reach, his friends say he is looking for the pot of gold at the end of the rainbow.

6. Grimace. The firefighter shall grimace by smiling or frowning. (This applies only to QNFT testing; it is not performed for QLFT)
7. Bending over. The firefighter shall bend at the waist as if he/she were to touch his/her toes. Jogging in place shall be substituted for

this exercise in those test environments such as shroud type QNFT or QLFT units that do not permit bending over at the waist.

8. Normal breathing. Same as exercise (1).(b) Each test exercise shall be performed for one minute except for the grimace exercise which shall be performed for 15 seconds. The firefighter shall be questioned by the test conductor regarding the comfort of the respirator upon completion of the protocol. If it has become unacceptable, another model of respirator shall be tried. The respirator shall not be adjusted once the fit test exercises begin. Any adjustment voids the test, and the fit test must be repeated.

B. Qualitative Fit Test (QLFT) Protocols

1. General

a. The RPPA shall ensure that persons administering QLFT are able to prepare test solutions, calibrate equipment and perform tests properly, recognize invalid tests, and ensure that test equipment is in proper working order.

b. The RPPA shall ensure that QLFT equipment is kept clean and well maintained so as to operate within the parameters for which it was designed.

2. Isoamyl Acetate Protocol

Note: This protocol is not appropriate to use for the fit testing of particulate respirators. If used to fit test particulate respirators, the respirator must be equipped with an organic vapor filter.

a. Odor Threshold Screening

Odor threshold screening, performed without wearing a respirator, is intended to determine if the individual tested can detect the odor of isoamyl acetate at low levels.

1. Three 1 liter glass jars with metal lids are required.
2. Odor-free water (e.g., distilled or spring water) at approximately 25 deg. C (77 deg. F) shall be used for the solutions.
3. The isoamyl acetate (IAA) (also known at isopentyl acetate) stock solution is prepared by adding 1 ml of pure IAA to 800 ml of odor-free water in a 1 liter jar, closing the lid and shaking for 30 seconds. A new solution shall be prepared at least weekly.
4. The screening test shall be conducted in a room separate from the room used for actual fit testing. The two rooms shall be well-

ventilated to prevent the odor of IAA from becoming evident in the general room air where testing takes place.

5. The odor test solution is prepared in a second jar by placing 0.4 ml of the stock solution into 500 ml of odor-free water using a clean dropper or pipette. The solution shall be shaken for 30 seconds and allowed to stand for two to three minutes so that the IAA concentration above the liquid may reach equilibrium. This solution shall be used for only one day.
6. A test blank shall be prepared in a third jar by adding 500 cc of odor-free water.
7. The odor test and test blank jar lids shall be labeled (e.g., 1 and 2) for jar identification. Labels shall be placed on the lids so that they can be peeled off periodically and switched to maintain the integrity of the test.
8. The following instruction shall be typed on a card and placed on the table in front of the two test jars (i.e., 1 and 2): "The purpose of this test is to determine if you can smell banana oil at a low concentration. The two bottles in front of you contain water. One of these bottles also contains a small amount of banana oil. Be sure the covers are on tight, then shake each bottle for two seconds. Unscrew the lid of each bottle, one at a time, and sniff at the mouth of the bottle. Indicate to the test conductor which bottle contains banana oil."
9. The mixtures used in the IAA odor detection test shall be prepared in an area separate from where the test is performed, in order to prevent olfactory fatigue in the firefighter.
10. If the firefighter is unable to correctly identify the jar containing the odor test solution, the IAA qualitative fit test shall not be performed.
11. If the firefighter correctly identifies the jar containing the odor test solution, the firefighter may proceed to respirator selection and fit testing.

b. Isoamyl Acetate Fit Test

1. The fit test chamber shall be a clear 55-gallon drum liner suspended inverted over a 2-foot diameter frame so that the top of the chamber is about 6 inches above the firefighter's head. If no drum liner is available, a similar chamber shall be constructed using plastic sheeting. The inside top center of the chamber shall have a small hook attached.
2. Each respirator used for the fitting and fit testing shall be equipped with organic vapor cartridges or offer protection against organic vapors.
3. After selecting, donning, and properly adjusting a respirator, the firefighter shall wear it to the fit testing room. This room shall be separate from the room used for odor threshold screening and

respirator selection, and shall be well-ventilated, as by an exhaust fan or lab hood, to prevent general room contamination.

4. A copy of the test exercises and any prepared text from which the firefighter is to read shall be taped to the inside of the test chamber.
5. Upon entering the test chamber, the firefighter shall be given a 6-inch by 5-inch piece of paper towel, or other porous, absorbent, single-ply material, folded in half and wetted with 0.75 ml of pure IAA. The firefighter shall hang the wet towel on the hook at the top of the chamber. An IAA test swab or ampoule may be substituted for the IAA wetted paper towel provided it has been demonstrated that the alternative IAA source will generate an IAA test atmosphere with a concentration equivalent to that generated by the paper towel method.
6. Allow two minutes for the IAA test concentration to stabilize before starting the fit test exercises. This would be an appropriate time to talk with the firefighter; to explain the fit test, the importance of his/her cooperation, and the purpose for the test exercises; or to demonstrate some of the exercises.
7. If at any time during the test, the firefighter detects the banana-like odor of IAA, the test is failed. The firefighter shall quickly exit from the test chamber and leave the test area to avoid olfactory fatigue.
8. If the test is failed, the firefighter shall return to the selection room and remove the respirator. The firefighter shall repeat the odor sensitivity test, select and put on another respirator, return to the test area and again begin the fit test procedure described in (b) (1) through (7) above. The process continues until a respirator that fits well has been found. Should the odor sensitivity test be failed, the firefighter shall wait at least 5 minutes before retesting. Odor sensitivity will usually have returned by this time.
9. If the firefighter passes the test, the efficiency of the test procedure shall be demonstrated by having the firefighter break the respirator face seal and take a breath before exiting the chamber. When the firefighter leaves the chamber, the firefighter shall remove the saturated towel and return it to the person conducting the test, so that there is no significant IAA concentration buildup in the chamber during subsequent tests. The used towels shall be kept in a self-sealing plastic bag to keep the test area from being contaminated.

3. Saccharin Solution Aerosol Protocol

The entire screening and testing procedure shall be explained to the firefighter prior to the conduct of the screening test.

a. Taste threshold screening.

The saccharin taste threshold screening, performed without wearing a respirator, is intended to determine whether the individual being tested can detect the taste of saccharin.

1. During threshold screening as well as during fit testing, firefighters shall wear an enclosure about the head and shoulders that is approximately 12 inches in diameter by 14 inches tall with at least the front portion clear and that allows free movements of the head when a respirator is worn. An enclosure substantially similar to the 3M hood assembly, parts # FT 14 and # FT 15 combined, is adequate.
2. The test enclosure shall have a 3/4-inch (1.9 cm) hole in front of the firefighter's nose and mouth area to accommodate the nebulizer nozzle.
3. The firefighter shall don the test enclosure. Throughout the threshold screening test, the firefighter shall breathe through his/her slightly open mouth with tongue extended. The firefighter is instructed to report when he/she detects a sweet taste.
4. Using a DeVilbiss Model 40 Inhalation Medication Nebulizer or equivalent, the test conductor shall spray the threshold check solution into the enclosure. The nozzle is directed away from the nose and mouth of the person. This nebulizer shall be clearly marked to distinguish it from the fit test solution nebulizer.
5. The threshold check solution is prepared by dissolving 0.83 gram of sodium saccharin USP in 100 ml of warm water. It can be prepared by putting 1 ml of the fit test solution (see (b)(5) below) in 100 ml of distilled water.
6. To produce the aerosol, the nebulizer bulb is firmly squeezed so that it collapses completely, then released and allowed to fully expand.
7. Ten squeezes are repeated rapidly and then the firefighter is asked whether the saccharin can be tasted. If the firefighter reports tasting the sweet taste during the ten squeezes, the screening test is completed. The taste threshold is noted as ten regardless of the number of squeezes actually completed.
8. If the first response is negative, ten more squeezes are repeated rapidly and the firefighter is again asked whether the saccharin is tasted. If the firefighter reports tasting the sweet taste during the second ten squeezes, the screening test is completed. The taste threshold is noted as twenty regardless of the number of squeezes actually completed.
9. If the second response is negative, ten more squeezes are repeated rapidly and the firefighter is again asked whether the saccharin is tasted. If the firefighter reports tasting the sweet taste during the third set of ten squeezes, the screening test is

completed. The taste threshold is noted as thirty regardless of the number of squeezes actually completed.

10. The test conductor will take note of the number of squeezes required to solicit a taste response.
11. If the saccharin is not tasted after 30 squeezes (step 10), the firefighter is unable to taste saccharin and may not perform the saccharin fit test. **Note to paragraph 3. (a):** If the firefighter eats or drinks something sweet before the screening test, he/she may be unable to taste the weak saccharin solution.
12. If a taste response is elicited, the firefighter shall be asked to take note of the taste for reference in the fit test.
13. Correct use of the nebulizer means that approximately 1 ml of liquid is used at a time in the nebulizer body.
14. The nebulizer shall be thoroughly rinsed in water, shaken dry, and refilled at least each morning and afternoon or at least every four hours.

b. Saccharin Solution Aerosol Fit Test Procedure.

1. The firefighter may not eat, drink (except plain water), smoke, or chew gum for 15 minutes before the test.
2. The fit test uses the same enclosure described in 3. (a) above.
3. The firefighter shall don the enclosure while wearing the respirator selected in section I. A. of this appendix. The respirator shall be properly adjusted and equipped with a particulate filter(s).
4. A second DeVilbiss Model 40 Inhalation Medication Nebulizer or equivalent is used to spray the fit test solution into the enclosure. This nebulizer shall be clearly marked to distinguish it from the screening test solution nebulizer.
5. The fit test solution is prepared by adding 83 grams of sodium saccharin to 100 ml of warm water.
6. As before, the firefighter shall breathe through the slightly open mouth with tongue extended, and report if he/she tastes the sweet taste of saccharin.
7. The nebulizer is inserted into the hole in the front of the enclosure and an initial concentration of saccharin fit test solution is sprayed into the enclosure using the same number of squeezes (either 10, 20 or 30 squeezes) based on the number of squeezes required to elicit a taste response as noted during the screening test. A minimum of 10 squeezes is required.
8. After generating the aerosol, the firefighter shall be instructed to perform the exercises in section I. A. 14. of this appendix.
9. Every 30 seconds the aerosol concentration shall be replenished using one half the original number of squeezes used initially (e.g., 5, 10 or 15).

10. The firefighter shall indicate to the test conductor if at any time during the fit test the taste of saccharin is detected. If the firefighter does not report tasting the saccharin, the test is passed.
11. If the taste of saccharin is detected, the fit is deemed unsatisfactory and the test is failed. A different respirator shall be tried and the entire test procedure is repeated (taste threshold screening and fit testing).
12. Since the nebulizer has a tendency to clog during use, the test operator must make periodic checks of the nebulizer to ensure that it is not clogged. If clogging is found at the end of the test session, the test is invalid.

4. Bitrex™ (Denatonium Benzoate) Solution Aerosol Qualitative Fit Test Protocol

The Bitrex™ (Denatonium benzoate) solution aerosol QLFT protocol uses the published saccharin test protocol because that protocol is widely accepted. Bitrex is routinely used as a taste aversion agent in household liquids which children should not be drinking and is endorsed by the American Medical Association, the National Safety Council, and the American Association of Poison Control Centers. The entire screening and testing procedure shall be explained to the firefighter prior to the conduct of the screening test.

a. Taste Threshold Screening. The Bitrex taste threshold screening, performed without wearing a respirator, is intended to determine whether the individual being tested can detect the taste of Bitrex.

1. During threshold screening as well as during fit testing, firefighters shall wear an enclosure about the head and shoulders that is approximately 12 inches (30.5 cm) in diameter by 14 inches (35.6 cm) tall. The front portion of the enclosure shall be clear from the respirator and allow free movement of the head when a respirator is worn. An enclosure substantially similar to the 3M hood assembly, parts # FT 14 and # FT 15 combined, is adequate.
2. The test enclosure shall have a 3/4 inch (1.9 cm) hole in front of the firefighter's nose and mouth area to accommodate the nebulizer nozzle.
3. The firefighter shall don the test enclosure. Throughout the threshold screening test, the firefighter shall breathe through his or her slightly open mouth with tongue extended. The firefighter is instructed to report when he/she detects a bitter taste
4. Using a DeVilbiss Model 40 Inhalation Medication Nebulizer or equivalent, the test conductor shall spray the Threshold Check Solution into the enclosure. This Nebulizer shall be clearly marked to distinguish it from the fit test solution nebulizer.

5. The Threshold Check Solution is prepared by adding 13.5 milligrams of Bitrex to 100 ml of 5% salt (NaCl) solution in distilled water.
6. To produce the aerosol, the nebulizer bulb is firmly squeezed so that the bulb collapses completely, and is then released and allowed to fully expand.
7. An initial ten squeezes are repeated rapidly and then the firefighter is asked whether the Bitrex can be tasted. If the firefighter reports tasting the bitter taste during the ten squeezes, the screening test is completed. The taste threshold is noted as ten regardless of the number of squeezes actually completed.
8. If the first response is negative, ten more squeezes are repeated rapidly and the firefighter is again asked whether the Bitrex is tasted. If the firefighter reports tasting the bitter taste during the second ten squeezes, the screening test is completed. The taste threshold is noted as twenty regardless of the number of squeezes actually completed.
9. If the second response is negative, ten more squeezes are repeated rapidly and the firefighter is again asked whether the Bitrex is tasted. If the firefighter reports tasting the bitter taste during the third set of ten squeezes, the screening test is completed. The taste threshold is noted as thirty regardless of the number of squeezes actually completed.
10. The test conductor will take note of the number of squeezes required to solicit a taste response.
11. If the Bitrex is not tasted after 30 squeezes (step 10), the firefighter is unable to taste Bitrex and may not perform the Bitrex fit test.
12. If a taste response is elicited, the firefighter shall be asked to take note of the taste for reference in the fit test.
13. Correct use of the nebulizer means that approximately 1 ml of liquid is used at a time in the nebulizer body.
14. The nebulizer shall be thoroughly rinsed in water, shaken to dry, and refilled at least each morning and afternoon or at least every four hours.

b. Bitrex Solution Aerosol Fit Test Procedure.

1. The firefighter may not eat, drink (except plain water), smoke, or chew gum for 15 minutes before the test.
2. The fit test uses the same enclosure as that described in 4. (a) above.
3. The firefighter shall don the enclosure while wearing the respirator selected according to section I. A. of this appendix. The respirator shall be properly adjusted and equipped with any type particulate filter(s).

4. A second DeVilbiss Model 40 Inhalation Medication Nebulizer or equivalent is used to spray the fit test solution into the enclosure. This nebulizer shall be clearly marked to distinguish it from the screening test solution nebulizer.
5. The fit test solution is prepared by adding 337.5 mg of Bitrex to 200 ml of a 5% salt (NaCl) solution in warm water.
6. As before, the firefighter shall breathe through his or her slightly open mouth with tongue extended, and be instructed to report if he/she tastes the bitter taste of Bitrex.
7. The nebulizer is inserted into the hole in the front of the enclosure and an initial concentration of the fit test solution is sprayed into the enclosure using the same number of squeezes (either 10, 20 or 30 squeezes) based on the number of squeezes required to elicit a taste response as noted during the screening test.
8. After generating the aerosol, the firefighter shall be instructed to perform the exercises in section I. A. 14. of this appendix.
9. Every 30 seconds the aerosol concentration shall be replenished using one half the number of squeezes used initially (e.g., 5, 10 or 15).
10. The firefighter shall indicate to the test conductor if at any time during the fit test the taste of Bitrex is detected. If the firefighter does not report tasting the Bitrex, the test is passed.
11. If the taste of Bitrex is detected, the fit is deemed unsatisfactory and the test is failed. A different respirator shall be tried and the entire test procedure is repeated (taste threshold screening and fit testing).

5. Irritant Smoke (Stannic Chloride) Protocol

This qualitative fit test uses a person's response to the irritating chemicals released in the "smoke" produced by a stannic chloride ventilation smoke tube to detect leakage into the respirator.

b. General Requirements and Precautions

1. The respirator to be tested shall be equipped with high efficiency particulate air (HEPA) or P100 series filter(s).
2. Only stannic chloride smoke tubes shall be used for this protocol.
3. No form of test enclosure or hood for the firefighter shall be used.
4. The smoke can be irritating to the eyes, lungs, and nasal passages. The test conductor shall take precautions to minimize the firefighter's exposure to irritant smoke. Sensitivity varies, and certain individuals may respond to a greater degree to irritant smoke. Care shall be taken when performing the sensitivity screening checks that determine whether the firefighter can detect

irritant smoke to use only the minimum amount of smoke necessary to elicit a response from the firefighter.

5. The fit test shall be performed in an area with adequate ventilation to prevent exposure of the person conducting the fit test or the build-up of irritant smoke in the general atmosphere.

b. Sensitivity Screening Check

The person to be tested must demonstrate his or her ability to detect a weak concentration of the irritant smoke.

1. The test operator shall break both ends of a ventilation smoke tube containing stannic chloride, and attach one end of the smoke tube to a low flow air pump set to deliver 200 milliliters per minute, or an aspirator squeeze bulb. The test operator shall cover the other end of the smoke tube with a short piece of tubing to prevent potential injury from the jagged end of the smoke tube.
2. The test operator shall advise the firefighter that the smoke can be irritating to the eyes, lungs, and nasal passages and instruct the firefighter to keep his/her eyes closed while the test is performed.
3. The firefighter shall be allowed to smell a weak concentration of the irritant smoke before the respirator is donned to become familiar with its irritating properties and to determine if he/she can detect the irritating properties of the smoke. The test operator shall carefully direct a small amount of the irritant smoke in the firefighter's direction to determine that he/she can detect it.

c. Irritant Smoke Fit Test Procedure

1. The person being fit tested shall don the respirator without assistance, and perform the required user seal check(s).
2. The firefighter shall be instructed to keep his/her eyes closed.
3. The test operator shall direct the stream of irritant smoke from the smoke tube toward the face seal area of the firefighter, using the low flow pump or the squeeze bulb. The test operator shall begin at least 12 inches from the facepiece and move the smoke stream around the whole perimeter of the mask. The operator shall gradually make two more passes around the perimeter of the mask, moving to within six inches of the respirator.
4. If the person being tested has not had an involuntary response and/or detected the irritant smoke, proceed with the test exercises.
5. The exercises identified in section I.A. 14. of this appendix shall be performed by the firefighter while the respirator seal is being continually challenged by the smoke, directed around the perimeter of the respirator at a distance of six inches.

6. If the person being fit tested reports detecting the irritant smoke at any time, the test is failed. The person being retested must repeat the entire sensitivity check and fit test procedure.
7. Each firefighter passing the irritant smoke test without evidence of a response (involuntary cough, irritation) shall be given a second sensitivity screening check, with the smoke from the same smoke tube used during the fit test, once the respirator has been removed, to determine whether he/she still reacts to the smoke. Failure to evoke a response shall void the fit test.
8. If a response is produced during this second sensitivity check, then the fit test is passed.

C. Quantitative Fit Test (QNFT) Protocols

The following quantitative fit testing procedures have been demonstrated to be acceptable: Quantitative fit testing using a non-hazardous test aerosol (such as corn oil, polyethylene glycol 400 [PEG 400], di-2-ethyl hexyl sebacate [DEHS], or sodium chloride) generated in a test chamber, and employing instrumentation to quantify the fit of the respirator; Quantitative fit testing using ambient aerosol as the test agent and appropriate instrumentation (condensation nuclei counter) to quantify the respirator fit; Quantitative fit testing using controlled negative pressure and appropriate instrumentation to measure the volumetric leak rate of a facepiece to quantify the respirator fit.

1. General

   a. The RPPA shall ensure that persons administering QNFT are able to calibrate equipment and perform tests properly, recognize invalid tests, calculate fit factors properly and ensure that test equipment is in proper working order.
   b. The RPPA shall ensure that QNFT equipment is kept clean, and is maintained and calibrated according to the manufacturer's instructions so as to operate at the parameters for which it was designed.

2. Generated Aerosol Quantitative Fit Testing Protocol

   a. Apparatus.

      1. Instrumentation. Aerosol generation, dilution, and measurement systems using particulates (corn oil, polyethylene glycol 400 [PEG 400], di-2-ethyl hexyl sebacate [DEHS] or sodium chloride) as test aerosols shall be used for quantitative fit testing.
      2. Test chamber. The test chamber shall be large enough to permit all firefighters to perform freely all required exercises without disturbing the test agent concentration or the measurement

apparatus. The test chamber shall be equipped and constructed so that the test agent is effectively isolated from the ambient air, yet uniform in concentration throughout the chamber.

3. When testing air-purifying respirators, the normal filter or cartridge element shall be replaced with a high efficiency particulate air (HEPA) or P100 series filter supplied by the same manufacturer.
4. The sampling instrument shall be selected so that a computer record or strip chart record may be made of the test showing the rise and fall of the test agent concentration with each inspiration and expiration at fit factors of at least 2,000. Integrators or computers that integrate the amount of test agent penetration leakage into the respirator for each exercise may be used provided a record of the readings is made.
5. The combination of substitute air-purifying elements, test agent and test agent concentration shall be such that the firefighter is not exposed in excess of an established exposure limit for the test agent at any time during the testing process, based upon the length of the exposure and the exposure limit duration.
6. The sampling port on the test specimen respirator shall be placed and constructed so that no leakage occurs around the port (e.g., where the respirator is probed), a free air flow is allowed into the sampling line at all times, and there is no interference with the fit or performance of the respirator. The in-mask sampling device (probe) shall be designed and used so that the air sample is drawn from the breathing zone of the firefighter, midway between the nose and mouth and with the probe extending into the facepiece cavity at least 1/4 inch.
7. The test setup shall permit the person administering the test to observe the firefighter inside the chamber during the test.
8. The equipment generating the test atmosphere shall maintain the concentration of test agent constant to within a 10 percent variation for the duration of the test.
9. The time lag (interval between an event and the recording of the event on the strip chart or computer or integrator) shall be kept to a minimum. There shall be a clear association between the occurrence of an event and its being recorded.
10. The sampling line tubing for the test chamber atmosphere and for the respirator sampling port shall be of equal diameter and of the same material. The length of the two lines shall be equal.
11. The exhaust flow from the test chamber shall pass through an appropriate filter (i.e., high efficiency particulate filter) before release.
12. When sodium chloride aerosol is used, the relative humidity inside the test chamber shall not exceed 50 percent.
13. The limitations of instrument detection shall be taken into account when determining the fit factor.

14. Test respirators shall be maintained in proper working order and be inspected regularly for deficiencies such as cracks or missing valves and gaskets.

b. Procedural Requirements.

1. When performing the initial user seal check using a positive or negative pressure check, the sampling line shall be crimped closed in order to avoid air pressure leakage during either of these pressure checks.
2. The use of an abbreviated screening QLFT test is optional. Such a test may be utilized in order to quickly identify poor fitting respirators that passed the positive and/or negative pressure test and reduce the amount of QNFT time. The use of the CNC QNFT instrument in the count mode is another optional method to obtain a quick estimate of fit and eliminate poor fitting respirators before going on to perform a full QNFT.
3. A reasonably stable test agent concentration shall be measured in the test chamber prior to testing. For canopy or shower curtain types of test units, the determination of the test agent's stability may be established after the firefighter has entered the test environment.
4. Immediately after the firefighter enters the test chamber, the test agent concentration inside the respirator shall be measured to ensure that the peak penetration does not exceed 5 percent for a half mask or 1 percent for a full facepiece respirator.
5. A stable test agent concentration shall be obtained prior to the actual start of testing.
6. Respirator restraining straps shall not be over-tightened for testing. The straps shall be adjusted by the wearer without assistance from other persons to give a reasonably comfortable fit typical of normal use. The respirator shall not be adjusted once the fit test exercises begin.
7. The test shall be terminated whenever any single peak penetration exceeds 5 percent for half masks and 1 percent for full facepiece respirators. The firefighter shall be refitted and retested.
8. Calculation of fit factors.
   i. The fit factor shall be determined for the quantitative fit test by taking the ratio of the average chamber concentration to the concentration measured inside the respirator for each test exercise except the grimace exercise.
   ii. The average test chamber concentration shall be calculated as the arithmetic average of the concentration measured before and after each test (i.e., 7 exercises) or the arithmetic average of the concentration measured before and after

each exercise or the true average measured continuously during the respirator sample.

iii. The concentration of the challenge agent inside the respirator shall be determined by one of the following methods:

A. Average peak penetration method means the method of determining test agent penetration into the respirator utilizing a strip chart recorder, integrator, or computer. The agent penetration is determined by an average of the peak heights on the graph or by computer integration, for each exercise except the grimace exercise. Integrators or computers that calculate the actual test agent penetration into the respirator for each exercise will also be considered to meet the requirements of the average peak penetration method.

B. Maximum peak penetration method means the method of determining test agent penetration in the respirator as determined by strip chart recordings of the test. The highest peak penetration for a given exercise is taken to be representative of average penetration into the respirator for that exercise.

C. Integration by calculation of the area under the individual peak for each exercise except the grimace exercise. This includes computerized integration.

D. The calculation of the overall fit factor using individual exercise fit factors involves first converting the exercise fit factors to penetration values, determining the average, and then converting that result back to a fit factor. This procedure is described in the following equation:

$$\text{Fit Factor} = \frac{\text{Number of exercises}}{1/ff1+1/ff2+1/ff3+1/ff4+1/ff5+1/ff6+1/ff7+1/ff8}$$

Where ff_1, ff_2, ff_3, etc. are the fit factors for exercises 1, 2, 3, etc.

9. The firefighter shall not be permitted to wear a half mask or quarter facepiece respirator unless a minimum fit factor of 100 is obtained, or a full facepiece respirator unless a minimum fit factor of 500 is obtained.

10. Filters used for quantitative fit testing shall be replaced whenever increased breathing resistance is encountered, or when the test agent has altered the integrity of the filter media.

3. Ambient Aerosol Condensation Nuclei Counter (CNC) Quantitative Fit Testing Protocol

The ambient aerosol condensation nuclei counter (CNC) quantitative fit testing (Portacount ™) protocol quantitatively fit tests respirators with the use of a probe. The probed respirator is only used for quantitative fit tests. A probed respirator has a special sampling device installed on the respirator that allows the probe to sample the air from inside the mask. A probed respirator is required for each make, style, model, and size that the RPPA uses and can be obtained from the respirator manufacturer or distributor. The CNC instrument manufacturer, TSI Inc., also provides probe attachments (TSI sampling adapters) that permit fit testing in a firefighter's own respirator. A minimum fit factor pass level of at least 100 is necessary for a half-mask respirator and a minimum fit factor pass level of at least 500 is required for a full facepiece negative pressure respirator. The entire screening and testing procedure shall be explained to the firefighter prior to the conduct of the screening test.

a. Portacount Fit Test Requirements.

1. Check the respirator to make sure the sampling probe and line are properly attached to the facepiece and that the respirator is fitted with a particulate filter capable of preventing significant penetration by the ambient particles used for the fit test (e.g., NIOSH 42 CFR 84 series 100, series 99, or series 95 particulate filter) per manufacturer's instruction.
2. Instruct the person to be tested to don the respirator for five minutes before the fit test starts. This purges the ambient particles trapped inside the respirator and permits the wearer to make certain the respirator is comfortable. This individual shall already have been trained on how to wear the respirator properly.
3. Check the following conditions for the adequacy of the respirator fit: Chin properly placed; Adequate strap tension, not overly tightened; Fit across nose bridge; Respirator of proper size to span distance from nose to chin; Tendency of the respirator to slip; Self-observation in a mirror to evaluate fit and respirator position.
4. Have the person wearing the respirator do a user seal check. If leakage is detected, determine the cause. If leakage is from a poorly fitting facepiece, try another size of the same model respirator, or another model of respirator.
5. Follow the manufacturer's instructions for operating the Portacount and proceed with the test.
6. The firefighter shall be instructed to perform the exercises in section I. A. 14. of this appendix.
7. After the test exercises, the firefighter shall be questioned by the test conductor regarding the comfort of the respirator upon

completion of the protocol. If it has become unacceptable, another model of respirator shall be tried.

b. Portacount Test Instrument.

1. The Portacount will automatically stop and calculate the overall fit factor for the entire set of exercises. The overall fit factor is what counts. The Pass or Fail message will indicate whether or not the test was successful. If the test was a Pass, the fit test is over.
2. Since the pass or fail criterion of the Portacount is user programmable, the test operator shall ensure that the pass or fail criterion meet the requirements for minimum respirator performance in this Appendix.
3. A record of the test needs to be kept on file, assuming the fit test was successful. The record must contain the firefighter's name; overall fit factor; make, model, style, and size of respirator used; and date tested.

4. Controlled negative pressure (CNP) quantitative fit testing protocol.

The CNP protocol provides an alternative to aerosol fit test methods. The CNP fit test method technology is based on exhausting air from a temporarily sealed respirator facepiece to generate and then maintain a constant negative pressure inside the facepiece. The rate of air exhaust is controlled so that a constant negative pressure is maintained in the respirator during the fit test. The level of pressure is selected to replicate the mean inspiratory pressure that causes leakage into the respirator under normal use conditions. With pressure held constant, air flow out of the respirator is equal to air flow into the respirator. Therefore, measurement of the exhaust stream that is required to hold the pressure in the temporarily sealed respirator constant yields a direct measure of leakage air flow into the respirator. The CNP fit test method measures leak rates through the facepiece as a method for determining the facepiece fit for negative pressure respirators. The CNP instrument manufacturer Dynatech Nevada also provides attachments (sampling manifolds) that replace the filter cartridges to permit fit testing in a firefighter's own respirator. To perform the test, the firefighter closes his or her mouth and holds his/her breath, after which an air pump removes air from the respirator facepiece at a pre-selected constant pressure. The facepiece fit is expressed as the leak rate through the facepiece, expressed as milliliters per minute. The quality and validity of the CNP fit tests are determined by the degree to which the in-mask pressure tracks the test pressure during the system measurement time of approximately five seconds. Instantaneous feedback in the form of a real-time pressure trace of the in-mask pressure is provided and used to determine test validity and quality. A minimum fit factor pass level of 100 is necessary for a half-mask respirator and a minimum fit factor of at least 500 is required for a full facepiece respirator. The entire

screening and testing procedure shall be explained to the firefighter prior to the conduct of the screening test.

a. CNP Fit Test Requirements.

1. The instrument shall have a non-adjustable test pressure of 15.0 mm water pressure.
2. The CNP system defaults selected for test pressure shall be set at -- 15 mm of water (-0.58 inches of water) and the modeled inspiratory flow rate shall be 53.8 liters per minute for performing fit tests. (**Note:** CNP systems have built-in capability to conduct fit testing that is specific to unique work rate, mask, and gender situations that might apply in a specific workplace. Use of system default values, which were selected to represent respirator wear with medium cartridge resistance at a low-moderate work rate, will allow inter-test comparison of the respirator fit.)
3. The individual who conducts the CNP fit testing shall be thoroughly trained to perform the test.
4. The respirator filter or cartridge needs to be replaced with the CNP test manifold. The inhalation valve downstream from the manifold either needs to be temporarily removed or propped open.
5. The firefighter shall be trained to hold his or her breath for at least 20 seconds.
6. The firefighter shall don the test respirator without any assistance from the individual who conducts the CNP fit test.
7. The QNFT protocol shall be followed according to section I.

   C. 1. of this appendix with an exception for the CNP test exercises.

b. CNP Test Exercises.

1. Normal breathing. In a normal standing position, without talking, the firefighter shall breathe normally for 1 minute. After the normal breathing exercise, the firefighter needs to hold head straight ahead and hold his or her breath for 10 seconds during the test measurement.
2. Deep breathing. In a normal standing position, the firefighter shall breathe slowly and deeply for 1 minute, being careful not to hyperventilate. After the deep breathing exercise, the firefighter shall hold his or her head straight ahead and hold his or her breath for 10 seconds during test measurement.
3. Turning head side to side. Standing in place, the firefighter shall slowly turn his or her head from side to side between the extreme positions on each side for 1 minute. The head shall be held at each extreme momentarily so the firefighter can inhale at each side. After the turning head side to side exercise, the firefighter needs to hold

head full left and hold his or her breath for 10 seconds during test measurement. Next, the firefighter needs to hold head full right and hold his or her breath for 10 seconds during test measurement.

4. Moving head up and down. Standing in place, the firefighter shall slowly move his or her head up and down for 1 minute. The firefighter shall be instructed to inhale in the up position (i.e., when looking toward the ceiling). After the moving head up and down exercise, the firefighter shall hold his or her head full up and hold his or her breath for 10 seconds during test measurement. Next, the firefighter shall hold his or her head full down and hold his or her breath for 10 seconds during test measurement.
5. Talking. The firefighter shall talk out loud slowly and loud enough so as to be heard clearly by the test conductor. The firefighter can read from a prepared text such as the Rainbow Passage, count backward from 100, or recite a memorized poem or song for 1 minute. After the talking exercise, the firefighter shall hold his or her head straight ahead and hold his or her breath for 10 seconds during the test measurement.
6. Grimace. The firefighter shall grimace by smiling or frowning for 15 seconds.
7. Bending Over. The firefighter shall bend at the waist as if he or she were to touch his or her toes for 1 minute. Jogging in place shall be substituted for this exercise in those test environments such as shroud-type QNFT units that prohibit bending at the waist. After the bending over exercise, the firefighter shall hold his or her head straight ahead and hold his or her breath for 10 seconds during the test measurement.
8. Normal Breathing. The firefighter shall remove and re-don the respirator within a one-minute period. Then, in a normal standing position, without talking, the firefighter shall breathe normally for 1 minute. After the normal breathing exercise, the firefighter shall hold his or her head straight ahead and hold his or her breath for 10 seconds during the test measurement. After the test exercises, the firefighter shall be questioned by the test conductor regarding the comfort of the respirator upon completion of the protocol. If it has become unacceptable, another model of a respirator shall be tried.

c. CNP Test Instrument.

1. The test instrument shall have an effective audio warning device when the firefighter fails to hold his or her breath during the test. The test shall be terminated whenever the firefighter failed to hold his or her breath. The firefighter may be refitted and retested.
2. A record of the test shall be kept on file, assuming the fit test was successful. The record must contain the firefighter's name; overall

fit factor; make, model, style and size of respirator used; and date tested.

Record of Fit Test

Firefighter Name: _____

Fit Test	Type of Fit Test	Results of Fit Test	Respirator Fit Tested
Date: _____ Reason: _____ _____		Pass _____ yes _____ no Fit Factor: _____ Conducted by: _____	Manufacturer: _____ Model: _____ Serial Number: _____ Size: _____
Date: _____ Reason: _____ _____		Pass _____ yes _____ no Fit Factor: _____ Conducted by: _____	Manufacturer: _____ Model: _____ Serial Number: _____ Size: _____
Date: _____ Reason: _____ _____		Pass _____ yes _____ no Fit Factor: _____ Conducted by: _____	Manufacturer: _____ Model: _____ Serial Number: _____ Size: _____
Date: _____ Reason: _____ _____		Pass _____ yes _____ no Fit Factor: _____ Conducted by: _____	Manufacturer: _____ Model: _____ Serial Number: _____ Size: _____
Date: _____ Reason: _____ _____		Pass _____ yes _____ no Fit Factor: _____ Conducted by: _____	Manufacturer: _____ Model: _____ Serial Number: _____ Size: _____
Date: _____ Reason: _____ _____		Pass _____ yes _____ no Fit Factor: _____ Conducted by: _____	Manufacturer: _____ Model: _____ Serial Number: _____ Size: _____
Date: _____ Reason: _____ _____		Pass _____ yes _____ no Fit Factor: _____ Conducted by: _____	Manufacturer: _____ Model: _____ Serial Number: _____ Size: _____

Section 4: Procedures for Proper Use of Respirators in Routine and Reasonably Foreseeable Emergency Situations

The selection of a specific respirator must be made by individuals knowledgeable about the limitations associated with each class of respirators and familiar with the actual workplace environment, including the job task(s) to be performed.

The correct use of a respirator is just as important as the selection process if adequate firefighter protection is to be achieved. Without a complete respiratory protection program, firefighters will not receive the degree of protection anticipated from a respirator, even if it is a correct choice for the situation.

The RPPA shall establish and implement procedures for the proper use of respirators that include prohibiting conditions that may result in facepiece seal leakage, preventing firefighters from removing respirators in hazardous environments, taking actions to ensure continued effective respirator operation throughout the work shift and establishing procedures for the user of respirators in IDLH atmospheres or in interior structural firefighting situations (29 CFR 1910.134(g)).

User Seal Check

A user seal check must be conducted by each firefighter before each use of the respirator (29 CFR 1910.134(g)(1), 29 CFR 1910.134 Appendix B-1). Seal Check Procedures follow below.

The firefighter who uses a tight-fitting respirator is to perform a user seal check to ensure that an adequate seal is achieved each time the respirator is put on. Either the positive and negative pressure checks listed below (Mandatory Appendix B-1 of 29 CFR 1910.134), or the respirator manufacturer's recommended user seal check method shall be used. User seal checks are not substitutes for qualitative or quantitative fit tests.

The firefighter conducts the following

- Positive Pressure Check: Close off the exhalation valve and exhale gently into the facepiece. The face fit is considered satisfactory if a slight positive pressure can be built up inside the facepiece without any evidence of outward leakage of air at the seal. For most respirators this method of leak testing requires the firefighter to first remove the exhalation valve cover before closing off the exhalation valve and then carefully replacing it after the test.
- Negative Pressure Check: Close off the inlet opening of the canister or cartridge(s) by covering with the palm of the hand(s) or by placing the filter seal(s), inhale gently so that the facepiece collapses slightly, and hold the breath for ten (10) seconds. The design of the inlet opening of some cartridges cannot be effectively covered with the palm of the hand. The test

can be performed by covering the inlet opening of the cartridge with a thin latex or nitrile glove. If the facepiece remains in its slightly collapsed condition and no inward leakage of air is detected, the tightness of the respirator is considered satisfactory.

The respirator manufacturer's recommended procedures for performing a user seal check may be used instead of the positive and negative pressure check procedures listed above provided that the RPPA demonstrates that the manufacturer's procedures are equally effective.

Adequate Warning Properties

No physiological effects in humans (e.g., odor, taste, eye irritation, respiratory irritation) have been demonstrated as being capable of consistently providing respirator wearers with timely, consistent, persistent, and reliable warning of hazardous airborne concentrations inside a respirator. Firefighters may be unable to detect the warning effect when necessary and may fail to take action necessary to protect themselves (e.g., leaving the area where respirators are necessary or changing the sorbent cartridge, canister, and/or filters).

Service Life Information

A cartridge's useful service life is how long it provides adequate protection from harmful chemicals in the air. The service life of a cartridge depends upon many factors, including:

- environmental conditions to include relative humidity through each sorbent element,
- breathing rate,
- cartridge filtering capacity,
- the make and model of sorbent material , and
- the amount of contaminants in the air.

Respirators with air-purifying sorbent elements shall be used with caution and with recognition of the wide variability of service lives under differing use conditions.

Tools used in the assessment of canister, cartridge, and filter use includes such information as the RPPA's exposure assessment and information based on manufacturer's and/or NIOSH breakthrough test data, mathematically based estimates, and/or reliable use recommendations from the RPPA's respirator and/or chemical suppliers.

Reliance on odor thresholds and other warning properties will not be permitted as the primary basis for determining the service life of gas and vapor cartridges and canisters.

OSHA emphasizes that a conservative approach is recommended when evaluating service life testing data. Temperature, humidity, air flow through the filter, the work rate, and the presence of other potential interfering chemicals in the workplace all can have a serious effect on the service life of an air-purifying cartridge or canister.

Canisters, cartridges, and filters shall be changed when

- the canister, cartridge, and/or filter has been used in a hazardous environment (refer to manufacturer's recommendations for length of service in specific hazardous environments), or
- the canister, cartridge, and/or filter becomes wet, or
- the user notices increased resistance, or
- the user detects an odor or taste while using the canister or cartridge, or
- the cartridge, canister, and/or filter reaches the manufacturer's expiration date on the canister, cartridge, and/or filter.

In the absence of any of the aforementioned factors, canisters, cartridges, and/or filter shall be discarded and destroyed no later than five (5) years after date of purchase of the canister, cartridge, or filter if unopened.

Chemical Contaminant Migration: The RPPA and firefighter should be aware that some contaminants have a tendency to migrate through cartridge/canister sorbent material during periods of storage or non-use. This is characteristic of the contaminant-carbon bed interaction for organic chemicals with boiling points below 65^0 centigrade and would predictably shorten breakthrough times. In cases where respirators are used for multiple days this could present an additional exposure to the respirator user. Where contaminant migration is possible, respirator cartridges/canisters should be changed after every workshift where exposure occurs unless the RPPA has specific objective data to the contrary (desorption studies) showing the performance of the cartridge in the conditions and schedule of use/non-use found in the workplace (Source: OSHA Instruction, Inspection Procedures for the Respiratory Protection Standard, September 28, 1995).

The Gerry O. Wood Mathematical Model and the Yoon Nelson Mathematical Model may also be used. These mathematical models may be referenced on the OSHA web site in the etools section (http://www.osha.gov).

Classes of respirators offering greater protection can usually be used in place of the minimum acceptable class of respirators. Respirator classes are consistent with respirator certification groupings as specified in 30 CFR Part 11.

Respirator Use Limitations

Recommendations in decision logic for respirator selection are based primarily on the physical, chemical, and toxicological properties of the contaminant and on the

limitations of each class of respirators, including filtration efficiency, air supply capability, and face seal characteristics and leakage. Section 1: Procedures for Selecting Respirators for Use in the Workplace includes an assessment tool, NIOSH Decision Logic for Respirator Selection, that is useful in respirator selection.

Negative pressure respirators shall not be used when facial scars or deformities interfere with the face seal. No respirator (including positive pressure respirators) shall be used when facial hair interferes with the face seal (29 CFR 1910.134(g)(1)).

Respirators shall be properly maintained, correctly used, and conscientiously worn. The usage limitations of air-purifying elements, particularly gas and vapor cartridges, shall not be exceeded. The respirator must be approved by the National Institute for Occupational Safety and Health (NIOSH).

Firefighters are to leave the contaminated area immediately upon suspicion of respirator failure and then determine the problem (29 CFR 1910.134(g)(2)).

Firefighters are not exposed to a single unvarying concentration of a hazardous substance; rather individual exposures may vary throughout a work shift and between days. The highest anticipated concentration shall therefore be used to compute the required protection factor for each respirator user. Respirator wearers shall be aware of the variability in human responses to the warning properties of hazardous substances.

Facial Hair

Facial hair that lies along the sealing area of the respirator, such as beards, sideburns, moustaches, or even a few days growth of stubble may interfere with the respirator seal of tight-fitting respirators. These conditions shall not be allowed when using tight-fitting respirators. Facial hair between the wearer's skin and the sealing surfaces of the respirator will prevent an adequate seal. A respirator that permits negative air pressure inside the facepiece during inhalation may allow leakage and, in the case or positive pressure devices, will either reduce service time or waste breathing air. A firefighter shall not enter a contaminated work area when conditions prevent an adequate seal of the respirator facepiece to the face (29 CFR 1910.134(g)(1)).

Facial Deformities

Facial deformities, such as scars, deep skin creases, prominent cheekbones, severe acne, and the lack of teeth or dentures, can prevent a respirator from sealing properly (29 CFR 1910.134(g)(1)).

Eye Glasses

Ordinary eye glasses shall not be used with full-facepiece respirators. Eye glasses with temple bars or straps that pass between the sealing surface of the full-facepiece and the worker's face will prevent an adequate seal, and shall not be used. Special corrective lenses can be mounted inside full-facepiece respirators and are available for full-facepiece respirators. To ensure good vision, comfort, and proper sealing of the facepiece, these corrective lenses shall be mounted by an individual designated by the manufacturer as qualified to install accessory items 929 CFR 1910.134(g)(1)).

Eye glasses and goggles may interfere with the half facepieces. When interference occurs, a full-facepiece with special corrective lenses shall be provided and worn.

Contact Lenses

Several factors may restrict or even prohibit the use of contact lenses while wearing any type of respiratory device. This is especially true of atmosphere-supplying respirators. With full-facepieces, incoming air directed toward the eye can cause discomfort from dirt, lint, or other debris lodging between the contact lens and the pupil.

Communications

Talking while wearing a respirator equipped with a facepiece may break the seal of the facepiece. When communication is necessary within a contaminated area, it should be done with the help of special communicating equipment, if available, from the manufacturer of the respirator and designed for use with the respirator.

In Dangerous Atmospheres

At least one standby firefighter, equipped with proper rescue equipment including an SCBA shall be preset in the nearest safe area for emergency rescue of those wearing respirators in an IDLH atmosphere. The "2-in, 2-out buddy system" is recommended. Communications (visual, voice, signal line, telephone, radio, or other suitable type) shall be maintained among all firefighters present (those in the IDLH atmosphere and the standby firefighter(s)).

Confined spaces are enclosures that are difficult to get out of, such as storage tanks, tank cars, boilers, sewers, tunnels, pipelines, pits, and tubs. Some enclosed buildings may be considered as confined spaces when IDLH atmospheres occur due to intentional or accidental introduction of hazardous environments. OSHA defines confined space in 29 CFR 1910.146(b): (1) is large enough and so configured that a firefighter can bodily enter and perform assigned work; and (2) have limited or restricted means for entry or exit...; and (3) is not designed for continuous firefighter occupancy.

The atmospheres in a confined space may be immediately dangerous to life or health because of toxic air contaminants or lack of oxygen. Before anyone enters a confined

space, tests shall be made to determine the presence and concentration of any flammable vapor or gas, or any toxic airborne particulate, vapor, or gas, and to determine the oxygen concentration.

No one shall enter if a flammable substance exceeds the lower exposure limit (LEL). No one shall enter without wearing the proper type of respirator if any air contaminant exceeds the established permissible exposure limit (PEL) or if there is an oxygen deficiency.

If the atmosphere in a confined space is immediately dangerous to life or health owing to a high concentration of air contaminant or oxygen deficiency, firefighters who must enter the space shall wear a pressure-demand SCBA or a combination pressure-demand airline and self-contained breathing apparatus that always maintains positive air pressure inside the respiratory inlet covering.

In Low and High Temperatures

Low temperatures may fog respirator lenses. Coating the inner surface of the lens with an anti-fogging compound normally available from the manufacturer should prevent fogging down to 32°F, but severe fogging may occur below 0°F. Full facepieces with nose cups that direct the warm, moist exhaled air through the exhalation valve without its touching the nose are available. They should provide satisfactory vision at as low as -30°F.

At very low temperatures, exhalation valves may freeze due to moisture. Dry respirable air should be used with airline respirators and with the type of SCBA that has an air cylinder when they are used in low temperatures.

The minimum temperature which an SCBA should be used, and has been tested and approved is listed on the approval label.

A firefighter working in high temperature air is under physiological stress. Wearing a respirator causes additional stress which should be minimized by using a light-weight respirator with low breathing resistance.

Fighters must be aware of the signs and symptoms of heat stress including heat cramps, heat exhaustion, and heat stroke. Heat stroke is a true medical emergency and should not be ignored.

Physiological Response to Respirator Use

Wearing any respirator, alone or in conjunction with other types of protective equipment, will impose some physiological stress on the firefighter. Weight of the equipment, for example, increases the energy requirement for a given task.

Use of respirators in conjunction with protective clothing can greatly affect the human response and endurance, especially in hot environments. Normally, in hot environments or during heavy work, the body relies a great deal on heat loss through the evaporation of sweat. With impermeable clothing, the heat loss by water evaporation is not possible.

To reduce the incidence of heat stress, reduce work rate by:

- Adjusting the work/rest schedules,
- Using automated procedures and/or mechanical assistance where possible, and
- Minimize the work intensity.

Include periodic fluid/water replacement breaks and consider cooling garments.

Orientation/Training Tool: Procedures for Proper Use of Respirators in Routine and Reasonably Foreseeable Emergency Situations

Firefighter Name: _____ Date: _____

☐ The correct use of a respirator is just as important as the selection process if adequate worker protection is to be achieved. Putting a respirator on is known as "donning". Removing a respirator is known as "doffing".

☐ Procedures for donning (putting on) the respirator include:

- Loosen the harness head straps on the facepiece so the end-tabs are approximately 1 inch from the buckle.
- Hold the facepiece by the straps and put your chin in first.
- Then, pull the harness back over your head.
- Tighten the straps using the ABC method: "a"bove straps, "b"elow the chin straps, "c"enter straps. Tighten the straps using short, jerky motions.
- Conduct a user seal check. If an airtight seal is not achieved, adjust the straps and perform the user seal check again. Continue this process until an airtight seal is achieved.

☐ Procedures for doffing (removing) the respirator include:

- Return to an uncontaminated area before removing the respirator. Perform self decontamination or proceed through an established decontamination line.
- To remove the facepiece, loosen the bottom chin straps of the respirator.
- Grasp the facepiece by the speaking diaphragm (voice-mitter) and pull it up and away from your face.

☐ The firefighter is competent in the user seal check process; this user seal check process must be conducted by each user before each use of the respirator. User Seal Check Procedures (Mandatory) are included in Tab 4.

☐ The firefighter is aware of the following: Adequate Warning Properties

No physiological effects in humans (e.g., odor, taste, eye irritation, respiratory irritation) have been demonstrated as being capable of consistently providing respirator wearers with timely, consistent, persistent, and reliable warning of hazardous airborne concentrations inside a respirator. Individual wearers may be unable to detect the warning effect when necessary and may fail to take

action necessary to protect themselves (e.g., leaving the area where respirators are necessary or changing the sorbent cartridge, canister, or filter).

- ❒ The firefighter is aware of the following: Service Life Information

  Respirators with air-purifying sorbent elements shall be used with caution and with recognition of the wide variability of service lives under differing use conditions.

  A cartridge's useful service life is how long it provides adequate protection from harmful chemicals in the air. The service life of a cartridge depends upon many factors, including:

  - environmental conditions to include relative humidity through each sorbent element,
  - breathing rate,
  - cartridge filtering capacity,
  - the make and model of sorbent material , and
  - the amount of contaminants in the air.

  Classes of respirators offering greater protection can usually be used in place of the minimum acceptable class of respirators. Respirator classes are consistent with respirator certification groupings as specified in 30 CFR 11.

  Recommendations in the decision logic are based primarily on the physical, chemical, and toxicological properties of the contaminant and on the limitations of each class of respirators, including filtration efficiency, air supply capability, and face seal characteristics and leakage.

- ❒ Non-powered air purifying particulate respirators (APR) are classified into three series: N-, R-, and P-series and are classified according to the efficiency level of the filter(s) as tested according to the requirements of 42 CFR 84.170.

  - The N-series filters are restricted to use in those workplaces free of oil aerosols.
  - The R- and P-series filters are intended for removal of any particulate that includes oil-based liquid particulates.
  - N100, R100, and P100 filters demonstrate a minimum efficiency level of 99.97%;
  - N99, R99, and P99 filters demonstrate a minimum efficiency level of 99%;
  - N95, R95, and P95 filters demonstrate a minimum efficiency level of 95%.

- ❒ All filters, cartridges, canisters, and/or filters used in the workplace are labeled and color coded with the NIOSH approval label and that label is not to be removed and must remain legible.

- ❒ Canisters, cartridges, and/or filters shall be changed when

  - the canister, cartridge, and/or filter is exposed to a hazardous environment;
  - the canister, cartridge, and/or filter becomes wet, or
  - the user notices increased resistance, or
  - the user detects an odor or taste while using the canister, cartridge, and/or filters, or
  - the cartridge, canister, and/or filter reaches the manufacturer's expiration date on the canister, cartridge, and/or filter.

  In the absence of any of the aforementioned factors, canisters, cartridges, and/or filters shall be discarded and destroyed no later than five (5) years after the RPPA's purchase of the canister, cartridge, and/or filter.

- ❒ Negative pressure respirators shall not be used when facial scars or deformities interfere with the face seal.

  Facial deformities, such as scars, deep skin creases, prominent cheekbones, severe acne, and the lack of teeth or dentures, can prevent a respirator from sealing properly.

No respirator (including positive pressure respirators) shall be used when facial hair interferes with the face seal.

Facial hair that lies along the sealing area of the respirator, such as beards, sideburns, moustaches, or even a few days growth of stubble may interfere with the respirator seal of tight-fitting respirators. These conditions shall be avoided when using tight-fitting respirators. Facial hair between the wearer's skin and the sealing surfaces of the respirator will prevent an adequate seal. A respirator that permits negative air pressure inside the facepiece during inhalation may allow leakage and, in the case of positive pressure devices, will either reduce service time or waste breathing air. A firefighter shall not enter a contaminated work area when conditions prevent an adequate seal of the respirator facepiece to the face.

- ❒ Ordinary eye glasses shall not be used with full-facepiece respirators.

  Eye glasses with temple bars or straps that pass between the sealing surface of the full-facepiece and the worker's face will prevent an adequate seal, and shall not be used. Special corrective lenses can be mounted inside a full-facepiece respirators and are available from all manufacturers of full-facepiece respirators. To ensure good vision, comfort, and proper sealing of the facepiece, these

corrective lenses shall be mounted by an individual designated by the manufacturer as qualified to install accessory items.

- ❒ Eye glasses and goggles may interfere with the half facepieces. When interference occurs, a full-facepiece with special corrective lenses shall be provided and worn.

- ❒ Several factors may restrict or even prohibit the use of contact lenses while wearing any type of respiratory device. This is especially true of atmosphere-supplying respirators. With full-facepieces, incoming air directed toward the eye can cause discomfort from dirt, lint, or other debris lodging between the contact lens and the pupil.

- ❒ Respirators shall be properly maintained, correctly used, and conscientiously worn.

- ❒ The usage limitations of air-purifying elements, particularly gas and vapor cartridges, shall not be exceeded.

- ❒ Firefighters are to leave the contaminated area immediately upon suspicion of respirator failure and then determine the problem. This includes, but is not limited to, the canister, cartridge, and/or filter becoming wet (a new canister, cartridge, and/or filter is needed), increased resistance, and the user detecting an odor or taste.

- ❒ Firefighters shall be aware of the variability in human responses to the warning properties of hazardous substances.

- ❒ Talking while wearing a respirator equipped with a facepiece may break the seal of the facepiece. When communication is necessary within a contaminated area, it should be done with the help of special communicating equipment obtained from the manufacturer of the respirator, if available.

- ❒ **Atmospheres Immediately Dangerous to Life and Health present special considerations. Where the RPPA and/or firefighter cannot identify or reasonably estimate the firefighter exposure, the RPPA and/or firefighter shall consider the atmosphere to be IDLH.**

  - At least one standby firefighter, equipped with proper rescue equipment including an SCBA shall be preset in the nearest safe area for emergency rescue of those wearing respirators in an IDLH atmosphere. The "2-in, 2-out buddy-system" is to be used where resources are present.
  - Communications (visual, voice, signal line, telephone, radio, or other suitable type) shall be maintained among all firefighters present (those in the IDLH atmosphere and the standby person(s)).

- Confined spaces are enclosures that are difficult to get out of, such as storage tanks, tank cars, boilers, sewers, tunnels, pipelines, pits, and tubs. Some enclosed buildings may be considered as confined spaces when IDLH atmospheres occur due to intentional or accidental introduction of hazardous environments.

  The atmospheres in a confined space may be immediately dangerous to life or health because of toxic air contaminants or lack of oxygen. Before anyone enters a confined space, tests shall be made to determine the presence and concentration of any flammable vapor or gas, or any toxic airborne particulate, vapor, or gas, and to determine the oxygen concentration.

- No firefighter shall enter a confined space if a flammable substance exceeds the lower exposure limit (LEL). No firefighter shall enter a confined space without wearing the proper type of respirator if any air contaminant exceeds the established permissible exposure limit or if there is an oxygen deficiency.

  If the atmosphere in a confined space is immediately dangerous to life or health (IDLH) owing to a high concentration of air contaminant or oxygen deficiency, firefighters who must enter the space shall wear a pressure-demand SCBA or a combination pressure-demand airline and self-contained breathing apparatus that always maintains positive air pressure inside the respiratory inlet covering.

- Low temperatures may fog respirator lenses.

  Coating the inner surface of the lens with the anti-fogging compound normally available from the manufacturer should prevent fogging down to 32°F, but severe fogging may occur below 0°F.

  Full facepieces with nose cups that direct the warm, moist exhaled air through the exhalation valve without its touching the nose are available. They should provide satisfactory vision at as low as -30°F.

  At very low temperatures, exhalation valves may freeze due to moisture. Dry respirable air should be used with airline respirators and with the type of SCBA that has an air cylinder when they are used in low temperatures.

  The minimum temperature that an SCBA should be used and has been tested and approved is listed on the approval label.

- A firefighter working in high temperature air is under physiological stress. Wearing a respirator causes additional stress which should be minimized by using a light-weight respirator with low breathing resistance.

- ☐ Firefighters must be aware of the signs and symptoms of heat stress including heat cramps, heat exhaustion, and heat stroke. Heat stroke is a true medical emergency and should not be ignored.

- ☐ Use of respirators in conjunction with protective clothing can greatly affect the human response and endurance, especially in hot environments.

- ☐ Normally, in hot environments or during heavy work, the body relies a great deal on heat loss through the evaporation of perspiration. With impermeable clothing, the heat loss by water evaporation is not possible.

  To reduce the incidence of heat stress, reduce work rate by:

  - Adjusting the work/rest schedules,
  - Using automated procedures and/or mechanical assistance where possible, and
  - Minimize the work intensity.

  Include periodic fluid/water replacement breaks and consider cooling garments.

- ☐ The respirators shall be cleaned and disinfected at the following intervals:

  - Respirators issued for the exclusive use of an firefighter shall be cleaned and disinfected as often as necessary to be maintained in a sanitary condition;
  - Respirators issued to more than one firefighter shall be cleaned and disinfected before being worn by different individuals;
  - Respirators maintained for emergency use shall be cleaned and disinfected after each use;
  - Respirators used in fit testing and training shall be cleaned and disinfected after each use.

- ☐ Firefighters shall store and inspect respirators in compliance with Section 5: Respirator Inspection and Respirator Storage.

Signature of Firefighter: _____ Date: _____

Signature of RPPA or Trainer: _____ Date: _____

Section 5: Procedures and Schedules for Cleaning, Disinfecting, Storing, Inspecting, Repairing, Discarding, and Otherwise Maintaining Respirators

The RPPA is shall provide for the cleaning and disinfecting, storage, inspection, and repair of respirators used by firefighters (29 CFR 1910.134(h)).

Cleaning and Disinfecting

The RPPA shall provide each respirator user with a respirator that is clean, sanitary, and in good working order (29 CFR 1910.134(h)(i)). The RPPA shall ensure that respirators are cleaned and disinfected using the procedures referred to in Appendix B-2 of 29 CFR 1910.134 and included in this document in Section 5. Procedures recommended by the respirator manufacturer, provided that such procedures are of equivalent effectiveness may be substituted.

The respirators shall be cleaned and disinfected at the following intervals:

- Respirators issued for the exclusive use of a firefighter shall be cleaned and disinfected as often as necessary to be maintained in a sanitary condition;
- Respirators issued to more than one firefighter shall be cleaned and disinfected before being worn by different individuals;
- Respirators maintained for emergency use shall be cleaned and disinfected after each use;
- Respirators used in fit testing and training shall be cleaned and disinfected after each use.

The following steps are to be followed, in order:

1. Remove filters, cartridges, or canisters. Disassemble facepieces by removing speaking diaphragms, demand and pressure-demand valve assemblies, hoses, or any components recommended by the manufacturer. Discard or repair any defective parts.

2. Wash components in warm (110°F (43°C) maximum) water with a mild detergent or with a cleaner recommended by the manufacturer. A stiff bristle (not wire) brush may be used to facilitate the removal of dirt.

3. Rinse components thoroughly in clean, warm (110°F (43°C) maximum) preferably running water. Drain.

4. When the cleaner used does not contain a disinfecting agent, respirator components shall be immersed for two minutes in one of the following:

a. Hypochlorite solution (50 ppm of chlorine) made by adding approximately one milliliter of laundry bleach to one liter of water at 110°F (43°C); or

b. Aqueous solution of iodine (50 ppm iodine) made by adding approximately 0.8 millimeters of tincture of iodine (6-8 grams ammonium and/or potassium iodine/100 cc of 45% alcohol) to one liter of water at 110°F (43°C); or

c. Other commercially available cleansers of equivalent disinfectant quality when used as directed, if their use is recommended or approved by the respirator manufacturer.

5. Rinse components thoroughly in clean, warm (110°F (43°C) maximum) preferably running water. Drain. The importance of thorough rinsing cannot be overemphasized. Detergents or disinfectants that dry on facepieces may result in dermatitis. In addition, some disinfectants may cause deterioration or rubber or corrosion of metal parts if not completely removed.

6. Components shall be hand-dried with a clean lint-free cloth or air-dried.

7. Reassemble facepiece, replacing filters, cartridges, and canisters where necessary.

8. Test the respirator to ensure that all components work properly.

Source 29 CFR 1910.134, Appendix B-2.

Storing

The RPPA shall ensure that respirators are stored as follows (29 CFR 1910.134(h)(2)):

- All respirators shall be stored to protect them from damage, contamination, dust, sunlight, extreme temperatures, excessive moisture, and damaging chemicals, and they shall be packed and stored to prevent deformation of the facepiece and exhalation valve;
- Emergency respirators shall be kept accessible to the work area;
- Emergency respirators shall be stored in compartments or in covers that are clearly marked as containing emergency respirators;
- Respirators shall be stored in accordance with any applicable manufacturer's instructions.

Inspecting

The RPPA shall ensure that respirators are inspected as follows (29 CFR 1910.134(h)(3)):

- All respirators used in routine situations shall be inspected before each use and during cleaning;
- All respirators maintained for use in emergency situations shall be inspected at least monthly and in accordance with the manufacturer's recommendations, and shall be checked for proper function before and after each use; and
- Emergency escape-only respirators shall be inspected before being carried into the workplace for use.

The RPPA shall ensure that respirator inspections include:

- A check of respirator function
- A check of tightness of connections
- A check of the condition of the various parts including, but not limited to, the facepiece, head straps, valves, connecting tube, and cartridges, canisters, and/or filters; and
- A check of electrometric parts for pliability and signs of deterioration;
- Self-contained breathing apparatus shall be inspected monthly; air and oxygen cylinders shall be maintained in a fully charged state and shall be recharged when the pressure falls to 90% of the manufacturer's recommended pressure level. The RPPA shall determine that the regulator and warning devices function properly.

For respirators maintained for emergency use, the RPPA shall:

- Certify the respirator by documenting the date the inspection was performed, the name (or signature) of the person who made the inspection, the findings, required remedial attention, and a serial number or other means of identifying the inspected respirator;
- Provide this above bulleted information on a tag or label that is attached to the storage compartment of the respirator, is kept with the respirator, or is included in inspection reports stored as paper or electronic files. This information shall be maintained until replaced following a subsequent certification.

A respirator inspection form is included at the end of this section.

Repairing, Discarding, and Otherwise Maintaining Respirators

The RPPA shall ensure that respirators that fail an inspection or are otherwise found to be defective are removed from service, and are discarded or repaired or adjusted in accordance with the following procedures (29 CFR 1910.134(h)(4)):

- Repairs or adjustments to respirators are to be made only by persons appropriately trained to perform such operations and shall use only the respirator manufacturer's NIOSH-approved parts designed for the respirator;
- Repairs shall be made according to the manufacturer's recommendations and specifications for the type and extent of repairs to be performed; and
- Reducing the admission values, regulators, and alarms shall be adjusted or repaired only by the manufacturer or a technician trained by the manufacturer.

Respirator Inspection Record

Respirators are inspected as follows:

- All respirators used in routine situations shall be inspected before each use and during cleaning;
- All respirators maintained for use in emergency situations shall be inspected at least monthly and in accordance with the manufacturer's recommendations, and shall be checked for proper function before and after each use; and
- Emergency escape-only respirators shall be inspected before being carried into the workplace for use.

The respirator inspections shall include:

- A check of respirator function
- A check of tightness of connections
- A check of the condition of the various parts including, but not limited to, the facepiece, head straps, valves, connecting tube, and cartridges, canisters, or filters; and
- A check of electrometric parts for pliability and signs of deterioration;
- Self-contained breathing apparatus shall be inspected monthly; air and oxygen cylinders shall be maintained in a fully charged state and shall be recharged when the pressure falls to 90% of the manufacturer's recommended pressure level. The RPPA shall determine that the regulator and warning devices function properly.

Type of Respirator: _____

Respirator Number: _____

Respirator Assigned to (individual name or "emergency use"): _____

List Defects Found

A. Facepiece: _____

B: Inhalation Value: _____

C: Exhalation Valve Assembly: _____

D: Headbands: _____

E: Cartridge Holder: _____

F: Cartridge/Canister: _____

G: Filter: _____

H: Harness Assembly: _____

I: Hose Assembly: _____

J: Speaking Diaphragm: _____

K: Gaskets: _____

L: Connections: _____

M: Other Defects: _____

N: No Defects Found: _____

Was this respirator removed from service? ..... Yes No

_____ _____

Signature, Respirator Inspector Date

Section 6: Procedures to Ensure Adequate Air Quality, Quantity, and Flow of Breathing Air for Atmosphere-Supplying Respirators

The RPPA shall provide firefighters using atmosphere-supplying respirators (supplied-air (SAR) and SCBA), with breathing gases of high purity (29 CFR 1910.134(i)).

The RPPA shall ensure that compressed air, compressed oxygen, liquid air, and liquid oxygen used for respiration accords with the following specifications:

- Compressed and liquid oxygen shall meet at least the requirements for Grade D breathing air described in ANSI/Compressed Gas Association Commodity Specification for Air, G-7.1-1989, to include:
  - Oxygen content (v/v) of 19.5-23.5%,
  - Hydrocarbon (condensed) content of 5 milligrams per cubic meter of air or less,
  - Carbon monoxide (CO) content of 10 ppm or less,
  - Carbon dioxide (CO_2) of 1000 ppm or less,
  - Lack of noticeable odor.

The RPPA shall ensure that compressed oxygen is not used in atmosphere-supplying respirators that have previously used compressed air.

The RPPA shall ensure that oxygen concentrations greater than 23.5% are used only in equipment designed for oxygen service or distribution.

The RPPA shall ensure that cylinders used to supply breathing air to respirators meet the following requirements:

- Cylinders are tested and maintained as prescribed in the Shipping Container Specification Regulations of the Department of Transportation (49 CFR 173 and 178);
- Cylinders of purchased breathing air have a certificate of analysis from the supplier that the breathing air meets the requirements for Grade D breathing air; and
- The moisture content in the cylinder does not exceed a dew pint of –50° F (-45.6° C) at 1 atmosphere pressure.

The RPPA shall ensure that compressors used to supply breathing air to respirators are constructed and situated so as to:

- Prevent entry of contaminated air into the air-supply system;

- Minimize moisture content so that the dew point at 1 atmosphere pressure is 10°F (5.56°C) below the ambient temperature;
- Have suitable in-line purifying sorbent beds and filters to further ensure breathing air quality. Sorbent beds and filters shall be maintained and replaced or refurbished periodically following the manufacturer's instructions;
- Have a tag containing the most recent change date and the signature of the person authorized by the RPPA to perform the change. The tag shall be maintained at the compressor.

For compressors that are not oil-lubricated, the RPPA shall ensure that carbon monoxide levels in the breathing air do not exceed 10 ppm.

For oil-lubricated compressors, the RPPA shall use a high-temperature or carbon monoxide alarm, or both, to monitor carbon monoxide levels. If only high-temperature alarms are used, the air supply shall be monitored at intervals sufficient to prevent carbon monoxide in the breathing air from exceeding 10 ppm.

The RPPA shall ensure that breathing air couplings are incompatible with outlets for nonrespirable worksite air or other gas systems. No asphyxiating substance shall be introduced into breathing air lines.

The RPPA shall use breathing gas containers marked in accordance with the NIOSH respirator certification standard, 42 CFR 84.

Identification of Filters, Cartridges, and Canisters

All filters, cartridges, canisters, and/or filters used in the workplace shall be labeled and color coded with the NIOSH approval label and that label will not to be removed and must remain legible. American National Standards Institute (ANSI) Standard 13.1-67 describes the required color coding scheme.

Atmospheric contaminants to be protected against	**Color assigned**
Acid gases	White
Hydrocyanic acid gas	White with 1/2-inch green stripe completely around the canister near the bottom.
Chlorine gas	White with 1/2-inch yellow stripe completely around the canister near the bottom.
Organic vapors	Black
Ammonia gas	Green
Acid gases and ammonia gases	Green with 1/2-inch white stripe completely around the canister near the bottom.
Carbon Monoxide	Blue
Acid gases and organic vapors	Yellow
Hydrocyanic acid gas and chloropicrin vapor	Yellow with 1/2-inch blue stripe completely around the canister near the bottom.
Acid gases, organic vapors, and ammonia gases	Brown
Radioactive materials, excepting tritium and noble gases	Purple (Magenta)
Particulates (dusts, fumes, mists, fogs, or smokes) in combination with any of the above gases or vapors	Canister color for contaminant, as designated above, with 1/2-inch gray stripe completely around the canister near the top
All of the above atmospheric contaminants	Red with 1/2-inch gray stripe completely around the canister near the top

Section 7: Training of Firefighters in the Respiratory Hazards to Which They Are Potentially Exposed During Routine and Emergency Situations

An analysis of the hazards that firefighters are potentially exposed during routine and emergency situations is contained in Section 1. Procedures for Selecting Respirators for Use in the Workplace.

Firefighters shall employ the "Recognize, Avoid, Isolate, and Notify (R.A.I.N.)" process with respect to respiratory hazards. R.A.I.N. Procedures follow. Training on these procedures shall be comprehensive, understandable, and conducted annually or more frequently if necessary (29 CFR 1910.134(k)).

Indicators that the firefighter may require additional training may include that the firefighter's competency in this function is questioned by the firefighter him/herself or the firefighter's supervisor, or if work conditions change in a manner that is inconsistent with the R.A.I.N. procedures.

Orientation/Training Tool: Recognize, Avoid, Isolate, and Notify

Hazards that firefighters are likely to be exposed include irritants (for example, riot control agents), toxic industrial chemicals/compounds (TIC), contagious and infectious diseases, and weapons of mass destruction (WMD). Due to the nature of emergency response work, the firefighter may approach a hazardous environment without his or her immediate knowledge. **Where the RPPA and/or firefighter cannot identify or reasonably estimate the firefighter exposure, the RPPA and/or firefighter shall consider the atmosphere to be IDLH.**

Relevant workplace and user factors include exposure to the respiratory hazards listed above. In addition, factors include the following:

- Outside (open-air) environments;
- Changing wind condition(s) including direction, speed, temperature;
- Thermal environmental conditions: heat conditions, cold conditions;
- Humidity, dew point;
- Precipitation: rain, snow, ice;
- Confined space environments; enclosed buildings may be included as confined spaces based on the hazards (known, unknown, or reasonably potential) presented.

Firefighters shall employ the R.A.I.N. process with respect to respiratory hazards.

❒ **R: Recognize**

Recognize respiratory hazards by observing signs and symptoms of victims such as salivation, lacrimation, urination, defecation, gastroenteritis, emesis, miosis, redness or blistering of the skin, and mass casualties or mass fatalities. Other indicators may include injury and/or illness in animals and/or birds.

Recognize potential respiratory hazards by observing package labels, vehicle or container placards, leaking or damaged containers, and/or the presence of containers that may be used as dissemination devices.

Recognize potential respiratory hazards by observing threat levels, verbal or written threats, and abnormal public behavior.

❒ **A: Avoid**

Avoid unprotected exposure in areas and situations with known or suspected respiratory hazard releases.

Don appropriate respiratory protection in known or suspected respiratory hazard releases.

Don other appropriate PPE as indicated.

❒ **I: Isolate**

Assume a safe distance from the respiratory hazard(s). Ensure a secure perimeter, as feasible, to ensure responder and worker safety, as well as public safety.

Establish control zones: hot, warm, and cold zones.

Perform self decontamination procedures to remove contaminants.

❒ **N: Notify**

Notify immediate supervisor and appropriate chain of communication for other responding units of known or suspected respiratory hazard release.

If you have been injured or exposed, an injury report form may be indicated.

Signature of Firefighter: _____ Date: _____

Signature of RPPA or Trainer: _____ Date: _____

Section 8: Training of Firefighters in the Proper Use of Respirators, Including Putting On and Removing Them, Any Limitations in Their Use, and Their Maintenance

The RPPA shall provide effective training to firefighters who are required to use a respirator (29 CFR 1910.134(k)). The training must be comprehensive, understandable, and recur at least annually or more often if necessary. The RPPA is required to provide the basic information on respirators cited in Appendix D of 29 CFR 1910.134 to firefighters who wear respirators when not required by 29 CFR 1910.134 or by the RPPA to do so.

The RPPA shall ensure that each firefighter can demonstrate knowledge of at least the following:

- Why the respirator is necessary and how improper fit, usage, or maintenance can compromise the protective effect of the respirator;
- What the limitations and capabilities of the respirator are;
- How to use the respirator effectively in emergency situations, including situations in which the respirator malfunctions;
- How to inspect, put on and remove, use and check the seals of the respirator;
- What the procedures are for maintenance and storage of the respirator;
- How to recognize medical signs and symptoms that may limit or prevent the effective use of respirators; and
- The general requirements of 29 CFR 1910.134.

The training shall be conducted in a manner that is understandable to the firefighter. The RPPA shall provide the training prior to requiring the firefighter to use a respirator in the workplace.

An RPPA who is able to demonstrate that a new firefighter has received training within the last 12 months that addresses the elements specified in the aforementioned bullets is not required to repeat such training provided that the firefighter can demonstrate knowledge of these same elements. Previous training not repeated initially by the RPPA must be provided no later than 12 months from the date of the previous training.

Retraining shall be administered annually, and when the following situations occur:

- Changes in the workplace or the type of respirator render previous training obsolete;
- Inadequacies in the firefighter's knowledge or use of the respirator indicate that the firefighter has not retained the requisite understanding or skill; or

- Any other situation arises in which retraining appears necessary to ensures safe respirator use.

The basic advisory information on respirators, as presented in 29 CFR 1910.134 Appendix D, shall be provided by the RPPA in any written or oral format, to firefighters who wear respirators when such use is not required by 29 CFR 1910.134 or by the RPPA.

A checklist for firefighter orientation and training on procedures for proper use of respirators in routine and reasonably foreseeable situations in included in Section 4. This checklist shall be completed as part of the procedural training requirements listed above in this section.

Section 4 also includes mandatory procedures for user seal check. These procedures will also become a part of the firefighter training process. Firefighters will demonstrate a user seal check to ensure competency. A user seal check must be conducted by each user before each use of the respirator.

Section 9: Procedures for Regularly Evaluating the Effectiveness of the Program

The RPPA shall conduct evaluations of the workplace as necessary to ensure that the provisions of the current written respiratory protection program are being effectively implemented and that it continues to be effective (29 CFR 1910.134(l)).

The RPPA shall regularly consult firefighters required to use respirators to assess the firefighters' views on program effectiveness and to identify any problems. Any problems that are identified during this assessment shall be corrected. Factors to be assessed include, but are not limited to:

- Respirator fit (including the ability to use the respirator without interfering with effective workplace performance);
- Appropriate respirator selection for the hazards to which the firefighter is exposed;
- Proper respirator use under the workplace conditions the firefighter encounters; and
- Proper respirator maintenance.

An assessment tool for program evaluation follows.

Assessment Tool: Respiratory Protection Program Evaluation Checklist _____

Generally speaking, the respiratory program should be evaluated for each job/position and at least annually, with program adjustments, as appropriate, made to reflect the evaluation results.

1. Is there a written policy which acknowledges RPPA responsibility for providing a safe and healthful workplace and assigns program responsibility, accountability, and authority. ..... Yes No

2. Is program responsibility vested in one individual who is knowledgeable and who can coordinate all aspects of the program at the worksite(s)?..... Yes No

3. Can feasible engineering controls or work practices eliminate the need for respirators? ..... Yes No

4. Are there written procedures/statements covering the various aspects of the respiratory protection program, including:

   Designation of a respiratory program administrator? ..... Yes No

Respirator selection? ..... Yes No
Purchase of NIOSH certified equipment? ..... Yes No
Medical aspects of respiratory protection program? ..... Yes No
Issuance of equipment? ..... Yes No
Fitting? ..... Yes no
Training? ..... Yes No
Maintenance, storage, and Repair? ..... Yes No
Inspection? ..... Yes No
Use under special conditions? ..... Yes No
Evaluation of the hazardous conditions the respirator user will likely face? ..... Yes No

5. Are work area conditions and worker exposures properly surveyed? ..... Yes No
Can environmental controls be put into place to avoid exposure to the hazards? ..... Yes No
Has an evaluation of the hazards the firefighter will likely face been conducted? ..... Yes No

6. Are respirators selected on the basis of the hazards to which the firefighter is exposed or has risk of exposure? ..... Yes No

7. Are selections of respirators made by individuals knowledgeable in proper selection procedures? ..... Yes No

8. Are only certified respirators purchased and used? ..... Yes No
Do they provide adequate protection for the specific hazard and concentration of the contaminant? ..... Yes No

9. Has a medical evaluation of the prospective user been made through the medical questionnaire and review process to determine physical and psychological ability to wear the selected respiratory protective equipment? ..... Yes No

10. Where practical, have respirators been issued to the users for their exclusive use? ..... Yes No
Are there records covering issuance? ..... Yes No

11. Respiratory protective equipment fitting:

Are the users given the opportunity to try on several respirators to determine whether the respirator they will subsequently be wearing is the best fitting one? ..... Yes No
Is the fit tested at appropriate intervals? ..... Yes No
Are those users who require corrective lenses properly fitted? ..... Yes No
Is the facepiece-to-face seal tested in a test atmosphere

(fit-tested)? ..... Yes No
Are workers prohibited from wearing respirators in contaminated work areas when they have facial hair or other characteristics that may cause face seal leakage? ..... Yes No

12. Respirator use in the work area

Are respirators being worn correctly? ..... Yes No
Are workers keeping respirators on all the time while in the hazardous work area? ..... Yes No

13. Maintenance of respiratory protective equipment

Cleaning and Disinfecting

Are respirators cleaned and disinfected after each use when different people use the same device? ..... Yes No
Are respirators cleaned and disinfected as frequently as necessary for devices issued to individual users?..... Yes No
Are proper methods of cleaning and disinfecting utilized?..... Yes No

Storing

Are respirators stored in a manner so as to protect them from dust, sunlight, heat, excessive cold or moisture, or damaging chemicals? ..... Yes No
Are respirators stored properly in a storage facility so as to prevent them from deforming? ..... Yes No
Is storage in lockers or other storage locations permitted only if the respirator is in a carrying case or carton? ..... Yes No

Inspecting

Are respirators inspected before and after each used and during cleaning? ..... Yes No
Are qualified individuals/users instructed in inspection techniques?. Yes No
Is respiratory protective equipment designated as "emergency use" inspected at least monthly (in addition to after each use)? ..... Yes No
Are SCBA incorporating breathing gas containers inspected weekly for breathing gas pressure?..... Yes No
Is a record kept of the inspection of "emergency use" respiratory protective equipment? ..... Yes No

Repairing

Are replacement parts used in repairing those of the manufacturer

of the respirator? ..... Yes No
Are repairs made by manufacturers or manufacturer-trained individuals? ..... Yes No

14. Special use conditions

Is a procedure developed for respiratory protective equipment usage in atmospheres immediately dangerous to life or health (IDLH)? ..... Yes No
Is a procedure developed for equipment usage for entry into confined space? ..... Yes No

15. Training

Are users trained in proper respirator use, cleaning, and inspection? ..... Yes No
Are users trained in the basis for selection of respirators? ..... Yes No
Are users evaluated, using competency-based evaluation, before and after training? ..... Yes No

Section 10: Definitions

Most definitions in this section can be found in 29 CFR 1910.134(b) and in 29 CFR 1910.120(a).

Air-Purifying Respirator	A respirator with an air-purifying filter, cartridge, or canister that removes specific air contaminants by passing ambient air through the air-purifying element.
Atmosphere-Supplying Respirator	A respirator that supplies the respirator user with breathing air from a source independent of the ambient atmosphere, and includes supplied-air respirators (SARs) and self-contained breathing apparatus (SCBA) units.
Canister or Cartridge	A container with a filter, sorbent, or catalyst, or combination of these items, which removes specific contaminants from the air passed through the container.
Demand Respirator	An atmosphere-supplying respirator that admits breathing air to the Facepiece only when a negative pressure is created inside the facepiece by inhalation.
Dew Point	The temperature at which vapor begins to condense.
Emergency Situation	Any occurrence such as, but not limited to, equipment failure, rupture of containers, or failure of control equipment that may or does result in an uncontrolled significant release of an airborne contaminant.
Firefighter exposure	Exposure to a concentration of an airborne contaminant that would occur if the firefighter were not using respiratory protection.
End-of-Service-Life Indicator (ESLI)	A system that warns the respirator user of the approach of the end of the adequate respiratory protection, for example, that the sorbent is approaching saturation or is no longer effective.

Escape-Only Respirator	A respirator intended to be used only for emergency exit.
Filter or Air Purifying Element	A component used in respirators to remove solid or liquid aerosols from the inspired air.
Filtering Facepiece (Dust Mask)	A negative pressure particulate respirator with a filter as an integral part of the Facepiece composed of the filtering medium.
Fit Factor	A quantitative estimate of the fit of a particular respirator to a specific individual, and typically estimates the ration of the concentration of a substance in ambient air to its concentration inside the respirator when worn.
Fit Test	The use of a protocol to qualitatively or quantitatively evaluate the fit of a respirator on an individual (See also Qualitative fit test QLFT and Quantitative fit test QNFT).
Helmet	Means a rigid respiratory inlet covering that also provides head protection against impact and penetration.
High Efficiency Particulate Air (HEPA) Filter	A filter that is at least 99.97% efficient in removing monodisperse particles of 0.3 micrometers in diameter. The equivalent NIOSH 42 CFR 84 particulate filters are the N100, R100, P100 filters).
Hood	A respiratory inlet covering that completely covers the head and neck and may also cover portions of the shoulders and torso.
Immediately Dangerous to Life and Health (IDLH)	An atmosphere that poses an immediate threat to life, would cause irreversible adverse health effects, or would impair an individual's ability to escape from a dangerous atmosphere.
Interior Structural Firefighting	The physical activity of fire suppression, rescue or both, inside of buildings or enclosed structures which are involved in a fire situation beyond the incipient stage (See 29 CFR 1910.155).

Loose-Fitting Facepiece	A respiratory inlet covering that is designed to form a partial seal with the face.
Negative Pressure Respirator (Tight Fitting)	A respirator in which the air pressure inside the facepiece is negative during inhalation with respect to the ambient air pressure inside the respirator.
Oxygen Deficient Atmosphere	An atmosphere with an oxygen content below 19.5% by volume.
Physician or Other Licensed Health Care Professional (PLHCP)	An individual whose legally permitted scope of practice (i.e., license, registration, or certification) allows him or her to independently provide, or be delegated the responsibility to provide, some or all of the health care services required by paragraph (e) of this section.
Positive Pressure Respirator	A respirator in which the pressure inside the reparatory inlet covering exceeds the ambient air pressure outside the respirator.
Powered Air-Purifying Respirator (PAPR)	An air-purifying respirator that uses a blower to force the ambient air through air-purifying elements to the inlet covering.
Pressure Demand Respirator	A positive pressure atmosphere-supplying respirator that admits breathing air to the facepiece when the positive pressure is reduced inside the facepiece by inhalation.
Qualitative Fit Test (QLFT)	A pass/fail fit test to assess the adequacy of respirator fit that relies on the individual's response to the test agent.
Quantitative Fit Test (QNFT)	An assessment of the adequacy of respirator fit by numerically measuring the amount of leakage into the respirator.
Respiratory Inlet Covering	That portion of a respirator that forms the protective barrier between the user's respiratory tract and an air-purifying device or breathing air source, or both. It may be a facepiece, helmet, hood, suit, or a mouthpiece respirator with nose clamp.

Self-Contained Breathing Apparatus (SCBA)	An atmosphere-supplying respirator for which the breathing air source is designed to be carried by the user.
Service Life	The period of time that a respirator, filter or sorbent, or other respiratory equipment provides adequate protection to the wearer.
Supplied-Air Respirator (SAR) or Airline Respirator	An atmosphere-supplying respirator for which the source of breathing air is not designed to be carried by the user.
Tight-Fitting Facepiece	A respiratory inlet covering that forms a complete seal with the face.
User Seal Check	An action conducted by the respirator user to determine if the respirator is properly seated to the face.

Regulations (Standards - 29 CFR)

Respiratory Protection. - 1910.134

Regulations (Standards - 29 CFR) - Table of Contents

• **Part Number:**	1910
• **Part Title:**	Occupational Safety and Health Standards
• **Subpart:**	I
• **Subpart Title:**	Personal Protective Equipment
• **Standard Number:**	1910.134
• **Title:**	Respiratory Protection.
• **Appendix:**	A , B-1 , B-2 , C , D

This section applies to General Industry (part 1910), Shipyards (part 1915), Marine Terminals (part 1917), Longshoring (part 1918), and Construction (part 1926).

1910.134(a)

Permissible practice.

1910.134(a)(1)

In the control of those occupational diseases caused by breathing air contaminated with harmful dusts, fogs, fumes, mists, gases, smokes, sprays, or vapors, the primary objective shall be to prevent atmospheric contamination. This shall be accomplished as far as feasible by accepted engineering control measures (for example, enclosure or confinement of the operation, general and local ventilation, and substitution of less toxic materials). When effective engineering controls are not feasible, or while they are being instituted, appropriate respirators shall be used pursuant to this section.

1910.134(a)(2)

Respirators shall be provided by the employer when such equipment is necessary to protect the health of the employee. The employer shall provide the respirators which are applicable and suitable for the purpose intended. The employer shall be responsible for the establishment and maintenance of a respiratory protection program which shall include the requirements outlined in paragraph (c) of this section.

1910.134(b)

Definitions. The following definitions are important terms used in the respiratory protection standard in this section.

Air-purifying respirator means a respirator with an air-purifying filter,

cartridge, or canister that removes specific air contaminants by passing ambient air through the air-purifying element.

Assigned protection factor (APF) [Reserved]

Atmosphere-supplying respirator means a respirator that supplies the respirator user with breathing air from a source independent of the ambient atmosphere, and includes supplied-air respirators (SARs) and self-contained breathing apparatus (SCBA) units.

Canister or cartridge means a container with a filter, sorbent, or catalyst, or combination of these items, which removes specific contaminants from the air passed through the container.

Demand respirator means an atmosphere-supplying respirator that admits breathing air to the facepiece only when a negative pressure is created inside the facepiece by inhalation.

Emergency situation means any occurrence such as, but not limited to, equipment failure, rupture of containers, or failure of control equipment that may or does result in an uncontrolled significant release of an airborne contaminant.

Employee exposure means exposure to a concentration of an airborne contaminant that would occur if the employee were not using respiratory protection.

End-of-service-life indicator (ESLI) means a system that warns the respirator user of the approach of the end of adequate respiratory protection, for example, that the sorbent is approaching saturation or is no longer effective.

Escape-only respirator means a respirator intended to be used only for emergency exit.

Filter or air purifying element means a component used in respirators to remove solid or liquid aerosols from the inspired air.

Filtering facepiece (dust mask) means a negative pressure particulate respirator with a filter as an integral part of the facepiece or with the entire facepiece composed of the filtering medium.

Fit factor means a quantitative estimate of the fit of a particular respirator to a specific individual, and typically estimates the ratio of the concentration of a substance in ambient air to its concentration inside the respirator when worn.

Fit test means the use of a protocol to qualitatively or quantitatively evaluate the fit of a respirator on an individual. (See also Qualitative fit test QLFT and Quantitative fit test QNFT.)

Helmet means a rigid respiratory inlet covering that also provides head protection against impact and penetration.

High efficiency particulate air (HEPA) filter means a filter that is at least 99.97% efficient in removing monodisperse particles of 0.3 micrometers in diameter. The equivalent NIOSH 42 CFR 84 particulate filters are the N100, R100, and P100 filters.

Hood means a respiratory inlet covering that completely covers the head and neck and may also cover portions of the shoulders and torso.

Immediately dangerous to life or health (IDLH) means an atmosphere that poses an immediate threat to life, would cause irreversible adverse health effects, or would impair an individual's ability to escape from a dangerous atmosphere.

Interior structural firefighting means the physical activity of fire suppression, rescue or both, inside of buildings or enclosed structures which are involved in a fire situation beyond the incipient stage. (See 29 CFR 1910.155)

Loose-fitting facepiece means a respiratory inlet covering that is designed to form a partial seal with the face.

Maximum use concentration (MUC) [Reserved].

Negative pressure respirator (tight fitting) means a respirator in which the air pressure inside the facepiece is negative during inhalation with respect to the ambient air pressure outside the respirator.

Oxygen deficient atmosphere means an atmosphere with an oxygen content below 19.5% by volume.

Physician or other licensed health care professional (PLHCP) means an individual whose legally permitted scope of practice (i.e., license, registration, or certification) allows him or her to independently provide, or be delegated the responsibility to provide, some or all of the health care services required by paragraph (e) of this section.

Positive pressure respirator means a respirator in which the pressure inside the respiratory inlet covering exceeds the ambient air pressure outside the respirator.

Powered air-purifying respirator (PAPR) means an air-purifying respirator that uses a blower to force the ambient air through air-purifying elements to the inlet covering.

Pressure demand respirator means a positive pressure atmosphere-supplying respirator that admits breathing air to the facepiece when the positive pressure is reduced inside the facepiece by inhalation.

Qualitative fit test (QLFT) means a pass/fail fit test to assess the adequacy of respirator fit that relies on the individual's response to the test agent.

Quantitative fit test (QNFT) means an assessment of the adequacy of respirator fit by numerically measuring the amount of leakage into the respirator.

Respiratory inlet covering means that portion of a respirator that forms the protective barrier between the user's respiratory tract and an air-purifying device or breathing air source, or both. It may be a facepiece, helmet, hood, suit, or a mouthpiece respirator with nose clamp.

Self-contained breathing apparatus (SCBA) means an atmosphere-supplying respirator for which the breathing air source is designed to be carried by the user.

Service life means the period of time that a respirator, filter or sorbent, or other respiratory equipment provides adequate protection to the wearer.

Supplied-air respirator (SAR) or airline respirator means an atmosphere-supplying respirator for which the source of breathing air is not designed to be carried by the user.

This section means this respiratory protection standard.

Tight-fitting facepiece means a respiratory inlet covering that forms a complete seal with the face.

User seal check means an action conducted by the respirator user to determine if the respirator is properly seated to the face.

1910.134(c)

Respiratory protection program. This paragraph requires the employer to develop and implement a written respiratory protection program with required worksite-specific procedures and elements for required respirator use. The program must be administered by a suitably trained program administrator. In addition, certain program elements may be required for voluntary use to prevent potential hazards associated with the use of the respirator. The Small Entity Compliance Guide contains criteria for the selection of a program administrator and a sample program that meets the requirements of this paragraph. Copies of the Small Entity Compliance Guide will be available on or about April 8, 1998 from the Occupational Safety and Health Administration's Office of Publications, Room N 3101, 200 Constitution Avenue, NW, Washington, DC, 20210 (202-219-4667).

1910.134(c)(1)

In any workplace where respirators are necessary to protect the health of the employee or whenever respirators are required by the employer, the employer shall establish and implement a written respiratory protection program with worksite-specific procedures. The program shall be updated as necessary to reflect those changes in workplace conditions that affect respirator use. The employer shall include in the program the following provisions of this section, as applicable:

1910.134(c)(1)(i)

Procedures for selecting respirators for use in the workplace;

1910.134(c)(1)(ii)

Medical evaluations of employees required to use respirators;

1910.134(c)(1)(iii)

Fit testing procedures for tight-fitting respirators;

1910.134(c)(1)(iv)

Procedures for proper use of respirators in routine and reasonably foreseeable

emergency situations;

1910.134(c)(1)(v)

Procedures and schedules for cleaning, disinfecting, storing, inspecting, repairing, discarding, and otherwise maintaining respirators;

1910.134(c)(1)(vi)

Procedures to ensure adequate air quality, quantity, and flow of breathing air for atmosphere-supplying respirators;

1910.134(c)(1)(vii)

Training of employees in the respiratory hazards to which they are potentially exposed during routine and emergency situations;

1910.134(c)(1)(viii)

Training of employees in the proper use of respirators, including putting on and removing them, any limitations on their use, and their maintenance; and

1910.134(c)(1)(ix)

Procedures for regularly evaluating the effectiveness of the program.

1910.134(c)(2)

Where respirator use is not required:

1910.134(c)(2)(i)

An employer may provide respirators at the request of employees or permit employees to use their own respirators, if the employer determines that such respirator use will not in itself create a hazard. If the employer determines that any voluntary respirator use is permissible, the employer shall provide the respirator users with the information contained in Appendix D to this section ("Information for Employees Using Respirators When Not Required Under the Standard"); and

1910.134(c)(2)(ii)

In addition, the employer must establish and implement those elements of a written respiratory protection program necessary to ensure that any employee using a respirator voluntarily is medically able to use that respirator, and that the respirator is cleaned, stored, and maintained so that its use does not present a health hazard to the user. Exception: Employers are not required to include in a written respiratory protection program those employees whose only use of respirators involves the voluntary use of filtering facepieces (dust masks).

1910.134(c)(3)

The employer shall designate a program administrator who is qualified by

appropriate training or experience that is commensurate with the complexity of the program to administer or oversee the respiratory protection program and conduct the required evaluations of program effectiveness.

1910.134(c)(4)

The employer shall provide respirators, training, and medical evaluations at no cost to the employee.

1910.134(d)

Selection of respirators. This paragraph requires the employer to evaluate respiratory hazard(s) in the workplace, identify relevant workplace and user factors, and base respirator selection on these factors. The paragraph also specifies appropriately protective respirators for use in IDLH atmospheres, and limits the selection and use of air-purifying respirators.

1910.134(d)(1)

General requirements.

1910.134(d)(1)(i)

The employer shall select and provide an appropriate respirator based on the respiratory hazard(s) to which the worker is exposed and workplace and user factors that affect respirator performance and reliability.

1910.134(d)(1)(ii)

The employer shall select a NIOSH-certified respirator. The respirator shall be used in compliance with the conditions of its certification.

1910.134(d)(1)(iii)

The employer shall identify and evaluate the respiratory hazard(s) in the workplace; this evaluation shall include a reasonable estimate of employee exposures to respiratory hazard(s) and an identification of the contaminant's chemical state and physical form. Where the employer cannot identify or reasonably estimate the employee exposure, the employer shall consider the atmosphere to be IDLH.

1910.134(d)(1)(iv)

The employer shall select respirators from a sufficient number of respirator models and sizes so that the respirator is acceptable to, and correctly fits, the user.

1910.134(d)(2)

Respirators for IDLH atmospheres.

1910.134(d)(2)(i)

The employer shall provide the following respirators for employee use in IDLH

atmospheres:

1910.134(d)(2)(i)(A)

A full facepiece pressure demand SCBA certified by NIOSH for a minimum service life of thirty minutes, or

1910.134(d)(2)(i)(B)

A combination full facepiece pressure demand supplied-air respirator (SAR) with auxillary self-contained air supply.

1910.134(d)(2)(ii)

Respirators provided only for escape from IDLH atmospheres shall be NIOSH-certified for escape from the atmosphere in which they will be used.

1910.134(d)(2)(iii)

All oxygen-deficient atmospheres shall be considered IDLH. Exception: If the employer demonstrates that, under all foreseeable conditions, the oxygen concentration can be maintained within the ranges specified in Table II of this section (i.e., for the altitudes set out in the table), then any atmosphere-supplying respirator may be used.

1910.134(d)(3)

Respirators for atmospheres that are not IDLH.

1910.134(d)(3)(i)

The employer shall provide a respirator that is adequate to protect the health of the employee and ensure compliance with all other OSHA statutory and regulatory requirements, under routine and reasonably foreseeable emergency situations.

1910.134(d)(3)(i)(A)

Assigned Protection Factors (APFs) [Reserved]

1910.134(d)(3)(i)(B)

Maximum Use Concentration (MUC) [Reserved]

1910.134(d)(3)(ii)

The respirator selected shall be appropriate for the chemical state and physical form of the contaminant.

1910.134(d)(3)(iii)

For protection against gases and vapors, the employer shall provide:

1910.134(d)(3)(iii)(A)

An atmosphere-supplying respirator, or

1910.134(d)(3)(iii)(B)

An air-purifying respirator, provided that:

1910.134(d)(3)(iii)(B)(1)

The respirator is equipped with an end-of-service-life indicator (ESLI) certified by NIOSH for the contaminant; or

1910.134(d)(3)(iii)(B)(2)

If there is no ESLI appropriate for conditions in the employer's workplace, the employer implements a change schedule for canisters and cartridges that is based on objective information or data that will ensure that canisters and cartridges are changed before the end of their service life. The employer shall describe in the respirator program the information and data relied upon and the basis for the canister and cartridge change schedule and the basis for reliance on the data.

1910.134(d)(3)(iv)

For protection against particulates, the employer shall provide:

1910.134(d)(3)(iv)(A)

An atmosphere-supplying respirator; or

1910.134(d)(3)(iv)(B)

An air-purifying respirator equipped with a filter certified by NIOSH under 30 CFR part 11 as a high efficiency particulate air (HEPA) filter, or an air-purifying respirator equipped with a filter certified for particulates by NIOSH under 42 CFR part 84; or

1910.134(d)(3)(iv)(C)

For contaminants consisting primarily of particles with mass median aerodynamic diameters (MMAD) of at least 2 micrometers, an air-purifying respirator equipped with any filter certified for particulates by NIOSH.

TABLE I. -- ASSIGNED PROTECTION FACTORS
[RESERVED]

TABLE II

	Oxygen

Altitude (ft.)	deficient Atmospheres (% O_2) for which the employer atmosphere-may rely on supplying respirators
Less than 3,001	16.0-19.5
3,001-4,000	16.4-19.5
4,001-5,000	17.1-19.5
5,001-6,000	17.8-19.5
6,001-7,000	18.5-19.5
7,001-8,000[1]	19.3-19.5.

[1]Above 8,000 feet the exception does not apply. Oxygen-enriched breathing air must be supplied above 14,000 feet.

1910.134(e)

Medical evaluation. Using a respirator may place a physiological burden on employees that varies with the type of respirator worn, the job and workplace conditions in which the respirator is used, and the medical status of the employee. Accordingly, this paragraph specifies the minimum requirements for medical evaluation that employers must implement to determine the employee's ability to use a respirator.

1910.134(e)(1)

General. The employer shall provide a medical evaluation to determine the employee's ability to use a respirator, before the employee is fit tested or required to use the respirator in the workplace. The employer may discontinue an employee's medical evaluations when the employee is no longer required to use a respirator.

1910.134(e)(2)

Medical evaluation procedures.

1910.134(e)(2)(i)

The employer shall identify a physician or other licensed health care professional (PLHCP) to perform medical evaluations using a medical questionnaire or an initial medical examination that obtains the same information as the medical questionnaire.

1910.134(e)(2)(ii)

The medical evaluation shall obtain the information requested by the questionnaire in Sections 1 and 2, Part A of Appendix C of this section.

1910.134(e)(3)

Follow-up medical examination.

1910.134(e)(3)(i)

The employer shall ensure that a follow-up medical examination is provided for an employee who gives a positive response to any question among questions 1 through 8 in Section 2, Part A of Appendix C or whose initial medical examination demonstrates the need for a follow-up medical examination.

1910.134(e)(3)(ii)

The follow-up medical examination shall include any medical tests, consultations, or diagnostic procedures that the PLHCP deems necessary to make a final determination.

1910.134(e)(4)

Administration of the medical questionnaire and examinations.

1910.134(e)(4)(i)

The medical questionnaire and examinations shall be administered confidentially during the employee's normal working hours or at a time and place convenient to the employee. The medical questionnaire shall be administered in a manner that ensures that the employee understands its content.

1910.134(e)(4)(ii)

The employer shall provide the employee with an opportunity to discuss the questionnaire and examination results with the PLHCP.

1910.134(e)(5)

Supplemental information for the PLHCP.

1910.134(e)(5)(i)

The following information must be provided to the PLHCP before the PLHCP makes a recommendation concerning an employee's ability to use a respirator:

1910.134(e)(5)(i)(A)

(A) The type and weight of the respirator to be used by the employee;

1910.134(e)(5)(i)(B)

The duration and frequency of respirator use (including use for rescue and escape);

1910.134(e)(5)(i)(C)

The expected physical work effort;

1910.134(e)(5)(i)(D)

Additional protective clothing and equipment to be worn; and

1910.134(e)(5)(i)(E)

Temperature and humidity extremes that may be encountered.

1910.134(e)(5)(ii)

Any supplemental information provided previously to the PLHCP regarding an employee need not be provided for a subsequent medical evaluation if the information and the PLHCP remain the same.

1910.134(e)(5)(iii)

The employer shall provide the PLHCP with a copy of the written respiratory protection program and a copy of this section.

Note to Paragraph (e)(5)(iii): When the employer replaces a PLHCP, the employer must ensure that the new PLHCP obtains this information, either by providing the documents directly to the PLHCP or having the documents transferred from the former PLHCP to the new PLHCP. However, OSHA does not expect employers to have employees medically reevaluated solely because a new PLHCP has been selected.

1910.134(e)(6)

Medical determination. In determining the employee's ability to use a respirator, the employer shall:

1910.134(e)(6)(i)

Obtain a written recommendation regarding the employee's ability to use the respirator from the PLHCP. The recommendation shall provide only the following information:

1910.134(e)(6)(i)(A)

Any limitations on respirator use related to the medical condition of the employee, or relating to the workplace conditions in which the respirator will be used, including whether or not the employee is medically able to use the respirator;

1910.134(e)(6)(i)(B)

The need, if any, for follow-up medical evaluations; and

1910.134(e)(6)(i)(C)

A statement that the PLHCP has provided the employee with a copy of the PLHCP's written recommendation.

1910.134(e)(6)(ii)

If the respirator is a negative pressure respirator and the PLHCP finds a medical condition that may place the employee's health at increased risk if the respirator is used, the employer shall provide a PAPR if the PLHCP's medical evaluation finds that the employee can use such a respirator; if a subsequent medical evaluation finds that the employee is medically able to use a negative pressure respirator, then the employer is no longer required to provide a PAPR.

1910.134(e)(7)

Additional medical evaluations. At a minimum, the employer shall provide additional medical evaluations that comply with the requirements of this section if:

1910.134(e)(7)(i)

An employee reports medical signs or symptoms that are related to ability to use a respirator;

1910.134(e)(7)(ii)

A PLHCP, supervisor, or the respirator program administrator informs the employer that an employee needs to be reevaluated;

1910.134(e)(7)(iii)

Information from the respiratory protection program, including observations made during fit testing and program evaluation, indicates a need for employee reevaluation; or

1910.134(e)(7)(iv)

A change occurs in workplace conditions (e.g., physical work effort, protective clothing, temperature) that may result in a substantial increase in the physiological burden placed on an employee.

1910.134(f)

Fit testing. This paragraph requires that, before an employee may be required to use any respirator with a negative or positive pressure tight-fitting facepiece, the employee must be fit tested with the same make, model, style, and size of respirator that will be used. This paragraph specifies the kinds of fit tests allowed, the procedures for conducting them, and how the results of the fit tests must be used.

1910.134(f)(1)

The employer shall ensure that employees using a tight-fitting facepiece respirator pass an appropriate qualitative fit test (QLFT) or quantitative fit test (QNFT) as stated in this paragraph.

1910.134(f)(2)

The employer shall ensure that an employee using a tight-fitting facepiece respirator is fit tested prior to initial use of the respirator, whenever a different respirator facepiece (size, style, model or make) is used, and at least annually

thereafter.

1910.134(f)(3)

The employer shall conduct an additional fit test whenever the employee reports, or the employer, PLHCP, supervisor, or program administrator makes visual observations of, changes in the employee's physical condition that could affect respirator fit. Such conditions include, but are not limited to, facial scarring, dental changes, cosmetic surgery, or an obvious change in body weight.

1910.134(f)(4)

If after passing a QLFT or QNFT, the employee subsequently notifies the employer, program administrator, supervisor, or PLHCP that the fit of the respirator is unacceptable, the employee shall be given a reasonable opportunity to select a different respirator facepiece and to be retested.

1910.134(f)(5)

The fit test shall be administered using an OSHA-accepted QLFT or QNFT protocol. The OSHA-accepted QLFT and QNFT protocols and procedures are contained in Appendix A of this section.

1910.134(f)(6)

QLFT may only be used to fit test negative pressure air-purifying respirators that must achieve a fit factor of 100 or less.

1910.134(f)(7)

If the fit factor, as determined through an OSHA-accepted QNFT protocol, is equal to or greater than 100 for tight-fitting half facepieces, or equal to or greater than 500 for tight-fitting full facepieces, the QNFT has been passed with that respirator.

1910.134(f)(8)

Fit testing of tight-fitting atmosphere-supplying respirators and tight-fitting powered air-purifying respirators shall be accomplished by performing quantitative or qualitative fit testing in the negative pressure mode, regardless of the mode of operation (negative or positive pressure) that is used for respiratory protection.

1910.134(f)(8)(i)

Qualitative fit testing of these respirators shall be accomplished by temporarily converting the respirator user's actual facepiece into a negative pressure respirator with appropriate filters, or by using an identical negative pressure air-purifying respirator facepiece with the same sealing surfaces as a surrogate for the atmosphere-supplying or powered air-purifying respirator facepiece.

910.134(f)(8)(ii)

Quantitative fit testing of these respirators shall be accomplished by modifying

the facepiece to allow sampling inside the facepiece in the breathing zone of the user, midway between the nose and mouth. This requirement shall be accomplished by installing a permanent sampling probe onto a surrogate facepiece, or by using a sampling adapter designed to temporarily provide a means of sampling air from inside the facepiece.

1910.134(f)(8)(iii)

Any modifications to the respirator facepiece for fit testing shall be completely removed, and the facepiece restored to NIOSH-approved configuration, before that facepiece can be used in the workplace.

1910.134(g)

Use of respirators. This paragraph requires employers to establish and implement procedures for the proper use of respirators. These requirements include prohibiting conditions that may result in facepiece seal leakage, preventing employees from removing respirators in hazardous environments, taking actions to ensure continued effective respirator operation throughout the work shift, and establishing procedures for the use of respirators in IDLH atmospheres or in interior structural firefighting situations.

1910.134(g)(1)

Facepiece seal protection.

1910.134(g)(1)(i)

The employer shall not permit respirators with tight-fitting facepieces to be worn by employees who have:

1910.134(g)(1)(i)(A)

Facial hair that comes between the sealing surface of the facepiece and the face or that interferes with valve function; or

1910.134(g)(1)(i)(B)

Any condition that interferes with the face-to-facepiece seal or valve function.

1910.134(g)(1)(ii)

If an employee wears corrective glasses or goggles or other personal protective equipment, the employer shall ensure that such equipment is worn in a manner that does not interfere with the seal of the facepiece to the face of the user.

1910.134(g)(1)(iii)

For all tight-fitting respirators, the employer shall ensure that employees perform a user seal check each time they put on the respirator using the procedures in Appendix B-1 or procedures recommended by the respirator manufacturer that the employer demonstrates are as effective as those in Appendix B-1 of this section.

1910.134(g)(2)

Continuing respirator effectiveness.

1910.134(g)(2)(i)

Appropriate surveillance shall be maintained of work area conditions and degree of employee exposure or stress. When there is a change in work area conditions or degree of employee exposure or stress that may affect respirator effectiveness, the employer shall reevaluate the continued effectiveness of the respirator.

1910.134(g)(2)(ii)

The employer shall ensure that employees leave the respirator use area:

1910.134(g)(2)(ii)(A)

To wash their faces and respirator facepieces as necessary to prevent eye or skin irritation associated with respirator use; or

1910.134(g)(2)(ii)(B)

If they detect vapor or gas breakthrough, changes in breathing resistance, or leakage of the facepiece; or

1910.134(g)(2)(ii)(C)

To replace the respirator or the filter, cartridge, or canister elements.

1910.134(g)(2)(iii)

If the employee detects vapor or gas breakthrough, changes in breathing resistance, or leakage of the facepiece, the employer must replace or repair the respirator before allowing the employee to return to the work area.

1910.134(g)(3)

Procedures for IDLH atmospheres. For all IDLH atmospheres, the employer shall ensure that:

1910.134(g)(3)(i)

One employee or, when needed, more than one employee is located outside the IDLH atmosphere;

1910.134(g)(3)(ii)

Visual, voice, or signal line communication is maintained between the employee (s) in the IDLH atmosphere and the employee(s) located outside the IDLH atmosphere;

1910.134(g)(3)(iii)

The employee(s) located outside the IDLH atmosphere are trained and equipped to provide effective emergency rescue;

1910.134(g)(3)(iv)

The employer or designee is notified before the employee(s) located outside the IDLH atmosphere enter the IDLH atmosphere to provide emergency rescue;

1910.134(g)(3)(v)

The employer or designee authorized to do so by the employer, once notified, provides necessary assistance appropriate to the situation;

1910.134(g)(3)(vi)

Employee(s) located outside the IDLH atmospheres are equipped with:

1910.134(g)(3)(vi)(A)

Pressure demand or other positive pressure SCBAs, or a pressure demand or other positive pressure supplied-air respirator with auxiliary SCBA; and either

1910.134(g)(3)(vi)(B)

Appropriate retrieval equipment for removing the employee(s) who enter(s) these hazardous atmospheres where retrieval equipment would contribute to the rescue of the employee(s) and would not increase the overall risk resulting from entry; or

1910.134(g)(3)(vi)(C)

Equivalent means for rescue where retrieval equipment is not required under paragraph (g)(3)(vi)(B).

1910.134(g)(4)

Procedures for interior structural firefighting. In addition to the requirements set forth under paragraph (g)(3), in interior structural fires, the employer shall ensure that:

1910.134(g)(4)(i)

At least two employees enter the IDLH atmosphere and remain in visual or voice contact with one another at all times;

1910.134(g)(4)(ii)

At least two employees are located outside the IDLH atmosphere; and

1910.134(g)(4)(iii)

All employees engaged in interior structural firefighting use SCBAs.

Note 1 to paragraph (g): One of the two individuals located outside the IDLH

atmosphere may be assigned to an additional role, such as incident commander in charge of the emergency or safety officer, so long as this individual is able to perform assistance or rescue activities without jeopardizing the safety or health of any firefighter working at the incident.

Note 2 to paragraph (g): Nothing in this section is meant to preclude firefighters from performing emergency rescue activities before an entire team has assembled.

1910.134(h)

Maintenance and care of respirators. This paragraph requires the employer to provide for the cleaning and disinfecting, storage, inspection, and repair of respirators used by employees.

1910.134(h)(1)

Cleaning and disinfecting. The employer shall provide each respirator user with a respirator that is clean, sanitary, and in good working order. The employer shall ensure that respirators are cleaned and disinfected using the procedures in Appendix B-2 of this section, or procedures recommended by the respirator manufacturer, provided that such procedures are of equivalent effectiveness. The respirators shall be cleaned and disinfected at the following intervals:

1910.134(h)(1)(i)

Respirators issued for the exclusive use of an employee shall be cleaned and disinfected as often as necessary to be maintained in a sanitary condition;

1910.134(h)(1)(ii)

Respirators issued to more than one employee shall be cleaned and disinfected before being worn by different individuals;

1910.134(h)(1)(iii)

Respirators maintained for emergency use shall be cleaned and disinfected after each use; and

1910.134(h)(1)(iv)

Respirators used in fit testing and training shall be cleaned and disinfected after each use.

1910.134(h)(2)

Storage. The employer shall ensure that respirators are stored as follows:

1910.134(h)(2)(i)

All respirators shall be stored to protect them from damage, contamination, dust, sunlight, extreme temperatures, excessive moisture, and damaging chemicals, and they shall be packed or stored to prevent deformation of the facepiece and exhalation valve.

1910.134(h)(2)(ii)

In addition to the requirements of paragraph (h)(2)(i) of this section, emergency respirators shall be:

1910.134(h)(2)(ii)(A)

Kept accessible to the work area;

1910.134(h)(2)(ii)(B)

Stored in compartments or in covers that are clearly marked as containing emergency respirators; and

1910.134(h)(2)(ii)(C)

Stored in accordance with any applicable manufacturer instructions.

1910.134(h)(3)

Inspection.

1910.134(h)(3)(i)

The employer shall ensure that respirators are inspected as follows:

1910.134(h)(3)(i)(A)

All respirators used in routine situations shall be inspected before each use and during cleaning;

1910.134(h)(3)(i)(B)

All respirators maintained for use in emergency situations shall be inspected at least monthly and in accordance with the manufacturer's recommendations, and shall be checked for proper function before and after each use; and

1910.134(h)(3)(i)(C)

Emergency escape-only respirators shall be inspected before being carried into the workplace for use.

1910.134(h)(3)(ii)

The employer shall ensure that respirator inspections include the following:

1910.134(h)(3)(ii)(A)

A check of respirator function, tightness of connections, and the condition of the various parts including, but not limited to, the facepiece, head straps, valves, connecting tube, and cartridges, canisters or filters; and

1910.134(h)(3)(ii)(B)

A check of elastomeric parts for pliability and signs of deterioration.

1910.134(h)(3)(iii)

In addition to the requirements of paragraphs (h)(3)(i) and (ii) of this section, self-contained breathing apparatus shall be inspected monthly. Air and oxygen cylinders shall be maintained in a fully charged state and shall be recharged when the pressure falls to 90% of the manufacturer's recommended pressure level. The employer shall determine that the regulator and warning devices function properly.

1910.134(h)(3)(iv)

For respirators maintained for emergency use, the employer shall:

1910.134(h)(3)(iv)(A)

Certify the respirator by documenting the date the inspection was performed, the name (or signature) of the person who made the inspection, the findings, required remedial action, and a serial number or other means of identifying the inspected respirator; and

1910.134(h)(3)(iv)(B)

Provide this information on a tag or label that is attached to the storage compartment for the respirator, is kept with the respirator, or is included in inspection reports stored as paper or electronic files. This information shall be maintained until replaced following a subsequent certification.

1910.134(h)(4)

Repairs. The employer shall ensure that respirators that fail an inspection or are otherwise found to be defective are removed from service, and are discarded or repaired or adjusted in accordance with the following procedures:

1910.134(h)(4)(i)

Repairs or adjustments to respirators are to be made only by persons appropriately trained to perform such operations and shall use only the respirator manufacturer's NIOSH-approved parts designed for the respirator;

1910.134(h)(4)(ii)

Repairs shall be made according to the manufacturer's recommendations and specifications for the type and extent of repairs to be performed; and

1910.134(h)(4)(iii)

Reducing and admission valves, regulators, and alarms shall be adjusted or repaired only by the manufacturer or a technician trained by the manufacturer.

1910.134(i)

Breathing air quality and use. This paragraph requires the employer to

provide employees using atmosphere-supplying respirators (supplied-air and SCBA) with breathing gases of high purity.

1910.134(i)(1)

The employer shall ensure that compressed air, compressed oxygen, liquid air, and liquid oxygen used for respiration accords with the following specifications:

1910.134(i)(1)(i)

Compressed and liquid oxygen shall meet the United States Pharmacopoeia requirements for medical or breathing oxygen; and

1910.134(i)(1)(ii)

Compressed breathing air shall meet at least the requirements for Grade D breathing air described in ANSI/Compressed Gas Association Commodity Specification for Air, G-7.1-1989, to include:

1910.134(i)(1)(ii)(A)

Oxygen content (v/v) of 19.5-23.5%;

1910.134(i)(1)(ii)(B)

Hydrocarbon (condensed) content of 5 milligrams per cubic meter of air or less;

1910.134(i)(1)(ii)(C)

Carbon monoxide (CO) content of 10 ppm or less;

1910.134(i)(1)(ii)(D)

Carbon dioxide content of 1,000 ppm or less; and

1910.134(i)(1)(ii)(E)

Lack of noticeable odor.

1910.134(i)(2)

The employer shall ensure that compressed oxygen is not used in atmosphere-supplying respirators that have previously used compressed air.

1910.134(i)(3)

The employer shall ensure that oxygen concentrations greater than 23.5% are used only in equipment designed for oxygen service or distribution.

1910.134(i)(4)

The employer shall ensure that cylinders used to supply breathing air to respirators meet the following requirements:

1910.134(i)(4)(i)

Cylinders are tested and maintained as prescribed in the Shipping Container Specification Regulations of the Department of Transportation (49 CFR part 173 and part 178);

1910.134(i)(4)(ii)

Cylinders of purchased breathing air have a certificate of analysis from the supplier that the breathing air meets the requirements for Grade D breathing air; and

1910.134(i)(4)(iii)

The moisture content in the cylinder does not exceed a dew point of -50 deg.F (-45.6 deg.C) at 1 atmosphere pressure.

1910.134(i)(5)

The employer shall ensure that compressors used to supply breathing air to respirators are constructed and situated so as to:

1910.134(i)(5)(i)

Prevent entry of contaminated air into the air-supply system;

1910.134(i)(5)(ii)

Minimize moisture content so that the dew point at 1 atmosphere pressure is 10 degrees F (5.56 deg.C) below the ambient temperature;

1910.134(i)(5)(iii)

Have suitable in-line air-purifying sorbent beds and filters to further ensure breathing air quality. Sorbent beds and filters shall be maintained and replaced or refurbished periodically following the manufacturer's instructions.

1910.134(i)(5)(iv)

Have a tag containing the most recent change date and the signature of the person authorized by the employer to perform the change. The tag shall be maintained at the compressor.

1910.134(i)(6)

For compressors that are not oil-lubricated, the employer shall ensure that carbon monoxide levels in the breathing air do not exceed 10 ppm.

1910.134(i)(7)

For oil-lubricated compressors, the employer shall use a high-temperature or carbon monoxide alarm, or both, to monitor carbon monoxide levels. If only high-temperature alarms are used, the air supply shall be monitored at intervals sufficient to prevent carbon monoxide in the breathing air from

exceeding 10 ppm.

1910.134(i)(8)

The employer shall ensure that breathing air couplings are incompatible with outlets for nonrespirable worksite air or other gas systems. No asphyxiating substance shall be introduced into breathing air lines.

1910.134(i)(9)

The employer shall use breathing gas containers marked in accordance with the NIOSH respirator certification standard, 42 CFR part 84.

1910.134(j)

Identification of filters, cartridges, and canisters. The employer shall ensure that all filters, cartridges and canisters used in the workplace are labeled and color coded with the NIOSH approval label and that the label is not removed and remains legible.

1910.134(k)

Training and information. This paragraph requires the employer to provide effective training to employees who are required to use respirators. The training must be comprehensive, understandable, and recur annually, and more often if necessary. This paragraph also requires the employer to provide the basic information on respirators in Appendix D of this section to employees who wear respirators when not required by this section or by the employer to do so.

1910.134(k)(1)

The employer shall ensure that each employee can demonstrate knowledge of at least the following:

1910.134(k)(1)(i)

Why the respirator is necessary and how improper fit, usage, or maintenance can compromise the protective effect of the respirator;

1910.134(k)(1)(ii)

What the limitations and capabilities of the respirator are;

1910.134(k)(1)(iii)

How to use the respirator effectively in emergency situations, including situations in which the respirator malfunctions;

1910.134(k)(1)(iv)

How to inspect, put on and remove, use, and check the seals of the respirator;

1910.134(k)(1)(v)

What the procedures are for maintenance and storage of the respirator;

1910.134(k)(1)(vi)

How to recognize medical signs and symptoms that may limit or prevent the effective use of respirators; and

1910.134(k)(1)(vii)

The general requirements of this section.

1910.134(k)(2)

The training shall be conducted in a manner that is understandable to the employee.

1910.134(k)(3)

The employer shall provide the training prior to requiring the employee to use a respirator in the workplace.

1910.134(k)(4)

An employer who is able to demonstrate that a new employee has received training within the last 12 months that addresses the elements specified in paragraph (k)(1)(i) through (vii) is not required to repeat such training provided that, as required by paragraph (k)(1), the employee can demonstrate knowledge of those element(s). Previous training not repeated initially by the employer must be provided no later than 12 months from the date of the previous training.

1910.134(k)(5)

Retraining shall be administered annually, and when the following situations occur:

1910.134(k)(5)(i)

Changes in the workplace or the type of respirator render previous training obsolete;

1910.134(k)(5)(ii)

Inadequacies in the employee's knowledge or use of the respirator indicate that the employee has not retained the requisite understanding or skill; or

1910.134(k)(5)(iii)

Any other situation arises in which retraining appears necessary to ensure safe respirator use.

910.134(k)(6)

The basic advisory information on respirators, as presented in Appendix D of

this section, shall be provided by the employer in any written or oral format, to employees who wear respirators when such use is not required by this section or by the employer.

1910.134(l)

Program evaluation. This section requires the employer to conduct evaluations of the workplace to ensure that the written respiratory protection program is being properly implemented, and to consult employees to ensure that they are using the respirators properly.

1910.134(l)(1)

The employer shall conduct evaluations of the workplace as necessary to ensure that the provisions of the current written program are being effectively implemented and that it continues to be effective.

1910.134(l)(2)

The employer shall regularly consult employees required to use respirators to assess the employees' views on program effectiveness and to identify any problems. Any problems that are identified during this assessment shall be corrected. Factors to be assessed include, but are not limited to:

1910.134(l)(2)(i)

Respirator fit (including the ability to use the respirator without interfering with effective workplace performance);

1910.134(l)(2)(ii)

Appropriate respirator selection for the hazards to which the employee is exposed;

1910.134(l)(2)(iii)

Proper respirator use under the workplace conditions the employee encounters; and

1910.134(l)(2)(iv)

Proper respirator maintenance.

1910.134(m)

Recordkeeping. This section requires the employer to establish and retain written information regarding medical evaluations, fit testing, and the respirator program. This information will facilitate employee involvement in the respirator program, assist the employer in auditing the adequacy of the program, and provide a record for compliance determinations by OSHA.

910.134(m)(1)

Medical evaluation. Records of medical evaluations required by this section

must be retained and made available in accordance with 29 CFR 1910.1020.

1910.134(m)(2)

Fit testing.

1910.134(m)(2)(i)

The employer shall establish a record of the qualitative and quantitative fit tests administered to an employee including:

1910.134(m)(2)(i)(A)

The name or identification of the employee tested;

1910.134(m)(2)(i)(B)

Type of fit test performed;

1910.134(m)(2)(i)(C)

Specific make, model, style, and size of respirator tested;

1910.134(m)(2)(i)(D)

Date of test; and

1910.134(m)(2)(i)(E)

The pass/fail results for QLFTs or the fit factor and strip chart recording or other recording of the test results for QNFTs.

1910.134(m)(2)(ii)

Fit test records shall be retained for respirator users until the next fit test is administered.

1910.134(m)(3)

A written copy of the current respirator program shall be retained by the employer.

1910.134(m)(4)

Written materials required to be retained under this paragraph shall be made available upon request to affected employees and to the Assistant Secretary or designee for examination and copying.

1910.134(n)

[Reserved]

1910.134(o)

Appendices.

1910.134(o)(1)

Compliance with Appendix A, Appendix B-1, Appendix B-2, and Appendix C of this section is mandatory.

1910.134(o)(2)

Appendix D of this section is non-mandatory and is not intended to create any additional obligations not otherwise imposed or to detract from any existing obligations.

[63 FR 1152, Jan. 8, 1998; 63 FR 20098, April 23, 1998; 71 FR 16672, April 3, 2006]

Next Standard (1910.134 App A)

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Regulations (Standards - 29 CFR)

User Seal Check Procedures (Mandatory). - 1910.134 App B-1

Regulations (Standards - 29 CFR) - Table of Contents

• **Part Number:**	1910
• **Part Title:**	Occupational Safety and Health Standards
• **Subpart:**	I
• **Subpart Title:**	Personal Protective Equipment
• **Standard Number:**	1910.134 App B-1
• **Title:**	User Seal Check Procedures (Mandatory).

Appendix B-1 to § 1910.134: User Seal Check Procedures (Mandatory)

The individual who uses a tight-fitting respirator is to perform a user seal check to ensure that an adequate seal is achieved each time the respirator is put on. Either the positive and negative pressure checks listed in this appendix, or the respirator manufacturer's recommended user seal check method shall be used. User seal checks are not substitutes for qualitative or quantitative fit tests.

I. Facepiece Positive and/or Negative Pressure Checks

A. *Positive pressure check.* Close off the exhalation valve and exhale gently into the facepiece. The face fit is considered satisfactory if a slight positive pressure can be built up inside the facepiece without any evidence of outward leakage of air at the seal. For most respirators this method of leak testing requires the wearer to first remove the exhalation valve cover before closing off the exhalation valve and then carefully replacing it after the test.

B. *Negative pressure check.* Close off the inlet opening of the canister or cartridge(s) by covering with the palm of the hand(s) or by replacing the filter seal(s), inhale gently so that the facepiece collapses slightly, and hold the breath for ten seconds. The design of the inlet opening of some cartridges cannot be effectively covered with the palm of the hand. The test can be performed by covering the inlet opening of the cartridge with a thin latex or nitrile glove. If the facepiece remains in its slightly collapsed condition and no inward leakage of air is detected, the tightness of the respirator is considered satisfactory.

II. Manufacturer's Recommended User Seal Check Procedures

The respirator manufacturer's recommended procedures for performing a user seal check may be used instead of the positive and/or negative pressure check procedures provided that the employer demonstrates that the manufacturer's procedures are equally effective.

[63 FR 1152, Jan. 8, 1998]

Next Standard (1910.134 App B-2)

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Regulations (Standards - 29 CFR)

Respirator Cleaning Procedures (Mandatory). - 1910.134 App B-2

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• **Part Number:**	1910
• **Part Title:**	Occupational Safety and Health Standards
• **Subpart:**	I
• **Subpart Title:**	Personal Protective Equipment
• **Standard Number:**	1910.134 App B-2
• **Title:**	Respirator Cleaning Procedures (Mandatory).

Appendix B-2 to § 1910.134: Respirator Cleaning Procedures (Mandatory)

These procedures are provided for employer use when cleaning respirators. They are general in nature, and the employer as an alternative may use the cleaning recommendations provided by the manufacturer of the respirators used by their employees, provided such procedures are as effective as those listed here in Appendix B- 2. Equivalent effectiveness simply means that the procedures used must accomplish the objectives set forth in Appendix B-2, i.e., must ensure that the respirator is properly cleaned and disinfected in a manner that prevents damage to the respirator and does not cause harm to the user.

I. Procedures for Cleaning Respirators

A. Remove filters, cartridges, or canisters. Disassemble facepieces by removing speaking diaphragms, demand and pressure- demand valve assemblies, hoses, or any components recommended by the manufacturer. Discard or repair any defective parts.

B. Wash components in warm (43 deg. C [110 deg. F] maximum) water with a mild detergent or with a cleaner recommended by the manufacturer. A stiff bristle (not wire) brush may be used to facilitate the removal of dirt.

C. Rinse components thoroughly in clean, warm (43 deg. C [110 deg. F] maximum), preferably running water. Drain.

D. When the cleaner used does not contain a disinfecting agent, respirator components should be immersed for two minutes in one of the following:

1. Hypochlorite solution (50 ppm of chlorine) made by adding approximately one milliliter of laundry bleach to one liter of water at 43 deg. C (110 deg. F); or,

2. Aqueous solution of iodine (50 ppm iodine) made by adding approximately 0.8 milliliters of tincture of iodine (6-8 grams ammonium and/or potassium iodide/100 cc of 45% alcohol) to one liter of water at 43 deg. C (110 deg. F); or,

3. Other commercially available cleansers of equivalent disinfectant quality when used as directed, if their use is recommended or approved by the respirator manufacturer.

E. Rinse components thoroughly in clean, warm (43 deg. C [110 deg. F] maximum), preferably running water. Drain. The importance of thorough rinsing cannot be overemphasized. Detergents or disinfectants that dry on facepieces may result in dermatitis. In addition, some disinfectants may cause deterioration of rubber or corrosion of metal parts if not completely removed.

F. Components should be hand-dried with a clean lint-free cloth or air-dried.

G. Reassemble facepiece, replacing filters, cartridges, and canisters where necessary.

H. Test the respirator to ensure that all components work properly.

[63 FR 1152, Jan. 8, 1998]

Next Standard (1910.134 App C)

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Regulations (Standards - 29 CFR)

OSHA Respirator Medical Evaluation Questionnaire (Mandatory). - 1910.134 App C

Regulations (Standards - 29 CFR) - Table of Contents

• **Part Number:**	1910
• **Part Title:**	Occupational Safety and Health Standards
• **Subpart:**	I
• **Subpart Title:**	Personal Protective Equipment
• **Standard Number:**	1910.134 App C
• **Title:**	OSHA Respirator Medical Evaluation Questionnaire (Mandatory).

Appendix C to Sec. 1910.134: OSHA Respirator Medical Evaluation Questionnaire (Mandatory)

To the employer: Answers to questions in Section 1, and to question 9 in Section 2 of Part A, do not require a medical examination.

To the employee:

Can you read (circle one): Yes/No

Your employer must allow you to answer this questionnaire during normal working hours, or at a time and place that is convenient to you. To maintain your confidentiality, your employer or supervisor must not look at or review your answers, and your employer must tell you how to deliver or send this questionnaire to the health care professional who will review it.

Part A. Section 1. (Mandatory) The following information must be provided by every employee who has been selected to use any type of respirator (please print).

1. Today's date:_____

2. Your name:_____

3. Your age (to nearest year):_____

4. Sex (circle one): Male/Female

5. Your height: _____ ft. _____ in.

6. Your weight: _____ lbs.

7. Your job title:_____

8. A phone number where you can be reached by the health care professional who reviews this questionnaire (include the Area Code): _____

9. The best time to phone you at this number: _____

10. Has your employer told you how to contact the health care professional who will review this questionnaire (circle one): Yes/No

11. Check the type of respirator you will use (you can check more than one category):
a. _____ N, R, or P disposable respirator (filter-mask, non- cartridge type only).
b. _____ Other type (for example, half- or full-facepiece type, powered-air purifying, supplied-air, self-contained breathing apparatus).

12. Have you worn a respirator (circle one): Yes/No

If "yes," what type(s):_____

_____

Part A. Section 2. (Mandatory) Questions 1 through 9 below must be answered by every employee who has been selected to use any type of respirator (please circle "yes" or "no").

1. Do you **currently** smoke tobacco, or have you smoked tobacco in the last month: Yes/No

2. Have you **ever had** any of the following conditions?

a. Seizures (fits): Yes/No
b. Diabetes (sugar disease): Yes/No
c. Allergic reactions that interfere with your breathing: Yes/No
d. Claustrophobia (fear of closed-in places): Yes/No
e. Trouble smelling odors: Yes/No

3. Have you **ever had** any of the following pulmonary or lung problems?

a. Asbestosis: Yes/No
b. Asthma: Yes/No
c. Chronic bronchitis: Yes/No
d. Emphysema: Yes/No
e. Pneumonia: Yes/No
f. Tuberculosis: Yes/No
g. Silicosis: Yes/No
h. Pneumothorax (collapsed lung): Yes/No
i. Lung cancer: Yes/No
j. Broken ribs: Yes/No
k. Any chest injuries or surgeries: Yes/No
l. Any other lung problem that you've been told about: Yes/No

4. Do you **currently** have any of the following symptoms of pulmonary or lung illness?

a. Shortness of breath: Yes/No
b. Shortness of breath when walking fast on level ground or walking up a slight hill or incline: Yes/No
c. Shortness of breath when walking with other people at an ordinary pace on level ground: Yes/No

d. Have to stop for breath when walking at your own pace on level ground: Yes/No
e. Shortness of breath when washing or dressing yourself: Yes/No
f. Shortness of breath that interferes with your job: Yes/No
g. Coughing that produces phlegm (thick sputum): Yes/No
h. Coughing that wakes you early in the morning: Yes/No
i. Coughing that occurs mostly when you are lying down: Yes/No
j. Coughing up blood in the last month: Yes/No
k. Wheezing: Yes/No
l. Wheezing that interferes with your job: Yes/No
m. Chest pain when you breathe deeply: Yes/No
n. Any other symptoms that you think may be related to lung problems: Yes/No

5. Have you **ever had** any of the following cardiovascular or heart problems?

a. Heart attack: Yes/No
b. Stroke: Yes/No
c. Angina: Yes/No
d. Heart failure: Yes/No
e. Swelling in your legs or feet (not caused by walking): Yes/No
f. Heart arrhythmia (heart beating irregularly): Yes/No
g. High blood pressure: Yes/No
h. Any other heart problem that you've been told about: Yes/No

6. Have you **ever had** any of the following cardiovascular or heart symptoms?

a. Frequent pain or tightness in your chest: Yes/No
b. Pain or tightness in your chest during physical activity: Yes/No
c. Pain or tightness in your chest that interferes with your job: Yes/No
d. In the past two years, have you noticed your heart skipping or missing a beat: Yes/No
e. Heartburn or indigestion that is not related to eating: Yes/ No
f. Any other symptoms that you think may be related to heart or circulation problems: Yes/No

7. Do you **currently** take medication for any of the following problems?

a. Breathing or lung problems: Yes/No
b. Heart trouble: Yes/No
c. Blood pressure: Yes/No
d. Seizures (fits): Yes/No

8. If you've used a respirator, have you **ever had** any of the following problems? (If you've never used a respirator, check the following space and go to question 9:)

a. Eye irritation: Yes/No
b. Skin allergies or rashes: Yes/No
c. Anxiety: Yes/No
d. General weakness or fatigue: Yes/No
e. Any other problem that interferes with your use of a respirator: Yes/No

9. Would you like to talk to the health care professional who will review this questionnaire about your answers to this questionnaire: Yes/No

Questions 10 to 15 below must be answered by every employee who has been selected to use either a full-facepiece respirator or a self-contained breathing apparatus (SCBA). For employees

who have been selected to use other types of respirators, answering these questions is voluntary.

10. Have you **ever lost** vision in either eye (temporarily or permanently): Yes/No

11. Do you **currently** have any of the following vision problems?

a. Wear contact lenses: Yes/No
b. Wear glasses: Yes/No
c. Color blind: Yes/No
d. Any other eye or vision problem: Yes/No

12. Have you **ever had** an injury to your ears, including a broken ear drum: Yes/No

13. Do you **currently** have any of the following hearing problems?

a. Difficulty hearing: Yes/No
b. Wear a hearing aid: Yes/No
c. Any other hearing or ear problem: Yes/No

14. Have you **ever had** a back injury: Yes/No

15. Do you **currently** have any of the following musculoskeletal problems?

a. Weakness in any of your arms, hands, legs, or feet: Yes/No
b. Back pain: Yes/No
c. Difficulty fully moving your arms and legs: Yes/No
d. Pain or stiffness when you lean forward or backward at the waist: Yes/No
e. Difficulty fully moving your head up or down: Yes/No
f. Difficulty fully moving your head side to side: Yes/No
g. Difficulty bending at your knees: Yes/No
h. Difficulty squatting to the ground: Yes/No
i. Climbing a flight of stairs or a ladder carrying more than 25 lbs: Yes/No
j. Any other muscle or skeletal problem that interferes with using a respirator: Yes/No

Part B Any of the following questions, and other questions not listed, may be added to the questionnaire at the discretion of the health care professional who will review the questionnaire.

1. In your present job, are you working at high altitudes (over 5,000 feet) or in a place that has lower than normal amounts of oxygen: Yes/No

If "yes," do you have feelings of dizziness, shortness of breath, pounding in your chest, or other symptoms when you're working under these conditions: Yes/No

2. At work or at home, have you ever been exposed to hazardous solvents, hazardous airborne chemicals (e.g., gases, fumes, or dust), or have you come into skin contact with hazardous chemicals: Yes/No

If "yes," name the chemicals if you know them:_____

_____

_____

3. Have you ever worked with any of the materials, or under any of the conditions, listed below:

a. Asbestos: Yes/No
b. Silica (**e.g.**, in sandblasting): Yes/No
c. Tungsten/cobalt (e.g., grinding or welding this material): Yes/No
d. Beryllium: Yes/No
e. Aluminum: Yes/No
f. Coal (for example, mining): Yes/No
g. Iron: Yes/No
h. Tin: Yes/No
i. Dusty environments: Yes/No
j. Any other hazardous exposures: Yes/No

If "yes," describe these exposures:_____

_____

_____

4. List any second jobs or side businesses you have:_____

_____

5. List your previous occupations:_____

_____

6. List your current and previous hobbies:_____

_____

7. Have you been in the military services? Yes/No

If "yes," were you exposed to biological or chemical agents (either in training or combat): Yes/No

8. Have you ever worked on a HAZMAT team? Yes/No

9. Other than medications for breathing and lung problems, heart trouble, blood pressure, and seizures mentioned earlier in this questionnaire, are you taking any other medications for any reason (including over-the-counter medications): Yes/No

If "yes," name the medications if you know them:_____

10. Will you be using any of the following items with your respirator(s)?

a. HEPA Filters: Yes/No
b. Canisters (for example, gas masks): Yes/No
c. Cartridges: Yes/No

11. How often are you expected to use the respirator(s) (circle "yes" or "no" for all answers that apply to you)?:

a. Escape only (no rescue): Yes/No
b. Emergency rescue only: Yes/No
c. Less than 5 hours **per week:** Yes/No
d. Less than 2 hours **per day:** Yes/No
e. 2 to 4 hours per day: Yes/No
f. Over 4 hours per day: Yes/No

12. During the period you are using the respirator(s), is your work effort:

a. **Light** (less than 200 kcal per hour): Yes/No

If "yes," how long does this period last during the average shift:_____hrs._____mins.

Examples of a light work effort are **sitting** while writing, typing, drafting, or performing light assembly work; or **standing** while operating a drill press (1-3 lbs.) or controlling machines.

b. **Moderate** (200 to 350 kcal per hour): Yes/No

If "yes," how long does this period last during the average shift:_____hrs._____mins.

Examples of moderate work effort are **sitting** while nailing or filing; **driving** a truck or bus in urban traffic; **standing** while drilling, nailing, performing assembly work, or transferring a moderate load (about 35 lbs.) at trunk level; **walking** on a level surface about 2 mph or down a 5-degree grade about 3 mph; or **pushing** a wheelbarrow with a heavy load (about 100 lbs.) on a level surface.

c. **Heavy** (above 350 kcal per hour): Yes/No

If "yes," how long does this period last during the average shift:_____hrs._____mins.

Examples of heavy work are **lifting** a heavy load (about 50 lbs.) from the floor to your waist or shoulder; working on a loading dock; **shoveling; standing** while bricklaying or chipping castings; **walking** up an 8-degree grade about 2 mph; climbing stairs with a heavy load (about 50 lbs.).

13. Will you be wearing protective clothing and/or equipment (other than the respirator) when you're using your respirator: Yes/No

If "yes," describe this protective clothing and/or equipment:_____

_____

14. Will you be working under hot conditions (temperature exceeding 77 deg. F): Yes/No

15. Will you be working under humid conditions: Yes/No

16. Describe the work you'll be doing while you're using your respirator(s):

_____

_____

17. Describe any special or hazardous conditions you might encounter when you're using your respirator(s) (for example, confined spaces, life-threatening gases):

_____

_____

18. Provide the following information, if you know it, for each toxic substance that you'll be exposed to when you're using your respirator(s):

Name of the first toxic substance: _____
Estimated maximum exposure level per shift: _____
Duration of exposure per shift: _____
Name of the second toxic substance: _____
Estimated maximum exposure level per shift: _____
Duration of exposure per shift: _____
Name of the third toxic substance: _____
Estimated maximum exposure level per shift: _____
Duration of exposure per shift: _____
The name of any other toxic substances that you'll be exposed to while using your respirator:

_____
_____
_____

19. Describe any special responsibilities you'll have while using your respirator(s) that may affect the safety and well-being of others (for example, rescue, security):

_____

[63 FR 1152, Jan. 8, 1998; 63 FR 20098, April 23, 1998]

Next Standard (1910.134 App D)

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Occupational Safety & Health Administration
200 Constitution Avenue, NW
Washington, DC 20210

FireHawk® M7 Air Mask Parts List

PARTS LIST

For More Information, call 1-800-MSA-2222 or Visit Our Website at www.MSAnet.com

MSA The Safety Company
MINE SAFETY APPLIANCES COMPANY
PITTSBURGH, PENNSYLVANIA, U.S.A. 15230

TAL 802 (L) Rev. 0

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FIREHAWK M7 CARRIER AND HARNESS

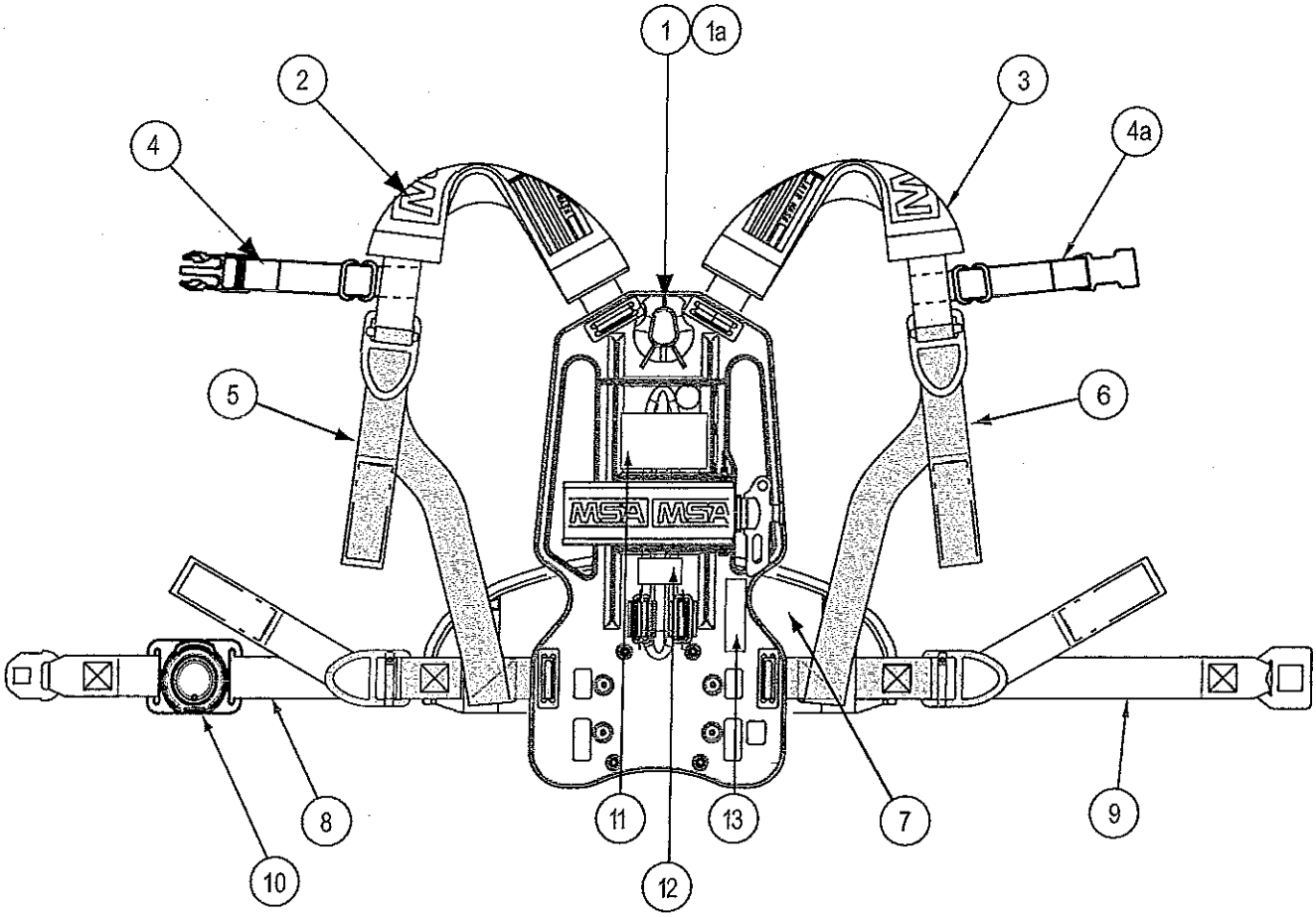
Replacement Kits

FireHawk M7 Carrier w/Labels (2216 psi/3000 psi)		
10090852	10083436	Carrier Assembly
	10084688	ID Label
	805430	Cylinder Band Label
	10084504	NIOSH Label
	10087472	CBRN Label
	10084687	NFPA Label
	10087293	FireHawk M7 Logo Label
FireHawk M7 Carrier w/Labels (4500 psi)		
10090853	10083436	Carrier Assembly
	10084688	ID Label
	805430	Cylinder Band Label
	10084504	NIOSH Label
	10087472	CBRN Label
	10084687	NFPA Label
	10087293	FireHawk M7 Logo Label
Chest Strap Replacement Kit		
10012167	818380	Left Chest Strap
	818379	Right Chest Strap
Strap and Belts		
10048173	10048173	Left Shoulder Strap
818381	818381	Right Shoulder Strap
10012167	10012167	Chest Strap
818378	818378	Left Double Pull Strap
818377	818377	Right Double Pull Strap
10083134	10083134	Swiveling Lumbar Pad
10025941	10025941	Left Double Pull Belt
10025942	10025942	Left Single Pull Belt (Not Shown)
818374	818374	Right Pull Belt
10022245	10022245	Belt Mount

Parts List

Item	P/N	Description
1	10086665	M7 Carrier & Harness w/ Chest Strap, 4500 psi
	10083129	M7 Carrier & Harness w/o Chest Strap, 4500 psi
	10086664	M7 Carrier & Harness w/ Chest Strap, 2216/3000 psi
	10083128	M7 Carrier & Harness w/o Chest Strap, 2216/3000 psi
	10086662	M7 Carrier & Harness w/ Chest Strap, Swiveling Lumbar, 4500 psi
	10086663	M7 Carrier & Harness w/ Chest Strap, Swiveling Lumbar, 2216/3000 psi
1a	10083436	M7 Backplate and Cylinder Band
2	10048173	Left Shoulder Strap
3	818381	Right Shoulder Strap
4	818380	Left Chest Strap
4a	818379	Right Chest Strap
5	818378	Left Double Pull Strap
6	818377	Right Double Pull Strap
7	10083134	Swiveling Lumbar Pad
8	10025941	Left Double Pull Belt
8a	10025942	Left Single Pull Belt (Not Shown)
9	818374	Right Pull Belt
10	10022245	Belt Mount
11	10084504	M7 NIOSH Label
12	10087472	CBRN Label
13	10084687	M7 NFPA Label

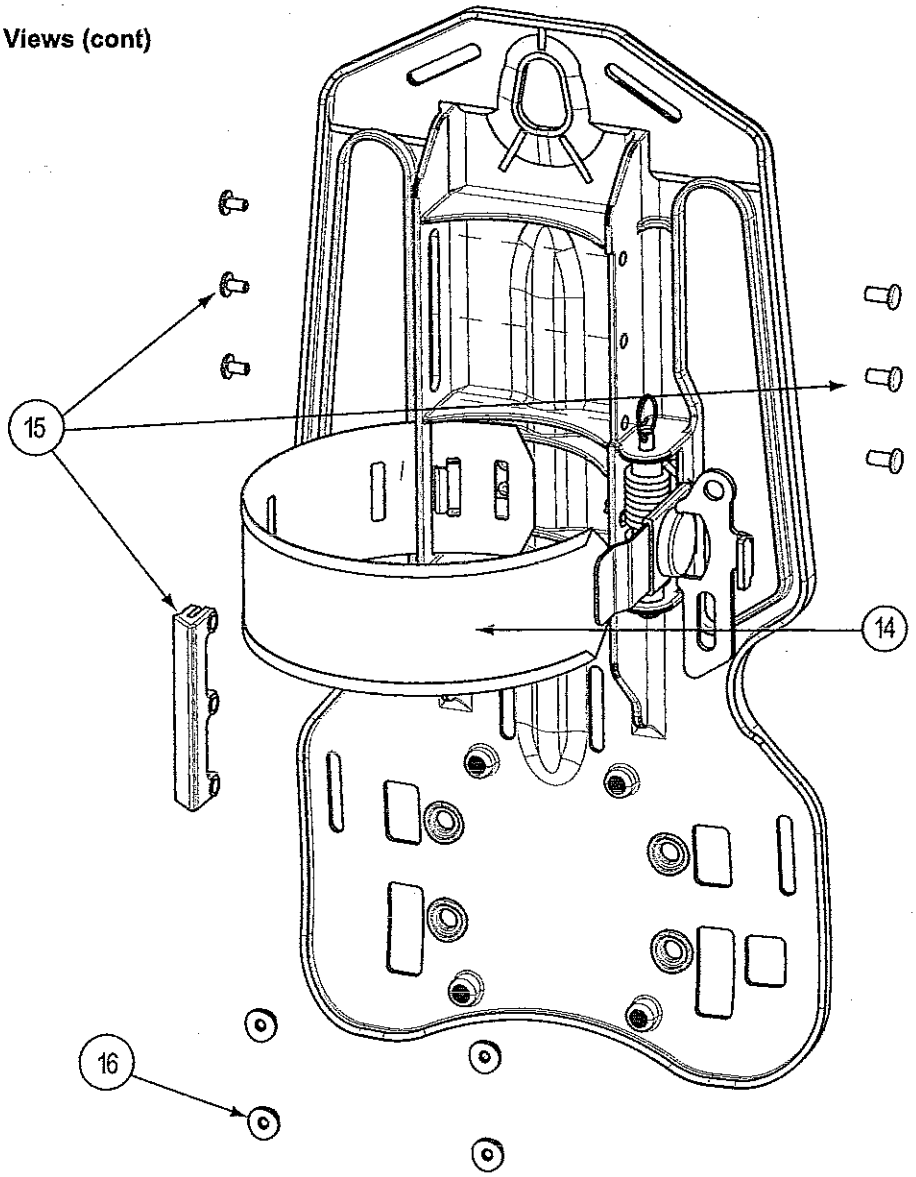
FIREHAWK M7 CARRIER AND HARNESS



Replacement Kits and Parts List (cont)

Item	P/N		Description
14	805430		Cylinder Band Label 2216/3000 psi
	805265		Cylinder Band Label 4500 psi
Cylinder Friction Pad Kit			
15	10086667	10084777	Binding Post with screws (3 req'd.)
		10083222	Friction Pad
Shock Mount Kit			
16	10090283	10083223	Shock Mounts (4 req'd.)

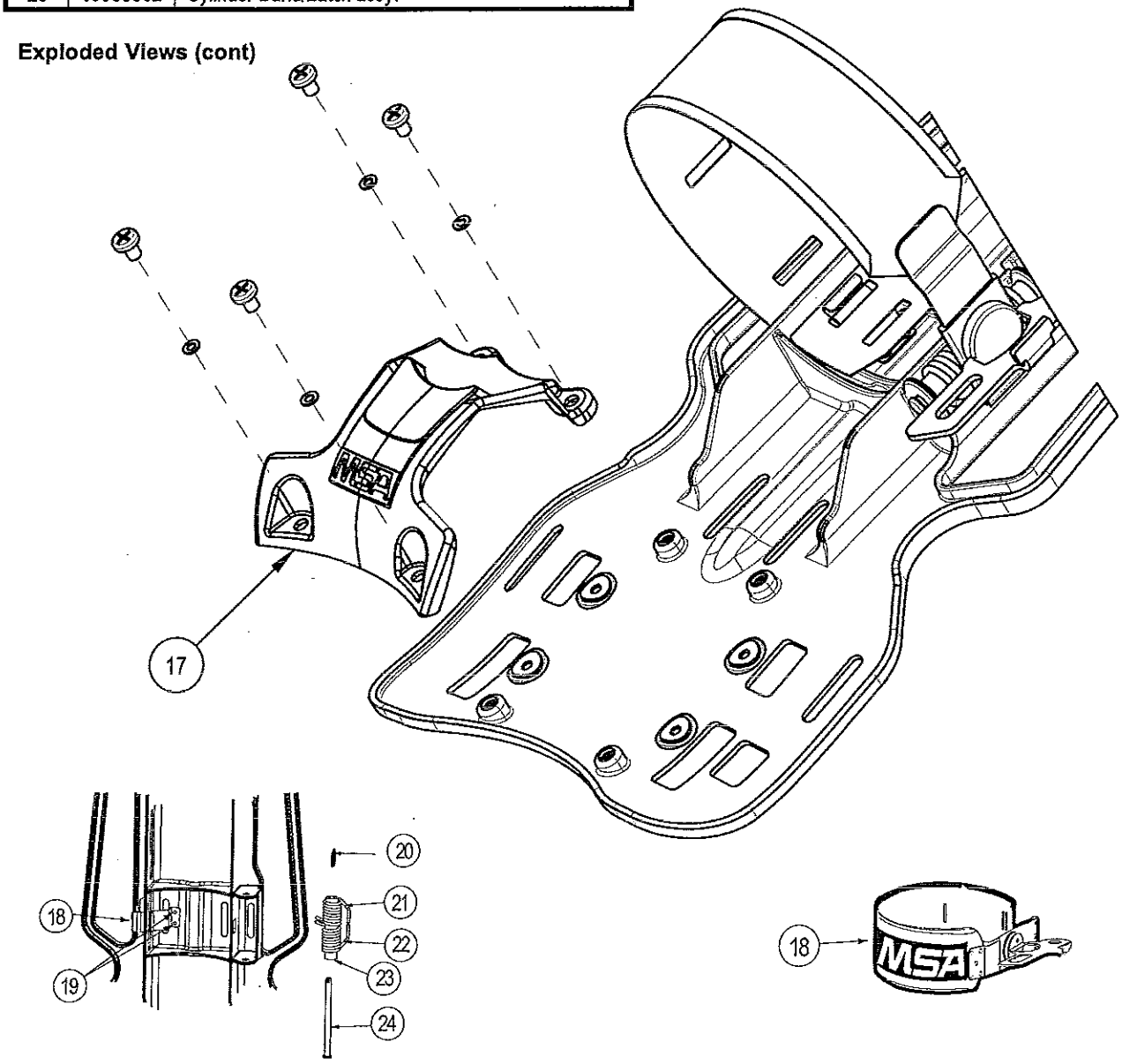
Exploded Views (cont)



Replacement Kits and Parts List (cont)

Item	P/N	Description	
17	10086666	10083225	Cylinder Stop Kit
		10084812	Screw (4 req'd.)
		10084815	Lock washer (4 req'd.)
18	10066867	Cylinder Band Adjuster	
19	10058780	Rivet (2 req'd.)	
20	10005952	Retaining Ring	
21	10012748	Spring (lower)	
22	10012749	Spring (upper)	
23	10005782	Bushing Spring	
24	10005950	Pin	
25	10050362	Cylinder Band/Latch assy.	

Exploded Views (cont)



FIREHAWK M7 AUID-LARM AUDIBLE ALARM

Replacement and Maintenance Kits: 2216/4500 psi

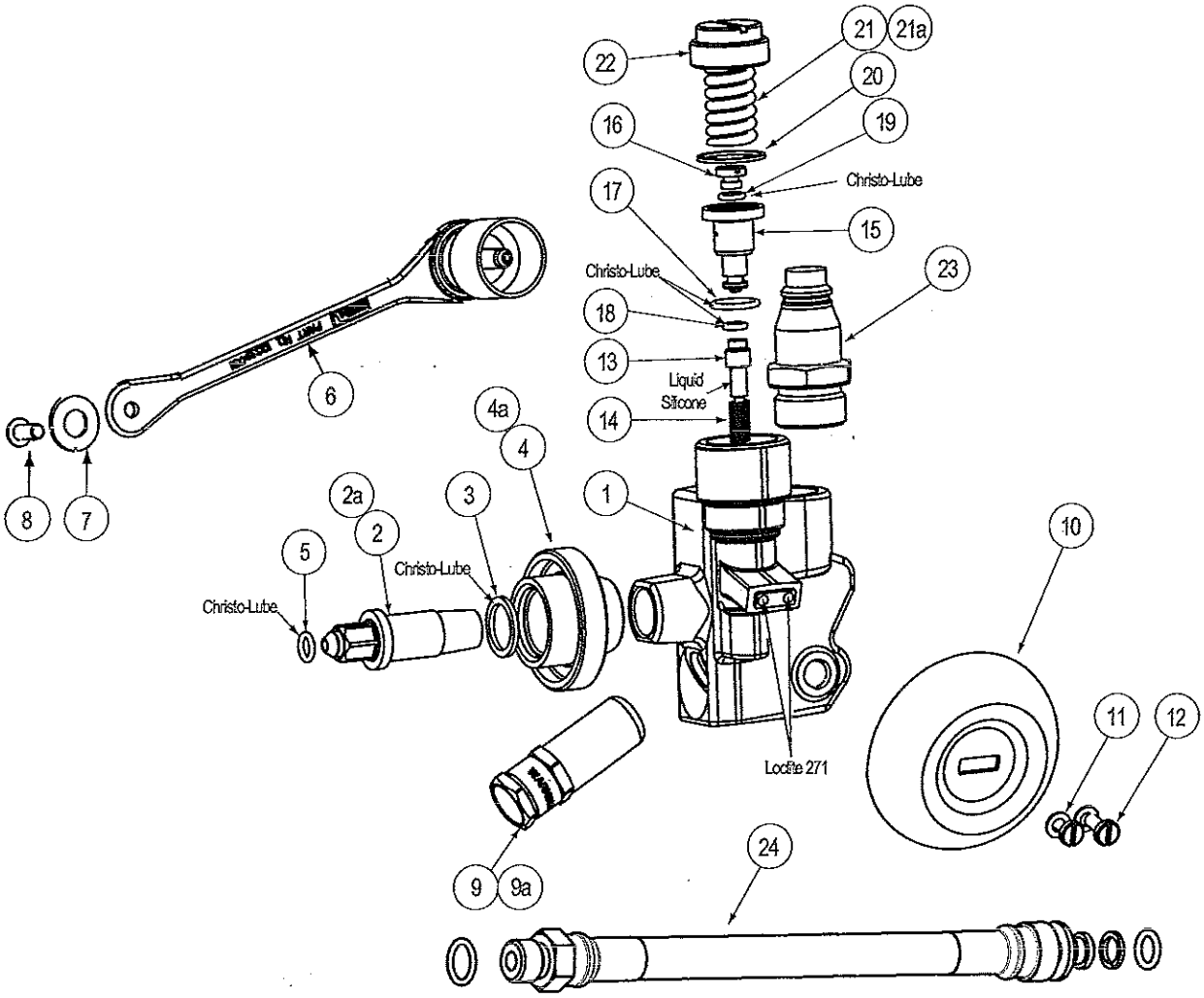
Audi-Larm Audible Alarm Replacement Kit		
10037310	Audi-Larm Audible Alarm 2216 psi, complete	
10037312	Audi-Larm Audible Alarm 4500 psi, complete	
Maintenance Kit		
10045831	635953	Piston Bore O-Ring
	635954	Piston Nose O-Ring
	66395	Piston Plug O-Ring
	85055	Striker Spring
	85051	Striker
	85053	Pellet
	68523	Retaining Ring
Bell Replacement Kit		
10090907	485829	Bell
	54197	Lock Washer Lock
	635245	Screw (2)
Piston Replacement Kit		
10090908	635953	Piston Bore O-Ring
	635954	Piston Nose O-Ring
	66395	Piston Plug O-Ring
	85052	Piston Plug
	85049	Piston Assembly
Striker Replacement Kit		
10044574	85051	Striker
	85053	Pellet
Dust Cover Replacement Kit		
10090909	10038031	Dust Cover Assembly
	10037952	Screw
	10041962	Washer
Audi-Larm O-Ring Replacement Kit		
10090910	633553	Nipple O-Ring Kit (pack of 10)

Parts List and Exploded View: 2216/4500 psi

Item	P/N	Description	Item	P/N	Description
1	**10038417**	Audi-Larm Body	15	**85049**	Piston Assembly
2	**10062086**	Fitting, Nipple, 2216 psi	16	**85052**	Piston Plug
2a	**10062087**	Fitting, Nipple, 4500 psi	17	**635953**	Piston Bore O-Ring
3	**93031**	Washer, CGA Nut	18	**635954**	Piston Nose O-Ring
4	**10062084**	Coupling Nut, 2216	19	**66395**	Piston Plug O-Ring
4a	**10062085**	Coupling Nut, 4500 psi	20	**68523**	Retaining Ring
5	**633553**	Nipple O-Ring	21	**455941**	Spring, 2216 psi
6	**10038031**	Dust Cover Assembly	21a	**474352**	Spring, 4500 psi
7	**10041011**	Washer	22	**474369**	Adjusting Nut
8	**10037952**	Screw	23	**485070**	UAC Adapter with O-Ring
9	**10036291**	Pressure Relief Valve* 2216 psi	24	**804382**	High Pressure Hose*
9a	**10036292**	Pressure Relief Valve* 4500 psi		**809028**	Christo-Lube Lubricant (2 cc tube)
10	**485829**	Bell		**28907**	Thread Tape
11	**54197**	Lock Washer (2)		**29787**	Loctite 222
12	**635245**	Screw, #8-32 x 7/16 LG (2)		**26875**	Loctite 271
13	**10044574**	Striker with Pellet		**494992**	Liquid Silicone Lubricant
14	**85055**	Striker Spring			

*Includes Back-Up and O-Rings as needed.

Exploded view: 2216/4500 psi



FIREHAWK M7 AUDI-LARM AUDIBLE ALARM

Replacement and Maintenance Kits: 3000 psi

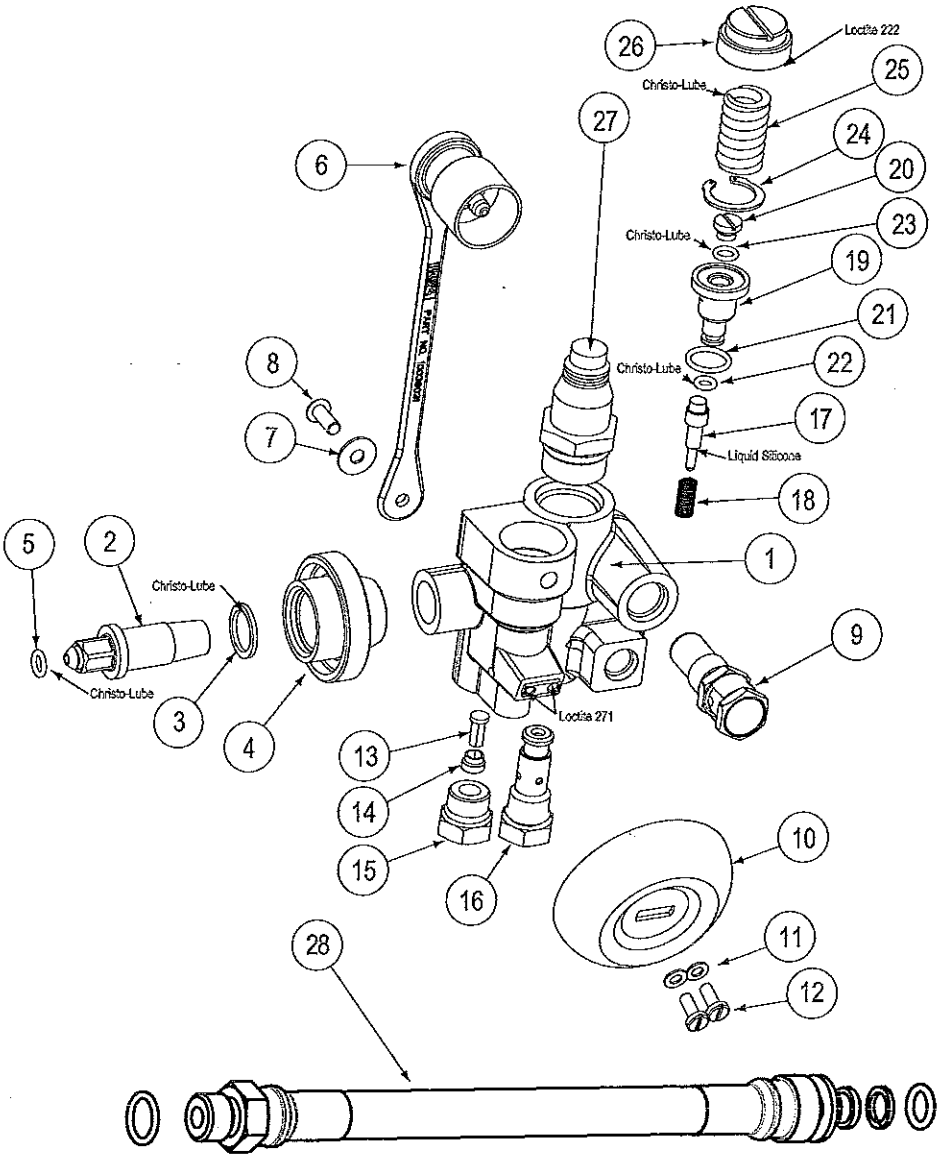
Audi-Larm Audible Alarm Replacement Kit		
10043947	Audi-Larm Audible Alarm 3000 psi, complete	
Maintenance Kit		
10045831	635953	Piston Bore O-Ring
	635954	Piston Nose O-Ring
	66395	Piston Plug O-Ring
	85055	Striker Spring
	68523	Retaining Ring
	809028	Christo-Lube Lubricant (2 cc tube)
	494992	Liquid Silicone Lubricant
Bell Replacement Kit		
10090907	485829	Bell
	54197	Washer, Lock, #8
	635245	Screw, #8-32 x 7/16 LG
Piston Replacement Kit		
10090908	635953	Piston Bore O-Ring
	635954	Piston Nose O-Ring
	66395	Piston Plug O-Ring
	85052	Plug, Piston
	85049	Piston Assembly
	604070	Christo-Lube Lubricant
Striker Replacement Kit		
10044574	85051	Striker
	85053	Pellet
	603342	Liquid Silicone Lubricant
Dust Cover Replacement Kit		
10090909	10038031	Dust Cover Assembly
	10037952	Screw, 10-32 UNF, SST
	10041962	Washer, Flat, SST
Audi-Larm O-Ring Replacement Kit		
10090910	633553	Nipple O-Ring Kit (pack of 10)

Parts list and Exploded View: 3000 psi

Item	P/N	Description	Item	P/N	Description
1	**10045593**	Audi-Larm Housing	17	**10044574**	Striker with Pellet
2	**10062086**	Nipple	18	**85055**	Striker Spring
3	**93031**	Washer, CGA Nut	19	**85049**	Piston Assembly
4	**10062084**	Coupling Nut	20	**85052**	Plug, Piston
5	**633553**	O-Ring, Nipple	21	**635953**	Piston Bore O-Ring
6	**10038031**	Dust Cover Assembly	22	**635954**	Piston Nose O-Ring
7	**10041962**	Washer, Flat, SST	23	**66395**	Piston Plug O-Ring
8	**10037952**	Screw, 10-32 UNF, SST	24	**68523**	Retaining Ring
9	**10036291**	Pressure Relief Valve*	25	**474352**	Spring
10	**485829**	Bell	26	**474369**	Adjusting Nut
11	**54197**	Washer, Lock, #8	27	**485070**	Quick-Fill Adapter
12	**635245**	Screw, #8-32 x 7/16 LG	28	**804382**	High Pressure Hose*
13	**476441**	Sintered Filter		**604070**	ChristoLube Lubricant
14	**80495**	Screen Holder		**29787**	Loctite 222
15	**10043943**	SAE Plug, Size 6 with O-Ring		**26875**	Loctite 271
16	**10043945**	Check Valve*		**494992**	Liquid Silicone Lubricant

*Includes Back-Up and O-Rings as needed.

Exploded view: 3000 psi



FIREHAWK M7 CONTROL MODULE

Replacement Kits

FireHawk M7Control Module Protective Boot Kit*		
10089272	Control Module Protective Boot Kit, w/ buttons	
FireHawk M7 Control Module Gauge & LCD Lens Covers		
10090220	Control Module Gauge & LCD Lens Covers, pack of 5 each	
FireHawk M7 Control Module Back-Up Ring Kit		
10090961	635277	pack of 10
FireHawk M7 Control Module O-Ring Kit		
10090962	638167	pack of 10
Jam Nut		
10090219	10003606	pack of 5

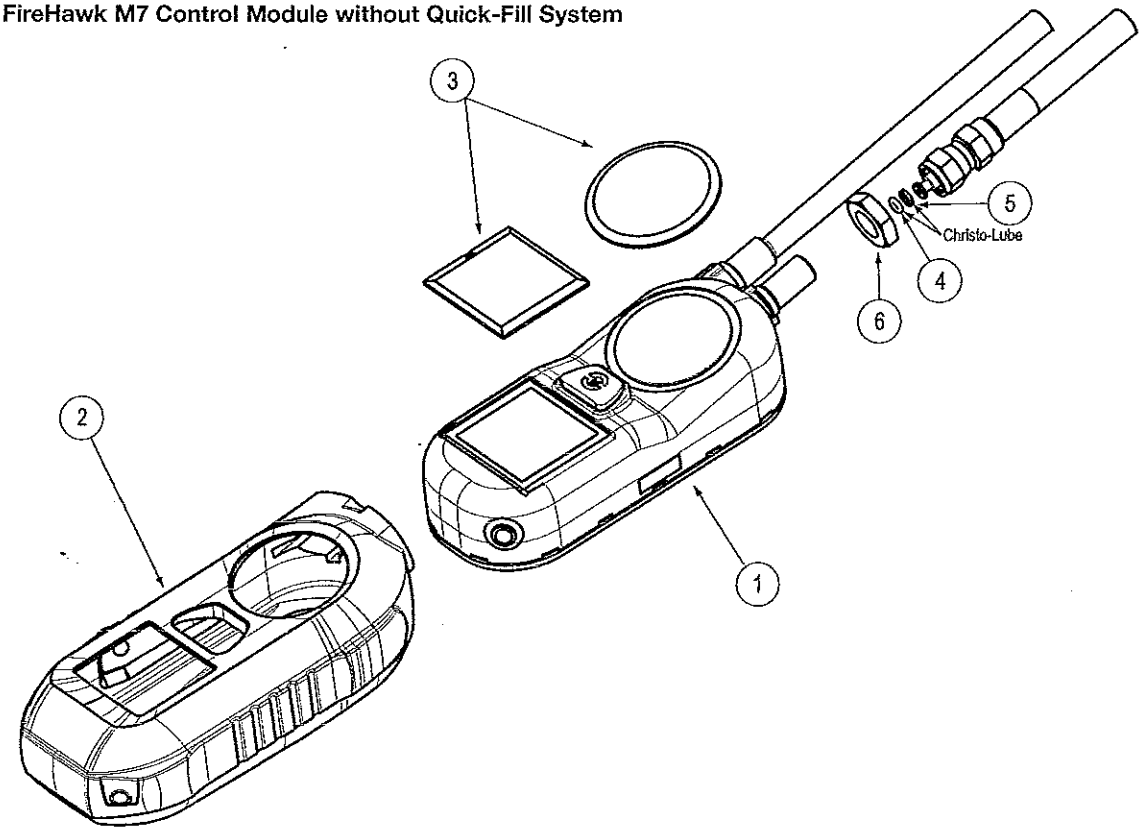
* For Control Modules without Quick-Fill® System only.

Parts List

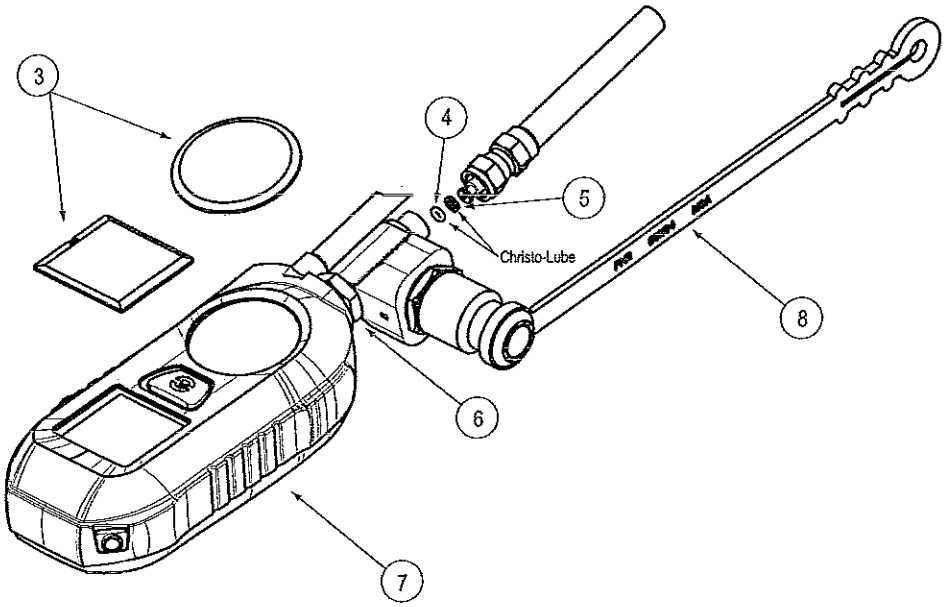
	Item	P/N	Description
Without Quick-Fill System	1	10091146	2216 psi w/ Thermistor*
		10091147	2216 psi*
		10091148	2216 psi w/Thermistor & Telemetry*
		10091149	2216 psi w/Telemetry*
		10091150	3000 psi w/Thermistor *
		10091201	3000 psi*
		10091202	3000 psi w/Thermistor & Telemetry*
		10091203	3000 psi w/Telemetry*
		10091204	4500 psi w/Thermistor*
		10091205	4500 psi*
		10091206	4500 psi w/Thermistor & Telemetry*
		10091207	4500 psi w/Telemetry*
	2	10089272	Control Module Protective Boot Kit, with buttons
	3	10090220	Control Module Gauge & LCD Lens Covers
	4	638167	O-Ring
	5	635277	Back-up Ring
	6	10003606	Jam nut
	Both	10016029	Tether
With Quick-Fill System	7	10091208	2216 psi w/Thermistor*
		10091209	2216 psi*
		10091210	2216 psi w/Thermistor & Telemetry*
		10091211	2216 psi w/Telemetry*
		10091212	4500 psi w/Thermistor*
		10091213	4500 psi*
		10091214	4500 psi w/Thermistor & Telemetry *
		10091215	4500 psi w/Telemetry*
	3	10090220	Control Module Gauge & LCD Lens Covers
	4	638167	O-Ring
	5	635277	Back-up Ring
	8	801164	Dust Cover

FIREHAWK M7 CONTROL MODULE

Exploded views
FireHawk M7 Control Module without Quick-Fill System



Exploded views
FireHawk M7 Control Module with Quick-Fill System



Cylinder and Valve Replacement Kits

P/N With air	P/N Less air	Description
809872	10033357	3AL Aluminum, 45 cu ft.*
469619	10033209	Hoop-wound, 45 cu ft.
807586	10033352	L-30 Stealth Carbon-wrapped.
816115	10033358	L-30+ Stealth Carbon-wrapped, 60 cu ft.
807587	10037095	H-30 Stealth Carbon-wrapped, 45 cu ft.
807570	10033356	H-45 Stealth Carbon-wrapped, 66 cu ft.
10035644	10040591	H-45 Low-Profile, Stealth Carbon-wrapped, 66 cu ft.
807588	10033355	H-60 Stealth Carbon-wrapped, 88 cu ft.

Cylinder Replacement Kits

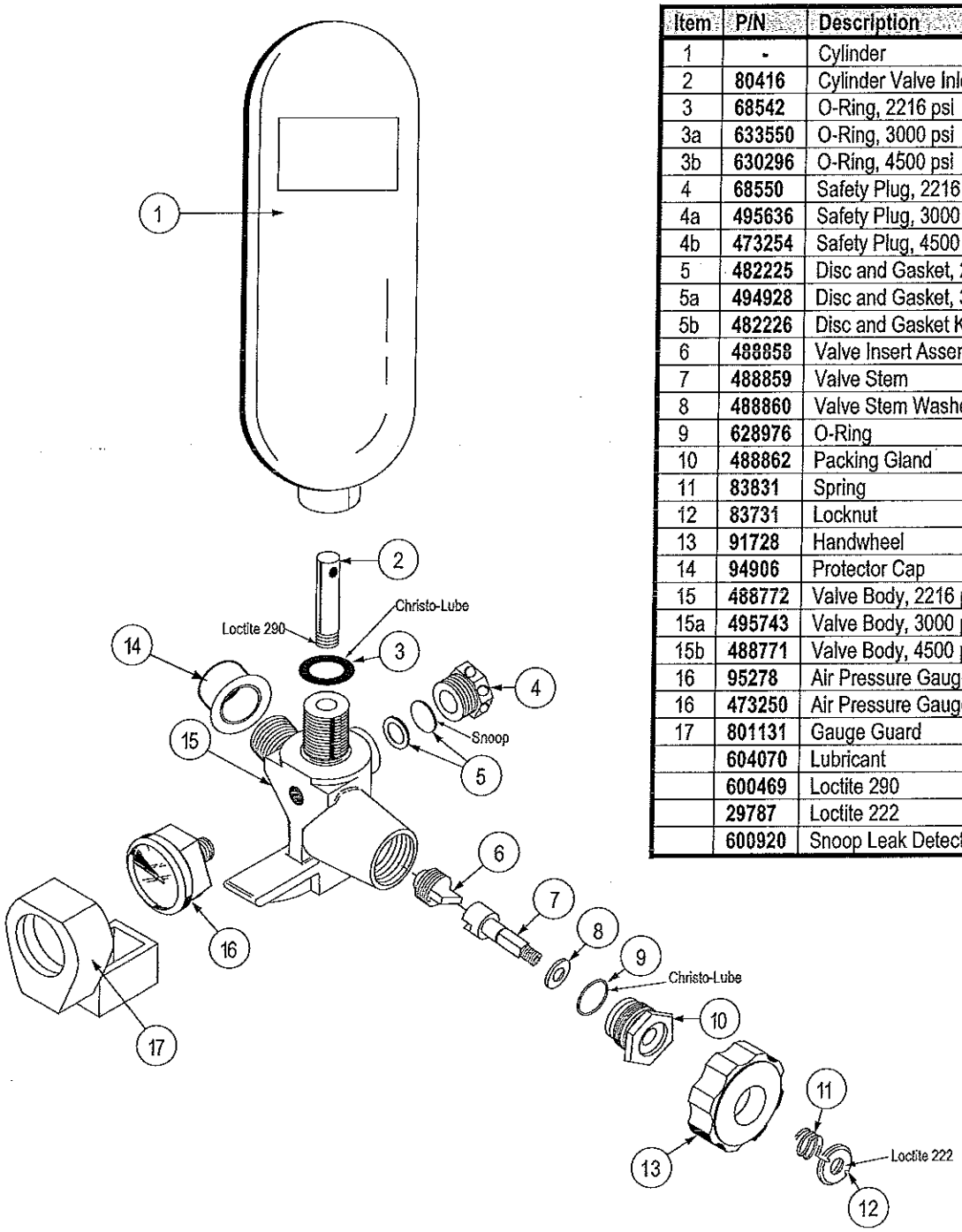
P/N	Description
814806	3AL Aluminum, 45 cu ft.*
811119	Hoop-wound, 45 cu ft.
816970	L-30 Stealth Carbon-wrapped.
816974	L-30+ Stealth Carbon-wrapped, 60 cu ft.
816972	H-30 Stealth Carbon-wrapped, 45 cu ft.
816973	H-45 Stealth Carbon-wrapped, 66 cu ft.
10044832	H-45 Low-Profile, Stealth Carbon-wrapped, 66 cu ft.
816971	H-60 Stealth Carbon-wrapped, 88 cu ft.

*Contact MSA Customer Service (1-800-MSA-2222) for approval information before ordering.

Cylinder Valve Replacement Kits

P/N	Description
488894	Cylinder Valve Assembly (2216 PSI)
494884	Cylinder Valve Assembly (3000 PSI)
488899	Cylinder Valve Assembly (4500 PSI)

FIREHAWK M7 CYLINDER AND VALVE



Parts list

Item	P/N	Description
1	-	Cylinder
2	80416	Cylinder Valve Inlet Tube
3	68542	O-Ring, 2216 psi
3a	633550	O-Ring, 3000 psi
3b	630296	O-Ring, 4500 psi
4	68550	Safety Plug, 2216 psi
4a	495636	Safety Plug, 3000 psi
4b	473254	Safety Plug, 4500 psi
5	482225	Disc and Gasket, 2216 psi
5a	494928	Disc and Gasket, 3000 psi
5b	482226	Disc and Gasket Kit, 4500 psi
6	488858	Valve Insert Assembly
7	488859	Valve Stem
8	488860	Valve Stem Washer
9	628976	O-Ring
10	488862	Packing Gland
11	83831	Spring
12	83731	Locknut
13	91728	Handwheel
14	94906	Protector Cap
15	488772	Valve Body, 2216 psi
15a	495743	Valve Body, 3000 psi
15b	488771	Valve Body, 4500 psi
16	95278	Air Pressure Gauge 2216/3000 psi
16	473250	Air Pressure Gauge, 4500 psi
17	801131	Gauge Guard
	604070	Lubricant
	600469	Loctite 290
	29787	Loctite 222
	600920	Snoop Leak Detector

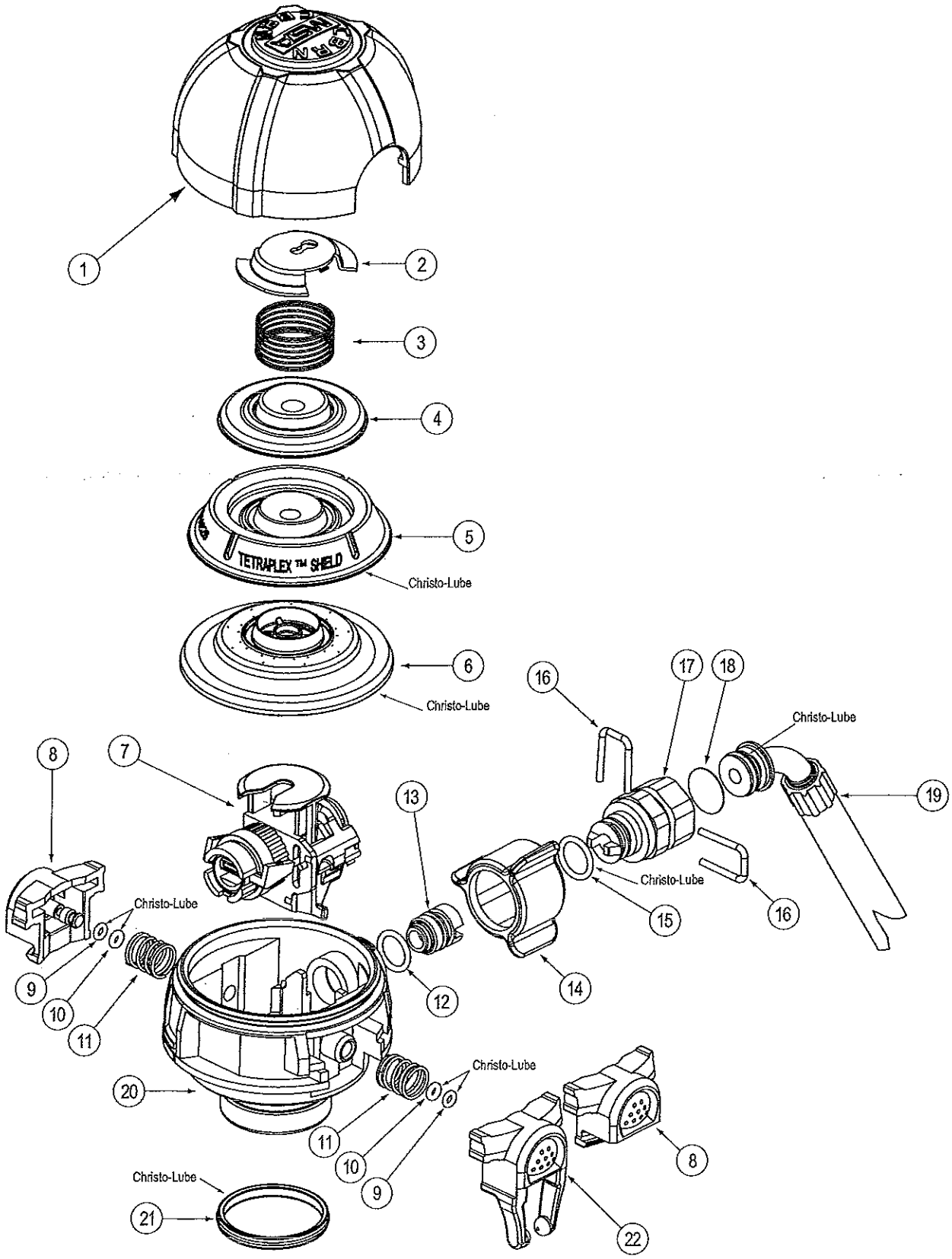
Standard Tools

Tool	Spec.	Drive	Type	
Wrench (open end)	7/16"			
	5/8"			
	11/16"			
	13/16"			
	7/8"			
Breaker bar		3/8"		
Socket adapters (Female to Male)		3/8" to 1/2"		
		1/2" to 3/4"		
Socket	7/16"	3/8"		6 point
	7/16"		Deep well	
	9/16"			
	11/16"			
	3/4"			
	7/8"		Deep well	
	1"		Deep well	
	1-5/8"	1/2" or 3/4"		6 point
Screwdriver Bit	No. 2	3/8"	Phillips	
Torque wrench	0-250 in lbs.	3/8"		
	10-100 ft lbs.			
Crowfoot	¾"	3/8"		
	5/8"			
	11/16"			
	13/16"			
	7/8"			
Hex Wrench	1/8"			
	1/4"			
	3/16"			
Screwdriver (Slot head)	1/8"			
	1/4"			
Pliers	Needle nose			
	Channel lock			
	Retaining ring		Convertible	
Nut driver	3/16"			

Special Tools, Adhesives, Lubricants, and Sealants

P/N	Description
636060	O-Ring Removal Tool
633411	Plastic Stick
28907	Teflon Tape
604070	Christo-Lube
600920	Snoop Leak Detector
29787	Loctite #222
26875	Loctite #271
466008	Locknut Wrench
494992	Silicone Lubricant
600469	Loctite 290
482426	Extraction Tool
10064117	PR14 First Stage Regulator Test Manifold, Threaded
10064120	PR14 First Stage Regulator Test Manifold, Quick Connect
10090548	Lever height gauge for PN 10090457
10050211	Lever height gauge for PN 10030664 (discontinued)

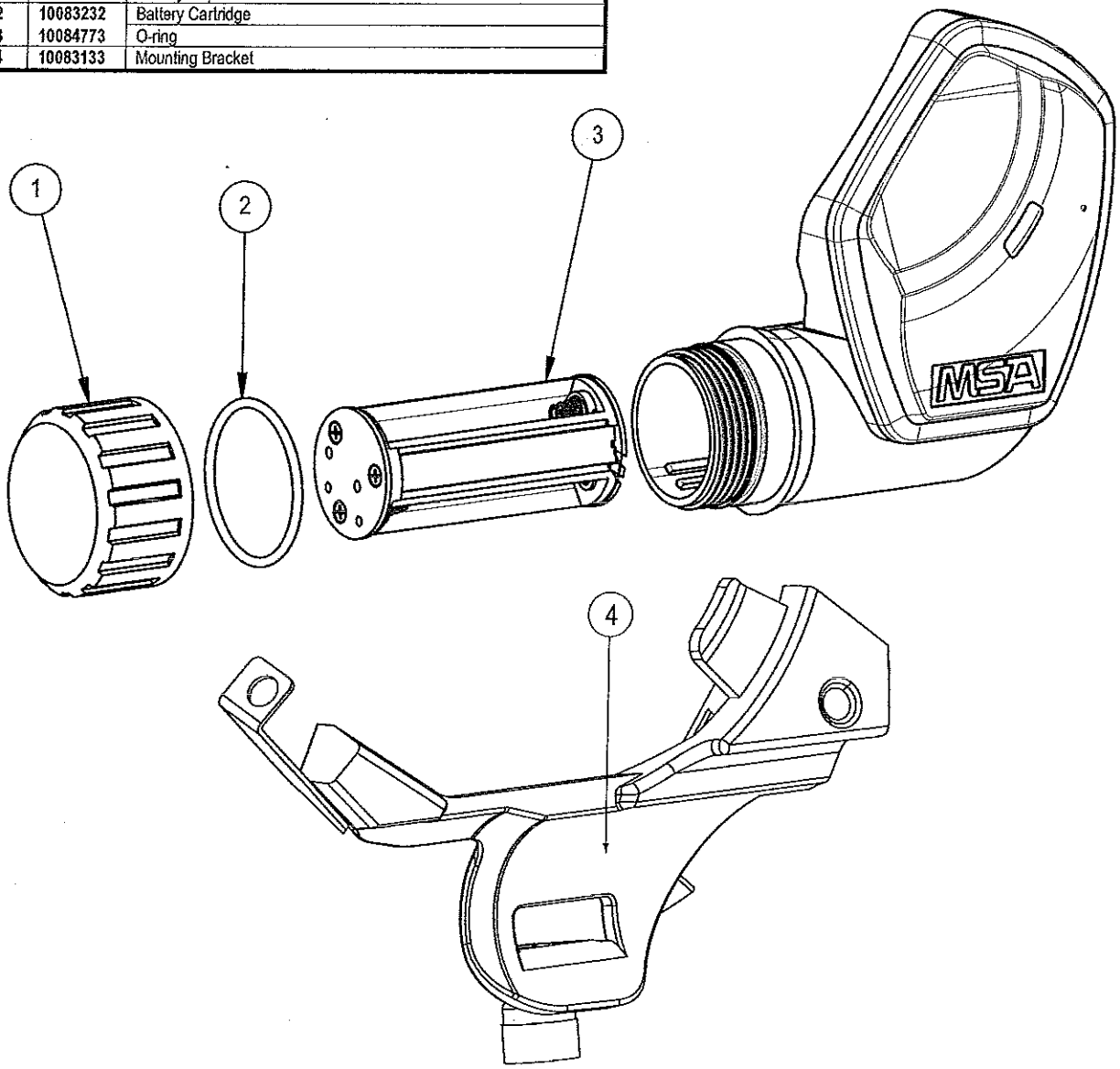
FIREHAWK M7 SECOND STAGE REGULATOR



Replacement Kits and Parts list

FireHawk M7 HUD O-Ring Kit		
10090218	10084773	O-Ring (Pack of 10)
FireHawk M7 HUD Assembly w/o mounting bracket		
10091446	10084773	O-Ring
	10083132	HUD Assembly
	10087292	Warning tag
	10086580	Battery
FireHawk M7 HUD Assembly w/ mounting bracket		
10091447	10083133	Mounting Bracket
	10084773	O-Ring
	10083132	HUD Assembly
	10087292	Warning tag
	10086580	Battery

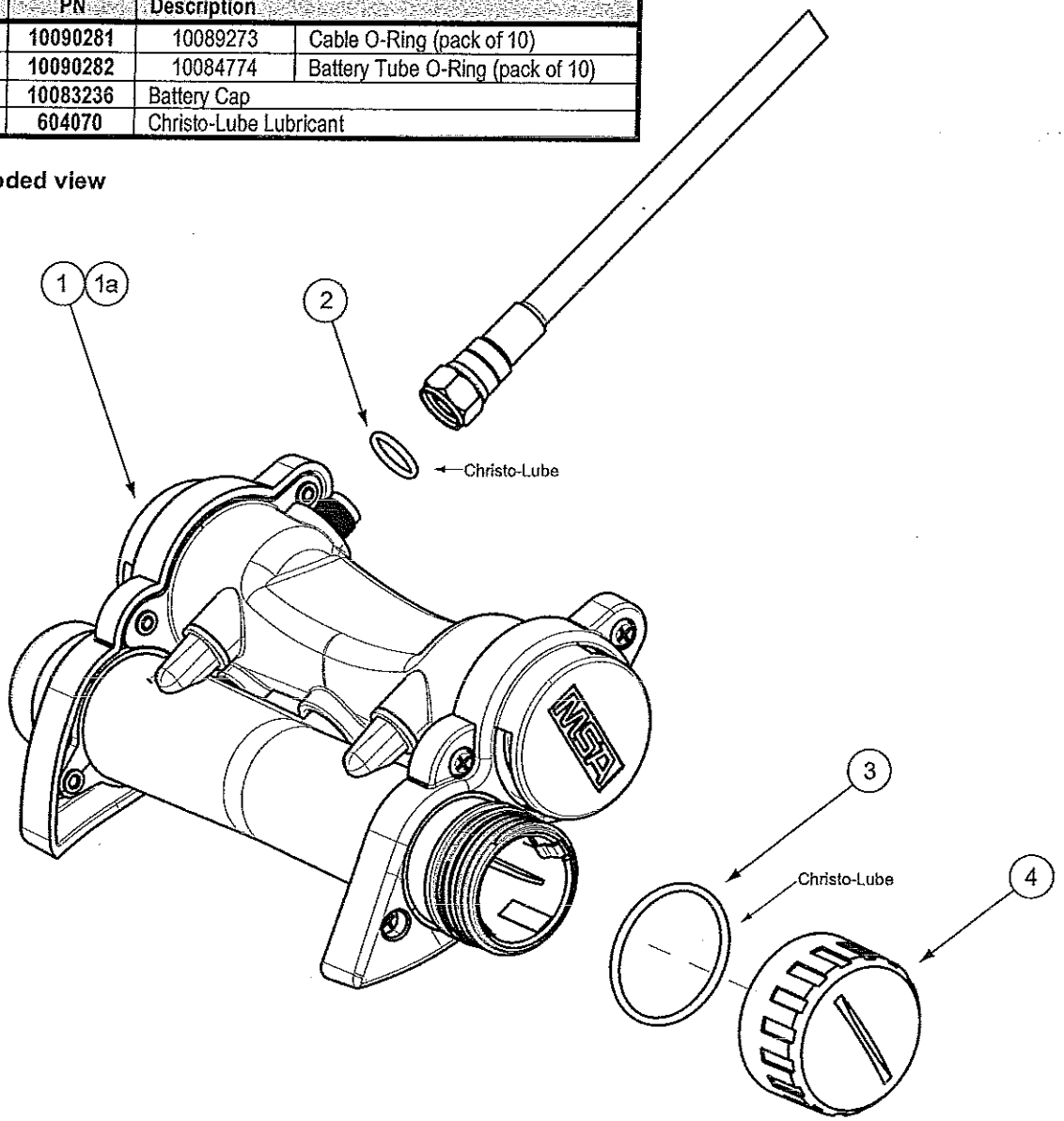
Item	P/N	Description
1	10081783	Battery Cap
2	10083232	Battery Cartridge
3	10084773	O-ring
4	10083133	Mounting Bracket



FireHawk M7 Power Module Replacement Kits and Parts List

M7 Power Module w/o Telemetry			
1	**10091448**	10089273	Cable O-Ring
		10084774	Battery Tube O-Ring
		10083243	Power Module Assembly
		10083223	Shock Mounts (4 req'd.)
		10086579	C-Size Batteries (4 req'd.)
M7 Power Module w/ Telemetry			
1a	**10091378**	10089273	Cable O-Ring
		10084774	Battery Tube O-Ring
		10083242	Power Module Assembly
		10083223	Shock Mounts (4 req'd.)
		10086579	C-Size Batteries (4 req'd.)
Item	**PN**	**Description**	
2	**10090281**	10089273	Cable O-Ring (pack of 10)
3	**10090282**	10084774	Battery Tube O-Ring (pack of 10)
4	**10083236**	Battery Cap	
	604070	Christo-Lube Lubricant	

Exploded view



FIREHAWK M7 PR14 FIRST STAGE REGULATOR

Replacement Kits

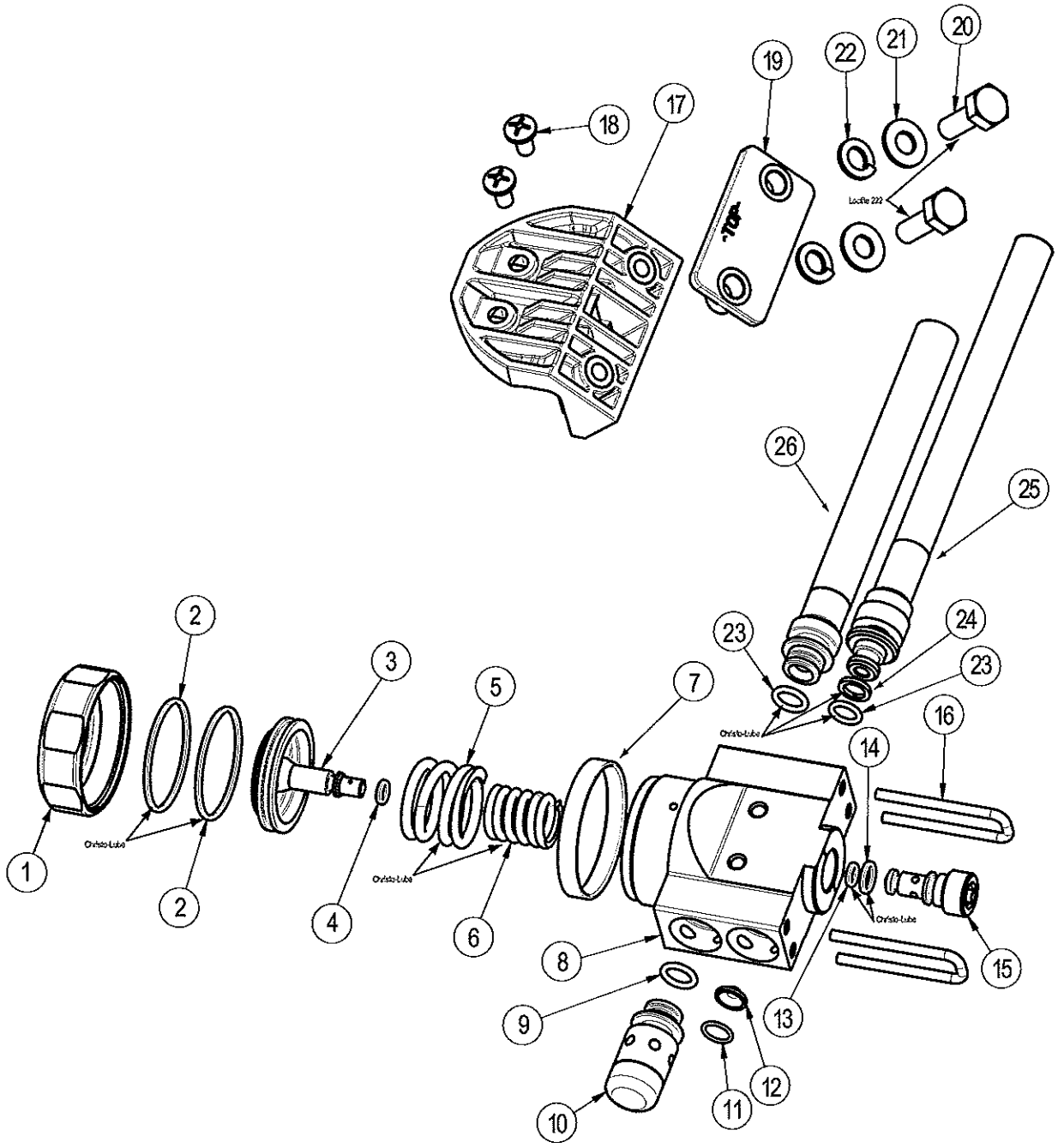
PR-14 First Stage Regulator Replacement Kit		
10053736	PR-14 First Stage Regulator (Complete)	
PR-14 First Stage Regulator Kit		
10065408	10050616	Seat
	633553	O-Ring (Bottom)
	10058236	O-Ring (Top)
	10050617	Piston
	10052365	O-Ring (2 Req'd)
	10052364	O-Ring
	10051663	Inlet Filter
	10052367	Inlet Filter O-Ring
	10053273	O-Ring (2 Req'd)
	63198	O-Ring ((2 Req'd)
	635278	Back up Ring
	10052622	Screw
10055349	10047898	Slider
	10055563	Screw (2 Req'd)
	10014878	Washer (2 Req'd)
	631356	Washer (2 Req'd)

Parts List

Item	P/N	Description
1	10050623	Regulator Cap
2	10052365	O-Ring (2 Req'd)
3	10050617	Piston
4	10052364	O-Ring
5	10050620	Outer Spring
6	10050621	Inner Spring
7	10052621	Seal Ring
8	10050615	Regulator Body
9	63198	O-Ring
10	10053426	Pressure Relief Valve
11	10052367	Inlet Filter O-Ring
12	10051663	Inlet Filter
13	10058236	O-Ring (Top)
14	633553	O-Ring (Bottom)
15	10050616	Seat
16	10050622	U-Clip (2 Req'd)
17	10051664	Mounting Bracket
18	10052622	Screw (2 Req'd)
19	10047898	Slider
20	10055563	Screw (2 Req'd)
21	10014878	Washer (2 Req'd)
22	631356	Lock Washer (2 Req'd)
23	63198	O-Ring (2 Req'd)
24	635278	Back up Ring
25	10053331	Gauge Hose*
26	10051882	Intermediate Pressure Hose, Threaded*
	10051883	Intermediate Pressure Hose, Quick-Connect*
	10051884	Intermediate Pressure Hose, ExtendAire™ System*
	29787	Loctite 222
	604070	Lubricant
	600920	Leak Detector

* Includes Back up and O-Rings as needed

FIREHAWK M7 PR14 FIRST STAGE REGULATOR



FIREHAWK M7 ULTRA ELITE FACEPIECE

Replacement Kits

	FireHawk M7 Ultra Elite Facepiece (complete)	
	P/N	Description
Push to Connect	10084690	Small
	10084822	Small, ClearCommand® Communication System-ready
	10084824	Medium
	10084826	Medium
	10084828	Large, ClearCommand Communication System-ready
	10084830	Large, ClearCommand Communication System-ready
Slide to Connect	10084689	Small
	10084821	Small, ClearCommand Communication System-ready
	10084823	Medium
	10084825	Medium, ClearCommand Communication System-ready
	10084827	Large
	10084829	Large, ClearCommand Communication System-ready

Component Housing Assembly (Complete)		
815604	804808	Speaking Diaphragm Retainer
	804809	Speaking Diaphragm
	815605	Component Housing w/ Exhalation valve
	804813	Inlet Valve Disc
	805011	Valve Spider

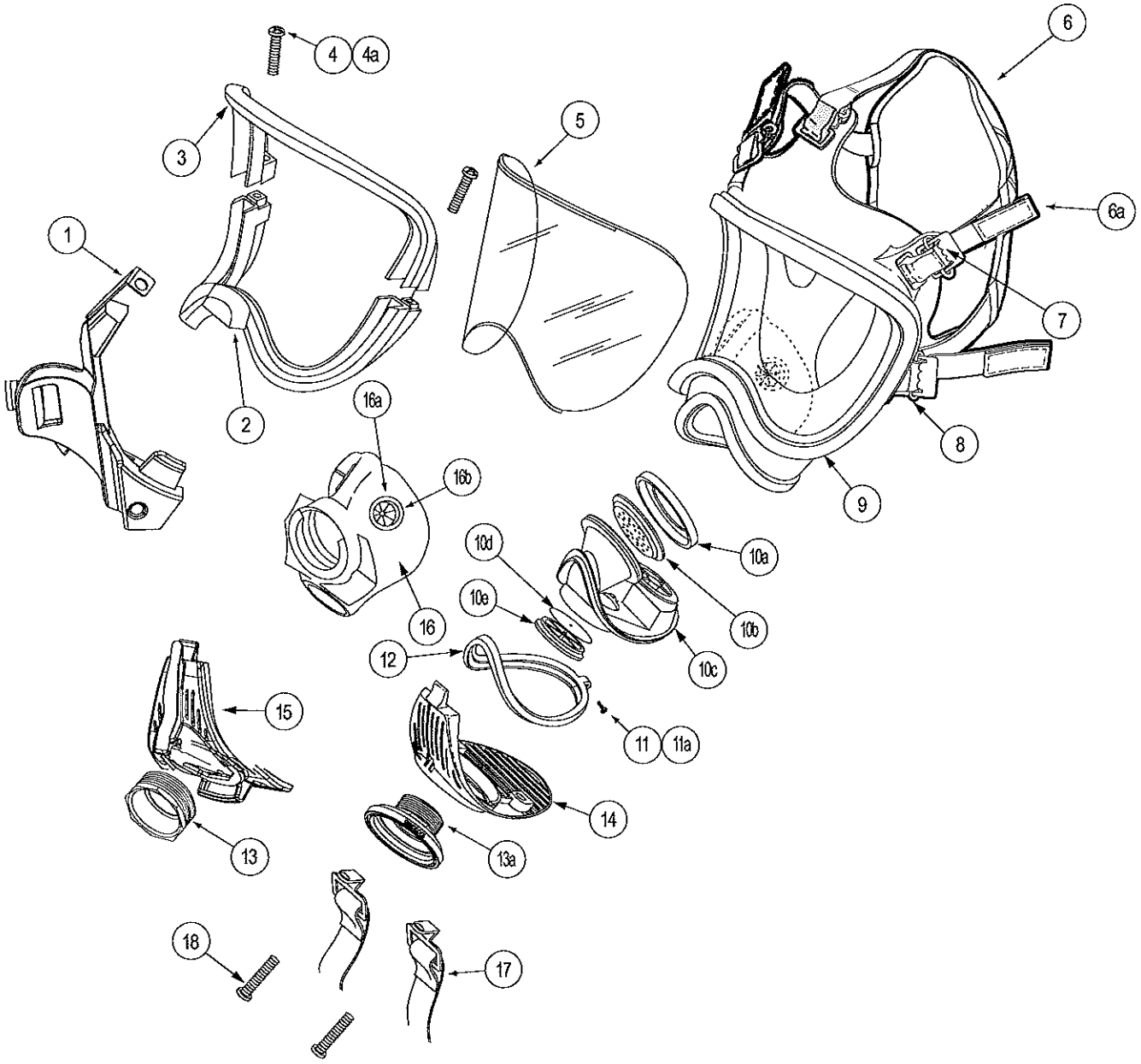
Exhalation Valve Retaining Bar Kit		
818107	490133	Spring
	490128	Spring Retainer

Nosecup Assembly (with valves)	
491121	Small/Medium
491123	Medium

Parts List

Item	P/N	Description
1	10083133	HUD Bracket
2	804805	Lower Lens Ring
3	804804	Upper Lens Ring
4	636955	Screw (2 Req'd)
4a	804806	Screw Kit (2 Req'd)
5	805020	Lens Super Hardcoat
6	10031102	Speed-ON® Harness Assembly
6a	817089	Speed-ON Harness Assembly (with 3 Buckles)
6b	817088	Speed-ON Harness Assembly (less Buckles)
7	494297	Buckles (3 Req'd.)
8	804807	Buckle Assembly with D-Ring (2 Req'd.)
9	10048814	Hycar™ Facepiece Blank (Small)
	10048813	Hycar Facepiece Blank (Medium)
	10048815	Hycar Facepiece Blank (Large)
10a	804808	Speaking Diaphragm Retainer
10b	804809	Speaking Diaphragm
10c	815605	Component Housing with Exhalation valve
10d	804813	Inlet Valve Disc
10e	805011	Valve Spider
11	636956	Screw
11a	804812	Screw Kit
12	804811	Component Housing Ring
13	10018621	Slide-To-Connect Adapter
13a	10033115	Push-To-Connect Adapter
14	489224	Component Housing Cover (Push-to-Connect)
15	10034500	Component Housing Cover (Slide-to-Connect)
16	491121	Nosecup Assembly w/ valves, Small/Medium
	491123	Nosecup Assembly w/ valves, Medium
16a	804822	Valve Seat (2 Req'd.)
16b	804823	Valve Disc (2 Req'd.)
17	804829	Neck strap
18	637070	Screw (2 Req'd.)
19	490133	Exhalation Valve
20	814459	Spring
21	490128	Spring Retainer
	600920	Snoop Leak Detector

FIREHAWK M7 ULTRA ELITE FACEPIECE

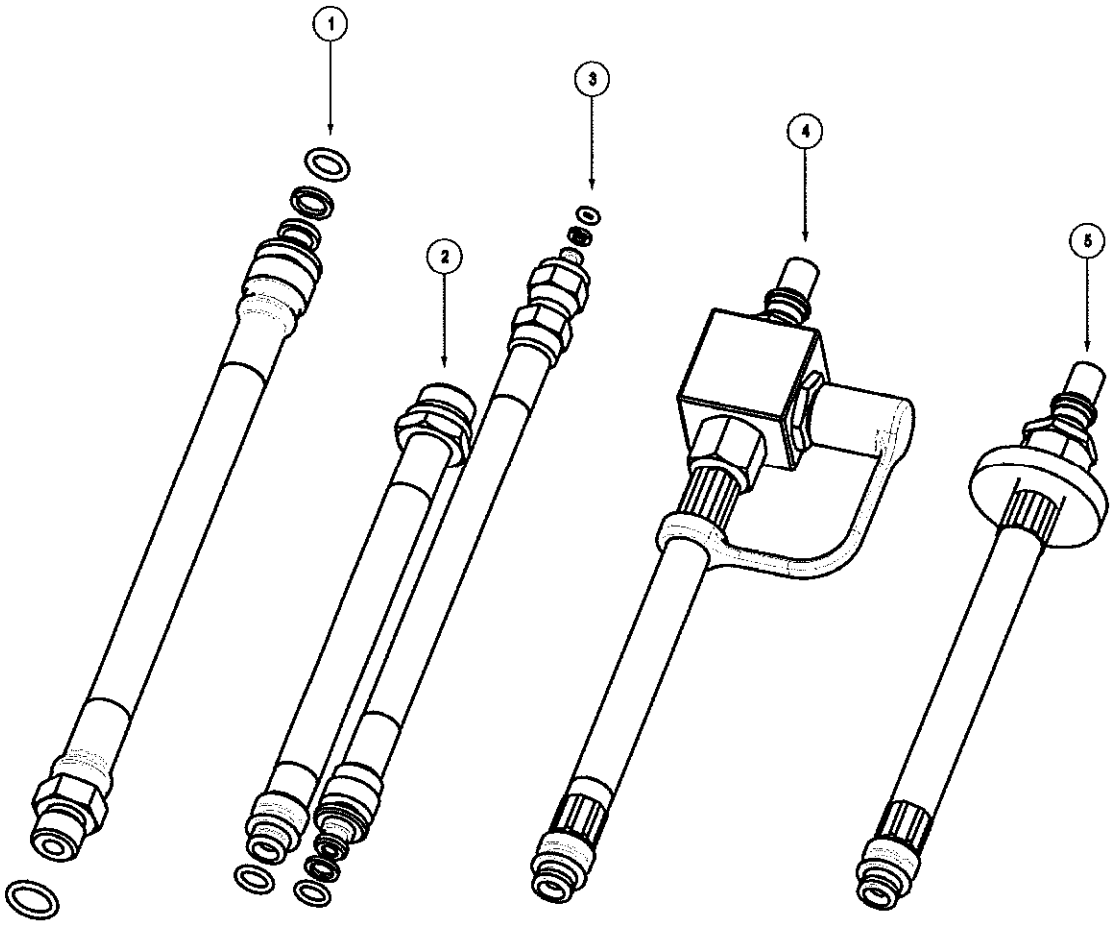


FIREHAWK M7 HOSE ASSEMBLIES

Item	P/N	Description
1	804382	High Pressure Hose*
2	10051882	Intermediate Pressure Hose, Threaded*
3	10053331	High Pressure Gauge Hose*
4	10051884	Intermediate Pressure Hose, ExtendAire™ System*
5	10051883	Intermediate Pressure Hose, Quick Connect*

* Includes Back Up and O-Rings as needed.

Exploded Views



Critical repair parts pictured within the boundary **MUST** be installed by C.A.R.E. certified repair technicians and tested with MSA-approved dynamic flow testers only.

P/N 10024094

Firehawk® M7 Second Stage Regulator

MAINTENANCE AND REPAIR

For More Information, call 1-800-MSA-2222 or Visit Our Website at www.MSAnet.com

MSA The Safety Company

MINE SAFETY APPLIANCES COMPANY
PITTSBURGH, PENNSYLVANIA, U.S.A. 15230

TAL 803 (L) Rev. 0

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Prnt. Spec. 10000005389(I) Mat. 10093086
Doc. 10093086

FIREHAWK M7 SECOND STAGE REGULATOR

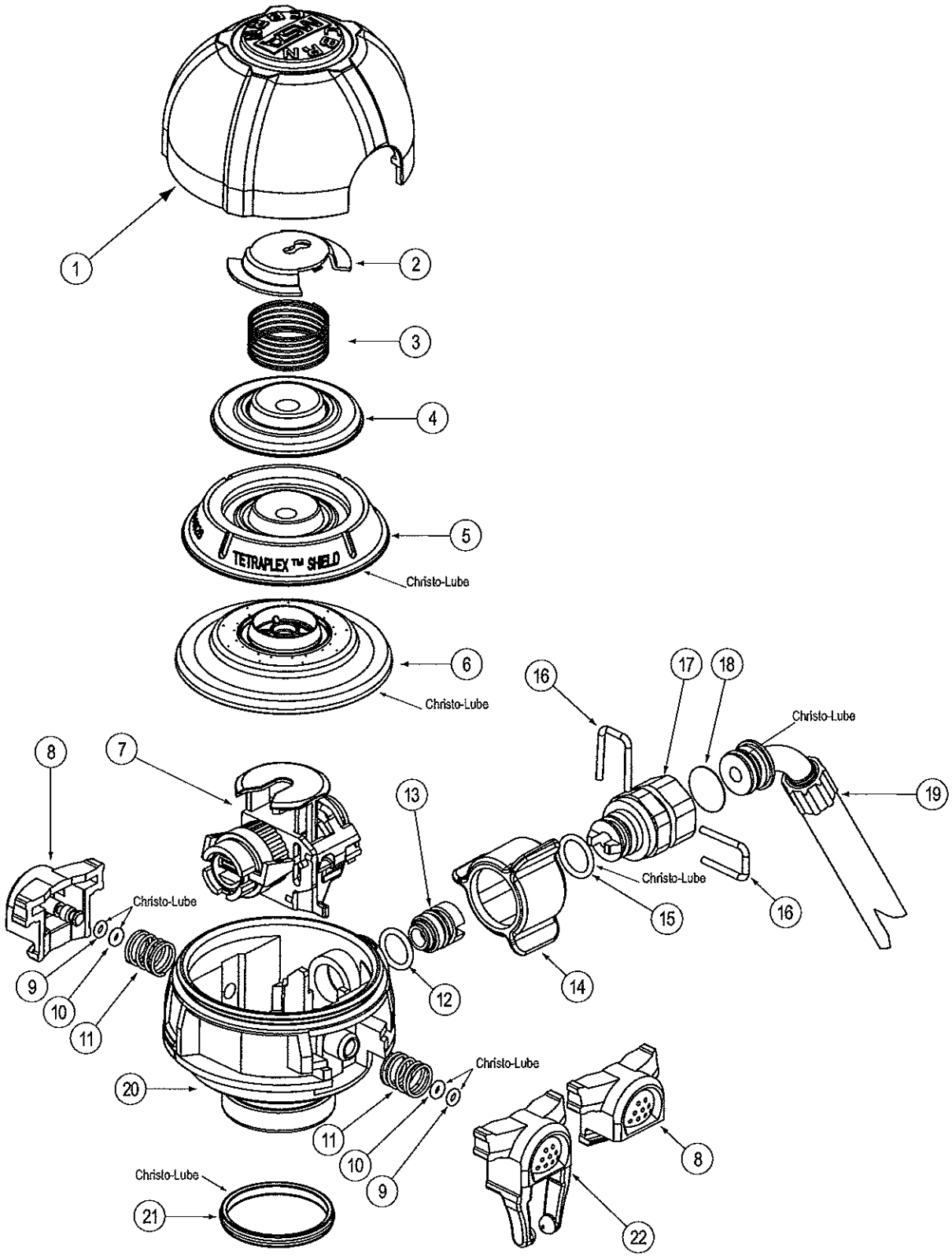
Firehawk M7 Second Stage Regulator Replacement and Overhaul Kits

P/N	Description	
Firehawk M7 Second Stage Regulator Replacement Kits		
10087305	10087295	Valve Assembly
	10087301	Housing Assembly
10087295	Valve Assembly	
10087301	Housing Assembly	
Firehawk M7 Second Stage Regulator Overhaul Kits		
10030663	10023509	O-Ring (2)
	10037951	O-Ring (2)
	697453	O-Ring, Silicone, Red
	634669	O-Ring
	63198	O-Ring
	10020784	Screen
10091435	10047528	Cap, Spring
	10044026	Shield, CBRN
10091436	10031192	Seal Ring (Pack of 10)
10091437	10023509	O-Ring (Pack of 10)
10091438	10037951	O-Ring (Pack of 10)
10091439	10018965	Spring, Button (Pack of 10)
10091440	697453	O-Ring, Silicone, Red (Pack of 10)
10091461	10018965	Spring, Button (Pack of 10)
	634669	O-Ring (Pack of 10)
Height Gauge Kits		
10090458	10090457	Height Gauge for PN 10087295 w/ Instructions
10050211	10050146	Height Gauge for PN 10030664 w/ Instructions

Parts List

Item	P/N	Description	Regulator Assembly							
			10043892	10043893	10043894	10043895	10047529	10047600	10047601	10047602
1	10047441	Cover, Purge	•	•	•	•				
	10047664	Cover, Non Purge					•	•	•	•
2	10018622	Retainer, Spring (not req'd w/ Solid Cover)	•	•	•	•				
3	10092041	Spring, Diaphragm	•	•	•	•	•	•	•	•
4	10047528	Cap, Spring	•	•	•	•	•	•	•	•
5	10044026	Shield, CBRN	•	•	•	•	•	•	•	•
6	10039172	Diaphragm, CBRN	•	•	•	•	•	•	•	•
7	10087295	Valve Assembly	•	•	•	•	•	•	•	•
8	10047238	Button, Push to-Connect	•	•	•	•	•	•	•	•
9	10023509	O-Ring (2 Required)	•	•	•	•	•	•	•	•
10	10037951	O-Ring (2 Required)	•	•	•	•	•	•	•	•
11	10018965	Spring, Button	•	•	•	•	•	•	•	•
12	697453	O-Ring, Silicone, Red	•	•	•	•	•	•	•	•
13	10018971	Bypass Insert	•	•	•	•	•	•	•	•
14	10018774	Knob, Bypass	•	•	•	•	•	•	•	•
15	634669	O-Ring	•	•	•	•	•	•	•	•
16	10018547	U-Clip (2 Required)	•	•	•	•	•	•	•	•
17	10018966	Body, Bypass	•	•	•	•	•	•	•	•
18	10020784	Screen, Bypass	•	•	•	•	•	•	•	•
19	10039171	Hose, Threaded	•		•				•	•
	10046484	Hose, Quick Connect		•		•	•	•		
20	10087301	Housing Assembly	•	•	•	•	•	•	•	•
21	10031192	Seal Ring	•	•	•	•	•	•	•	•
22	10047331	Button, Slide-to-Connect	•	•				•		•
	604070	Christo-Lube Lubricant	•	•	•	•	•	•	•	•

FIREHAWK M7 SECOND STAGE REGULATOR



FIREHAWK M7 SECOND STAGE REGULATOR

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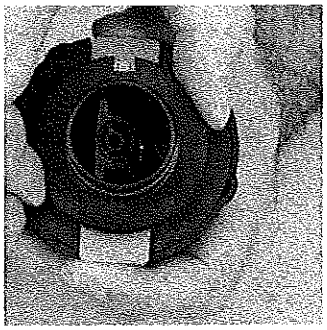
FIREHAWK M7 SECOND STAGE REGULATOR DISASSEMBLY

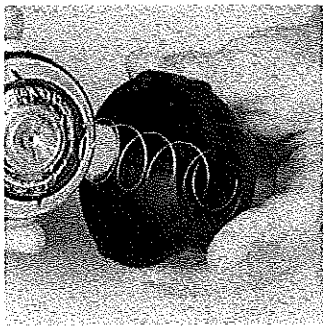
Removing the Regulator Cover, Spring, and Spring Retainer

1. Remove the regulator outlet o-ring.
2. Remove the regulator cover.

a. Press and hold the release buttons while pressing the regulator housing retaining latches.



b. Pull off the cover.



c. Remove the spring, and spring retainer from the regulator housing.

d. Turn the spring clockwise to remove it from the retainer.

Note: Do not stretch the spring.

Removing the Diaphragm

1. Remove the CBRN Shield.

⚠ CAUTION

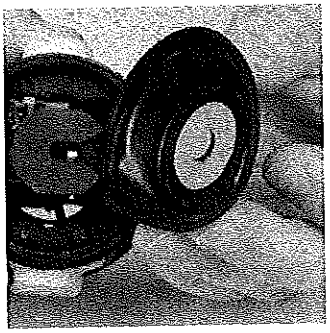
Handle the CBRN Shield by the rim only.

a. Lift the CBRN Shield Assembly and Spring Cap off the diaphragm assembly.

b. Lift the Spring Cap off the CBRN Shield Assembly.

2. Roll the edge off the regulator housing.

3. Slide the diaphragm away from the bypass handwheel off the valve fork.



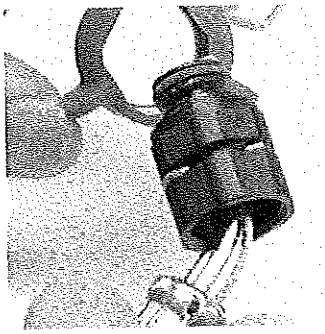
Disassembling the Bypass and Hose with Swivel

1. Remove the regulator cover, spring, and spring retainer.

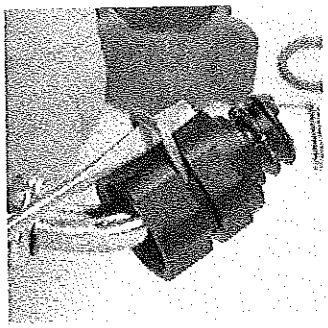
Note: It is not necessary to remove the diaphragm.

2. Use a small, flat-blade screwdriver to remove the U-clip.

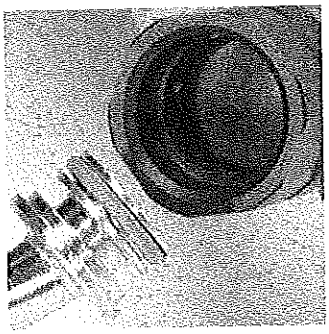
3. Remove the bypass knob.



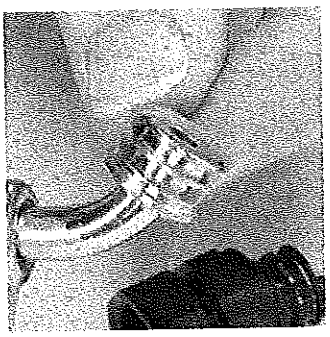
4. Remove the bypass body U-Clip.



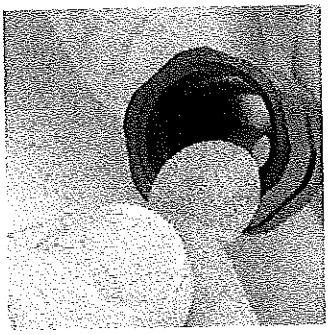
5. Remove the bypass and hose assembly by pulling the hose out of the bypass body.



6. Remove the hose assembly o-ring. Be careful not to scratch the o-ring groove.

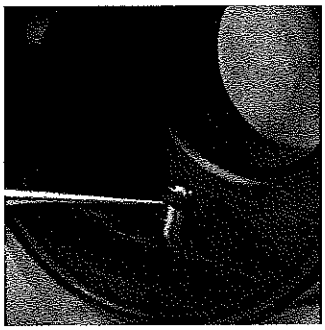


7. Use the plastic stick or small flat blade screwdriver to push the screen out of the bypass body. Inspect the bypass screen. Remove all dirt and foreign matter before reinstalling the screen.



Disassembling the Regulator Housing Buttons

1. Remove the old o-rings. Be careful not to scratch the o-ring groove.



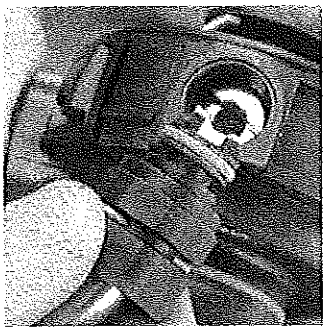
2. Pull firmly on the buttons to remove them.

   a. Be careful not to lose the spring.

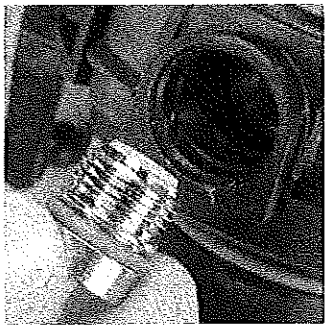
Removing the Valve Assembly

1. Remove the regulator cover, spring, and spring retainer.
2. Remove the diaphragm.
3. Remove the U-clip from the regulator housing.
4. Remove the bypass insert.

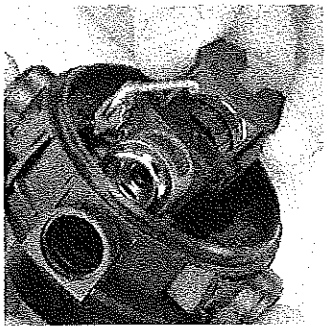
Note: Use the bypass body as a tool to unscrew the bypass insert.



   a. Remove the bypass insert.



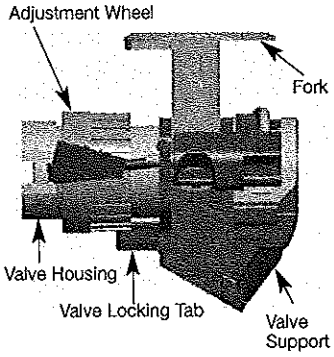
5. Lift the valve out of the regulator housing.



Inspection of the Valve Fork for Proper Height

Inspect and adjust valve fork height with the valve fork pointing toward you. The valve fork assembly must move up and down freely.

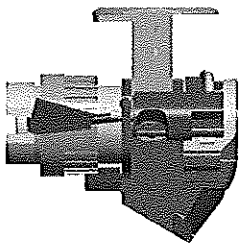
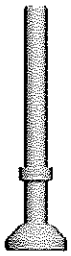
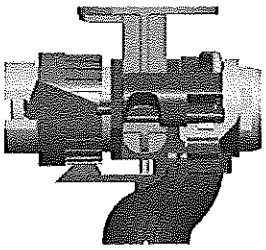
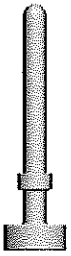
1. Press the top of the valve fork to check movement.



2. Use the Height Gauge to verify the fork height setting.

FIREHAWK M7 SECOND STAGE REGULATOR

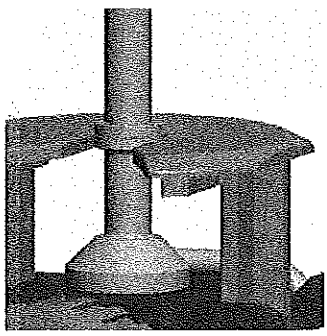
Note: Firehawk regulators use one of two valve assemblies: P/N 10090458 or P/N 10030664. Use the appropriate Gauge.

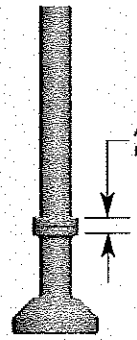
Valve Assembly PN 10090458	Height Gauge* PN 10090457 Kit PN 10090458
If your valve assembly looks like this: 	Use this height gauge 
Valve Assembly PN 10030664	**Height Gauge* PN 10050146 Kit PN 10050211**
If your valve assembly looks like this 	Use this height gauge 

***See Firehawk M7 Second Stage Regulator Replacement and Overhaul Kits/Height Gauge Kits** for ordering information.

3. Center the Gauge in the valve fork.

Note: Ensure that the valve assembly is vertical and can move freely.

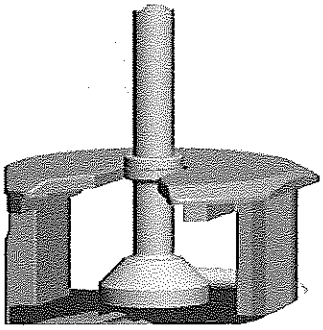




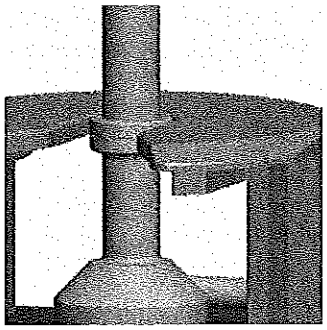
4. The top of the valve fork must be within the acceptable range.

Acceptable Valve Fork Heights

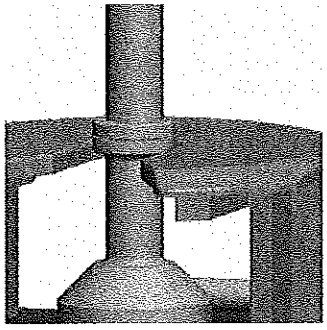
Nominal height – Top of fork level with center of acceptable range.



Maximum Height – Top of fork level with top of acceptable range.



Minimum Height – Top of fork level with bottom of acceptable range.

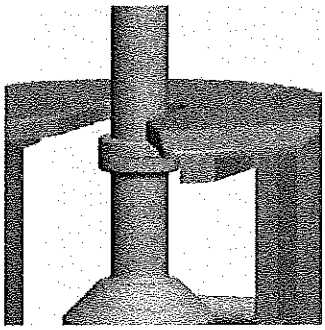


Note: If the top of the valve fork is above or below the acceptable range, adjust the valve. Normally the valve fork will not require adjustment. Do not adjust the valve if the fork is within the acceptable range.

Adjusting Valve Fork Height for Proper Performance

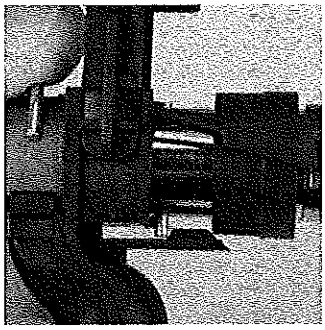
Adjustment of Valve Fork if Above the Maximum
Inspect and adjust valve fork height with the valve fork pointing toward you. Turn the Adjustment Wheel **clockwise to lower the fork.** Turn the Adjustment Wheel **counterclockwise to raise the fork.**

Above maximum height – Top of fork above top of acceptable range.



1. Slide the adjustment when and valve housing slightly away from the valve support to allow the adjustment wheel to rotate.

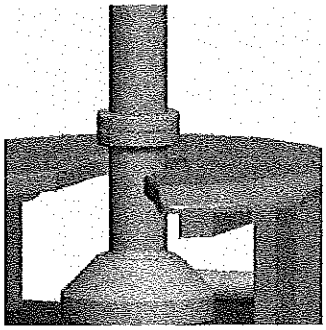
Note: The adjustment wheel cannot turn unless the ribs are free from the locking tab.



2. Turn the adjustment wheel clockwise to lower the fork.
3. Slide the adjustment wheel and valve housing back into place. Ensure that the valve lever and fork do not bind. The fork should move up and down easily.

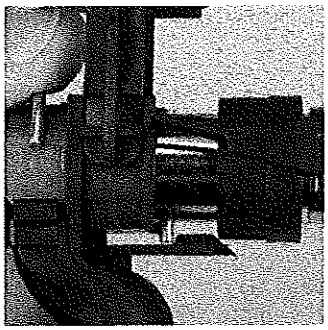
Adjustment for Valve Fork if Below the Minimum

Below minimum height – Top of fork is below acceptable range.



1. Slide the adjustment wheel and valve housing slightly away from the valve support to allow the adjustment wheel to rotate.
2. Turn the adjustment wheel counterclockwise to raise the fork.

Note: The adjustment wheel cannot turn unless the ribs are free from the locking tab.



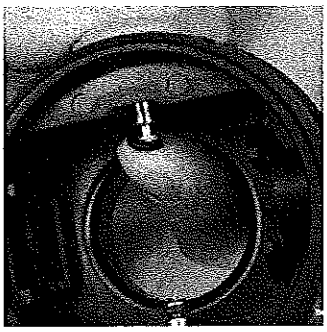
3. Slide the valve housing back into place. Ensure that the valve lever and fork do not bind. The fork should move up and down easily.

Firehawk Second Stage Regulator Reassembly

Installing the Regulator Housing and Buttons
P/N 10047331
P/N 10047238

1. Apply a thin film of Christo-Lube lubricant (P/N 604070) to the new o-rings.

2. Install new o-rings on the button posts.



3. Install the springs.
4. Align the buttons.

Note: With the bypass at 9:00 o'clock, the slide button is at 12:00 o'clock and the housing button is at 6:00 o'clock.

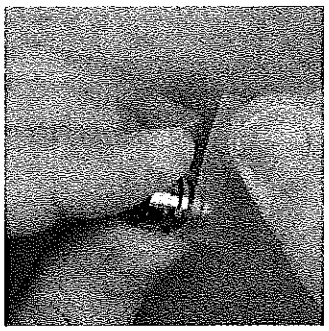
5. Push firmly on the buttons.
6. Double check proper engagement by pulling on the buttons.
7. Reinstall the diaphragm.
8. Reinstall the spring and regulator cover.
9. Connect the Second Stage hose to the First Stage Intermediate Pressure Hose.
   a. Use a torque wrench and **3/4" crow foot** to tighten to **125 ±5 in lbs.**
10. Check Valve Fork Height. (See Adjusting Valve Fork Height for Proper Performance)
11. Flow Test the SCBA. (See Flow Test and Overhaul Requirements, P/N 10051109)

Installing the Valve Assembly
P/N 10090458
P/N 10030664

1. Insert the valve into the regulator housing with the valve fork up and facing away from the bypass port.

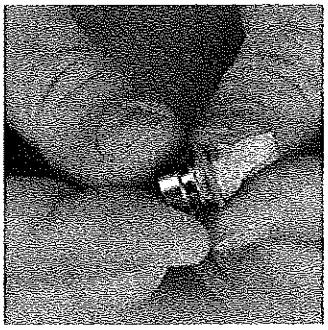
2. Push the valve into the regulator housing.
3. Reinstall the bypass insert.
   a. Install a new o-ring.

   i. Protect the o-ring with tape or a thin piece of paper.



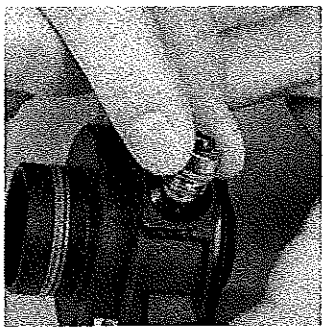
   ii. Apply a small amount of Christo-Lube lubricant (P/N 604070) to the o-ring.

   iii. Slip the o-ring over the thread.



   iv. Remove the protective tape or paper.

   b. Install the bypass insert into the bypass port with the slot facing out.



4. Use the bypass body to screw the bypass insert into the valve. Hand tighten.

Note: If the bypass insert does not screw into the valve assembly easily, the valve assembly may not be properly aligned. Ensure that the valve assembly is seated fully in the regulator housing.

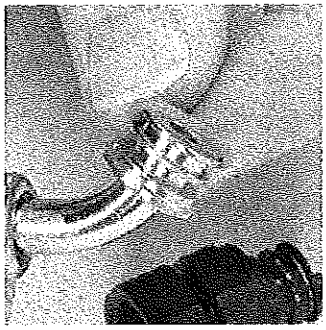
Installing the Bypass and Hose Assembly

1. Install the bypass screen (P/N 10020784).

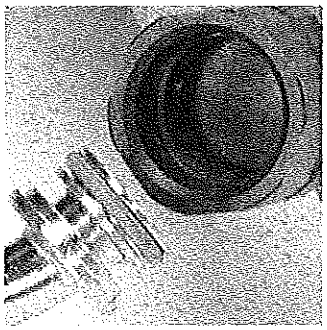
Note: Be careful not to damage the screen. Make sure that the screen lays flat inside the body.

2. Apply a thin film of Christo-Lube lubricant (P/N 604070) to a new o-ring.

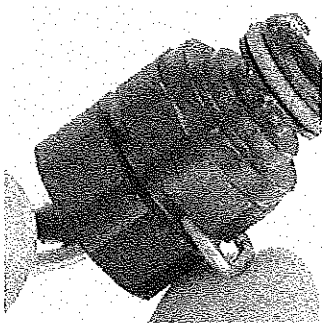
3. Install the new o-ring into the first groove of the hose swivel.



4. Insert the swivel into the bypass body.

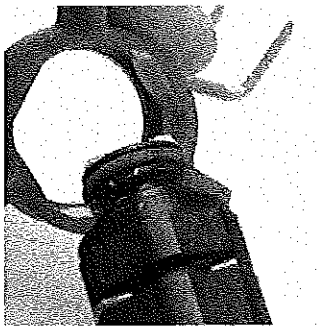


5. Slide the U-clip through the bypass body.

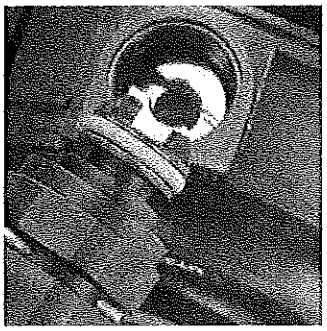


Note: The U-clip should slide through the bypass body freely.

6. Slide the bypass knob onto the bypass body.



7. Insert the bypass body and hose assembly into the regulator housing so that the bypass body tabs line up with the slots in the bypass insert.



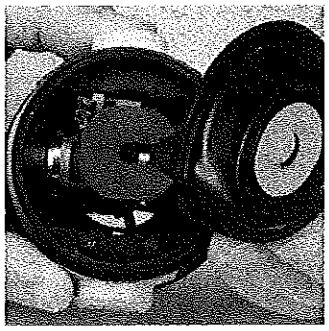
8. Ensure that the hose with swivel moves freely.

9. Slide the U-clip through the regulator housing.

Note: The U-clip should slide through the regulator housing freely.

Installing the Diaphragm

1. Apply a thin coat of Christo-Lube to the top rim of the regulator housing.



2. Slide the diaphragm knob into the valve fork slot.

3. Slide the diaphragm toward the bypass handwheel.

4. Roll the diaphragm over the regulator-housing rim.

Installing the CBRN Shield
P/N 10044026

Note: Replace the cap and shield annually.

1. Push the shut off buttons in for OFF position.

Note: While installing the Shield, the valve fork must be in the UP position.

2. Apply a thin coating of Christo-Lube lubricant (P/N 604070) to the bottom of the Shield Assembly.

3. Place the CBRN Shield over the diaphragm assembly.

4. Tap lightly on the top of CBRN Shield to remove trapped air.

5. Replace spring cap.

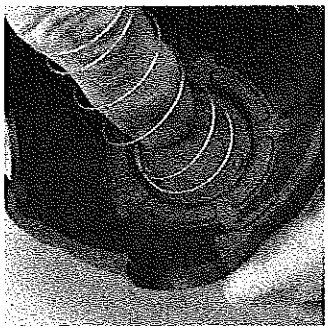
Installing Spring into the Solid (Non-Purge) Regulator Cover
P/N 10020931

Note: The Solid Regulator Cover does not use a spring retainer.

1. Insert the spring into solid cover.

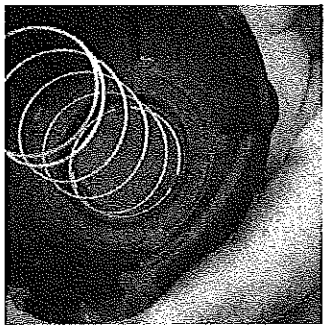
   a. Slide the spring onto a finger.
   b. Insert spring and finger into the solid cover.
   c. Attach last coil of spring to cover hooks.

2. Hold the spring in the center of the cover.



3. Engage the last coil of the spring to each of the three (3) molded hooks.

4. Ensure that the last coil of the spring is engaged to each of the three (3) molded hooks.



⚠ WARNING

Double-check proper engagement by gently pulling on the spring. Ensure that the spring is securely attached to the regulator cover. Do not stretch the spring. Failure to follow this warning may result in serious personal injury or death.

5. Push regulator cover and spring onto regulator housing.

⚠ WARNING

Double check proper engagement by pulling on the regulator cover. Ensure that the regulator cover is securely attached to the regulator housing. Failure to follow this warning may result in serious personal injury or death.

Installing the Regulator Cover

Regulator Cover, Purge	P/N 10047441
Regulator Cover, Non-Purge	P/N 10047664

1. Attach spring and spring retainer (Purge models only) by attaching last coil to retainer hooks.
2. Install the spring retainer.

   a. Pull the stem through the retainer.

3. Double check proper engagement by lifting spring retainer.
4. Push regulator cover, spring, and spring retainer onto regulator housing.

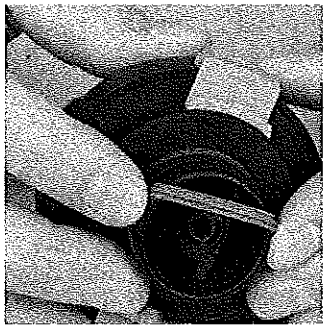
⚠ WARNING

Double check proper engagement by pulling on regulator cover to ensure that the regulator cover is securely attached to the regulator housing. Failure to follow this warning could cause the regulator to malfunction resulting in serious personal injury or death.

Installing the Regulator Outlet O-Ring

1. Apply a thin film of Christo-Lube lubricant (P/N 604070) to the new o-ring.

2. Roll the new o-ring onto the regulator outlet and seat it into the o-ring groove.



Note: An unseated o-ring can cause an air leak.

FireHawk® M7 Air Mask Maintenance and Repair

INTRODUCTION

For More Information, call 1-800-MSA-2222 or Visit Our Website at www.MSAnet.com

MSA The Safety Company

MINE SAFETY APPLIANCES COMPANY
PITTSBURGH, PENNSYLVANIA, U.S.A. 15230

TAL 803 (L) Rev. 0

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Doc. 10093079

INTRODUCTION

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INTRODUCTION

FireHawk M7 Air Mask Operation and Instructions
A thorough understanding of the FireHawk M7 Air Mask is essential before attempting to repair or maintain the FireHawk M7 Air Mask.

The FireHawk M7 Air Mask Operation and Instructions (P/N 10082858) available at www.MSAFire.com has NIOSH Approval information and user instructions for donning and doffing, negative pressure user seal checks, and cleaning and disinfecting, etc.

Thoroughly read the FireHawk M7 Air Mask Operation and Instructions. Follow procedures and maintenance schedules in the Operation and Instructions and/or as specified herein. If an apparatus does not pass all tests and/or checks, remove it from service until it has been repaired and passes all tests.

FireHawk M7 Air Mask Maintenance and Repair
FireHawk M7 Air Mask Maintenance and Repair documents contain all maintenance procedures for the FireHawk M7 Air Mask. This document is for C.A.R.E. certified Air Mask Repair personnel only.

Only MSA C.A.R.E certified personnel are permitted to maintain and repair the FireHawk M7 Air Mask and only according to FireHawk M7 Air Mask Maintenance and Repair instructions.

⚠ WARNING

DO NOT ATTEMPT TO REPAIR THE FIREHAWK® M7 AIR MASK UNLESS C.A.R.E CERTIFIED BY MSA. Only MSA C.A.R.E certified personnel are permitted to maintain and repair the FireHawk M7 Air Mask and only according to FireHawk M7 Air Mask Maintenance and Repair instructions. Do not attempt to maintain and/or repair the FireHawk M7 Air Mask without CARE Certification from MSA. Failure to follow this warning may result in serious personal injury or death.

Use only MSA-approved parts.

TheFireHawk M7 Air Mask is certified by the National Institute of Occupational Safety and Health (NIOSH). Do not alter, modify, or substitute parts without the approval of MSA. Doing so voids NIOSH approval.

Do not deviate from the maintenance and repair procedures contained herein unless approved in writing by MSA.

⚠ WARNING

DO NOT ATTEMPT TO MAKE REPAIRS BEYOND THOSE SPECIFIED IN THIS MANUAL. USE ONLY MSA APPROVED PARTS. The FireHawk M7 Air Mask will perform as designed only if used, maintained and repaired according to FireHawk M7 Air Mask Maintenance and Repair instructions . If not used, maintained and repaired according to these instructions, the Air Mask could fail to perform as designed and persons who rely on the Air Mask for respiratory protection could sustain serious personal injury or death.

The warranties made by MSA with respect to the product are void if the product is not used, maintained, and repaired according to FireHawk M7 Air Mask Maintenance and Repair documents.

For additional information, or for answers to maintenance and repair questions, write to MSA at the address below, or call 1-800-MSA-2222 during regular working hours.

SPECIAL NOTE FOR FIREHAWK M7 AIR MASK MAINTENANCE AND REPAIR DOCUMENTS

Earlier C.A.R.E. documents identify "critical repair" items with a heavy black outline. Critical repair items require C.A.R.E. certification for maintenance and repair and must be flow tested on MSAapproved flow test equipment.

FireHawk M7 Air Mask Maintenance and Repair documents do not differentiate between userserviceable and critical repair items. However, the requirements for C.A.R.E. certification and the use of MSA-approved flow testing equipment remain.

INTRODUCTION

GENERAL NOTES

Depressurize

- Depressurize the FireHawk M7 Air Mask before maintenance or repair.
  1. Close the cylinder valve.
  2. Squeeze the shut off buttons.
  3. Open the bypass.
  4. Disconnect the FireHawk M7 Audi-Larm Audible Alarm.

Eye and Face Protection

⚠ WARNING

Wear eye or face protection to avoid injury. Failure to follow this warning may result in serious personal injury.

Christo-Lube Lubricant

- When instructed to apply Christo-Lube lubricant, use it sparingly. A "small amount" is almost invisible. If you can see white, you've used too much.
- Lubricate and install the part immediately. Lubricant can collect dirt and contaminants.

Tools

Most repairs can be accomplished with standard tools. Some special tools are required.

Standard Tools

Tool	Spec.	Drive	Type	
Wrench (open end)	7/16"			
	5/8"			
	11/16"			
	13/16"			
	7/8"			
Breaker bar		3/8"		
Socket adapters (Female to Male)		3/8" to 1/2"		
		1/2" to 3/4"		
Socket	7/16"	3/8"		6 point
	7/16"		Deep well	
	9/16"			
	11/16"			
	3/4"			
	7/8"		Deep well	
	1"		Deep well	
	1-5/8"	1/2" or 3/4"		6 point
Screwdriver Bit	No. 2	3/8"	Phillips	
Torque wrench	0-250 in lbs.	3/8"		
	10-100 ft lbs.			
Crowfoot	¾"	3/8"		
	5/8"			
	11/16"			
	13/16"			
	7/8"			
Hex Wrench	1/8"			
	1/4"			
	3/16"			
Screwdriver (Slot head)	1/8"			
	1/4"			
Pliers	Needle nose			
	Channel lock			
	Retaining ring		Convertible	
Nut driver	3/16"			

INTRODUCTION

Special Tools, Adhesives, Lubricants, and Sealants

P/N	Description
636060	O-Ring Removal Tool
633411	Plastic Stick
28907	Teflon Tape
604070	Christo-Lube
600920	Snoop Leak Detector
29787	Loctite #222
26875	Loctite #271
466008	Locknut Wrench
494992	Silicone Lubricant
600469	Loctite 290
482426	Extraction Tool
10064117	PR14 First Stage Regulator Test Manifold, Threaded
10064120	PR14 First Stage Regulator Test Manifold, Quick Connect
10090548	Lever height gauge for PN 10090457
10050211	Lever height gauge for PN 10030664 (discontinued)

O-Rings, Back-Up Rings, and Gaskets

- Do not reuse o-rings, back-up rings or gaskets.
- If a part with o-ring(s), back-up rings, or gasket(s) is removed, discard and replace the o-rings, back-up rings and/or gaskets.
- Use tape, a thin piece of paper, or other protector when installing o-rings.
- Lubricate as instructed.

PTFE (Teflon) Pipe-sealing Tape

- Use Teflon tape on fittings with tapered thread.
- Start at the second thread. Do not put tape on the first thread.
- Wrap 1 to 1-1/2 turns of tape clockwise.
- Pieces of tape can break off and reduce air flow. Apply a small amount of Christo-Lube lubricant before inserting taped threaded fittings.

Note: Do not over-tighten threaded parts.

Torque

- Unless specified otherwise, torques are calculated for dry thread.
- **DO NOT APPLY LUBRICANT UNLESS SPECIFICALLY INSTRUCTED.** Lubricant can cause thread failure and component separation.
- Calibrate torque wrenches, gauges, and other test instruments regularly.

Adhesives and Sealants

- Use only as instructed.
- Use MSA-approved adhesives, sealants, leak detectors, and lubricants.
- Use adhesives, sealants, and lubricants sparingly.
- Although adhesives and sealants hold parts in place, never swap them.

Tools

Most repairs can be accomplished with standard tools. Some special tools are required.

FLOW TEST AND OVERHAUL REQUIREMENTS

The FireHawk M7 Air Mask PR-14 Regulator and Audi-Larm Audible Alarm must be flow tested and overhauled at the intervals determined by use. FireHawk M7 Air Masks must be flow tested annually using an MSA-approved flow test device.

Overhaul frequency is determined by individual apparatus use.

INTRODUCTION

FLOW TEST AND OVERHAUL REQUIREMENTS

The FireHawk M7 Air Mask PR-14 Regulator and Audi-Larm Audible Alarm must be flow tested and overhauled at the intervals determined by use. FireHawk M7 Air Masks must be flow tested annually using an MSA-approved flow test device.

Required Overhaul and Flow Test Frequency

Average Air Mask Use*	CBRN Second Stage Regulator Overhaul Frequency**	PR-14 Regulator and Audi-Larm Assembly Overhaul Frequency	Flow Test Frequency
One (1) or more 30 minute cylinders per day	Every 1 year	Every 3 years	Every year
One (1) 30 minute cylinder every other day	Every 3 years	Every 8 years	
Up to one (1) 30 minute cylinder per week	Every 10 years	Every 15 years	

*The unit of Air Mask use is defined as the consumption of one thirty (30) minute cylinder. For example, if three cylinders are consumed consider the Air Mask used three times. If Air Mask use cannot be determined, overhaul every three years.
** Replace the Spring Cap (PN 10047528) and Tetraplex™ CBRN Shield (PN 10044026) annually.

See **FireHawk M7 Audi-Larm Audible Alarm Maintenance and Repair (P/N 10093084)and FireHawk M7 PR-14 First Stage Regulator Maintenance and Repair (P/N 10093086)** for instructions.

Retiring an Air Mask
Base the decision to retire an Air Mask on performance data. Retire Air Masks that do not meet specified performance levels.

FireHawk® M7 Audi-Larm™ Audible Alarm

MAINTENANCE AND REPAIR

For More Information, call 1-800-MSA-2222 or Visit Our Website at www.MSAnet.com

MSA The Safety Company
MINE SAFETY APPLIANCES COMPANY
PITTSBURGH, PENNSYLVANIA, U.S.A. 15230

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Doc. 10093084

REPLACEMENT KITS AND PARTS LIST

Replacement and Maintenance Kits: 2216/4500 psi

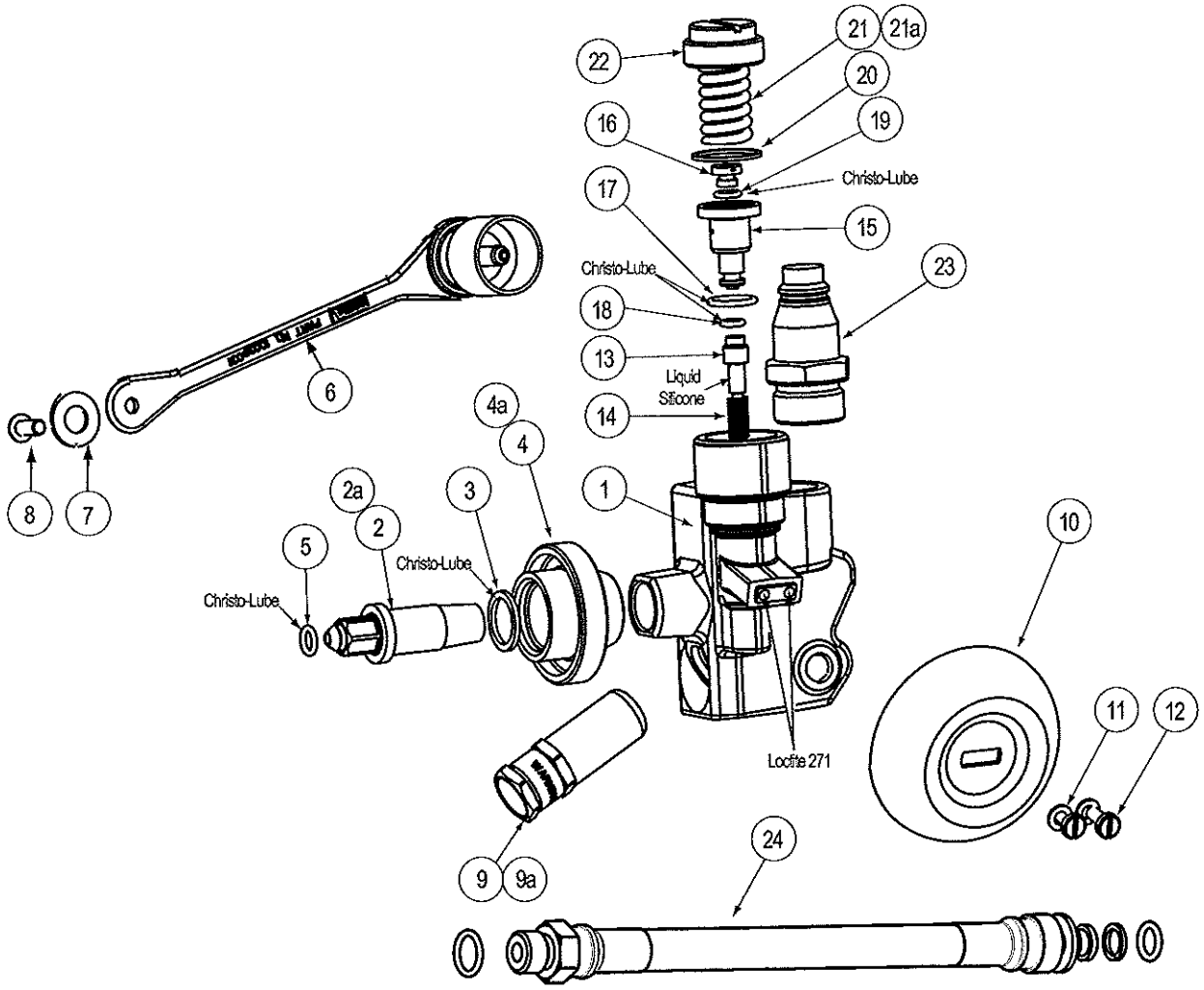
Audi-Larm Audible Alarm Replacement Kit		
10037310	Audi-Larm Audible Alarm 2216 psi, complete	
10037312	Audi-Larm Audible Alarm 4500 psi, complete	
Maintenance Kit		
10045831	635953	Piston Bore O-Ring
	635954	Piston Nose O-Ring
	66395	Piston Plug O-Ring
	85055	Striker Spring
	85051	Striker
	85053	Pellet
	68523	Retaining Ring
Bell Replacement Kit		
10090907	485829	Bell
	54197	Lock Washer Lock
	635245	Screw (2)
Piston Replacement Kit		
10090908	635953	Piston Bore O-Ring
	635954	Piston Nose O-Ring
	66395	Piston Plug O-Ring
	85052	Piston Plug
	85049	Piston Assembly
Striker Replacement Kit		
10044574	85051	Striker
	85053	Pellet
Dust Cover Replacement Kit		
10090909	10038031	Dust Cover Assembly
	10037952	Screw
	10041962	Washer
Audi-Larm O-Ring Replacement Kit		
10090910	633553	Nipple O-Ring Kit (pack of 10)

FIREHAWK M7 AUDI-LARM AUDIBLE ALARM

Parts List and Exploded View: 2216/4500 psi

Item	P/N	Description	Item	P/N	Description
1	10038417	Audi-Larm Body	15	85049	Piston Assembly
2	10062086	Fitting, Nipple, 2216 psi	16	85052	Piston Plug
2a	10062087	Fitting, Nipple, 4500 psi	17	635953	Piston Bore O-Ring
3	93031	Washer, CGA Nut	18	635954	Piston Nose O-Ring
4	10062084	Coupling Nut, 2216	19	66395	Piston Plug O-Ring
4a	10062085	Coupling Nut, 4500 psi	20	68523	Retaining Ring
5	633553	Nipple O-Ring	21	455941	Spring, 2216 psi
6	10038031	Dust Cover Assembly	21a	474352	Spring, 4500 psi
7	10041011	Washer	22	474369	Adjusting Nut
8	10037952	Screw	23	485070	UAC Adapter with O-Ring
9	10036291	Pressure Relief Valve* 2216 psi	24	804382	High Pressure Hose*
9a	10036292	Pressure Relief Valve* 4500 psi		809028	Christo-Lube Lubricant (2 cc tube)
10	485829	Bell		28907	Thread Tape
11	54197	Lock Washer (2)		29787	Loctite 222
12	635245	Screw, #8-32 x 7/16 LG (2)		26875	Loctite 271
13	10044574	Striker with Pellet		494992	Liquid Silicone Lubricant
14	85055	Striker Spring			

*Includes Back-Up and O-Rings as needed.



REPLACEMENT KITS AND PARTS LIST

Replacement and Maintenance Kits: 3000 psi

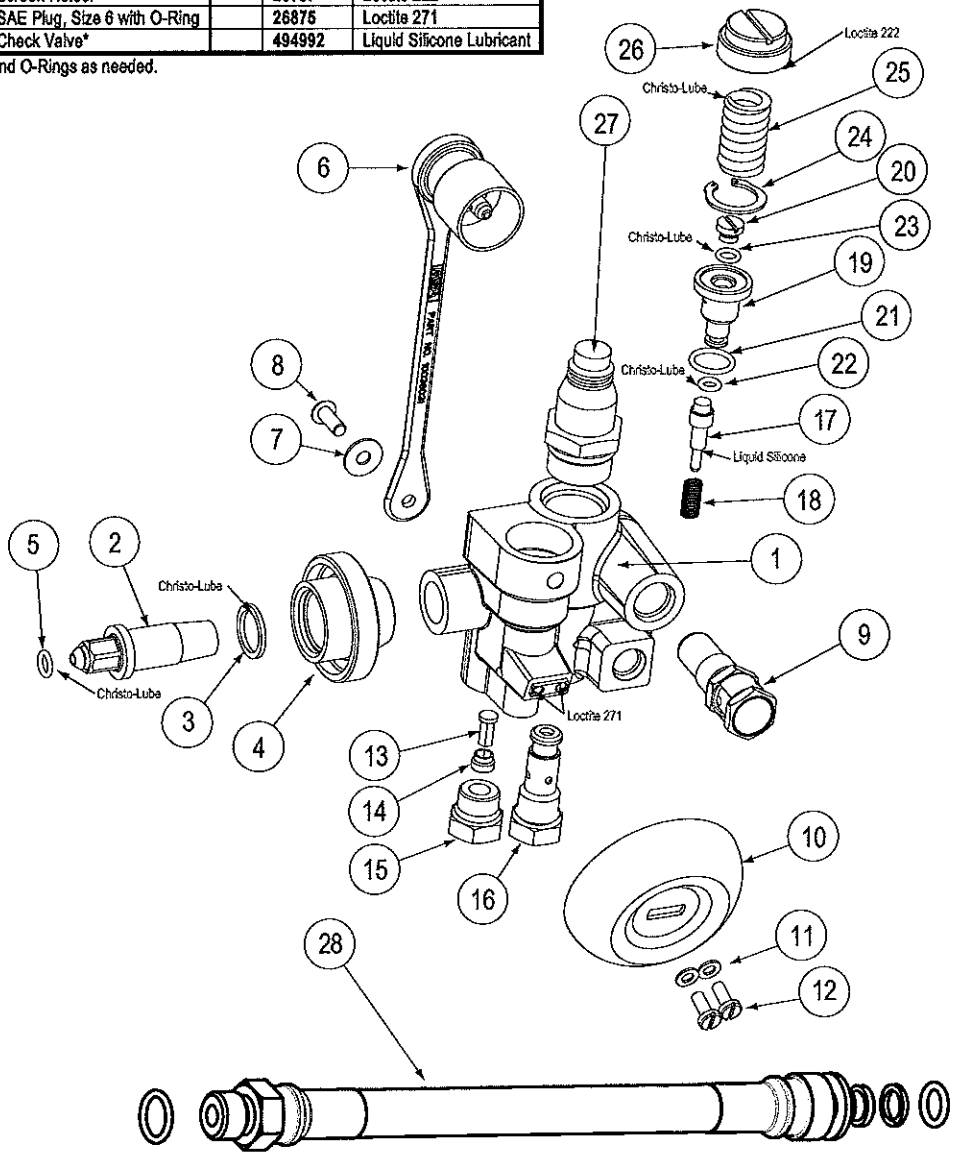
Audi-Larm Audible Alarm Replacement Kit		
10043947	Audi-Larm Audible Alarm 3000 psi, complete	
Maintenance Kit		
10045831	635953	Piston Bore O-Ring
	635954	Piston Nose O-Ring
	66395	Piston Plug O-Ring
	85055	Striker Spring
	68523	Retaining Ring
	809028	Christo-Lube Lubricant (2 cc tube)
	494992	Liquid Silicone Lubricant
Bell Replacement Kit		
10090907	485829	Bell
	54197	Washer, Lock, #8
	635245	Screw, #8-32 x 7/16 LG
Piston Replacement Kit		
10090908	635953	Piston Bore O-Ring
	635954	Piston Nose O-Ring
	66395	Piston Plug O-Ring
	85052	Plug, Piston
	85049	Piston Assembly
	604070	Christo-Lube Lubricant
Striker Replacement Kit		
10044574	85051	Striker
	85053	Pellet
	603342	Liquid Silicone Lubricant
Dust Cover Replacement Kit		
10090909	10038031	Dust Cover Assembly
	10037952	Screw, 10-32 UNF, SST
	10041962	Washer, Flat, SST
Audi-Larm O-Ring Replacement Kit		
10090910	633553	Nipple O-Ring Kit (pack of 10)

FIREHAWK M7 AUDI-LARM AUDIBLE LARM

Parts list and Exploded View: 3000 psi

Item	P/N	Description	Item	P/N	Description
1	10045593	Audi-Larm Housing	17	10044574	Striker with Pellet
2	10062086	Nipple	18	85055	Striker Spring
3	93031	Washer, CGA Nut	19	85049	Piston Assembly
4	10062084	Coupling Nut	20	85052	Plug, Piston
5	633553	O-Ring, Nipple	21	635953	Piston Bore O-Ring
6	10038031	Dust Cover Assembly	22	635954	Piston Nose O-Ring
7	10041962	Washer, Flat, SST	23	66395	Piston Plug O-Ring
8	10037952	Screw, 10-32 UNF, SST	24	68523	Retaining Ring
9	10036291	Pressure Relief Valve*	25	474352	Spring
10	485829	Bell	26	474369	Adjusting Nut
11	54197	Washer, Lock, #8	27	485070	Quick-Fill Adapter
12	635245	Screw, #8-32 x 7/16 LG	28	804382	High Pressure Hose*
13	476441	Sintered Filter		604070	ChristoLube Lubricant
14	80495	Screen Holder		29787	Loctite 222
15	10043943	SAE Plug, Size 6 with O-Ring		26875	Loctite 271
16	10043945	Check Valve*		494992	Liquid Silicone Lubricant

*Includes Back-Up and O-Rings as needed.



FIREHAWK M7 AUDI-LARM AUDIBLE ALARM

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AUDI-LARM ASSEMBLY DISASSEMBLY

Only MSA-certified personnel may maintain and repair the apparatus. Use only replacement parts from MSA to assure proper performance. Thoroughly understand all instructions, inspection procedures, cautions, and warnings that pertain to the breathing apparatus.

Most repairs require standard tools. However, certain special tools, tapes, lubricants, and a tester from MSA are required. See the Required Tool List.

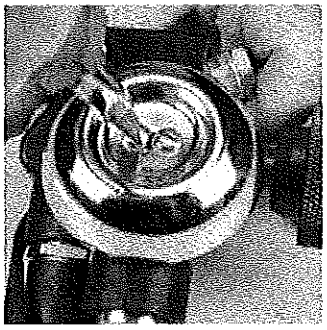
Follow maintenance procedures exactly. Deviation from written repair procedures is unacceptable, unless approved by authorized MSA personnel.

⚠ WARNING

Relieve all pressure from the system. Close thecylinder valve. Be sure that nothing blocks the regulator outlet. Open the bypass valve to release trapped air. Failure to follow this warning can result in serious personal injury or death.

Removing the Bell

1. Use a flat-blade screwdriver to remove the screws and lock-washers holding the bell to the Audi-Larm housing.



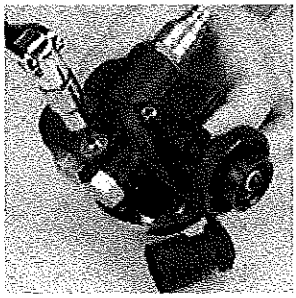
2. Discard the screws and washers.

⚠ WARNING

Do not remove the bell from the alarm housing unless the bell is damaged. If the bell is damaged replace it with a new bell. Failure to follow this warning can result in serious personal injury or death.

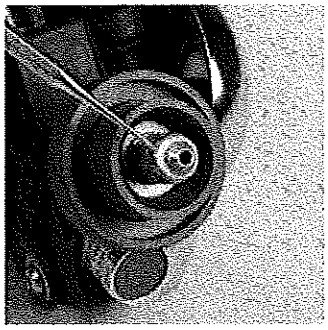
Removing the Dust Cover

1. Use a **1/8" hex wrench** to remove the screw.
2. Discard screw, washer, and dust cover.



Removing the Coupling Nut O-Ring

1. Use the o-ring removal tool to remove the o-ring.



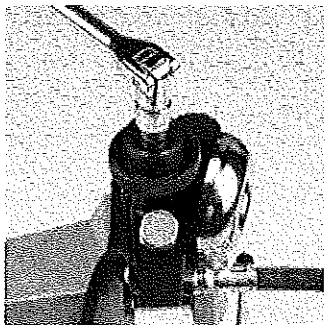
Note: Be careful not to scratch the o-ring groove.

2. Discard the o-ring

Removing the Coupling Nut

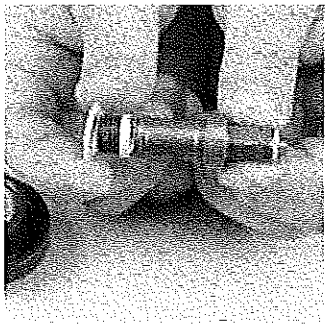
1. Remove the nipple.
   a. Secure the alarm body with a wrench or vise.

Note: Use protective sleeves on the jaws of the vise.



b. Use a **7/16" deep-well socket** to unscrew the nipple.

c. Remove the nipple and coupling nut.



d. Remove the washer.

e. Clean pipe-sealing tape and lubricant residue from the thread.

Disassembly

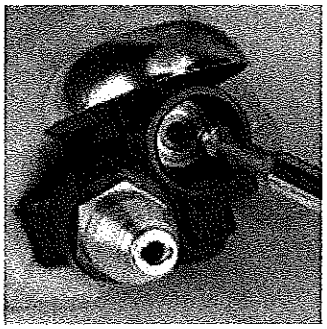
1. Remove the Audi-Larm coupling nut from the cylinder valve.

2. Use a large flat-blade scrwdriver to remove the adjusting screw.

3. Remove the spring.

4. Use retaining-ring pliers to remove the ring. Apply only enough pressure to remove the ring.

   a. Discard the o-ring.



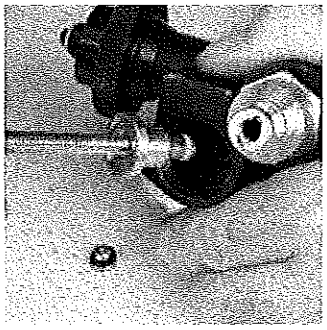
5. Unscrew and remove the piston plug and o-ring.

   a. Discard the o-ring.

6. Screw the extraction tool (P/N 482426) into the back of the piston.

⚠ CAUTION

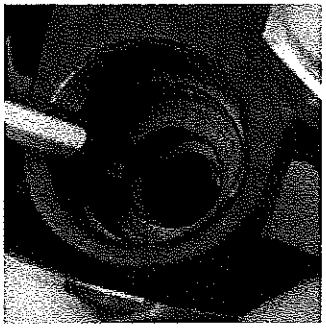
Be careful not to damage the piston valve seat on the opposite end of the piston.



7. Remove the piston by gently rocking and pulling the extraction tool.

8. Remove the extraction tool.
9. Remove and discard piston o-ring and the piston plu
10. Turn the alarm over to remove the striker and spring from the alarm housing.
11. Discard striker and valve pellet.

12. Remove and discard the o-ring beneath the alarm housing shoulder.



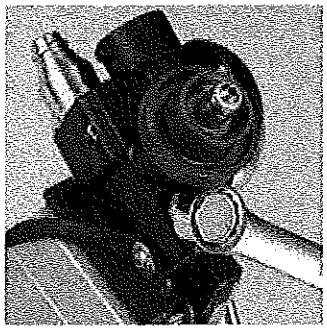
13. Wipe all dirt and grease from the striker.

Removing the Relief Valve

⚠ WARNING

If label on Relief Valve is missing or damaged, install a new Relief Valve. Failure to follow this warning can result in serious personal injury or death.

1. Use an **11/16" wrench** to loosen and remove the relief valve.

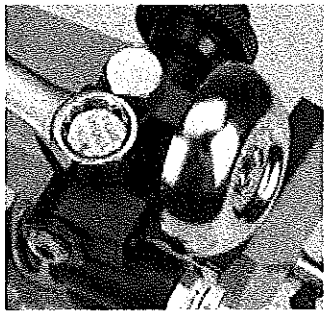


2. Discard the check valve.

Note: The Relief valve is factory set and must be replaced with a new relief valve.

Removing the Check Valve on a 3000 psi System

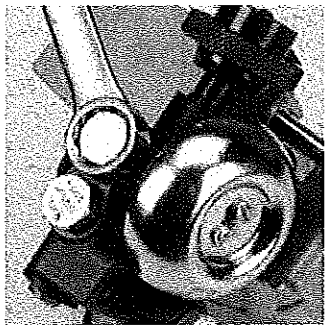
1. Use an **11/16" wrench** to unscrew the check valve.



2. Discard the check valve.

Removing the Plug and Sintered Filter on a 3000 psi System

1. Use an **11/16" wrench** to unscrew and remove the plug.



2. Use a **3/8" nut driver** to loosen and remove the filter and filter holder.

3. Discard the filter.

⚠ CAUTION

Be careful not to round hex head or snap off filter inside the alarm body.

Removing the UAC Adapter

1. Place the Audi-Larm block in a vise.

Note: Use protective sleeves to avoid damaging the block.

2. Use a **1" deep-well socket** to loosen the UAC Adapter from alarm body.
3. Discard UAC Adapter.

Installing the Relief Valve

1. Remove the protective cap.
2. Install a new o-ring
   a. Apply a small amount of Christo-Lube lubricant to the o-ring.
3. Screw the relief valve into the alarm body and hand tighten.

Note: Be careful not to cross-thread the relief valve.

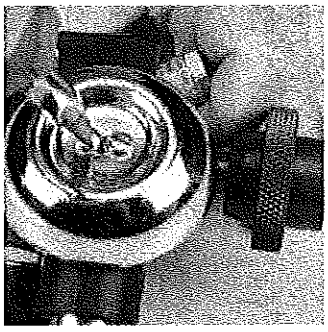
4. Use a torque wrench and **11/16" socket** to tighten the relief valve to **200-250 in lbs.**

AUDI-LARM AUDIBLE ALARM REASSEMBLY

Installing the Bell
P/N 10090907

1. Align the bell with the boss on the alarm housing. The rim of the bell must not touch the alarm housing.
2. Remove residual Loctite thread locker.
3. Apply one drop of Loctite 271 (P/N 26875) into each hole.
4. Insert screws with lock-washers (P/N 54197) into the Audi-Larm body and tighten.

5. Ensure that the bell is tight.



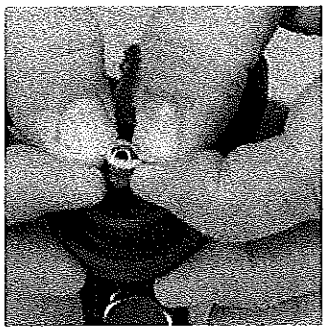
Installing the Dust Cover
P/N 10090909

1. Insert screw with washer through tether into Audi-Larm body.
2. Tighten with a **1/8" hex wrench.**

Installing the Nipple O-Ring
P/N 10090909 P/N 633553

1. Apply a Small amount of Christo-Lube (P/N 604070) lubricant to the new o-ring.

2. Roll the new o-ring into the groove until seated.



Note: An improperly seated o-ring can cause an air leak.

Reassembling the Coupling Nut and Nipple

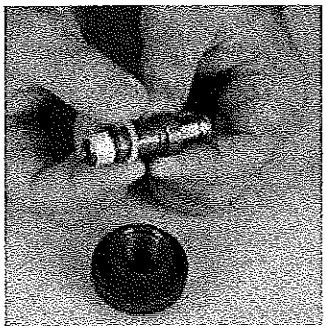
Nipple	2216/3000 psi: P/N 10062086
	4500 psi: P/N 10062087
Coupling Nut	2216/3000 psi: P/N 10062084
	4500 psi: P/N 10062085

1. Reinstall the Coupling Nut

   a. Apply pipe-sealing tape to the nipple thread.

2. Apply a small amount of Christo-Lube lubricant to the new washer.

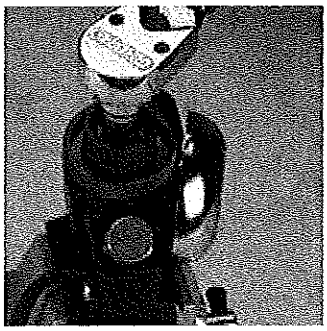
3. Slide the new washer onto the threaded end of the nipple.



4. Slide the coupling nut onto the threaded end of the nipple.

a. Screw the coupling nut and nipple into the Audi-Larm body.

b. Use a torque wrench and **7/16" deep well socket** to tighten the nipple to **25 ft lbs.**



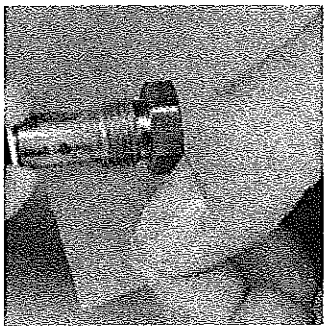
⚠ CAUTION

Do not over-tighten to prevent damage the Audi-Larm body or the nipple thread.

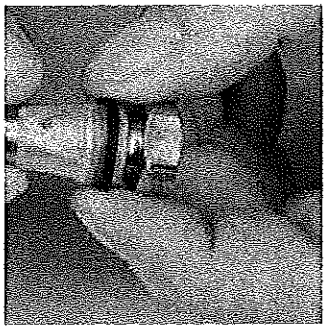
Installing the Check Valve
P/N 10043945

1. Remove protective cap.
2. Install the o-ring and back-up ring.
   a. Apply a small amount of Christo-Lube lubricant to the o-rings and back-up rings.

b. Protect the threads with thread protector, tape or paper.



c. Slide the o-ring over the thread.



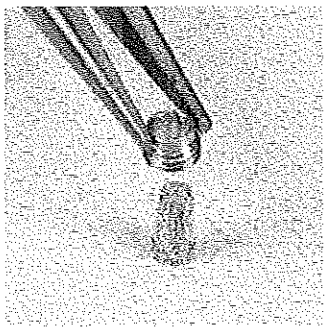
3. Screw the check valve into the alarm body port and hand-tighten. Be careful not to cross-thread the check valve.

4. Use a torque wrench and **11/16" socket** to tighten the check valve to **200-250 in lbs.**

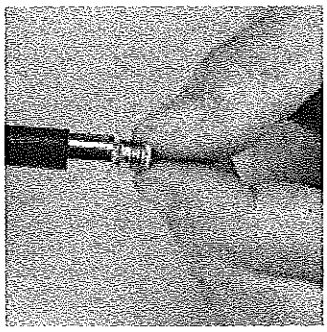
Installing the Plug and Sintered Filter on a 3000 psi System

Plug	P/N 10043943
Filter	P/N 476441
Holder	P/N 80495

1. With the filter flange down, slide the non-threaded end of filter holder onto the filter.



2. Insert the filter and holder into a **3/16" nut driver.**



3. Insert the filter holder, filter, and nut driver into the alarm plug port.

4. Finger tighten.

Note: To prevent over-tightening, use a nut driver, not a socket and ratchet wrench.

⚠ CAUTION

Do not over-tighten, round hex head, or snap filter off inside the alarm body.

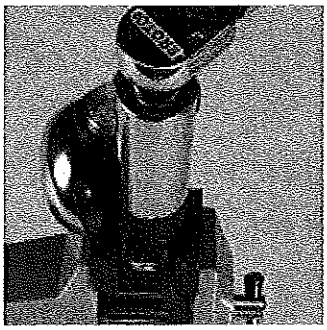
5. Install a new plug and o-ring.
   a. Apply a small amount of Christo-Lube lubricant to the o-ring.
6. Screw plug into the alarm body port and hand-tighten. Be careful not to cross-thread the plug.
7. Use a torque wrench and **11/16" socket** to tighten to **200-250 in lbs.**

Installing URC Adapter in the Alarm Body

1. Install a new URC Adapter
   a. Secure the Audi-Larm body in a vise.

Note: Use protective sleeves to keep from damaging the block.

2. Screw the coupling into the alarm body by hand.

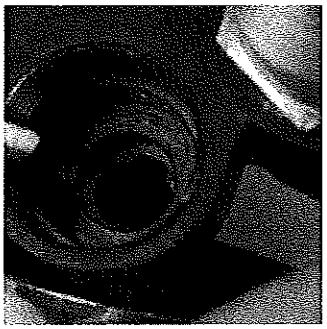


3. Use a torque wrench and **1" deep-well socket** to tighten to **70–75 ft lbs.**

Installing the Striker

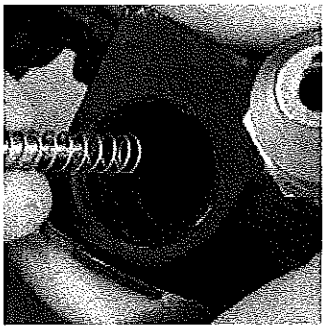
Audi-Larm Audible Alarm Maintenance Kit	P/N 10045831
Striker Replacement Kit	P/N 10044574

Note: Replace all o-rings. Reuse of o-rings is the most frequent cause of alarm malfunction. Apply a small amount of Christo-Lube lubricant to each o-ring before installing.



1. Install the o-ring under the shoulder inside the alarm housing. Use the o-ring removal tool to push the o-ring into place.

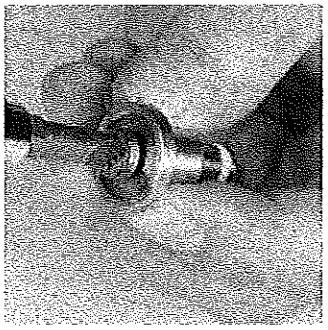
2. Apply a small amount of Silicone Lubricant (P/N 494992) to the striker shaft.
3. Place the spring over the striker.



4. Insert the spring and striker into the alarm housing.

Audi-Larm Assembly Reassembly
P/N 10090908

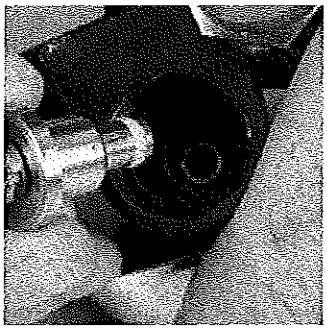
1. Ensure that the striker extends through the hole and can touch the bell.
2. Install new o-rings on the piston and the piston plug.



3. Screw the plug into the piston and tighten.

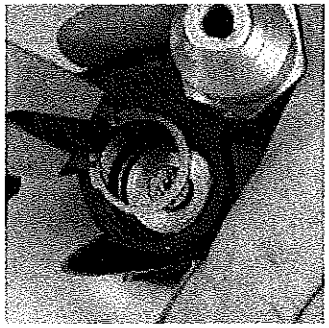
4. Apply a small amount of Christo-Lube lubricant to the beveled shoulder of the piston assembly.

5. Insert the piston into the alarm housing and press it into place.

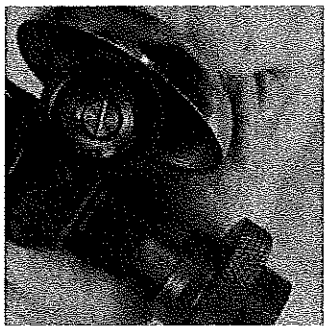


Note: Be careful not to damage the piston seat. The striker will extend through the forward hole toward the bell.

6. Use retaining-ring pliers to install the new retaining ring flat side out.

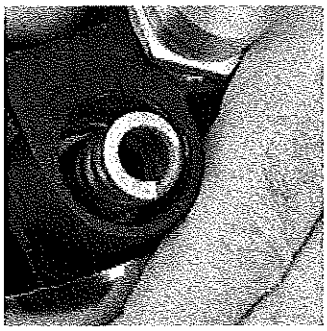


Note: The ring must seat in the groove located about 1/16" above the piston. Use the o-ring removal tool if necessary to push the ring into the groove. If the ring is bent, or does not fit tightly, replace it.

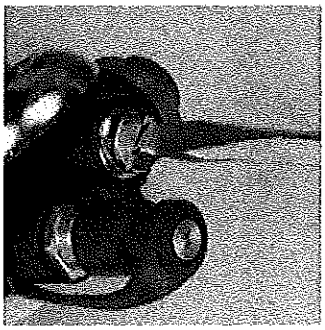


7. Apply a small amount of Christo-Lube lubricant to both ends of the adjusting spring.

8. Insert the adjusting spring into the alarm housing.



9. Insert the screw into the alarm housing and tighten about 1-1/2 turns.



10. Verify proper Audi-Larm operation by performing the required ring-up, set point, and ring-down tests specified in the Audi-Larm Audible Alarm Testing.

Note: After testing, place one drop of Loctite 222 on the adjusting screw threads.

11. Ensure cylinder valve is closed.
12. Open the bypass valve to release air pressure.
13. Remove the Audi-Larm assembly from the alarm tester.
14. Check the alarm for air leaks. See **Leak Testing-Audi-Larm P/N 1005113**).

Audi-Larm Audible Alarm Testing

PosiChek3 Machine
MSA requires C.A.R.E. facilities to use the Audi-Larm Tester (P/N 10045522) to evaluate the accuracy of the Audi-Larm™ Audible Alarm during each flow test of the SCBA. MSA also authorizes use of upgraded Biosystems PosiChek3 SCBA Test Benches to test Audi-Larm accuracy.

Upgrades to the PosiChek3 Machine are available through Biosystems:
54-21-A12 - EP (Enhanced Precision) Upgrade Only, and
54-21-A13 - Sound Detection System Upgrade Only, or
54-21-A14 - EP and Sound Detection System Upgrade Combined.

⚠ WARNING

If upgrades have not beenperformed to the Biosystems PosiChek3 Test Bench, MSA requires C.A.R.E. facilities to use the Audi-Larm Tester (P/N 10045522) to check the accuracy of the Audi-Larm™ Audible Alarm during each flow test of the SCBA. Failure to follow this warning can cause Audi-Larm malfunction, resulting in serious personal injury or death.

Contact Biosystems (www.biosystems.com) for information regarding other necessary upgrades.

FireHawk® M7 Carrier and Harness Assembly

MAINTENANCE AND REPAIR

For More Information, call 1-800-MSA-2222 or Visit Our Website at www.MSAnet.com

MSA The Safety Company

MINE SAFETY APPLIANCES COMPANY
PITTSBURGH, PENNSYLVANIA, U.S.A. 15230

TAL 803 (L) Rev. 0

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Prnt. Spec. 10000005389(I) Mat. 10093081
Doc. 10093081

REPLACEMENT KITS AND PARTS LIST

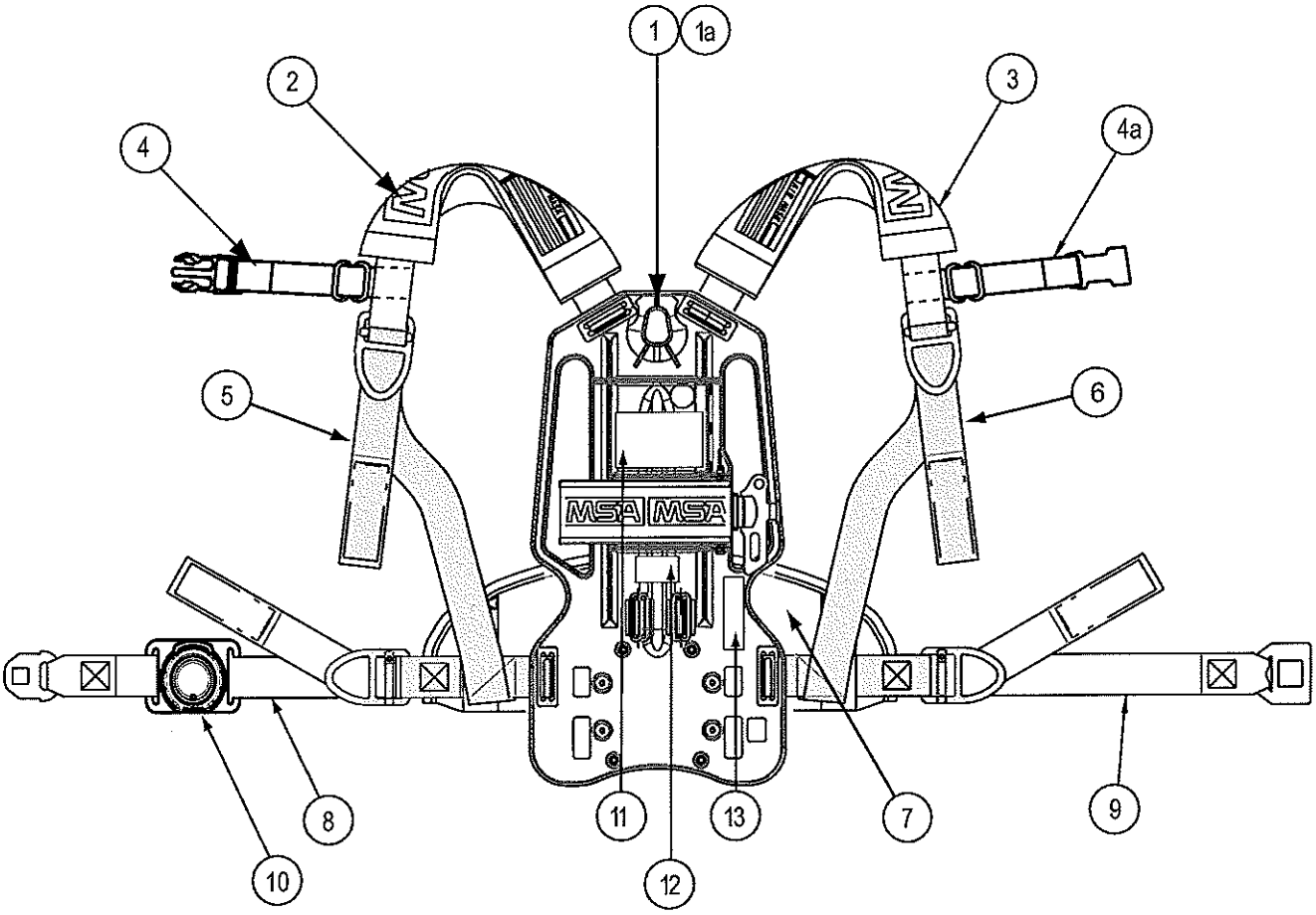
Replacement Kits

FireHawk M7 Carrier w/Labels (2216 psi/3000 psi)		
10090852	10083436	Carrier Assembly
	10084688	ID Label
	805430	Cylinder Band Label
	10084504	NIOSH Label
	10087472	CBRN Label
	10084687	NFPA Label
	10087293	FireHawk M7 Logo Label
FireHawk M7 Carrier w/Labels (4500 psi)		
10090853	10083436	Carrier Assembly
	10084688	ID Label
	805430	Cylinder Band Label
	10084504	NIOSH Label
	10087472	CBRN Label
	10084687	NFPA Label
	10087293	FireHawk M7 Logo Label
Chest Strap Replacement Kit		
10012167	818380	Left Chest Strap
	818379	Right Chest Strap
Strap and Belts		
10048173	10048173	Left Shoulder Strap
818381	818381	Right Shoulder Strap
10012167	10012167	Chest Strap
818378	818378	Left Double Pull Strap
818377	818377	Right Double Pull Strap
10083134	10083134	Swiveling Lumbar Pad
10025941	10025941	Left Double Pull Belt
10025942	10025942	Left Single Pull Belt (Not Shown)
818374	818374	Right Pull Belt
10022245	10022245	Belt Mount

Parts List

Item	P/N	Description
1	10086665	M7 Carrier & Harness w/ Chest Strap, 4500 psi
	10083129	M7 Carrier & Harness w/o Chest Strap, 4500 psi
	10086664	M7 Carrier & Harness w/ Chest Strap, 2216/3000 psi
	10083128	M7 Carrier & Harness w/o Chest Strap, 2216/3000 psi
	10086662	M7 Carrier & Harness w/ Chest Strap, Swiveling Lumbar, 4500 psi
	10086663	M7 Carrier & Harness w/ Chest Strap, Swiveling Lumbar, 2216/3000 psi
1a	10083436	M7 Backplate and Cylinder Band
2	10048173	Left Shoulder Strap
3	818381	Right Shoulder Strap
4	818380	Left Chest Strap
4a	818379	Right Chest Strap
5	818378	Left Double Pull Strap
6	818377	Right Double Pull Strap
7	10083134	Swiveling Lumbar Pad
8	10025941	Left Double Pull Belt
8a	10025942	Left Single Pull Belt (Not Shown)
9	818374	Right Pull Belt
10	10022245	Belt Mount
11	10084504	M7 NIOSH Label
12	10087472	CBRN Label
13	10084687	M7 NFPA Label

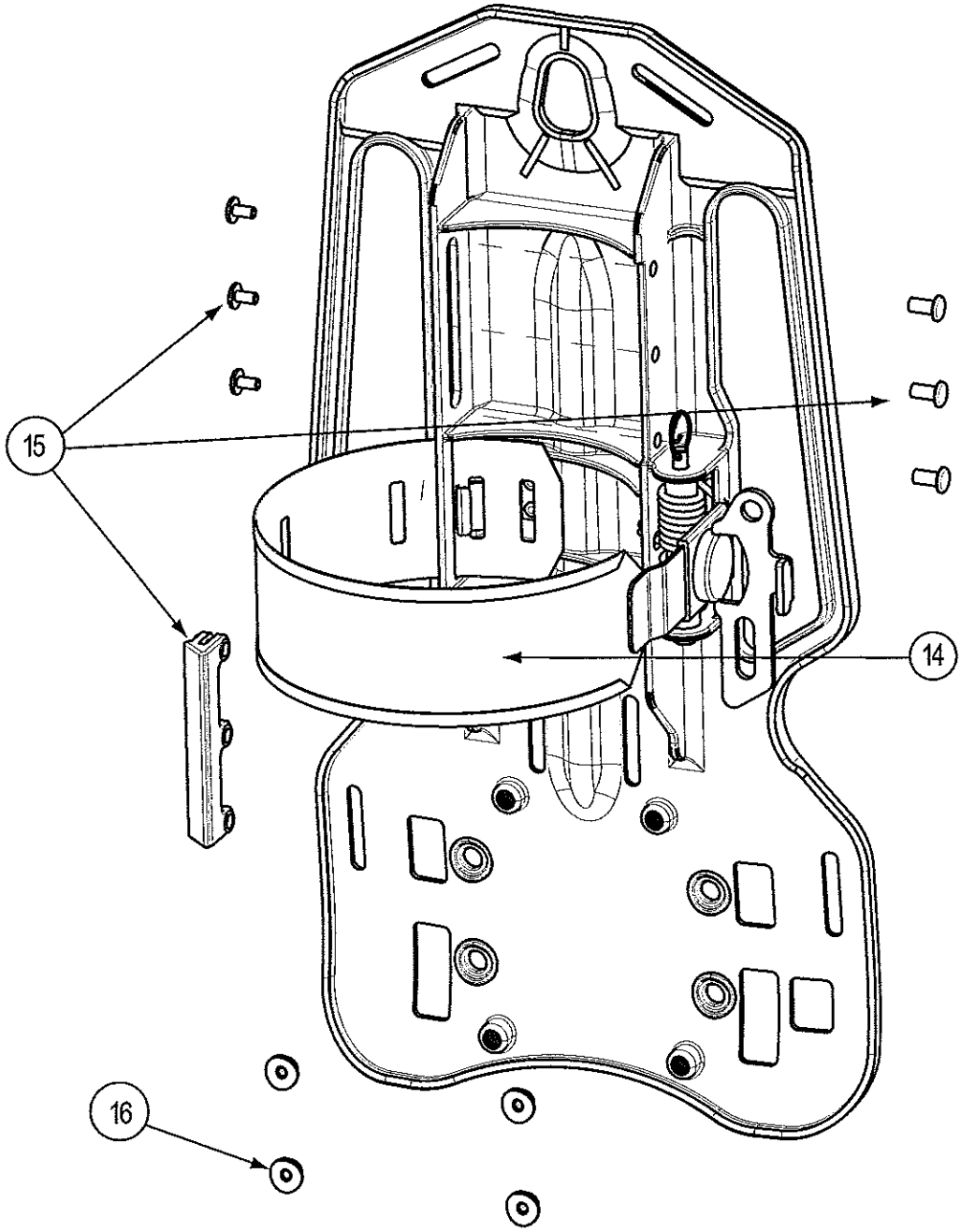
FIREHAWK M7 CARRIER AND HARNESS ASSEMBLY



FIREHAWK M7 CARRIER AND HARNESS ASSEMBLY

Replacement Kits and Parts List (cont)

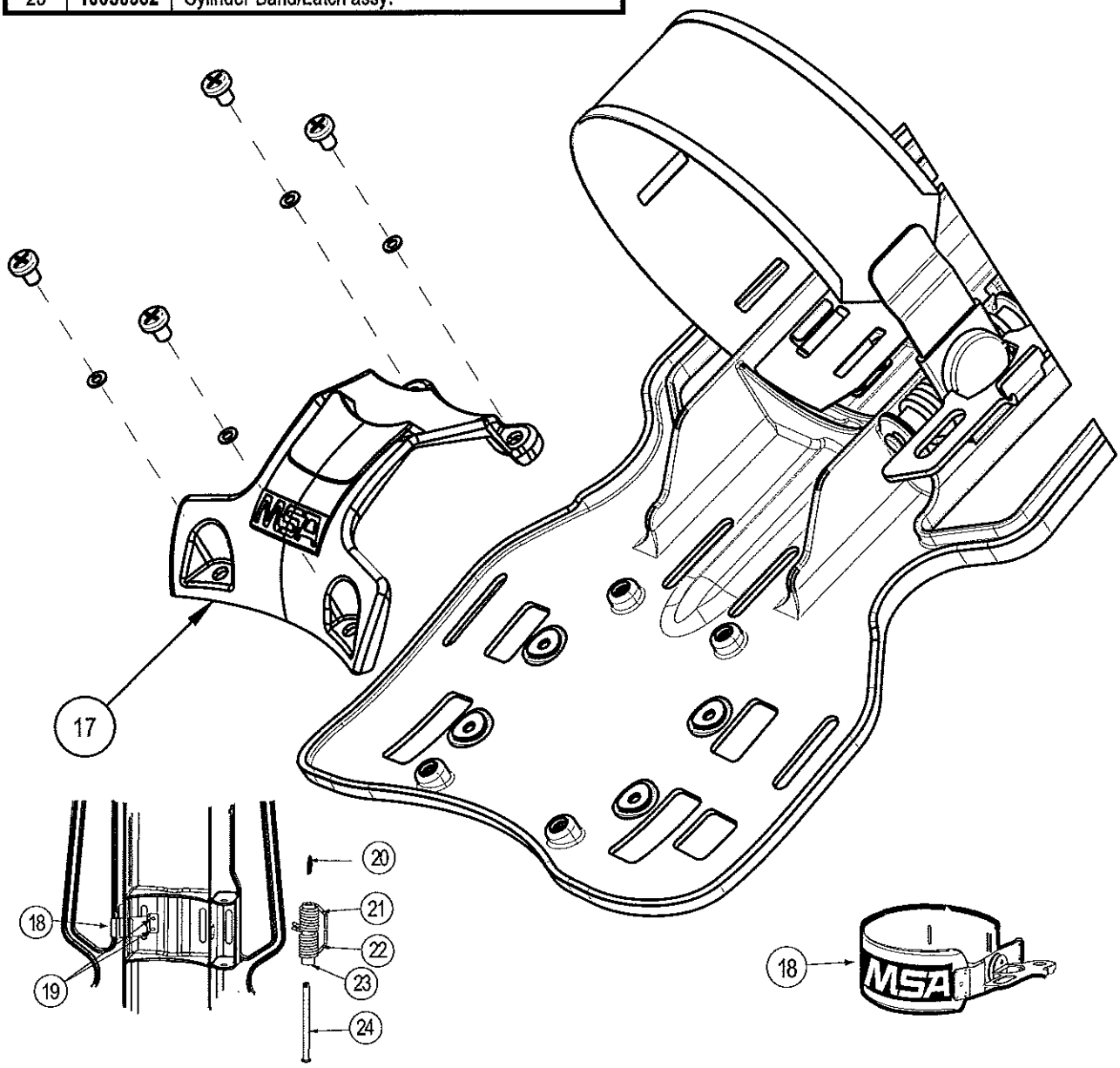
Item	P/N		Description
14	805430		Cylinder Band Label 2216/3000 psi
	805265		Cylinder Band Label 4500 psi
Cylinder Friction Pad Kit			
15	10086667	10084777	Binding Post with screws (3 req'd.)
		10083222	Friction Pad
Shock Mount Kit			
16	10090283	10083223	Shock Mounts (4 req'd.)



FIREHAWK M7 CARRIER AND HARNESS ASSEMBLY

Replacement Kits and Parts List (cont)

Item	P/N	Description	
17	10086666	10083225	Cylinder Stop Kit
		10084812	Screw (4 req'd.)
		10084815	Lock washer (4 req'd.)
18	10066867	Cylinder Band Adjuster	
19	10058780	Rivet (2 req'd.)	
20	10005952	Retaining Ring	
21	10012748	Spring (lower)	
22	10012749	Spring (upper)	
23	10005782	Bushing Spring	
24	10005950	Pin	
25	10050362	Cylinder Band/Latch assy.	



FIREHAWK M7 CARRIER AND HARNESS ASSEMBLY

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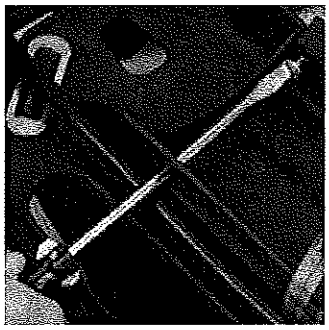
Installing Waist Belts 10
Installing the Swiveling Lumbar Pad 10

DISASSEMBLY

Removing the Friction Pad

1. Remove the cylinder.
2. Use a slot head screwdriver to unscrew the Friction Pad screws.



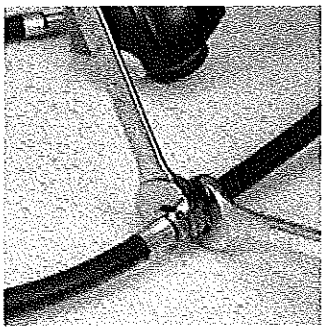
Note: To ease access to the screws, remove the PR-14 Mounting Bracket and pass the screwdriver through the slot.

Removing the Right Shoulder Strap

1. Remove the M7 Control Module. See M7 Control Module Repair and Maintenance for Instructions.
2. Unlace the free end of the pull-strap from the friction buckle.

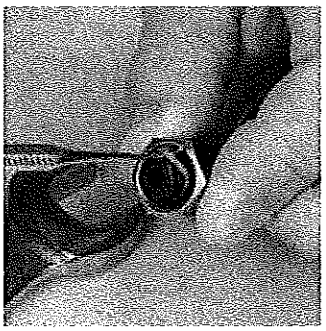
3. Remove the shoulder strap by angling the Tri-bar slide through the slot.

Removing the Left Shoulder Strap



1. Disconnect the second stage regulator from the intermediate pressure hose.

a. If present, use an **11/16" wrench** to remove the Extend-Aire manifold.

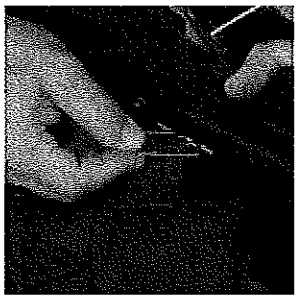


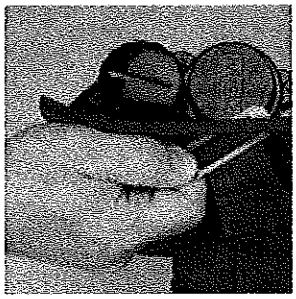
b. Remove the o-ring and discard.

2. Pull the first stage intermediate pressure hose through the shoulder strap.

3. Remove the pull-strap from the friction buckle.

Removing Waist Belts
Remove the waist pull-straps from the backplate by angling the tri-bar through the slots.





Removing the Swiveling Lumbar Pad

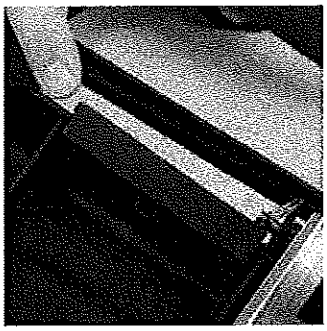
1. Remove the Swiveling Lumbar Pad by angling the tri-bars through the backplate slots.

REASSEMBLY

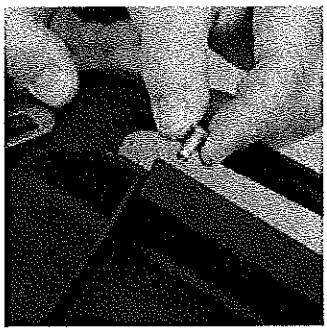
Installing the Friction Pad
Cylinder Friction Pad Kit P/N 10086667

1. Remove the cylinder.
2. Position the new Friction Pad on the backplate.

Note: Ensure that the Friction Pad face slopes toward the center of the backplate.



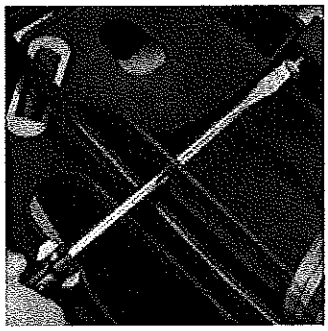
3. Insert T-nuts through the holes.



4. Insert screws.

5. Use a slot head screwdriver to tighten the Friction Pad screws.

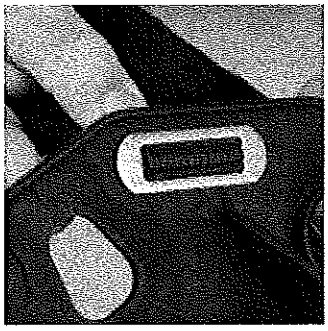
Note: To ease access to the screws, remove the PR-14 Mounting Bracket and pass the screwdriver through the slot.



Installing the Right Shoulder Strap
P/N 818381

1. Install the shoulder strap by angling the tri-bar through the slot.

2. Tug on the shoulder strap to test the attachment.

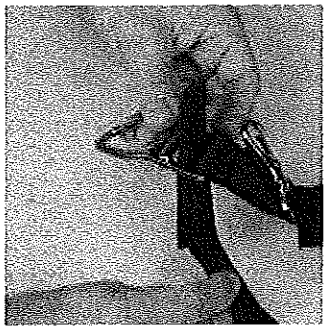


3. Lace the free end of the pull-strap through the friction buckle.

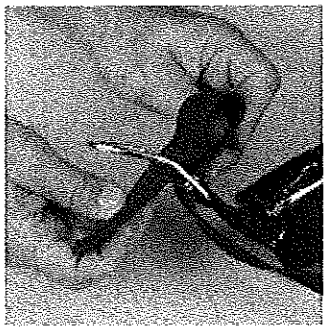
   a. Fully extend the shoulder and pull strap. Make sure the straps are untwisted.

   b. Twist the pull strap counterclockwise one-half turn.

   c. With the fold down, pass the strap from back to front through the buckle.



   d. Pass the strap over the bar and back through the buckle.

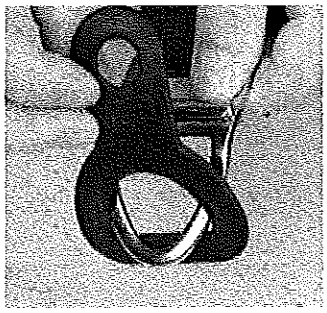


   e. Reinstall the M7 Control Module. (See **M7 Control Module Maintenance and Repair** for instructions.)

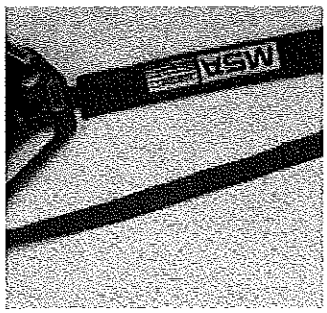
Installing the Left Shoulder Strap
P/N 10048173

1. Install the shoulder strap by angling the tri-bar through the slot.
2. Tug on the shoulder strap to test the attachment.
3. Install the tether.

   a. Pass the friction buckle through the tether's large opening.



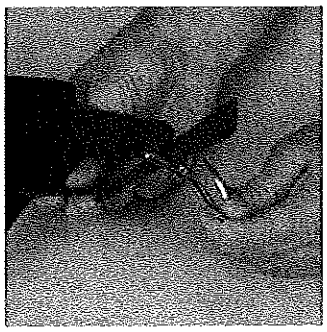
4. Lace the free end of the pull-strap through the friction buckle.



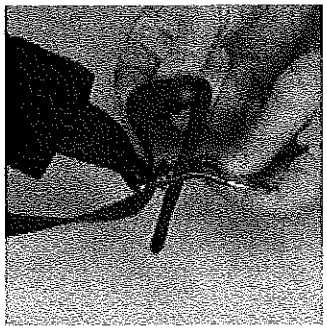
FIREHAWK M7 CARRIER AND HARNESS ASSEMBLY

a. Twist the strap clockwise one-half turn.

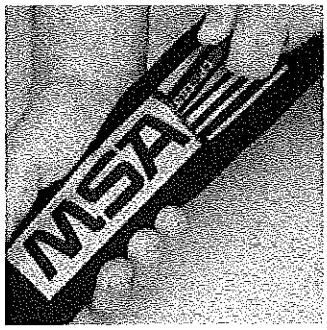
b. With the fold down, pass the strap from back to front through the buckle.



c. Pass the strap over the bar and back through the buckle.

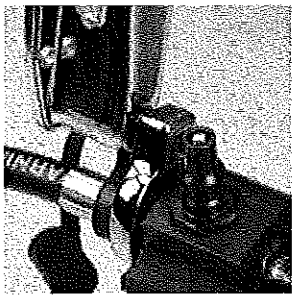


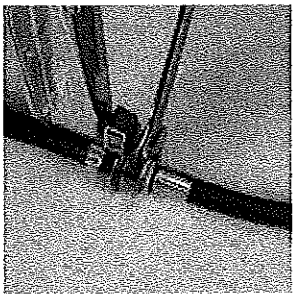
d. Pass the first stage intermediate-pressure hose through the tunnel.



5. Reinstall the M7 Extend Aire manifold as needed.
   a. Install a new o-ring.
   b. Ensure that the dust cover is properly attached.
6. Reconnect the intermediate-pressure hose.

a. Use a torque wrench with **11/16" crowfoot** to tighten the connector to **75 ± 5 in lbs.**

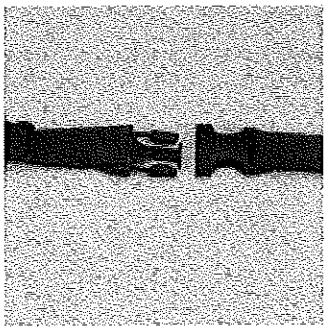




Installing the Chest Strap
Left Chest Strap P/N 818380
Right Chest Strap P/N 818379

Connect male and female ends of chest strap.

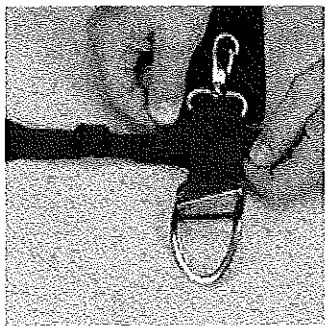
1. Extend the chest straps.



2. Lay the unconnected male end under the right shoulder strap.

3. Lay the unconnected end of the male chest strap under the left shoulder strap.

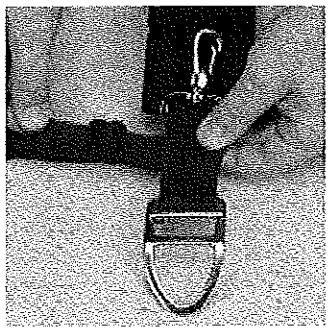
FIREHAWK M7 CARRIER AND HARNESS ASSEMBLY



4. Pass the end through the tunnel in the strap.

5. Lace the strap through the slide buckle.

a. Lace the chest strap over the bar and down through the slide buckle.



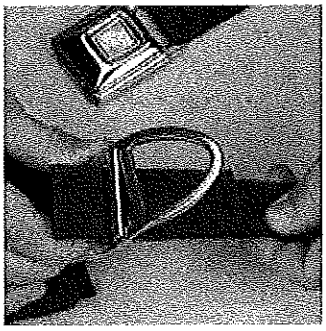
b. Pull the chest strap through.

6. Don the Carrier/Harness Assembly to check chest strap installation.

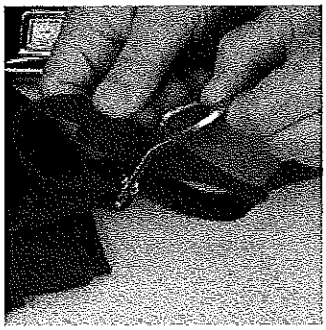
Installing Waist Belts

Left Double Pull Waist Belt:	P/N 818378
Right Waist Belt:	P/N 818377
Left Single Pull Waist Belt:	P/N 10025942

1. Angle the tri-bar strap through the slot.
2. Tug on the belt to test the attachment.



3. From back to front, lace the free end of the pull-strap through the friction buckle.



4. Pass the strap over the bar and back through the buckle.

Installing the Swiveling Lumbar Pad
P/N 10083134

1. Position the Swiveling Lumbar Pad behind the backplate with the curved edge up.

2. Angle the tri-bars through the slots.

FireHawk® M7 Control Module

MAINTENANCE AND REPAIR

For More Information, call 1-800-MSA-2222 or Visit Our Website at www.MSAnet.com

MSA The Safety Company
MINE SAFETY APPLIANCES COMPANY
PITTSBURGH, PENNSYLVANIA, U.S.A. 15230

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Prnt. Spec. 10000005389(I) Mat. 10093088
Doc. 10093088

REPLACEMENT KITS AND PARTS LIST

Replacement Kits

FireHawk M7Control Module Protective Boot Kit*		
10089272	Control Module Protective Boot Kit, w/ buttons	
FireHawk M7 Control Module Gauge & LCD Lens Covers		
10090220	Control Module Gauge & LCD Lens Covers, pack of 5 each	
FireHawk M7 Control Module Back-Up Ring Kit		
10090961	635277	pack of 10
FireHawk M7 Control Module O-Ring Kit		
10090962	638167	pack of 10
Jam Nut		
10090219	10003606	pack of 5

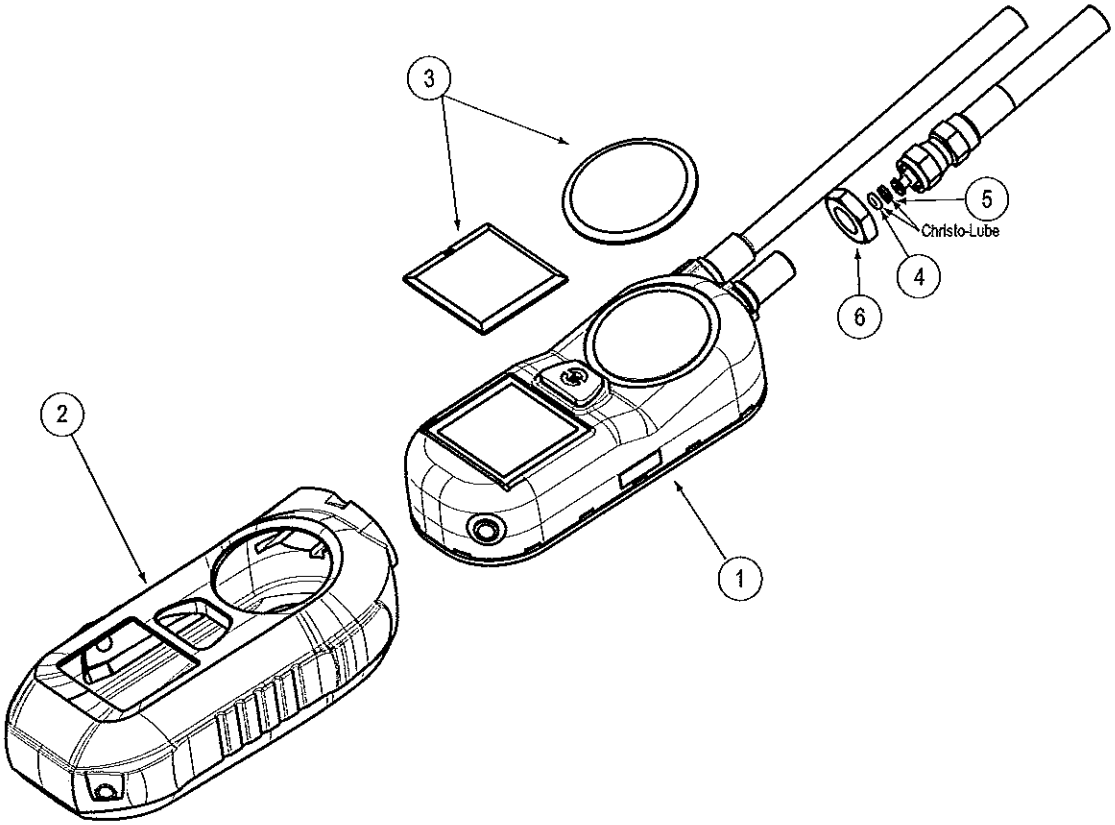
* For Control Modules without Quick-Fill® System only.

Parts List

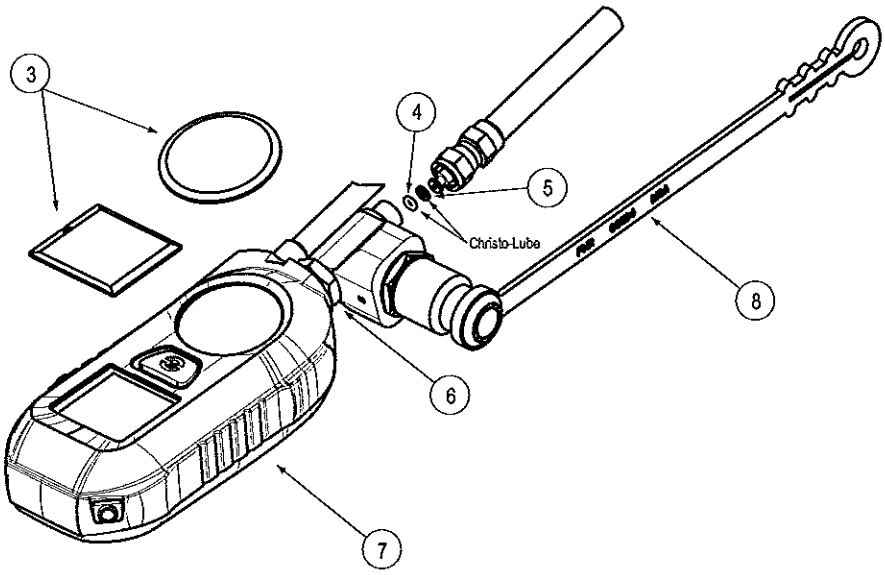
	Item	P/N	Description
Without Quick-Fill System	1	10091146	2216 psi w/ Thermistor*
		10091147	2216 psi*
		10091148	2216 psi w/Thermistor & Telemetry*
		10091149	2216 psi w/Telemetry*
		10091150	3000 psi w/Thermistor *
		10091201	3000 psi*
		10091202	3000 psi w/Thermistor & Telemetry*
		10091203	3000 psi w/Telemetry*
		10091204	4500 psi w/Thermistor*
		10091205	4500 psi*
		10091206	4500 psi w/Thermistor & Telemetry*
		10091207	4500 psi w/Telemetry*
	2	10089272	Control Module Protective Boot Kit, with buttons
	3	10090220	Control Module Gauge & LCD Lens Covers
	4	638167	O-Ring
	5	635277	Back-up Ring
	6	10003606	Jam nut
Both		10016029	Tether
With Quick-Fill System	7	10091208	2216 psi w/Thermistor*
		10091209	2216 psi*
		10091210	2216 psi w/Thermistor & Telemetry*
		10091211	2216 psi w/Telemetry*
		10091212	4500 psi w/Thermistor*
		10091213	4500 psi*
		10091214	4500 psi w/Thermistor & Telemetry *
		10091215	4500 psi w/Telemetry*
	3	10090220	Control Module Gauge & LCD Lens Covers
	4	638167	O-Ring
	5	635277	Back-up Ring
	8	801164	Dust Cover

FIREHAWK M7 CONTROL MODULE

Exploded Views
FireHawk M7 Control Module without Quick-Fill System



FireHawk M7 Control Module with Quick-Fill System



FIREHAWK M7 CONTROL MODULE

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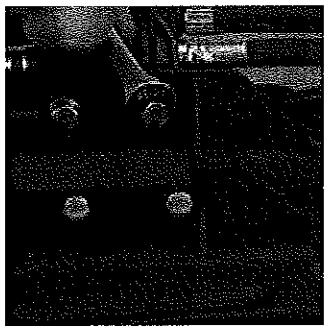
Replacing the FireHawk M7 Control Module Boot and Buttons....4
Reassembly....5
Installing the FireHawk M7 Control Module....5
Connecting the Power and Data Cable....6
Replacing Cover Lenses....7

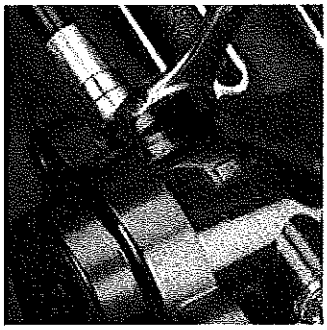
Note: The M7 Control Module is hermetically sealed at the factory and is not field serviceable. Replace damaged or malfunctioning M7 Control Modules.

DISASSEMBLY

Removing the M7 Control Module

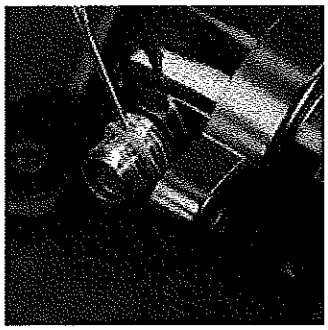


1. Use a **7/16" wrench** to remove the PR-14 First Stage Regulator from the carrier.



2. Disconnect the power and data cable from the M7 Power Module.

USE EXTRA CARE WHEN DISCONNECTING THE POWER AND DATA CABLE TO AVOID DAMAGE TO THE PINS OR SOCKET.



3. Remove and discard the o-ring.

4. Disconnect the high-pressure hose from the M7 Control Module.

Note: If equipped with Quick-Fill system, disconnect the high-pressure hose from the Quick-Fill manifold.

5. Pull the power and data cable, and high-pressure hose through the shoulder strap.
6. Return damaged M7 Control Modules to MSA.

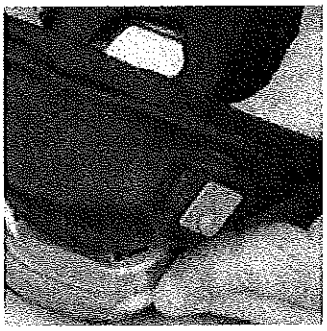
Replacing the FireHawk M7 Control Module Boot and Buttons

P/N 10089272

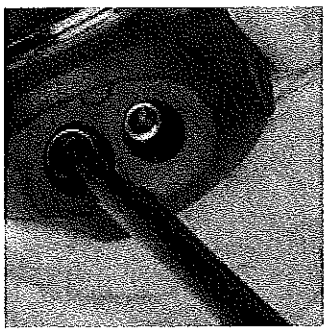
Quick-Fill System Note: The M7 Control Module Boot and Buttons are not field replaceable on models equipped with Quick-Fill Systems.

2. Remove the FireHawk M7 Control Module. See Removing the FireHawk M7 Control Module for instructions.

3. Remove the existing boot.



4. Thread the power and data cable through the new boot.



5. Stretch the new boot onto the Control Module housing.

Note: If a button becomes dislodged while installing the boot, reinstall by sliding the button under the boot. Stretch the boot as needed to engage the button.

6. Reconnect the power and data cable and high-pressure hose. See **Installing the M7 Control Module, steps 4-8** for instructions.
7. Leak test the connection. (See Leak Testing, P/N 10051131)

Pressurize the system and test button functions.

REASSEMBLY

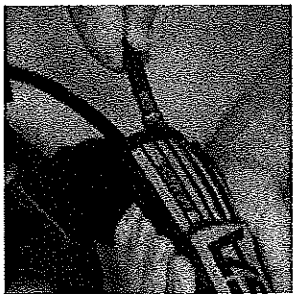
Installing the FireHawk M7 Control Module

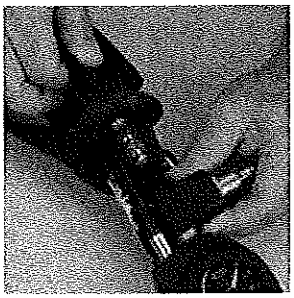
1. Beginning at the front, thread the power and data cable through the tether and shoulder strap, and high-pressure hose through the tether and shoulder strap.

USE EXTRA CARE WHEN HANDLING THE POWER AND DATA CABLE CONNECTOR TO AVOID DAMAGE TO THE PINS OR CONNECTOR.

Note: The power and data cable is curved to favor proper installation. Do not attempt to straighten the cable.

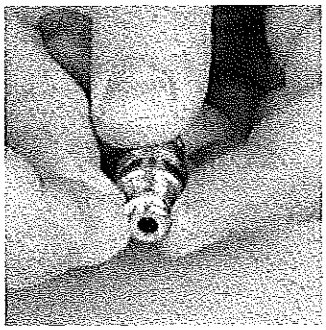
2. Pass the high-pressure hose through the shoulder strap and tether.





3. Install new Back-up and O-Rings
   a. Apply a thin film of Christo-Lube lubricant to the back-up ring (P/N 635277).

   b. Install the back-up ring in the groove.



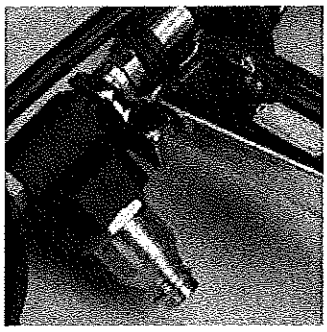
   c. Apply a thin film of Christo-Lube lubricant to the o-ring (P/N 638167).

   d. Place the o-ring in the groove.

4. Install the Jam Nut.
5. Connect the high-pressure hose.

Note: If equipped with a Quick-Fill system, reconnect the high-pressure hose to the Quick-Fill manifold.

a. Use a torque wrench and **5/8" crow foot** to tighten the connector to **100-125 in lbs.**



b. Turn the Jam Nut counterclockwise until it buts against the connector.

6. Use a **5/8" crow foot** to tighten the Jam Nut to **225 - 250 in lbs.**

Note: Turn the Jam Nut counterclockwise to tighten it against the Quick-Fill manifold.

7. Route the power and data cable through the channel on the carrier.

8. Reinstall the PR-14 Second Stage Regulator.

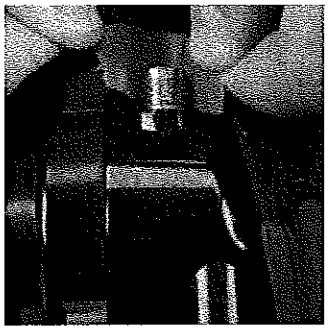
9. Use a torque wrench and **7/16" socke**t to tighten the PR-14 mounting bolts to **35± 5 in lbs.**

Connecting the Power and Data Cable

1. Install a new o-ring. (P/N 10084774)

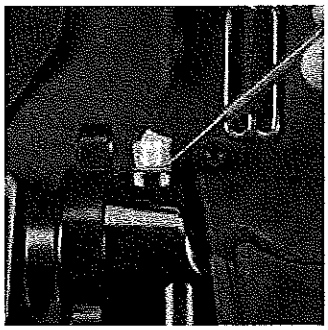
Note: Contact with the thread can damage the o-ring.

a. Protect the o-ring with tape or a thin piece of paper.

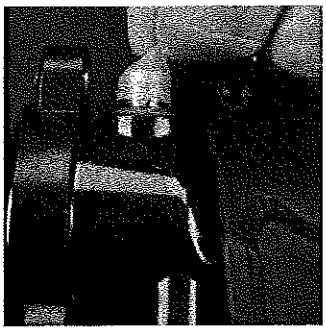


i. Apply a small amount of Christo-Lube lubricant to the o-ring.

ii. Slip the o-ring over the thread.

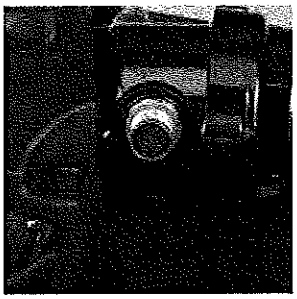


iii. Remove the protective tape or paper.

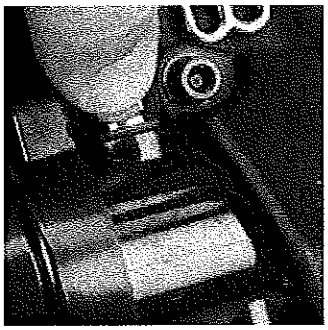


2. Carefully align the keyed connection.

USE EXTRA CARE WHEN CONNECTING THE POWER AND DATA CABLE CONNECTOR TO AVOID DAMAGE TO THE PINS OR CONNECTOR.



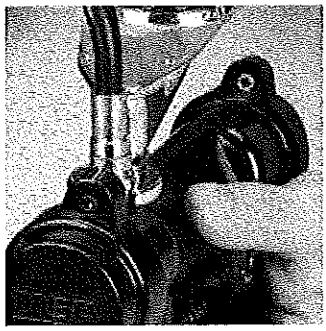
3. Hand tighten the connector until the o-ring is no longer visible.



4. Use a torque wrench and **5/8" crow foot** to tighten the connector to **10 in lbs.**

DO NOT OVER-TIGHTEN THE POWER AND DATA CABLE CONNECTOR. OVER-TIGHTENING THE POWER AND DATA CABLE CONNECTOR CAN DAMAGE THE CONNECTOR, DISABLING THE UNIT.

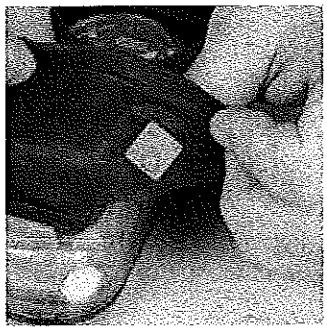
Note: For easier access, remove the Power Module from the Carrier before tightening.



Note: The control module executes a start up sequence when it receives power. Double-press the reset button to enter sleep mode.

Replacing Cover Lenses
P/N 10090220

1. Turn the boot inside out to remove the lenses.



2. Reinstall the boot.

3. Slide new lenses through cover openings until they seat.

FireHawk® M7 Cylinder and Valve

MAINTENANCE AND REPAIR

For More Information, call 1-800-MSA-2222 or Visit Our Website at www.MSAnet.com

MSA The Safety Company

MINE SAFETY APPLIANCES COMPANY
PITTSBURGH, PENNSYLVANIA, U.S.A. 15230

TAL 803 (L) Rev. 0

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Prnt. Spec. 10000005389(I) Mat. 10093083
Doc. 10093083

FIREHAWK M7 CYLINDER AND VALVE

Cylinder and Valve Replacement Kits

P/N		Description
With air	Less air	
809872	10033357	3AL Aluminum, 45 cu ft.*
469619	10033209	Hoop-wound, 45 cu ft.
807586	10033352	L-30 Stealth Carbon-wrapped.
816115	10033358	L-30+ Stealth Carbon-wrapped, 60 cu ft.
807587	10037095	H-30 Stealth Carbon-wrapped, 45 cu ft.
807570	10033356	H-45 Stealth Carbon-wrapped, 66 cu ft.
10035644	10040591	H-45 Low-Profile, Stealth Carbon-wrapped, 66 cu ft.
807588	10033355	H-60 Stealth Carbon-wrapped, 88 cu ft.

Cylinder Replacement Kits

P/N	Description
814806	3AL Aluminum, 45 cu ft.*
811119	Hoop-wound, 45 cu ft.
816970	L-30 Stealth Carbon-wrapped.
816974	L-30+ Stealth Carbon-wrapped, 60 cu ft.
816972	H-30 Stealth Carbon-wrapped, 45 cu ft.
816973	H-45 Stealth Carbon-wrapped, 66 cu ft.
10044832	H-45 Low-Profile, Stealth Carbon-wrapped, 66 cu ft.
816971	H-60 Stealth Carbon-wrapped, 88 cu ft.

*Contact MSA Customer Service (1-800-MSA-2222) for approval information before ordering.

Cylinder Valve Replacement Kits

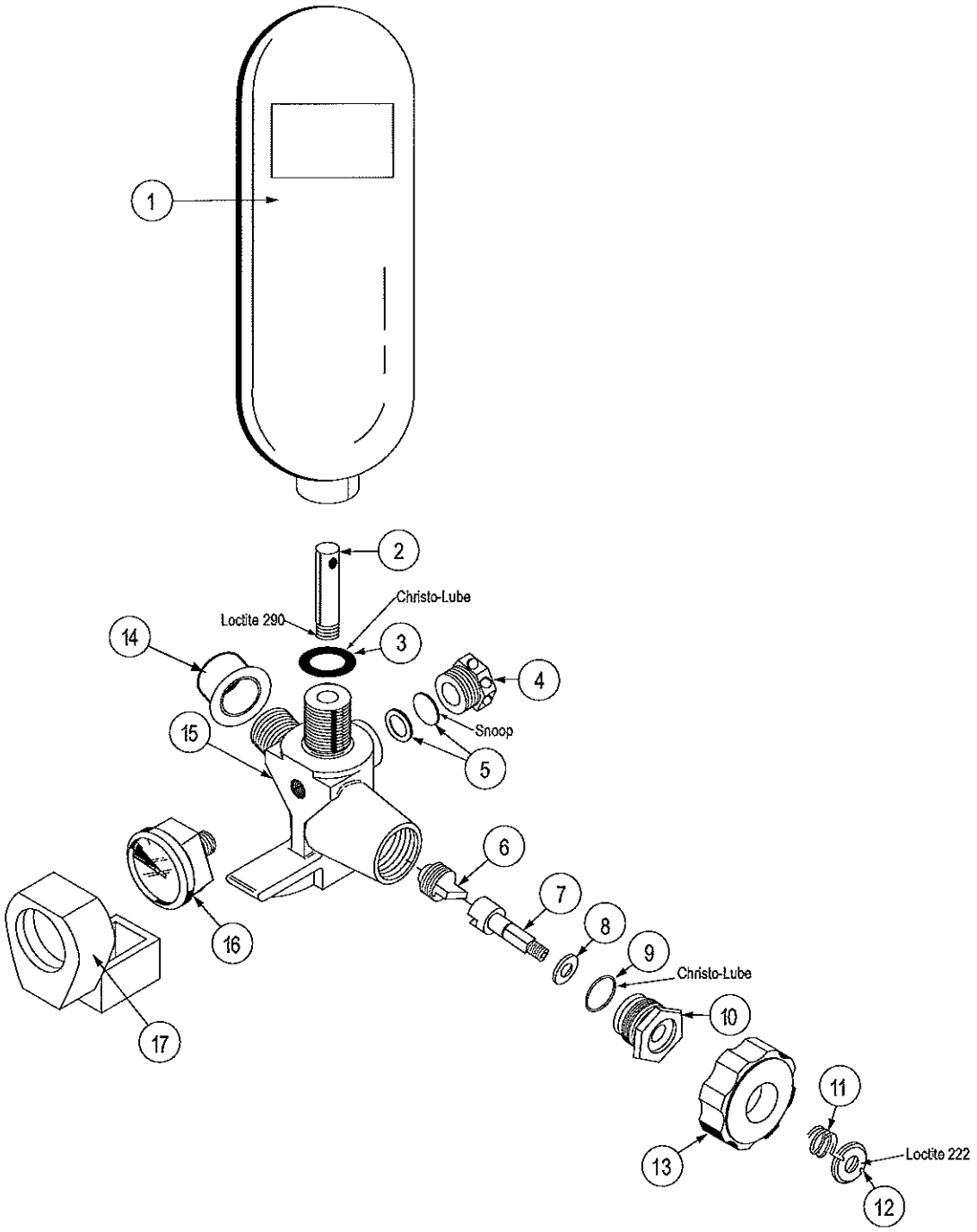
P/N	Description
488894	Cylinder Valve Assembly (2216 PSI)
494884	Cylinder Valve Assembly (3000 PSI)
488899	Cylinder Valve Assembly (4500 PSI)

FIREHAWK M7 CYLINDER AND VALVE

Parts list

Item	P/N	Description
1	-	Cylinder
2	**80416**	Cylinder Valve Inlet Tube
3	**68542**	O-Ring, 2216 psi
3a	**633550**	O-Ring, 3000 psi
3b	**630296**	O-Ring, 4500 psi
4	**68550**	Safety Plug, 2216 psi
4a	**495636**	Safety Plug, 3000 psi
4b	**473254**	Safety Plug, 4500 psi
5	**482225**	Disc and Gasket, 2216 psi
5a	**494928**	Disc and Gasket, 3000 psi
5b	**482226**	Disc and Gasket Kit, 4500 psi
6	**488858**	Valve Insert Assembly
7	**488859**	Valve Stem
8	**488860**	Valve Stem Washer
9	**628976**	O-Ring
10	**488862**	Packing Gland
11	**83831**	Spring
12	**83731**	Locknut
13	**91728**	Handwheel
14	**94906**	Protector Cap
15	**488772**	Valve Body, 2216 psi
15a	**495743**	Valve Body, 3000 psi
15b	**488771**	Valve Body, 4500 psi
16	**95278**	Air Pressure Gauge 2216/3000 psi
16	**473250**	Air Pressure Gauge, 4500 psi
17	**801131**	Gauge Guard
	604070	Lubricant
	600469	Loctite 290
	29787	Loctite 222
	600920	Snoop Leak Detector

FIREHAWK M7 CYLINDER AND VALVE



FIREHAWK M7 CYLINDER AND VALVE

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⚠ WARNING

Relieve all pressure from the system. Close the cylinder valve. Be sure that nothing blocks the regulator outlet. Open the bypass valve to release trapped air. Failure to follow this warning can result in serious personal injury or death.

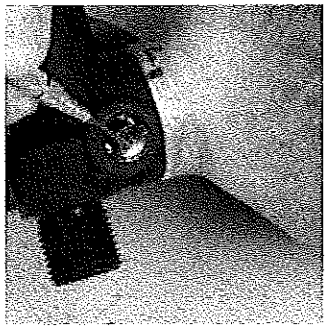
Removing the Cylinder Valve Pressure Gauge

1. Use a **7/16" wrench** to remove the gauge from the cylinder valve body.
2. Clean the threads in the cylinder valve body to be sure no tape residue remains.

REMOVING THE BURST DISC

To remove the burst disc:

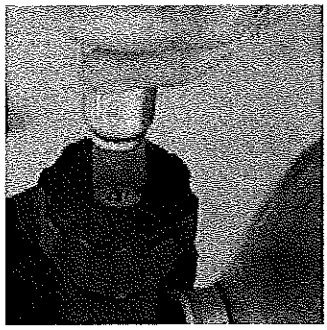
1. Unscrew the safety plug. (See **Safety Plug Torque Specifications.**)



2. Punch a hole in the burst disc and remove it.
3. Discard the disc.

Note: Be careful not to scratch the cylinder valve body.

Removing the Handwheel



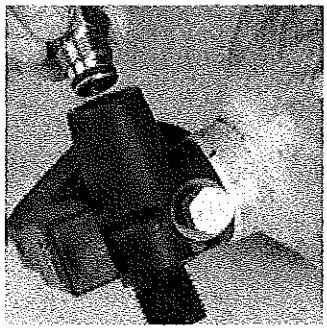
1. Use the spanner to remove the locknut and spring.

2. Remove the handwheel.

FIREHAWK M7 CYLINDER AND VALVE

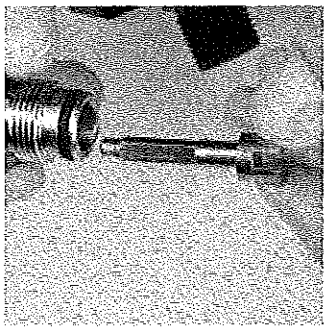
3. Use a **7/8" wrench** to unscrew the packing gland.

a. Remove the packing gland.

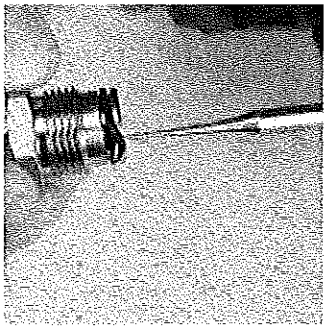


4. Use the handwheel to unscrew the valve stem.

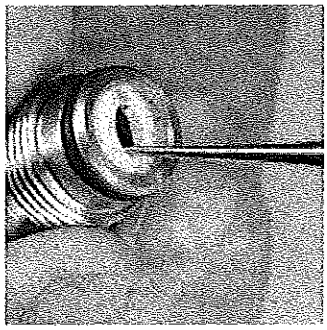
a. Remove the valve stem.



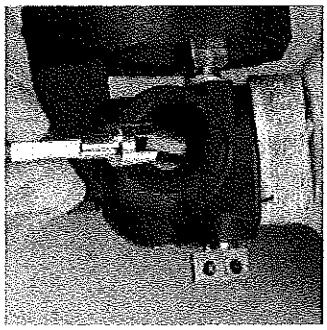
5. Remove the o-ring.



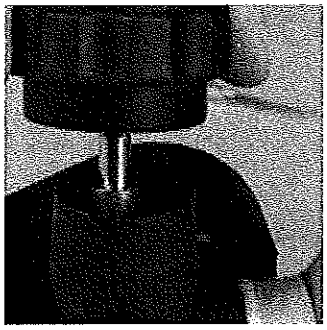
6. Remove valve stem washer from the packing gland.



7. Reinsert the valve stem into the valve body.

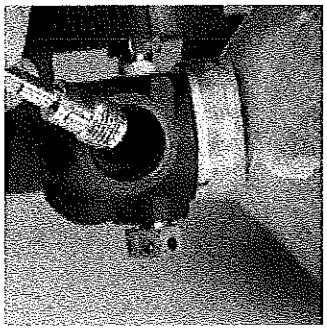


8. Replace the handwheel on the valve stem.



a. Turn the stem until it engages the insert.

b. Unscrew and remove the insert.



c. Replace worn inserts.

Removing the Cylinder Valve Body

⚠ WARNING

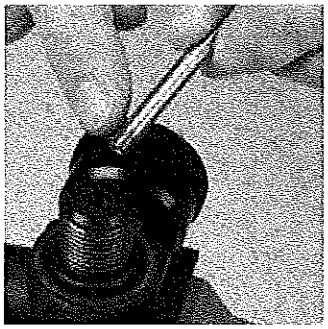
Before removing or repairing the cylinder valve, bleed all air from the cylinder. Do not attempt to remove or repair the valve if the cylinder pressure gauge shows pressure. If you cannot relieve pressure by opening the cylinder valve, loosen the safety plug no more than 1/4 turn. Wear hearing protection. Open the cylinder valve 1/2 turn and leave it open until all air is exhausted. Failure to follow this precaution may result in severe personal injury or death.

1. Secure the cylinder in a suitable fixture.
2. Remove the rubber pressure gauge guard.
3. Use a **13/16" crowfoot or wrench** to unscrew the cylinder valve.
4. Remove and discard the o-ring.

Installing the Inlet Tube
(P/N 80418)

Note: If the cylinder valve inlet tube is damaged, replace the entire cylinder valve. Do not attempt to replace a damaged inlet tube.

1. Apply one drop of Loctite 290 (P/N 600496) sealant to the inlet thread.



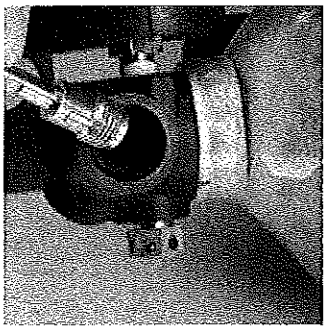
2. Screw the tube into the cylinder valve.

Note: Do not over-tighten.

3. Set the valve aside and allow the sealant to dry for four (4) hours.

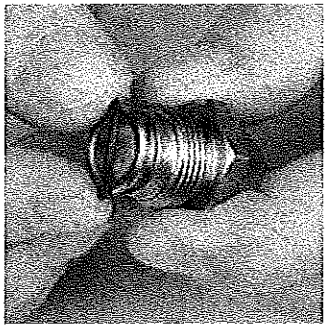
Installing the Insert

1. Use the valve stem to install the insert.

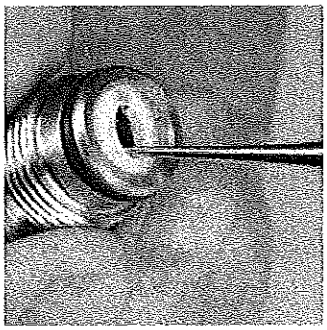


2. Screw the insert finger-tight.
3. Install a new o-ring on the packing gland.

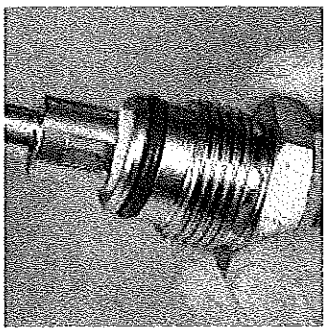
a. Apply a small amount of Christo-Lube lubricant to the o-ring.



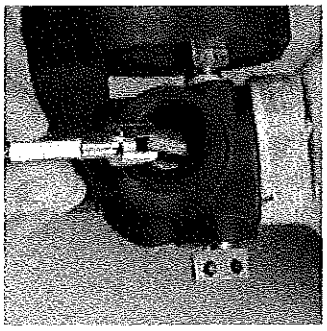
4. Install a new washer into the packing gland.



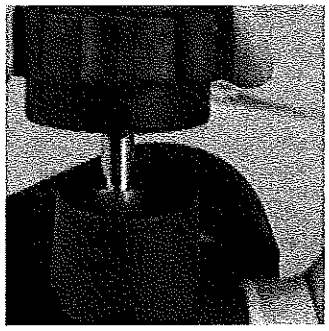
a. Seat the washer.



5. Reinsert the valve stem into the valve body.



6. Replace the handwheel on the valve stem.



a. Turn the stem until it engages the insert.

7. Screw the packing gland into the cylinder valve, finger-tight.

8. Turn the valve stem counterclockwise until it stops.
   a. Be sure the gland does not turn.
9. Remove the handwheel.

10. Use a **7/8" crow foot or deep well socket** to tighten the packing gland to 85-105 in lbs.

11. Use the handwheel to check the valve for proper action. The handwheel should turn with light resistance.
12. Replace the spring.

Note: Open the valve fully to ease locknut installation.

13. Put a drop of Loctite #222 (P/N 29787) on the stem threads.

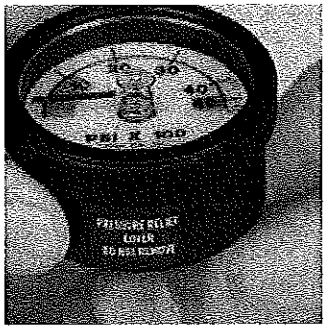
14. Use the locknut spanner wrench on the locknut to compress the spring.

15. Tighten the locknut until it is flush with the handwheel.
16. Open and close the valve completely several times to seat the stem, insert, and the valve stem gasket.
17. Leak test the valve. (See Leak Testing, P/N 10051131)
18. Open and close the valve completely several times to seat the stem, insert, and the valve stem gasket.
19. Leak test the valve. (See Leak Testing, P/N 10051131)

Installing the Cylinder Valve Gauge

2216/3000 psi:	P/N 95278
4500 psi:	P/N 473250

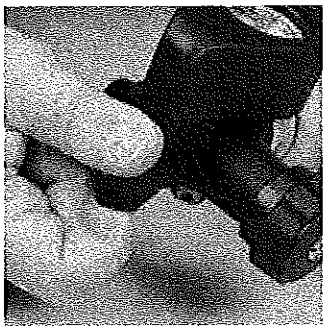
Note: Inspect Pressure Relief Label. If the Pressure Relief Label is perforated or missing replace the Cylinder Valve Gauge.



1. Apply pipe-sealing tape to gauge threads.
2. Screw the gauge into the gauge port.
3. Tighten with a **7/16" wrench.**
   a. Ensure that the MSA logo is parallel to the base of the valve body.

b. Ensure that the needle points to the cylinder valve outlet.

4. Replace the rubber gauge protector.



5. Perform a Leak Test to check connection. (See **Leak Testing, P/N 10051131**)

Installing the Safety Plug and Burst Disc

Safety Plug Torque Specifications

System Pressure	Socket	Torque Specification
2216 psi	11/16"	50-53 ft lbs.
3000 psi	3/4"	26-30 ft lbs.
4500 psi	9/16"	21-25 ft lbs.

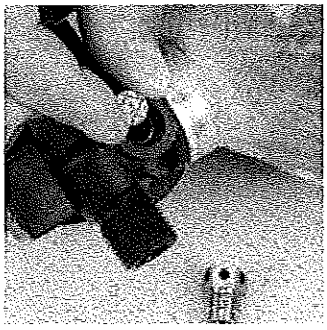
⚠ WARNING

Install the gasket, then burst disc as instructed. Ensure threads of burst disc area and safety plug threads are free of Christo-Lube lubricant. Do not reuse the burst disc or gasket. Failure to install properly may cause burst disc malfunction resulting in serious personal injury or death.

1. Install a new burst disc gasket.

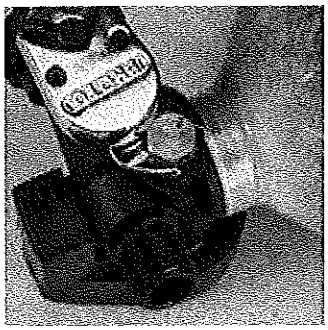
2. Place a thin film of Snoop on the new burst disc.

3. Install a new burst disc. Be sure the disc lays flat.



4. Screw the safety plug into the cylinder valve body.

5. Use a torque wrench and socket or crow foot (See **Safety Plug Torque Specifications**) to tighten the plug to the proper torque specification.



Inspecting Inside of Cylinder

1. Use a high intensity light to inspect the inside of the cylinder for contamination. Be sure the cylinder interior is completely dry.

⚠ CAUTION

Do not use the cylinder if it has an odor, is contaminated internally, or has any visible signs of damage. If the cylinder appears damaged, return it to a Certified MSA Air Mask Service Center for repair.

Installing the Cylinder Valve

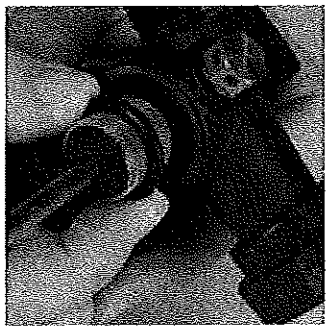
1. Clean the cylinder o-ring sealing surface with a clean, dry, lint-free cloth.

Note: Be sure the cylinder-sealing surface is undamaged and free from contaminants such as dirt or tape residue.

2. Inspect the cylinder neck for cuts, scratches, weakened areas, or any other condition that could prevent an airtight seal.
3. Install a new o-ring.
   a. To avoid contamination and dirt collection, apply Christo-Lube lubricant to the o-ring and the o-ring groove immediately before installing the cylinder valve.

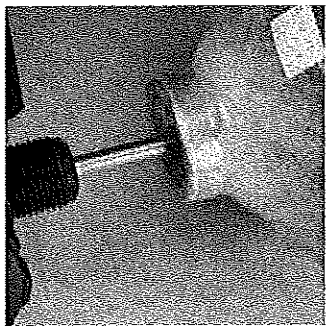
b. Place two (2) small drops of Christo-Lube lubricant into the o-ring groove 180° apart.
c. Protect the threads with thread protector or thin piece of paper.

d. Roll the o-ring onto the male thread end of the valve body.



e. Rotate the o-ring 1/2 to 3/4 of a turn to spread the Christo-Lube lubricant evenly around the groove.
f. Remove the thread protector.

g. Carefully insert the cylinder valve into the cylinder neck.



Note: Take care not to damage the cylinder-sealing surface.

4. Use the foot-pound torque wrench with a **13/16" crowfoot** to tighten the cylinder valve to **70-75 ft lbs.**

5. Reinstall the gauge guard.
6. Leak test the assembly. (See **Leak Testing, P/N 10051131.**)

FireHawk® M7 PR-14 First Stage Regulator

MAINTENANCE AND REPAIR

For More Information, call 1-800-MSA-2222 or Visit Our Website at www.MSAnet.com

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MINE SAFETY APPLIANCES COMPANY
PITTSBURGH, PENNSYLVANIA, U.S.A. 15230

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Doc. 10093085

FIREHAWK M7 PR-14 FIRST STAGE REGULATOR

Replacement Kits

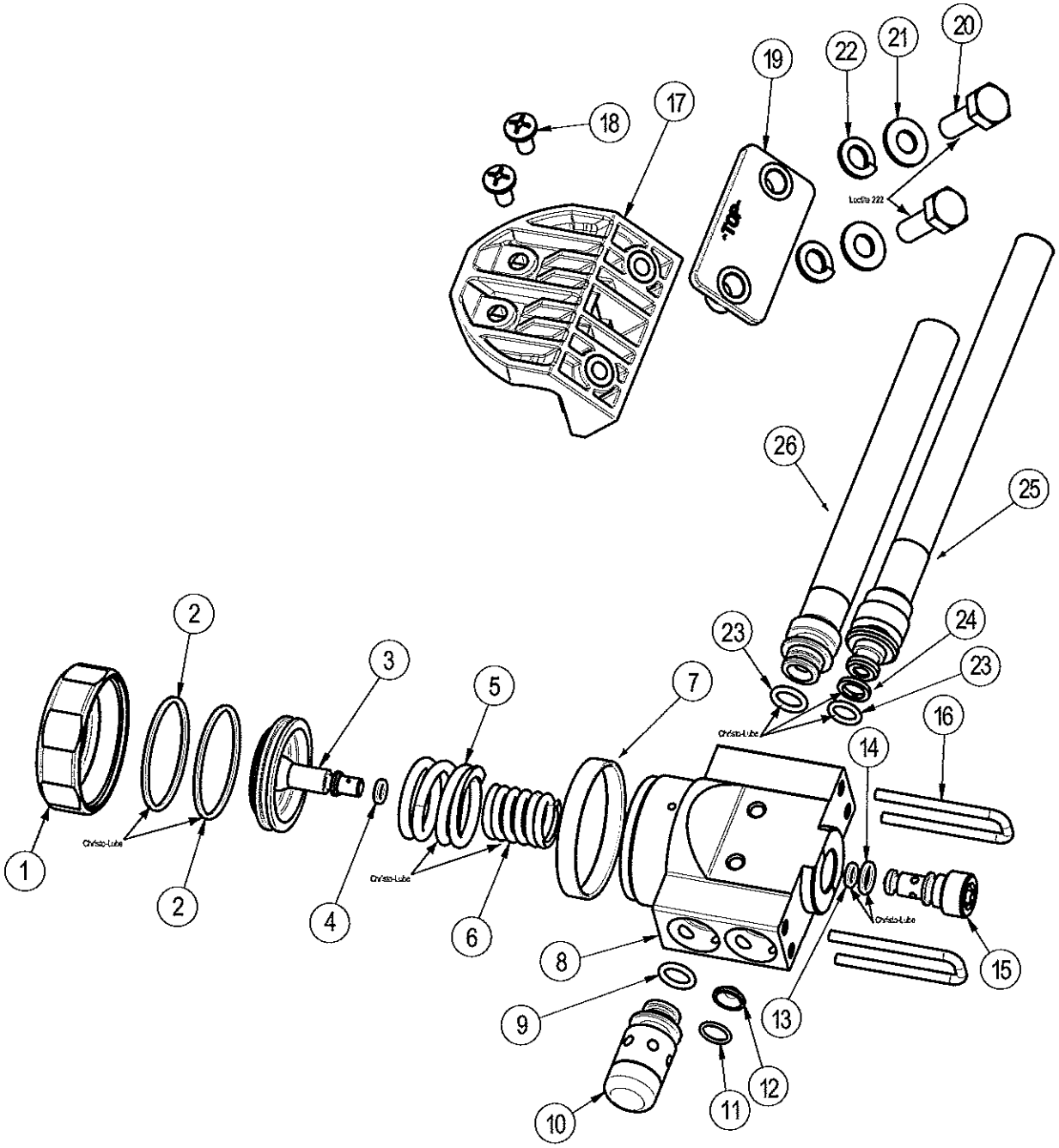
PR-14 First Stage Regulator Replacement Kit		
10053736	PR-14 First Stage Regulator (Complete)	
PR-14 First Stage Regulator Kit		
10065408	10050616	Seat
	633553	O-Ring (Bottom)
	10058236	O-Ring (Top)
	10050617	Piston
	10052365	O-Ring (2 Req'd)
	10052364	O-Ring
	10051663	Inlet Filter
	10052367	Inlet Filter O-Ring
	10053273	O-Ring (2 Req'd)
	63198	O-Ring ((2 Req'd)
	635278	Back up Ring
	10052622	Screw
10055349	10047898	Slider
	10055563	Screw (2 Req'd)
	10014878	Washer (2 Req'd)
	631356	Washer (2 Req'd)

Parts List

Item	P/N	Description
1	10050623	Regulator Cap
2	10052365	O-Ring (2 Req'd)
3	10050617	Piston
4	10052364	O-Ring
5	10050620	Outer Spring
6	10050621	Inner Spring
7	10052621	Seal Ring
8	10050615	Regulator Body
9	63198	O-Ring
10	10053426	Pressure Relief Valve
11	10052367	Inlet Filter O-Ring
12	10051663	Inlet Filter
13	10058236	O-Ring (Top)
14	633553	O-Ring (Bottom)
15	10050616	Seat
16	10050622	U-Clip (2 Req'd)
17	10051664	Mounting Bracket
18	10052622	Screw (2 Req'd)
19	10047898	Slider
20	10055563	Screw (2 Req'd)
21	10014878	Washer (2 Req'd)
22	631356	Lock Washer (2 Req'd)
23	63198	O-Ring (2 Req'd)
24	635278	Back up Ring
25	10053331	Gauge Hose*
26	10051882	Intermediate Pressure Hose, Threaded*
	10051883	Intermediate Pressure Hose, Quick-Connect*
	10051884	Intermediate Pressure Hose, ExtendAire™ System*
	29787	Loctite 222
	604070	Lubricant
	600920	Leak Detector

* Includes Back-up and O-Rings as needed.

FIREHAWK M7 PR-14 FIRST STAGE REGULATOR



FIREHAWK M7 PR-14 FIRST STAGE REGULATOR

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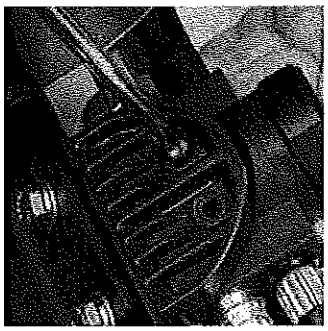
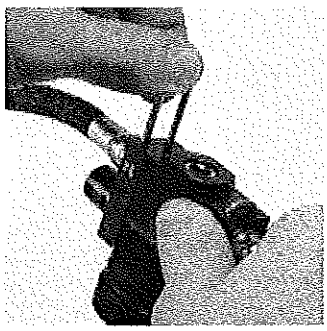
REMOVING THE PR-14 FIRST STAGE REGULATOR

To remove the PR-14 First Stage Regulator from the carrier:

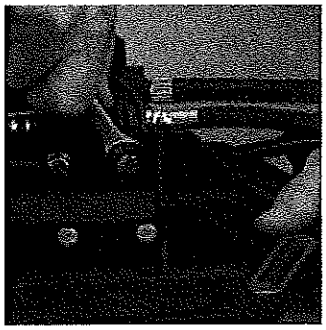


1. Use a screwdriver to remove the screws.
2. Remove the regulator from the mounting bracket.
3. Remove residual thread-locking material from the bolts.



4. Remove residual thread-locking material from the regulator body threads..

Removing the Mounting Bracket



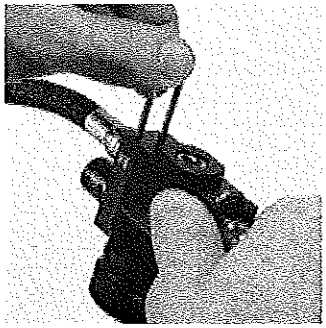
1. Use a **7/16" wrench** to remove the mounting bracket bolts.
2. Remove the regulator from the mounting bracket.

Note: Store the U-clips in the regulator body.

3. Remove the mounting bracket.
4. Remove the plastic slider.
5. Remove residual thread-locking material from the bolts.
6. Remove residual thread-locking material from the mounting bracket threads.

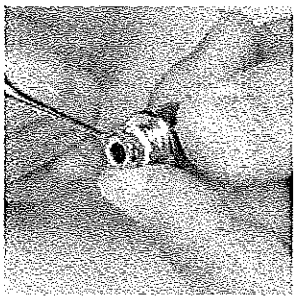
Removing the High Pressure Audi-Larm Audible Alarm Hose

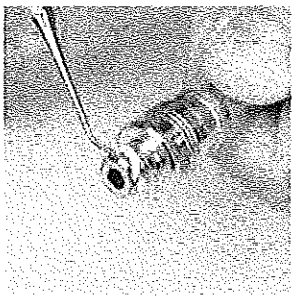
P/N 10088638



1. Remove the U-clip.
2. Pull the hose firmly to remove it from the regulator body.

3. Use the o-ring removal tool to remove the o-ring and back-up ring from the hose fitting.



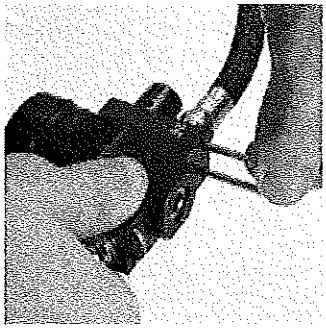


Note: Be careful not to damage the o-ring sealing surfaces.

4. Discard the o-ring and back-up ring.

Removing the Pressure Relief Valve

1. Remove the U-clip.



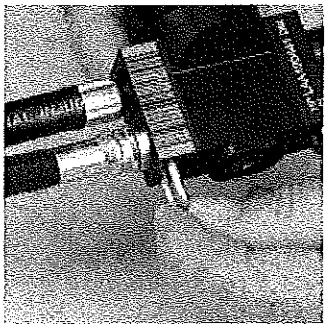
2. Pull the relief valve firmly to remove it from the regulator body. P/N 10088638

3. Use the o-ring removal tool to remove the o-ring.

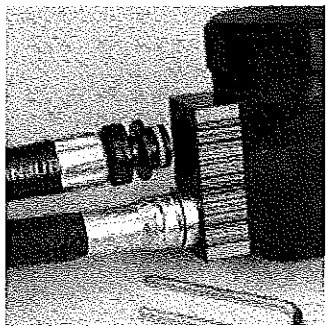
Note: Be careful not to damage the o-ring sealing surfaces.

Removing the Intermediate Pressure Hose

1. Remove the U-clip.

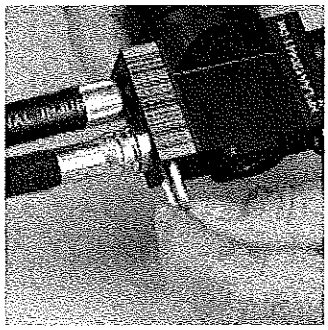


2. Pull the hose firmly to remove it from the regulator body.

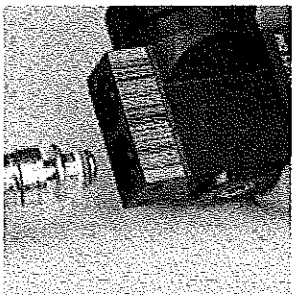


Removing the High Pressure Gauge Hose

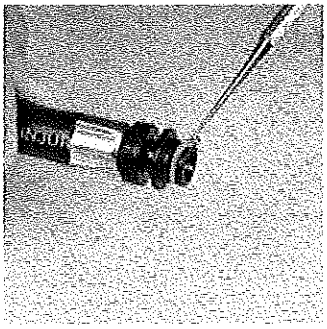
1. Remove the U-clip.



2. Pull the hose firmly to remove it from the regulator body.



3. Use the o-ring removal tool to remove the o-ring.



Note: Be careful not to damage the o-ring sealing surfaces.

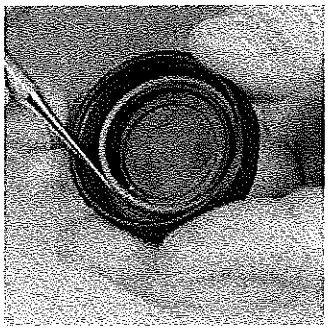
4. Discard the o-ring.

Removing the Regulator Cap and Seal Ring

1. Mount the PR-14 Regulator body in a vise.
2. Use a **1-5/8" 6 point socket and breaker bar** to remove the cap.
3. Remove the regulator body from the vise.

Note: Use protective sleeves on the jaws of the vise.

4. Use the o-ring removal tool to remove the cap o-ring.



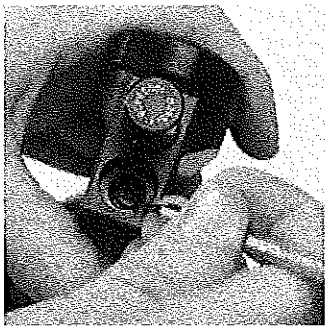
Note: Be careful not to damage the o-ring sealing surfaces.

5. Discard the o-ring.
6. Use the o-ring removal tool to remove the seal ring.

Note: Be careful not to damage the seal ring sealing surfaces.

Removing the Inlet Filter and O-Ring

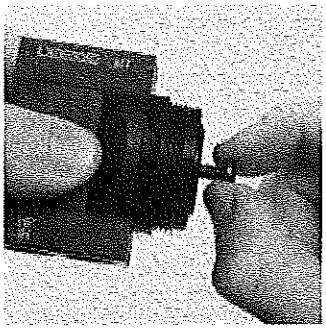
1. Use the o-ring removal tool to remove the filter o-ring.



2. Discard the o-ring.
3. Allow the filter to drop out.
4. Discard the filter.

Removing the Piston, Piston O-Rings, and Springs

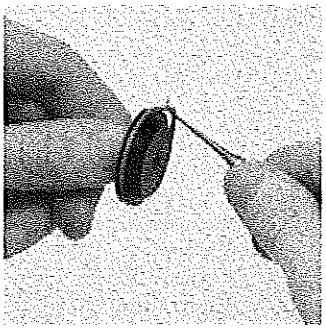
1. Screw the mounting screw partially into the piston head.



2. Pull gently on the mounting screw to extract the piston from the regulator body.

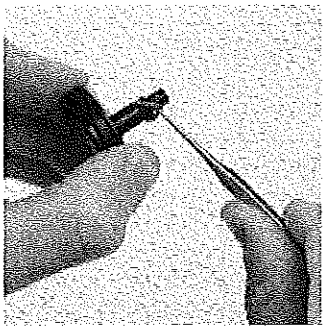
Note: Be careful not to damage the regulator body sealing surfaces.

3. Use the o-ring removal tool to remove the piston o-ring.



Note: Be careful not to damage the o-ring sealing surfaces.

4. Use the o-ring removal tool to remove the piston shaft o-ring.



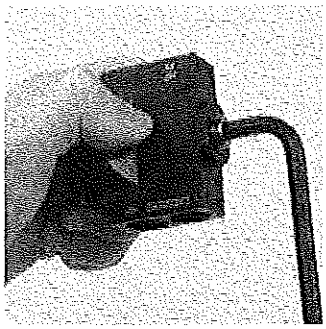
Note: Be careful not to damage the o-ring sealing surfaces.

5. Use the o-ring removal tool to remove the inner spring.
6. Use the o-ring removal tool to remove outer spring.
7. Discard all o-rings.

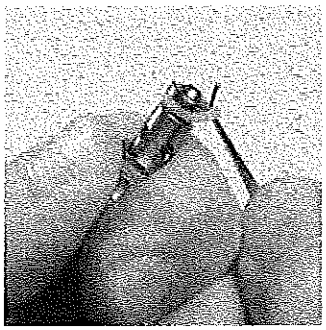
FIREHAWK M7 PR-14 FIRST STAGE REGULATOR

Removing the Seat and Seat O-Rings

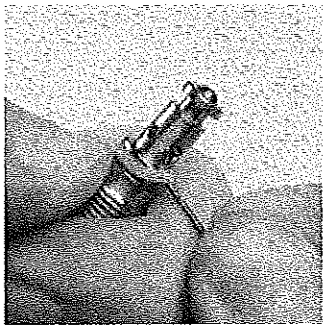
1. Use a **1/4" hex wrench** to remove the seat from the regulator body.



2. Use the o-ring removal tool to remove the top seat o-ring.



3. Use o-ring removal tool to remove the bottom seat o-ring.



Note: Be careful not to damage the o-ring sealing surfaces.

4. Discard both o-rings.

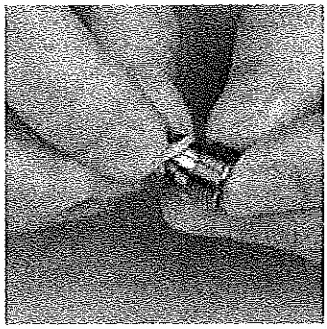
PR-14 FIRST STAGE REGULATOR REASSEMBLY

Installing the Seat and Seat O-Rings

Seat:	P/N 10050616
Top O-Ring:	P/N 10058236
Bottom O-Ring:	P/N 633553

1. Install a new seat.
   a. Apply lubricant to the new bottom seat o-ring.

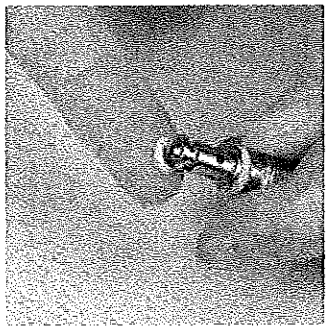
   b. Install the bottom o-ring.



Note: Be careful not to damage the o-ring sealing surfaces.

   c. Apply lubricant to the new top seat o-ring.

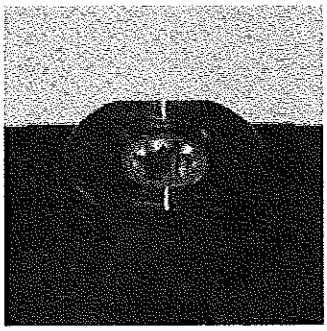
   d. Install the new top o-ring.



Note: Be careful not to damage the seat.

2. Use a **1/4" hex wrench** to screw the seat into the regulator body until it seats.
3. Back the seat out one and one half turns.

4. Continue to unscrew the seat as necessary to align a seat hex point with the regulator body scribe line.



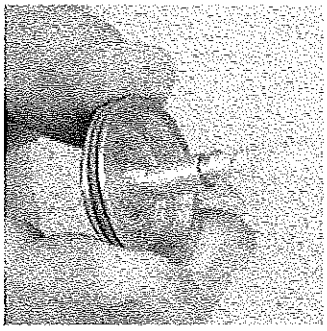
Installing the Piston, Piston O-Rings, and Springs
Piston: P/N 10050617
O-Ring: P/N 10052364
Outer Spring: P/N 10050620
Inner Spring: P/N 10050621

1. Apply a small amount of lubricant to the piston bore.
2. Apply lubricant to both ends of the outer spring.
3. Install the spring into the regulator body.
4. Apply lubricant to both ends of the inner spring.

5. Install the spring into the regulator body.

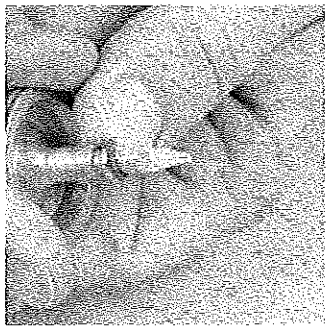
6. Apply lubricant to the new piston head o-ring.
7. Install the new o-ring.

a. Cover the piston sensing holes with tape.

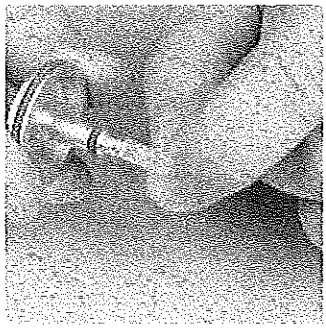


b. Apply lubricant to the new piston shaft o-ring.

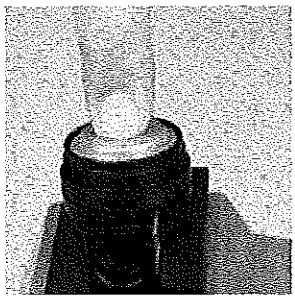
8. Install the new o-ring.



9. Remove the tape.

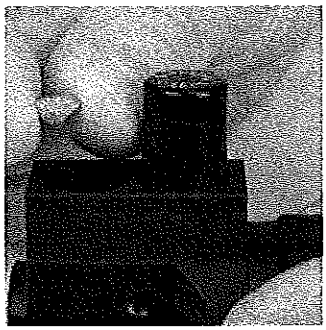


10. Install the piston into the regulator body.



Installing the Inlet Filter and O-Ring
Inlet Filter: P/N 10051663
Inlet Filter O-Ring: P/N 10052367

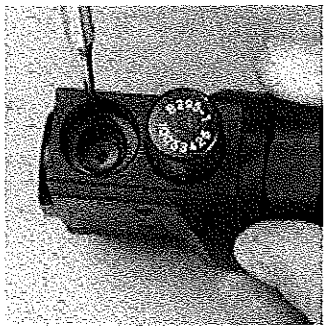
1. Install the filter into the high-pressure supply-port cone point in.



Note: The high-pressure supply port is labeled "HP IN."

2. Install the filter o-ring into port and seat it against the filter.

Note: Do not lubricate the filter o-ring.



FIREHAWK M7 PR-14 FIRST STAGE REGULATOR

Installing the Regulator Cap and Seal Ring
Regulator Cap: P/N10050623
Seal Ring: P/N10052621

1. Install the seal ring onto the regulator body.
2. Ensure that the flat surface faces out.
3. Apply a small amount of lubricant to the new cap o-ring
4. Install the o-ring into the cap o-ring gland.

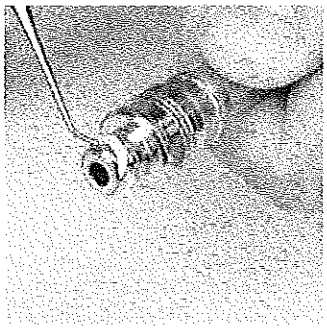
Note: Ensure that the o-ring is completely seated.

5. Screw the cap onto the regulator body.
6. Use a foot-pound torque wrench and **1 5/8" six-point socket** to tighten the cap to **38-42 ft lbs.**

Installing the High Pressure Gauge Hose

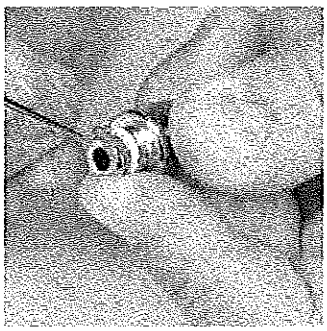
High Pressure Gauge Hose:	P/N 10053331
O-Ring:	P/N 631198
Back-Up Ring:	P/N 635278

1. Install the new back-up ring.

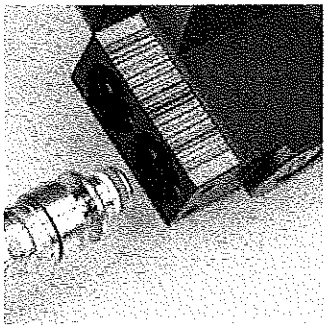


2. Apply a small amount of lubricant to the high-pressure hose o-ring

3. Install the new o-ring.



4. Install the high pressure gauge hose into the high pressure gauge port.



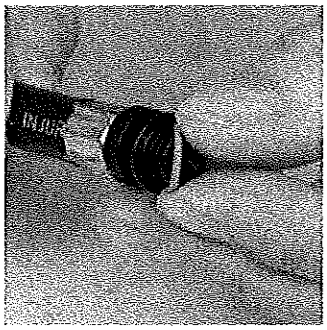
Note: The high pressure gauge port is not labeled.

Installing the Intermediate Pressure (IP) Hose

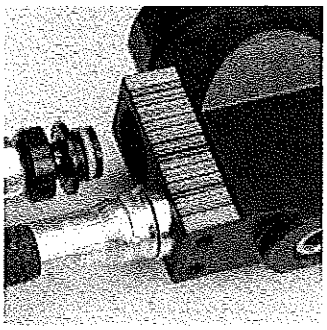
IPressure Hose, Threaded:	P/N 10051882
IP Hose, Quick Connect:	P/N 10051883
IP Hose, ExtendAire™ System:	P/N 10051884
O-Ring:	P/N 63198

1. Apply lubricant to the intermediate pressure hose o-ring.

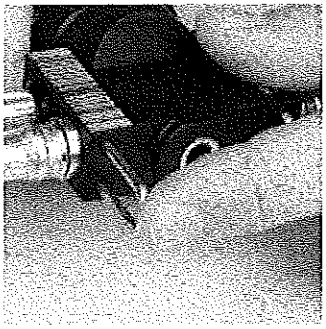
2. Install the new o-ring.



3. Install the intermediate pressure hose into the intermediate pressure port.



4. Install the U-clip to secure the high-pressure and intermediate pressure fittings.



Installing the High Pressure Audi-Larm Hose
P/N: 804382

1. Install the new back-up ring.
2. Apply lubricant to the high pressure hose o-ring.
3. Install the new o-ring.
4. Install the high-pressure Audi-Larm hose into the high-pressure supply port.

Note: The high-pressure supply port is labeled "HP IN."

Installing the Pressure Relief Valve
P/N 10053426

1. Apply Christo-Lube lubricant to the pressure relief valve o-ring.
2. Install the new o-ring.

3. Install the pressure relief valve into the intermediate pressure port.

4. Install the U-clip to secure the hose and valve.

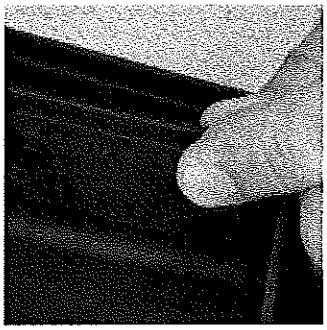
5. Leak test the regulator.

Note: The regulator cannot be leak tested while installed because the seat is inaccessible. (See **FireHawk M7 Air Mask Leak Testing** for instructions.)

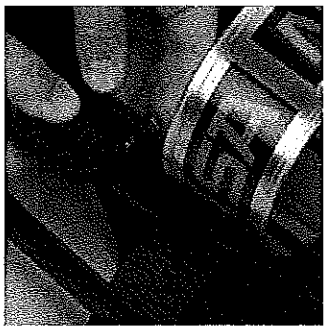
Installing the Mounting Bracket

Bracket:	P/N 10051664
Slider:	P/N 10047898
Screws (2):	P/N 10055563
Washer (2):	P/N 10014878
Lock Washer (2):	P/N 631356
Loctite 222:	P/N 29787

1. Install the plastic slider onto the carrier rail.



2. Position the mounting bracket against the carrier rail.



3. Apply Loctite 222 (P/N 29787) to each bolt.
4. Insert the bolts through the lock washers, flat washers, and slider into the mounting bracket.

5. Use a torque wrench and **7/16" socket** to tighten the bolts to **35 ±5 in lbs.**

6. Ensure the mounting bracket slides freely.

Installing the Regulator onto the Mounting Bracket
P/N 10053736 PR-14 First Stage Regulator Replacement Kit

1. Position the regulator on the mounting bracket.

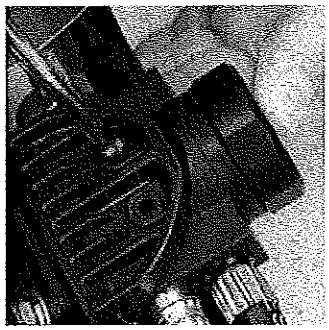
   a. Align the regulator mounting holes with the mounting bracket holes.

2. Apply Loctite 222 (P/N 29787) to each screw.

Note: New screws have a pre-applied thread-locker and do not require Loctite 222 application.

3. Install the screws through the mounting bracket into regulator.

4. Tighten the screws to **35-45 in lbs.**



FireHawk® M7 HUD (Heads-Up Display)

MAINTENANCE AND REPAIR

For More Information, call 1-800-MSA-2222 or Visit Our Website at www.MSAnet.com

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TAL 803 (L) Rev. 0

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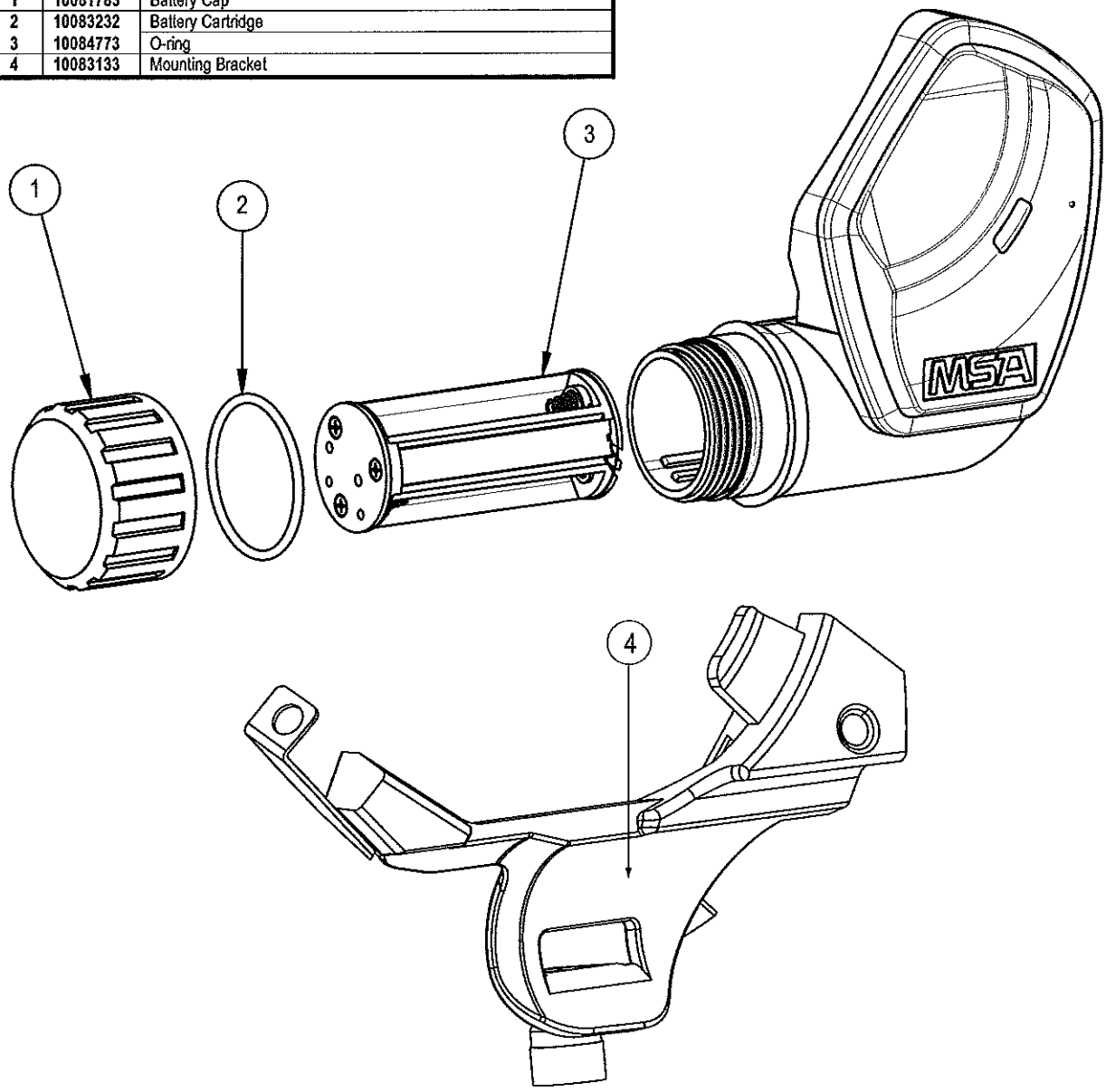
Prnt. Spec. 10000005389(I) Mat. 10093090
Doc. 10093090

FIREHAWK M7 HUD (HEADS-UP DISPLAY)

Replacement Kits and Parts list

FireHawk M7 HUD O-Ring Kit		
10090218	10084773	O-Ring (Pack of 10)
FireHawk M7 HUD Assembly w/o mounting bracket		
10091446	10084773	O-Ring
	10083132	HUD Assembly
	10087292	Warning tag
	10086580	Battery
FireHawk M7 HUD Assembly w/ mounting bracket		
10091447	10083133	Mounting Bracket
	10084773	O-Ring
	10083132	HUD Assembly
	10087292	Warning tag
	10086580	Battery

Item	P/N	Description
1	10081783	Battery Cap
2	10083232	Battery Cartridge
3	10084773	O-ring
4	10083133	Mounting Bracket



FIREHAWK M7 HUD (HEADS-UP DISPLAY)

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Replacing Batteries 3
Attaching the M7 HUD Receiver to the Mounting Bracket 4
Battery Disposal/Recycling 4

INSPECTION

1. Inspect the M7 HUD for cracks or other damage that could allow contaminants to enter the housing.
2. Ensure that moisture or debris is not present in the battery compartment.
3. Ensure the battery compartment o-ring on the battery cap is present and in good condition. Check for nicks, breaks, tackiness, or loss of elasticity. Replace as needed.
4. Reattach the M7 HUD to the facepiece bracket.

Replacing the O-Ring
P/N 10084773

1. Unscrew the battery cap.
2. Remove and discard the o-ring.
3. Apply a small amount of Christo-Lube to the o-ring.

4. Carefully slide the o-ring onto the HUD body.

Replacing Batteries
Install fresh batteries in the M7 HUD and M7 Power Module prior to storage of the Air Mask at cold temperature for an extended period.

⚠ WARNING

Use only Rayovac 824 LR03, Rayovac, Ultrapro 4R03, Energizer E92, Energizer Industrial EN92, Duracell MN2400, or Duracell Process MN2400 alkaline batteries in the M7 HUD. Use of other batteries, or a combination of batteries from different manufacturers, will affect the performance of unit and void the Intrinsic Safety Approval. Change the batteries in a non-hazardous area only. Failure to follow this warning can result in serious personal injury or death.

1. Unscrew the battery cap.

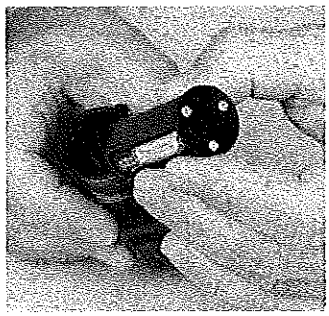
2. Remove the battery cartridge from the M7 HUD.

3. Remove the batteries and dispose of or recycle batteries in accordance with all applicable federal, state, and local regulations.
5. Inspect the battery cartridge for damage, cracks, corrosion on the terminals, or any condition that could impair its function. Replace as needed.

6. Insert three new AAA alkaline batteries with the negative pole at the spring.

7. Insert the battery cartridge into the battery tube.

Note: Align the key with the battery compartment rails. Do not force.

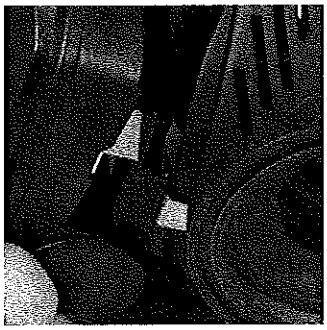


8. Before installing the battery cap, inspect the o-ring. Screw the battery cap on to the battery tube of the M7 HUD. Hand tighten. Do not over tighten.
9. As the battery cap makes contact with the battery cartridge, verify that the M7 HUD display turns on and goes through its start up sequence before turning off.

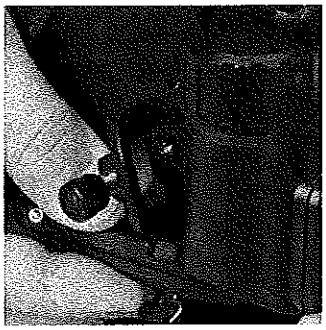
Attaching the M7 HUD Receiver to the Mounting Bracket

Note: Assemble the M7 HUD Receiver to the mounting bracket before donning the air mask.

1. Align the metal tab on the M7 HUD with the metal plate on the front edge of the bracket.



2. Rotate the M7 HUD so that the tab fits into the slot behind the thumbscrew.



3. Finger tighten the thumbscrew.

⚠ CAUTION

DO NOT use a screwdriver to tighten the thumbscrew.

Battery Disposal/Recycling

⚠ WARNING

DO NOT dispose of the batteries in fire. They may explode. Failure to follow this warning can result in serious personal injury or death.

FireHawk® M7 Power Module

MAINTENANCE AND REPAIR

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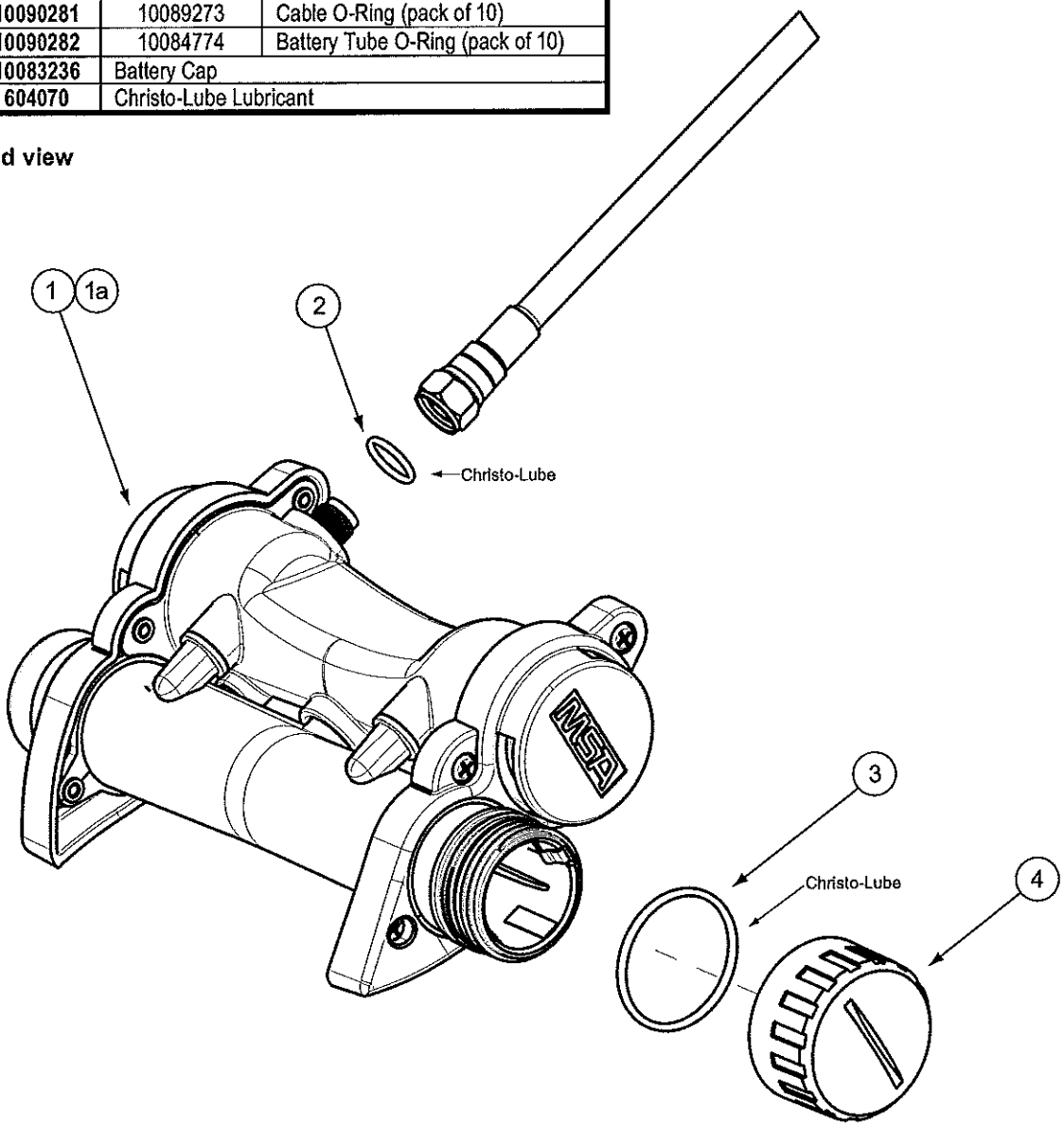
Doc. 10093087

FIREHAWK M7 POWER MODULE

FireHawk M7 Power Module Replacement Kits and Parts List

M7 Power Module w/o Telemetry			
1	10091448	10089273	Cable O-Ring
		10084774	Battery Tube O-Ring
		10083243	Power Module Assembly
		10083223	Shock Mounts (4 req'd.)
		10086579	C-Size Batteries (4 req'd.)
M7 Power Module w/ Telemetry			
1a	10091378	10089273	Cable O-Ring
		10084774	Battery Tube O-Ring
		10083242	Power Module Assembly
		10083223	Shock Mounts (4 req'd.)
		10086579	C-Size Batteries (4 req'd.)
Item	**PN**	**Description**	
2	10090281	10089273	Cable O-Ring (pack of 10)
3	10090282	10084774	Battery Tube O-Ring (pack of 10)
4	10083236	Battery Cap	
	604070	Christo-Lube Lubricant	

Exploded view



FIREHAWK M7 POWER MODULE

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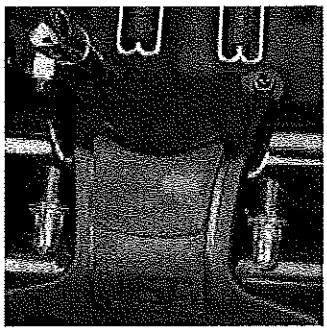
DISASSEMBLY

The M7 Power Module is hermetically sealed at the factory and is not field serviceable. Replace damaged or malfunctioning Power Modules.

Removing the Cylinder Stop

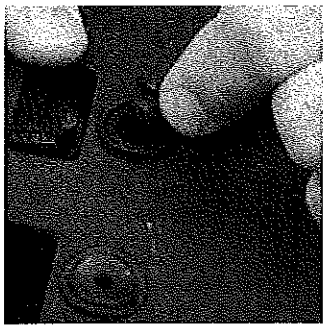
1. Use a **3/16" hex wrench** to remove the Cylinder Stop screws .



Removing the M7 Power Module

1. Remove the Cylinder Stop.
2. Lift the Power Module from the carrier.

3. Remove the shock mounts.



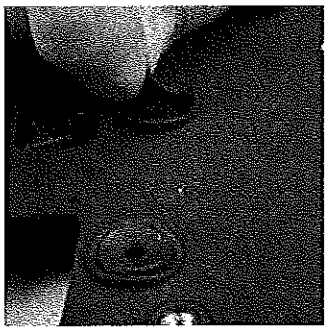
REASSEMBLY

Installing the M7 Power Module

P/N 10083223

1. Inspect shock mounts before installation. Replace worn or damaged shock mounts.

Note: Shock mounts and shock mount bosses are contoured. Match contours when installing shock mounts.



2. Inspect the M7 Power Module before installation.
   a. Check for cracks, weakened areas, loose or missing screws, or any condition that could impair proper function. Repair or replace as needed.
   b. Inspect the threaded inserts. See **M7 Carrier and Harness Assembly Repair and Maintenance** for instructions.

3. Insert the M7 Power Module locating pins into the shock mounts.

4. Verify proper insertion.
5. Install Cylinder Stop.

Installing the Cylinder Stop Kit
P/N 10086666

1. Inspect the Cylinder Stop before installation.
   a. Check for cracks, charring, weakened areas, warping, or any condition that could impair proper function.

2. Position the Cylinder Stop over the Power Module.

3. Insert screws with lock washers.

4. Use a torque wrench and **3/16" hex bit** to tighten the screws in an X pattern to **25-30 in lbs.**

⚠ WARNING

Use only Rayovac 814 LR14, Rayovac Ultrapro LR14, Energizer E93, Energizer Industrial EN93, Duracell MN1400, or Duracell Procell MN4100 alkaline batteries in the M7 HUD. Use of other batteries, or a combination of batteries from different manufacturers, will affect the performance of unit and void the Intrinsic Safety Approval.

Firehawk® M7 Ultra Elite® Facepiece

MAINTENANCE AND REPAIR

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FIREHAWK M7 ULTRA ELITE FACEPIECE

Replacement Kits

	FireHawk M7 Ultra Elite Facepiece (complete)	
	P/N	**Description**
Push to Connect	**10084690**	Small
	10084822	Small, ClearCommand® Communication System-ready
	10084824	Medium
	10084826	Medium
	10084828	Large, ClearCommand Communication System-ready
	10084830	Large, ClearCommand Communication System-ready
Slide to Connect	**10084689**	Small
	10084821	Small, ClearCommand Communication System-ready
	10084823	Medium
	10084825	Medium, ClearCommand Communication System-ready
	10084827	Large
	10084829	Large, ClearCommand Communication System-ready

Component Housing Assembly (Complete)		
815604	**804808**	Speaking Diaphragm Retainer
	804809	Speaking Diaphragm
	815605	Component Housing w/ Exhalation valve
	804813	Inlet Valve Disc
	805011	Valve Spider

Exhalation Valve Retaining Bar Kit		
818107	490133	Spring
	490128	Spring Retainer

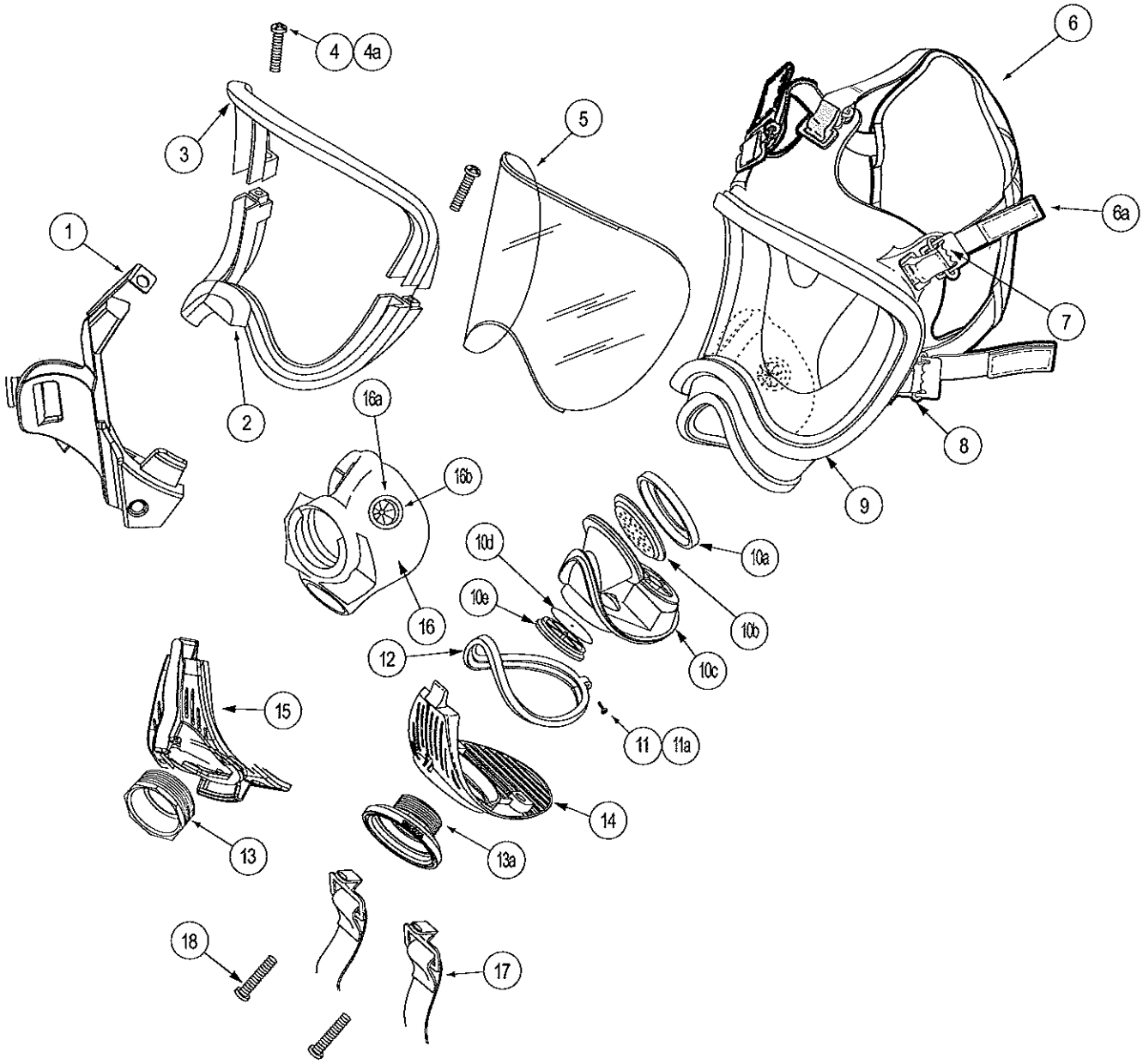
Nosecup Assembly (with valves)	
491121	Small/Medium
491123	Medium

FIREHAWK M7 ULTRA ELITE FACEPIECE

Parts List

Item	P/N	Description
1	10083133	HUD Bracket
2	804805	Lower Lens Ring
3	804804	Upper Lens Ring
4	636955	Screw (2 Req'd)
4a	804806	Screw Kit (2 Req'd)
5	805020	Lens Super Hardcoat
6	10031102	Speed-ON® Harness Assembly
6a	817089	Speed-ON Harness Assembly (with 3 Buckles)
6b	817088	Speed-ON Harness Assembly (less Buckles)
7	494297	Buckles (3 Req'd.)
8	804807	Buckle Assembly with D-Ring (2 Req'd.)
9	10048814	Hycar™ Facepiece Blank (Small)
	10048813	Hycar Facepiece Blank (Medium)
	10048815	Hycar Facepiece Blank (Large)
10a	804808	Speaking Diaphragm Retainer
10b	804809	Speaking Diaphragm
10c	815605	Component Housing with Exhalation valve
10d	804813	Inlet Valve Disc
10e	805011	Valve Spider
11	636956	Screw
11a	804812	Screw Kit
12	804811	Component Housing Ring
13	10018621	Slide-To-Connect Adapter
13a	10033115	Push-To-Connect Adapter
14	489224	Component Housing Cover (Push-to-Connect)
15	10034500	Component Housing Cover (Slide-to-Connect)
16	491121	Nosecup Assembly w/ valves, Small/Medium
	491123	Nosecup Assembly w/ valves, Medium
16a	804822	Valve Seat (2 Req'd.)
16b	804823	Valve Disc (2 Req'd.)
17	804829	Neck strap
18	637070	Screw (2 Req'd.)
19	490133	Exhalation Valve
20	814459	Spring
21	490128	Spring Retainer
	600920	Snoop Leak Detector

FIREHAWK M7 ULTRA ELITE FACEPIECE



FIREHAWK M7 ULTRA ELITE FACEPIECE

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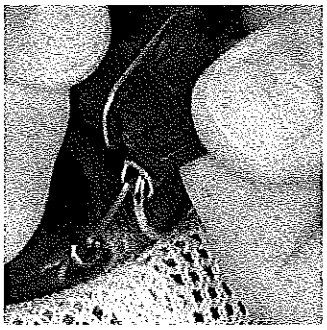
DISASSEMBLY

Removing the SpeeD-ON® Head Harness

The center strap of the SpeeD-ON head Harness is stitched permanently to the buckle. To replace the harness:

1. Remove the center strap and buckle.
   a. Grasp the facepiece lug with one hand and the buckle with the other.

   b. Lift the metal buckle while stretching the facepiece lug.



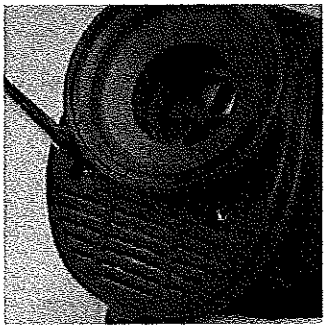
2. Remove the temple and jaw straps.
   a. Extend each strap so that the end tab is at the buckle.
   b. Unlace the straps.

Note: To remove the SpeeD-ON Head harness with buckles, repeat step 1 on each buckle.

Removing the Component Housing Cover

1. Remove the two component housing cover screws and neck strap.

2. Remove the locking ring.



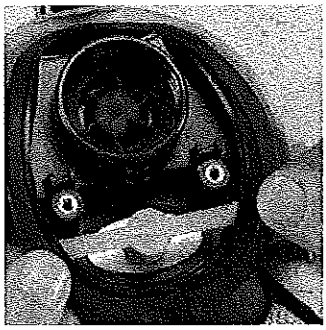
3. Lift the cover release hook.

4. Unscrew and remove the adapter assembly.

Removing the Component Housing

1. Use a small Phillips screwdriver to remove the component housing ring screw.

2. Gently spread the ring to remove it from the facepiece.



Note: If necessary, pull the component housing down slightly to allow room to remove the ring.

3. Pull the facepiece rubber from the component housing and remove the housing and nosecup (if installed).

Removing the Facepiece Lens and Lens Ring

Note: Remove the adapter assembly and component housing cover.

1. Remove the screws from the top and bottom lens rings.

2. Remove the lens rings.

3. Fold the flange back and pull the lens out of the groove.

Removing the Speaking Diaphragm
P/N 804809

1. Remove the nosecup.

2. Unscrew and remove the speaking diaphragm-retaining ring.

3. Turn the facepiece upside down and shake out the speaking diaphragm and gasket assembly.
4. Check the speaking diaphragm and gasket assembly for wear or damage. Replace as needed.
   a. Be sure that the gasket is bonded securely to the speaking diaphragm.
   b. Check the gasket for perforation.

Removing the Inlet Gasket and Disc Valve
P/N 804813 & 805011

1. Remove the component housing cover and adapter assembly.
2. Remove the spider gasket.
3. Disassemble the spider gasket:
   a. Stretch the disc off of the stem

REASSEMBLY

Installing the Inlet Gasket and Disc Valve
Inlet Valve Disc: P/N 804813
Valve Spider: P/N 805011

1. Gently stretch the valve disc over the stem.

2. Insert the gasket so that groove captures the housing rim.

3. Ensure that the groove captures the component housing rim.

Note: Flex the spider gasket as needed to fully capture the rim. When installed correctly, the gasket will lay flat and all of the spokes will be straight.

4. Reinstall the adapter assembly.
5. Don the facepiece and check the face-to-facepiece seal.

Installing the Speaking Diaphragm
P/N 804809

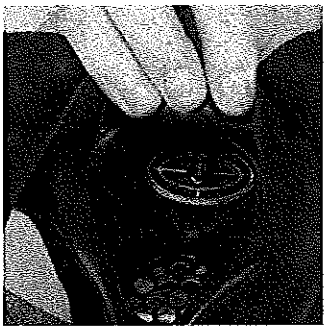
1. With the gasket forward place the diaphragm in the component housing.

2. Reinstall the retaining ring (P/N 804808) and hand tighten.

3. Reinstall the nosecup. (Small/Medium P/N 491121, Medium P/N 491123)

   a. Stretch the nose cup over the exhalation valve flange.

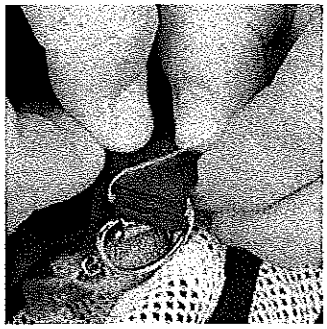
   b. Stretch the nose cup over the retaining ring.



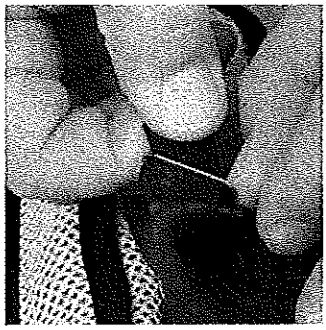
Installing the SpeeD-ON Head Harness
P/N 10031102

1. Install the crown buckle.

2. Insert the long tab of the lug into the D-ring.



3. Pull the entire lug through.



Note: Repeat steps 1 and 2 to install temple, and jaw buckles. See Kit P/N 817088 Head Harness Installation instructions to attach the harness.

Installing the M7 HUD Mounting Bracket
P/N 10083133

1. Remove the component housing cover.
2. Remove the screw from right side of the facepiece lens-retaining ring.
3. Slide the bracket assembly onto the facepiece.

   a. Make sure that molded tab is under the lower lens ring.

4. Align the upper tab screw hole with the upper lens-ring screw hole.

5. Reinstall the screw.

   a. Make sure that the screw goes through the hole in the upper metal tab.

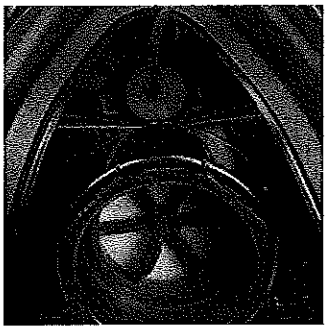
6. Align the screw hole in the lower metal tab with component housing screw hole.

7. Reinstall the component housing cover.
8. Check alignment and tighten screws.

Installing the Adapter Assembly and Component Housing Cover
Slide-to-Connect: P/N 10018621
Push-to-Connect: P/N 10033115

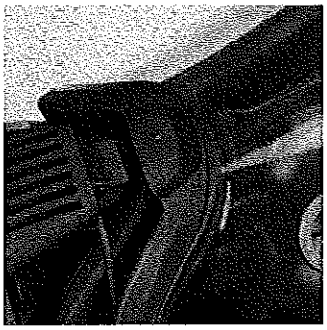
1. Screw the adapter assembly into the facepiece.

   a. Ensure that the top flat is perpendicular to the centerline.



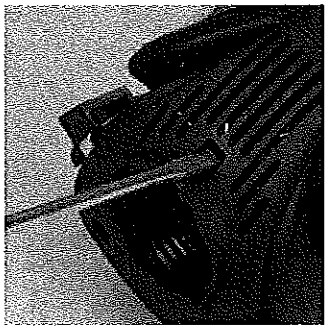
2. Place the component housing cover over the adapter assembly.

3. Insert the tab on the cover into the slot in the lens ring.



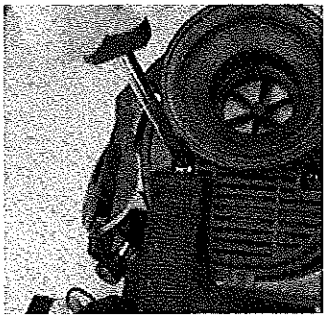
4. Press the cover until it locks.

Note: If necessary, use a small slot head screwdriver to engage the cover.



5. Place the neck strap brackets into the sockets.

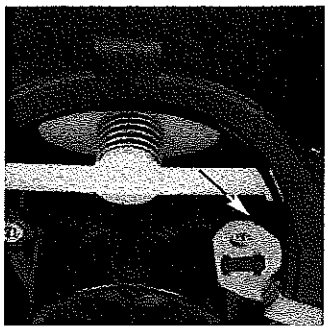
   a. Install Phillips screws and tighten.



6. Don the facepiece and check the face-to-facepiece seal.

Removing the Spring and Spring Retainer

1. Remove and discard the spring retainer.



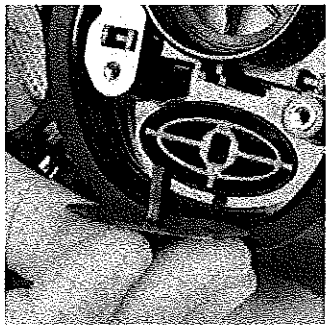
a. Slide one end of the retainer out of the slot.

b. Carefully push the center of the retainer and release the other end.

Note: Be careful not to damage the slots, valve, or valve seat. If the slots, valve, or valve seat are damaged, replace the entire component housing.

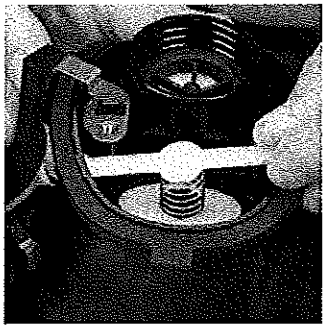
2. Inspect the slots in the component housing for damage or distortion. If damage or distortion is present, replace the component housing.

Installing the Exhalation Valve
P/N 818107



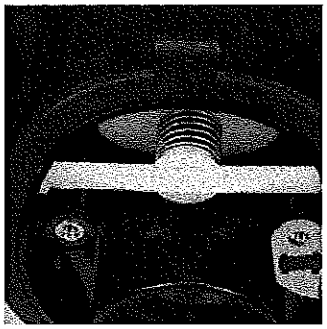
1. Insert the exhalation valve post into the slot.

2. Place a new spring on the valve.



3. Insert a new spring retainer.

4. Ensure spring retainer is secure.
   a. Make sure the retainer is fully engaged in the slots.



b. Ensure that the spring is centered on the exhalation valve.

Note: If the retainer cannot be secured, replace the component housing.

5. Install Component Housing Cover
6. Don the facepiece.
7. Cycle exhalation valve by inhaling and exhaling six times.
8. Check the face-to-facepiece seal. See FireHawk™ M7 Air Mask Operation and Instructions P/N 10082858

Installing the Facepiece Lens and Lens Ring
Lens: P/N 805020
Lens Ring: P/N 804804 & 804805

1. Remove dirt, lens fragments, or debris from the groove.
2. Lubricate the groove with Snoop (P/N 600920) or properly mixed Confidence Plus cleaner sanitizer solution.

3. Line up the new lens centerline marks (top and bottom) with the facepiece centerline marks.

Note: Verify proper lens

selection. NFPA approved lenses bear the Identification Mark "A" at the top center of the lens.

4. Insert the top of the lens into the groove.
5. Work the flange around the lens to seat the lens.

Note: The bottom lens-centerline mark must line up with the bottom facepiece-centerline mark.

⚠ CAUTION

Keep the protective paper on new lenses until facepiece assembly is complete.

6. Moisten the mating surfaces of the facepiece and lens ring with Snoop (P/N 600920).
7. Install the bottom ring.

8. Insert the tab at the top of the component housing into the slot at the bottom of the lower lens ring. Snap into place.

9. Align top lens ring centerline with the facepiece top centerline mark.
10. Press the ring into place.
11. Press the ring halves together to mate the ends.
12. Install a screw on each side.
    a. If the screws do not go in easily, pull them out and try again. Avoid cross threading.
13. Alternate tightening the left and right screws to seat the ring evenly.

⚠ CAUTION

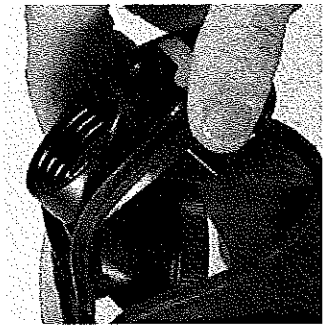
Do not over tighten. Facepiece rubber must not be visible through the joint. If the facepiece rubber is visible, reassemble.

14. Remove lens protective papers.
15. Reinstall the component housing and adapter assembly.
16. Don the facepiece and check the face-to-facepiece seal.
17. Install a cover lens to protect the lens during storage.

Installing the Component Housing Assembly
P/N 815604

1. Slide the housing into the front of the facepiece.
2. Starting at the top (narrow end) of the housing, work the housing in the facepiece groove.

Note: Ensure that the housing is captured completely by the groove and that centerlines and marks are aligned.

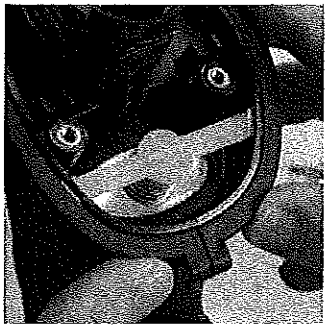


3. Moisten the mating surfaces of the facepiece housing and housing ring.
4. Insert the narrow end of the housing ring between the lower lens ring and facepiece housing.

5. Align the component housing ring center mark with the facepiece centerline.

6. Starting at the top, work the housing ring onto the facepiece.

7. Work down both sides until the ring completely captures the facepiece rubber.



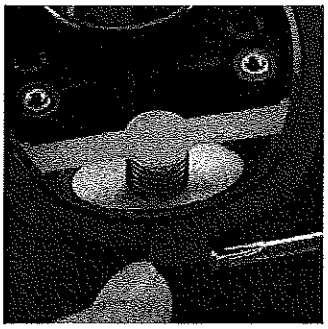
8. Check by gently squeezing the ring ends together. Bulges or wrinkles indicate that the rubber is not completely captured.
   a. Rework the ring until there are no bulges or wrinkles.

⚠ WARNING

Bulges or wrinkles indicate that the facepiece rubber is not seated properly. Reinstall the ring so that there are no bulges or wrinkles. Failure to follow this warning can cause the facepiece to leak and result in serious personal injury or death.

9. Install the screw and tighten using a small Phillips screwdriver.

   a. Make sure the facepiece rubber does not extrude between the component housing ring ends.



⚠ CAUTION

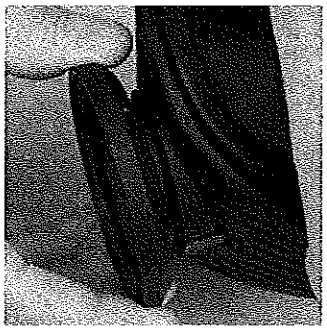
If facepiece rubber extrudes between the component housing ring ends loosen the ring and reassemble.

11. Reinstall the nosecup.
12. Reinstall the component housing cover and adapter assembly.
13. Don the facepiece and check the face-to-facepiece seal. Follow the Facepiece Fit Check.

Installing the PTC Adapter Assembly and Component Housing Cover

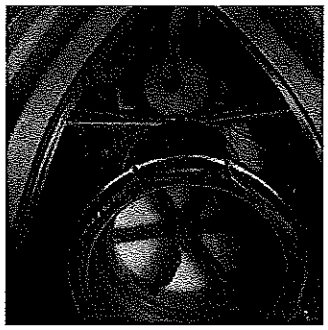
1. Insert component housing cover tab into lens ring slot.

2. Insert the adapter through the component housing cover.



3. Screw the adapter into the facepiece. Tighten to **12-27 in lbs.**

Note: Tighten until the top flat is centered between the notches on the Component Housing. (Slide-to-Connect Adapter shown for illustration purposes only.)



4. Reach inside the facepiece and tilt the Component Housing to engage the hook inside the Component Housing Cover.
5. Place the neck strap clips into the sockets.
6. Install Phillips screws and tighten.
7. Don the facepiece and check the face-to-facepiece seal.

Cleaning and Disinfecting

In general, only the facepiece requires cleaning and disinfecting after each use.

Cleaning the SpeeD-ON Head Harness

Machine wash in warm water (maximum 110°F) with a mild detergent. Allow to air dry. **Do not dry clean.** Do not bleach or use abrasive cleaners. Do not fold or store when wet.

POWER SAWS

Purpose

This guideline serves to specify the minimum performance requirements for the operation, maintenance and inspection of power saws and provides for a safer work environment by strict adherence to safety procedures.

Scope

Although ventilation is the most common use for power saws, this guideline shall apply to all power driven saws, whether gas, electric or battery types and shall apply to all personnel when using power saws for any activity. This guideline shall apply to, but not limited to, rescue saws, K-12 Partner Saws®, Cutters' Edge® Saws, chain saws, circular saws, saws-alls (reciprocating) or worm drive saws.

1. Responsibility

1.1 The responsibility for the proper use and safe operation of any power driven saw shall reside with the saw operator.

1.2 The overall task shall be supervised by the company officer and be closely monitored by the Incident Safety Officer. The Incident Safety Officer shall have the authority to halt any cutting operation deemed unsafe.

1.3 The training department shall be responsible for all training, refresher training/practice and all records with regards to saw training. No person shall operate any power saw without the proper training.

1.4 Each member is responsible for knowing the proper uses and limitations of each saw and blade type as recommended by the manufacturer.

2. Personnel Protection

2.1 Full protective clothing shall be worn by all personnel operating power saws and any personnel in close proximity to any cutting operation.

2.2 All protective clothing shall be completely buttoned to avoid moving parts of the saw.

2.3 Face shields shall be used and it is recommended that close-fitting goggles or safety eyeglasses be worn in addition to the shield.

3. Operating Procedures

3.1 Saws shall be operated in a manner consistent with the manufacturer's recommendations and limitations; saws must never be used for any purpose not intended by the manufacturer. Blades shall only be used on materials consistent with the blade design and type.

3.2 Saw operators shall be well-versed in the use of the saw(s) and blade types. Never force a saw by exerting excessive lateral force or twisting.

3.3 Rescue saws shall be carried in an off position with the blade facing forward and the muffler facing away from the body. Never transport a running saw.

3.4 Chain saws shall be carried in an off position with the chain and guide bar to the rear and the muffler facing away from the body.

3.5 Sawing/cutting operations should be conducted by a minimum of two firefighters, but no more than what is required to complete the task. Sawing/cutting shall not begin until the operator has a firm grasp on the saw and balanced footing.

3.6 Sawing/cutting should not normally be done from a ladder unless absolutely necessary.

3.7 Saws should not normally be operated from above chest height; if necessary, an additional person may be needed to steady the saw and sustain the weight while cutting.

3.8 Prior to saw operations, each member shall be made aware of the intended task goal and the probable/possible results of the cutting, such as venting smoke and heat, sparks, flying debris, possible collapse, jagged edges, etc.

3.9 When cutting to ventilate, the saw operation should proceed from an upwind location to aid the operator's vision.

3.10 Personnel should be cognizant of the possibility that gasoline powered saws may not function properly in oxygen deficient atmospheres, as well as emitting high levels of carbon monoxide.

3.11 Do not operate power saws in flammable atmospheres or around unknown chemicals or vapors.

3.12 All saws shall be shut down and in the off position when not attended.

3.13 Company officers should consider the deployment of a charged hoseline whenever sawing operations have a possibility of igniting combustible materials.

4. Maintenance and Inspection

4.1 All power saws shall be inspected for operational readiness each day and after each use. Fuel and fluid levels shall be checked at the beginning of each shift and after each use. Batteries should be replaced or recharged as necessary.

4.2 Check the position and depth of all guides and guards at the beginning of each shift.

4.3 All saws shall be thoroughly cleaned and all blades closely inspected during the weekly check for that apparatus. Composite blades must not become in contact with petroleum products or any other substance that may dissolve the blade resin.

4.4 Power saws are repaired and maintained by Fleet Services and any deficiencies shall be immediately reported to them on a *Request for Maintenance Report* and reported to the Equipment Coordinator.

4.5 Do not refuel a running or hot saw. If fuel is spilled on the saw, it must be wiped clean before starting.

ALERTING PAGERS

Purpose

This policy establishes a procedure for assignment and use of the electronic pagers and text messaging receivers

Scope

This policy pertains to all members of the department and applies to all situations involving the use of radio pagers, tone activated pagers, text messenger pagers, alpha-numeric pagers, or any other device used to electronically communicate with department employees

1. Responsibilities

1.1. Each employee issued any electronic paging device shall be responsible for its safe keeping and proper care.

1.2. Each employee issued an electronic paging device shall be responsible for routine maintenance including but not limited to battery charging, battery replacement, and cleaning.

1.3. The Communications Coordinator shall be responsible for the inventory of all pagers and shall maintain an accountability of all pagers.

1.4. The Communications Coordinator shall issue pagers to department members in accordance with this policy and/or direction of the Fire Chief.

1.5. The Communications Coordinator shall be responsible for regular and emergency maintenance and replacement of all pagers and/or accessories.

1.6. The department will not be held responsible for any personal message, personal text message, or other information received on an alpha-numeric pager where or when the message or page was not sent by the department

1.7. The department will not be held responsible for the failure to receive any personal message or page.

1.8. The toning-out or paging of an incident or request to report for duty at an incident or station stand-by shall be the only responsibility of the department for the notification of that overtime and the department will not be held responsible for the employee's failure to receive, or failure to respond, to such incidents once the incident has been properly dispatched.

2. Procedures

2.1. Members of the department will be assigned an alerting pager for response back to the Village of Hanover Park for those emergencies that are toned out by the dispatch center. Toned out calls may consist of Full Still Alarms for station standby, Full Still Alarms for equipment responses, or General Alarms for emergency response of fire equipment to the scene of an accident or fire.

2.2. Members will be assigned pagers based upon department need. Members of a specialty team may receive multiple pagers, including text messaging devices.

2.3. Members receiving text messaging pagers shall promptly respond to the page when so indicated in the message. Information only pages need not be answered. Failure to answer when requested shall be cause for removal from the team and return of the pager.

2.4. Members assigned a tone-activated alerting pager will be expected to return to the Village for callbacks in accordance with this policy.

2.5. Members responding back to or within the Village of Hanover Park will drive safety following all State of Illinois Driving laws. Responding members should report to the stations to further the response of equipment to a scene.

2.6. All members of the department will be required to provide their pager for inspections or inventories upon request. Pagers are the property of the Village of Hanover Park and must be returned upon termination of service or employment.

2.7. All part-time firefighters must meet all training hours. At that time, they will be assigned a pager and are expected to report back for toned out calls.

DIGITAL PHOTOGRAPHIC DOCUMENTATION

Purpose

This policy describes the procedure for documenting incidents and activities using digital photography or digital video. This policy serves as a guideline when determining the appropriateness of imagery or the sharing of such media. This policy is in effect to protect the confidentiality of members of the department, patients and the public and to protect the image, reputation and operations of the fire department.

Scope

This policy pertains to all fire department personnel and all fire department activities, at all times. Digital photography shall refer to any digital still camera, digital movie camera or camcorder, helmet camera, or cell phone, including such accessories as tripods, CDs or memory discs or auxiliary drives. This policy shall apply to all such recordings including those made by personal devices. All such recordings are subject to the Freedom of Information Act and may be subject to public disclosure. All photographs, videos and other images created by members while on duty are the property of the fire department pursuant to applicable copyright laws.

Excluded are those photographs that are work product necessary to conduct village business which do not contain images of fire department personnel, logos or fire/EMS scenes such as photographs used to indicate code violation, building design, aerial views, streetscapes, Inspectional Services documentation or any other photographs or videos necessary for the completion of village business; however, the sharing of such images is limited to the persons involved in such business.

1. Procedure

1.1. Whenever a fire department incident or activity is to be documented, the preferred method shall be digital photographs or digital movies.

1.2. Still 35mm photography should only be used by fire investigators at their discretion and direction.

1.3. Prior to taking photographs, the photographer shall ensure that the camera disc is formatted and does not contain any other images. The camera date and time should be verified, and if necessary, re-set.

1.4. Digital photographs that are taken using fire department camera(s) shall be downloaded from the camera onto a compact disc (CD) as soon as is practical. The downloaded photographs shall remain unedited when placed on a single-use, single-record session CD.

1.5. Digital photographs placed on the original disc shall not be edited in any way. No photographs shall be deleted. No photographs shall be renamed.

1.6. The CD shall be labeled using permanent ink with at least the following:
- 1.6.1. The date and time
- 1.6.2. The incident type and location
- 1.6.3. The maker of the photographs (initials are OK)

1.7. CD containing images of fire scenes or investigations shall remain with the original fire NFIRS Incident Report. The number and type of images shall be recorded on the incident folder or envelope.

1.8. After making an original disc, the camera shall be re-formatted, re-charged and replaced in the proper location.

1.9. Subsequent copies of the photographs may be edited, but any photograph so edited shall be clearly and distinctly labeled or renamed as "*File Name* Edited by XXX (initials)."

2. General Provisions

2.1. All photographs, files, images, movies and likenesses created by the fire department remain the property of the fire department.

2.2. No photographs and /or videos are to be copied, released, sent by mail or e-mail or otherwise distributed without the expressed written permission of the Fire Chief. Material subject to this policy shall not be uploaded or posted to any social media web site or personal web page without the expressed written permission of the Fire Chief.

2.3. Photographers should always exercise good judgment when photographing people who may be in distress. Photographs of injuries or injured persons, blood or bodily fluids, body parts, or other situations that may be considered gruesome, should only be taken in the furtherance of patient care or case investigation. Any disc containing such photographs shall be labeled as "Some Images May be Disturbing." Photographs and/or videos containing patient information are protected under HIPPA regulations.

2.4. Fire department photography equipment shall not be used for personal use or personal photographs. Photos that are purely personal, such as photos taken during station visits (group photos), are permitted.

2.5. Digital photography equipment shall not be loaned to other persons or agencies without prior approval from the Fire Chief and notification to the on-duty Battalion Chief.

2.6. Misuse of any fire department photography equipment, including the misuse of photographs or images, shall be cause for discipline.

3. Helmet Cameras

3.1. Video generated with a helmet mounted camera audio/video may be used for training, post incident analysis, fire investigation, public relations and recruitment. Helmet camera video content is not ordinarily intended to be used for disciplinary purposes.

3.2. Helmet camera use shall not delay any fire suppression or rescue activities. A helmet camera shall not be used to record any patient contact and/or treatment.

3.3. All content generated by the helmet camera shall be reviewed by the Fire Chief or his designee prior to being uploaded to any department server.

3.4. Audio recorded by a helmet camera may be exempted under current eavesdropping statutes under certain conditions out lined as exemptions in 720 ILCS 5/14-3:

3.4.1. (d) Recording or listening with the aid of any device to any emergency communication made in the normal course of operations by any federal, state or local law enforcement agency or institutions dealing in emergency services, including, but not limited to, hospitals, clinics, ambulance services, firefighting agencies, any public utility, emergency repair facility, civilian defense establishment or military installation.

2 IN 2 OUT

Purpose

This policy establishes standard procedures regarding respiratory protection that will serve to provide a safer working environment for all members and help to reduce the risk of injury or death as a result of fire department operations at emergency incidents involving hazardous atmospheres.

Scope

This policy is applicable to all members and at all incidents. This policy will serve as compliance with the 2 In – 2 Out provision in the Occupational Safety and Heath Administration (OSHA) Respiratory Protection Rule 29 CFR Part 1910. This OSHA standard is a respiratory protection standard and is not intended to limit or replace any staffing standards or practices where Rapid Intervention Teams are employed, but may be used in conjunction with such teams.

1. Responsibilities

1.1. It is the responsibility of the Incident Commander to ensure that provisions of this policy are employed on the incident scene.

1.2. It is the Company Officer's responsibility to ensure that each member of his/her crew complies fully with this policy.

1.3. Each individual member is responsible for knowing and complying with this policy.

2. Definitions

2.1. An Immediately Dangerous to Life and Health (IDLH) atmosphere shall be defined as an atmospheric concentration of any toxic, corrosive, or asphyxiant substance that poses an immediate threat to life or would cause irreversible or delayed adverse health effects or would interfere with an individual's ability to escape from a dangerous atmosphere.

2.2. An atmosphere lacking a 19.5 % concentration of oxygen shall be considered an IDLH

2.3. Incipient Fire shall be any fire in the initial stage which can be controlled or extinguished using a hand-held portable fire extinguisher.

2.4. 2-In shall mean any 2 or more firefighters entering an IDLH and shall be equipped with Self Contained Breathing Apparatus unless operating under an OSHA exception as defined elsewhere in this policy.

2.5. 2-Out shall be defined as a fully capable crew of at least 2 persons equipped with Self Contained Breathing Apparatus, tools for rescue and standing by to aid a firefighter in distress. Except as noted elsewhere, the 2-Out team shall have no other duties as long as the IDLH exists and there are persons operating in the IDLH.

3. Procedures

3.1. The first arriving company shall determine if an IDLH atmosphere exists. This information shall be conveyed in the initial size-up, i.e. smoke showing, vapor cloud present.

3.2. If no IDLH atmosphere exists, the companies shall investigate or mitigate the incident as directed by policies and/or practices.

3.3. If an IDLH atmosphere exists the Incident Commander shall establish an Incident Action Plan that:

- 3.3.1. Ensures that all companies working at the incident are aware of the IDLH
- 3.3.2. Identifies the IDLH area in larger buildings or high-rises
- 3.3.3. Provides that all persons operating inside the IDLH are wearing full protective clothing including Self Contained Breathing Apparatus (SCBA)
- 3.3.4. Provides that crews are working in no less than 2 person teams at all times within the IDLH.
- 3.3.5. Provides for a 2-Out team to be standing by outside any or all IDLH areas (may require multiple teams)
- 3.3.6. Designates an Incident Safety Officer
- 3.3.7. Provides for air quality monitoring

3.4. The Incident Commander shall request additional resources if necessary

3.5. The 2-Out Team shall:

- 3.5.1. Have sufficient tools, equipment and resources to facilitate an immediate intervention in order to aid any distressed firefighter(s).
- 3.5.2. Remain in voice or visual contact with the firefighters entering an IDLH. Radios or rope tethering will not qualify as voice or visual contact.
- 3.5.3. Report any loss of contact to the Incident Safety Officer or Incident Commander.
- 3.5.4. Not perform any other incident scene function except as noted elsewhere.

4. Exceptions

4.1. If upon arrival companies find a fire in its incipient stage, the extinguishment of such fire may be permitted without the establishment of a 2-Out team. Extinguishment of outside

fires such as dumpster fires, grass fires or automobile fires shall also be permitted without a 2-Out team.

4.2. If upon arrival crews find an imminent life threatening situation or probable life threatening situation where immediate intervention may prevent the loss of life or serious injury, such intervention may be permitted without establishing a 2-Out team. All other size-up factors shall also be taken into consideration when determining the risk/benefit analysis. In the absence of clear signs or a report from a responsible person that people are in the IDLH no entry shall be made prior to establishing a 2-Out team.

4.3. One member of the 2-Out team may be allowed to perform other duties on the incident scene so long as, if those duties were to suddenly cease, the operation would not be hindered. Pump operators may qualify as the 2-Out team member only if the engine is proximate to the building, the member is wearing full turnout gear with SCBA and the engine pump operations are computer controlled with a single line deployed.

4.4. The Incident Commander with full turnout clothing and SCBA may serve as part of the 2-Out team.

Care and Maintenance of Ropes

Purpose

This serves as a guideline for the minimum requirements for the care, maintenance, inspection and documentation of our ropes and provides a safer work environment by strict adherence to safety procedures.

Scope

NFPA 1500 requires all ropes to be inspected after each use. This guideline shall apply to all of our ropes that are of synthetic material, from the life safety lines, utility ropes and to the personal rope bags. This is to ensure that our ropes are safe and ready for use either on an incident or during training. According to manufacturer's guidelines:

1. Care

1.1. Ropes require very little maintenance, but with proper care and a few simple rules we will be able to make them last much longer. Avoid standing, walking, jumping, sitting or dropping objects on the rope. This type of mistreatment will damage the fibers of the rope, both the outer sheath and the core. Ropes should come in contact with the ground as little as possible, thereby reducing the chance that dirt particles may become imbedded in the sheath and work their way to the core damaging the fibers. Ropes should not extend outside the bag when being stored.

1.2. Avoid sharp or rough edges and sharp bends, especially if the line is moved back and forth, as these could cut the rope fibers. Place edge rollers or padding between the rope and any unavoidable edge. Use edge protection any time there is contact between the rope and abrasive surfaces.

1.3. If possible avoid any chemicals from coming into contact with the rope. Chemical exposure may cause a weakening or damage the fibers without any visible evidence. Avoid products that contain benzene, phenol (pine oil cleaners), carbon tetrachloride, formaldehyde, and petroleum products (gasoline). Do not use permanent markers as these products contain benzene. Software ends can be marked with a laundry marking pen.

1.4. Avoid exposing the rope to sunlight for long periods. Ultraviolet radiation will significantly shorten the life of the nylon rope.

1.5. High temperatures will damage nylon very quickly. The melting point of nylon is 400 degrees Fahrenheit. Problems occur when rope runs through a brake or rappel system too rapidly. Nylon should never be moved across another piece of nylon, as the heat generated may melt the stationary piece in a short time. Always use a carabineer between two pieces of software, rope or webbing.

2. Inspection

2.1. Regular inspection of the rope should be done at least once a year and also before and after it is placed into service. Visually inspect the rope for the following:

2.1.1. Dirt or foreign objects imbedded between the rope fibers.

2.1.2. Cuts, abrasions, unusual wear and other damage to the sheath. Fuzz appears on the surface of the rope as individual fibers are broken. Closer examination of the fibers with a magnifying glass is required to determine the percentage cut and uncut fibers. When 50% of the fibers are cut in one pique* or when 30% of the fibers are broken over a large area, the rope should be taken out of service.

2.1.3. Discoloration of the rope that could be from chemical contamination or being exposed to sunlight for too long.

2.1.4. Burn marks from excessive heat.

*A “pique” is the area of the braided sheath where two strands of the rope intersect. This is where one strand passes over another. This area forms a visible square on the sheath. A “pique” refers to one of these strands only.

2.2. Not only should you visibly inspect the rope but you should also feel for any inconsistencies in the sheath of the rope but also in the core. The rope should be removed from service if any of the following reasons are found:

2.2.1. Dirt or other foreign objects imbedded in the fibers.

2.2.2. Inconsistencies in the diameter of the rope, such as hour glassing, bulging, soft or hard spots and kinks.

2.2.3. Any inconsistencies in the flexibility and texture of the rope.

2.2.4. And finally any cuts, melted or glazed areas on the sheath.

3. Cleaning and Storing

3.1. Cleaning of the ropes should be done after each use. This offers multiple opportunities to examine and feel the rope as we wash, dry and store our ropes. Hosing off the rope is an acceptable way of cleaning the dirt from the fibers. Find a clean area to lay out the rope before hosing it off. You may also clean the ropes with the clothes washer after the rope has been daisy chained to help prevent entanglement. A non-detergent soap can be used or just plain warm or cold water. Fabric softener maybe added during the rinse cycle to replace washed out lubricant.

3.2. Do not use the dryer for drying of the rope as this will cause unnecessary heat and further entanglement. Hang the rope out of the sunlight and allow to air dry. The hose tower could be used as long as no heat is applied.

3.3. Store the rope inside their designated bag, this keeps them free of contaminates and also out of sunlight. Stuff the rope into the bag and once again take the time examine the rope as the bag is being loaded. The rope ends should not be left outside of the bag.

4. Documentation (See appendix A)

4.1. Purchase date
4.2. Inventory number
4.3. Date used
4.4. Reason for use
4.4.1. Incident
4.4.2. Training

4.5. Comments
4.5.1. Any type of damage
4.5.2. Any unusual loading
4.5.3. Whether it sustained a “fall load” or a shock load
4.5.4. Whether an object fell on the rope
4.5.5. What materials or contaminants the rope may have come in contact with

Hanover Park Fire Rope Log

Date Purchased: _____
Placed in Service: _____
Inventory No. _____
Style of Rope: *Static or Dynamic*
Length & Diameter: _____

Date Used	Reason	Cleaned	Comments
	training or		
	Run #		

Disposal of Unused Prescription Medications

Purpose

This policy defines the Hanover Park Fire Department's program for the proper and safe disposal of unused prescription medications. The direction that is given to the public only pertains to the disposal, the employee will not provide information as to medication use, medication misuse, overdose amounts, side effects or any other medical direction which pertains to medicines.

Scope

This policy pertains to all members of the Fire Department who may present information to the public, either in person or by phone.

1. Definition

1.1. Waste pharmaceuticals include a wide variety of items, including over-the-counter and prescription medications.

1.2. These wastes come in the form of solid pills and capsules, creams, liquids and aerosols.

1.3. Many pharmaceuticals intended for pets are similar or identical to those prescribed to humans and should be disposed of in accordance with this policy.

2. Procedures

2.1. Follow any specific disposal instructions on the drug label or patient information that accompanies the medication. **DO NOT** flush prescription drugs down the toilet unless this information specifically lists flushing as the preferred method of disposal.

2.2. Take the medication out of the original container and mix with an undesirable substance, such as used coffee grounds or kitty litter. **DO NOT** crush tablets or capsules.

2.3. Place the mixture in a sealable bag, empty garbage can, or other container to prevent the medication from leaking or breaking out of the garbage can and dispose of the medication in the trash.

3. Resources

3.1. U.S. Food and Drug Administration
- 3.1.1. Website: http://www.fda.gov/ForConsumers/ConsumerUpdates/ucm101653.htm
- 3.1.2. Attached as Appendix A "How to Dispose of Unused Medicines"

APPENDIX A

How to Dispose of Unused Medicines

Is your medicine cabinet filled with expired drugs or medications you no longer use? How should you dispose of them?

Most drugs can be thrown in the household trash, but consumers should take certain precautions before tossing them out, according to the Food and Drug Administration (FDA). A few drugs should be flushed down the toilet. And a growing number of community-based "take-back" programs offer another safe disposal alternative.

Guidelines for Drug Disposal

FDA worked with the White House Office of National Drug Control Policy (ONDCP) to develop the first consumer guidance for proper disposal of prescription drugs. Issued by ONDCP in February 2007 and updated in October 2009, the federal guidelines are summarized here:

- Follow any specific disposal instructions on the drug label or patient information that accompanies the medication. Do not flush prescription drugs down the toilet unless this information specifically instructs you to do so.
- Take advantage of community drug take-back programs that allow the public to bring unused drugs to a central location for proper disposal. Call your city or county government's household trash and recycling service (see blue pages in phone book) to see if a take-back program is available in your community. The Drug Enforcement Administration, working with state and local law enforcement agencies, is sponsoring National Prescription Drug Take Back Days (*www.deadiversion.usdoj.gov*) throughout the United States.
- If no instructions are given on the drug label and no

Take drugs out of their original containers and mix them with an undesirable substance, such as used coffee grounds …

take-back program is available in your area, throw the drugs in the household trash, but first:

- Take them out of their original containers and mix them with an undesirable substance, such as used coffee grounds or kitty litter. The medication will be less appealing to children and pets, and unrecognizable to people who may intentionally go through your trash.
- Put them in a sealable bag, empty can, or other container to prevent the medication from leaking or breaking out of a garbage bag.

FDA's Deputy Director of the Office of Compliance Ilisa Bernstein, Pharm.D., J.D., offers some additional tips:

- Before throwing out a medicine container, scratch out all identifying information on the prescription label to make it unreadable. This will help protect your identity and the privacy of your personal health information.
- Do not give medications to friends. Doctors prescribe drugs based on a person's specific symptoms and medical history. A drug that works for you could be dangerous for someone else.
- When in doubt about proper disposal, talk to your pharmacist.

Bernstein says the same disposal methods for prescription drugs could apply to over-the-counter drugs as well.

Why the Precautions?

Disposal instructions on the label are part of FDA's "risk mitigation" strategy, says Capt. Jim Hunter, R.Ph., M.P.H., senior program manager on FDA's Controlled Substance Staff. When a drug contains instructions to flush it down the toilet, he says, it's because FDA, working with the manufacturer, has determined this method to be the most appropriate route of disposal that presents the least risk to safety.

Drugs such as powerful narcotic pain relievers and other controlled substances carry instructions for flushing to reduce the danger of unintentional use or overdose and illegal abuse.

For example, the fentanyl patch, an adhesive patch that delivers a potent pain medicine through the skin, comes with instructions to flush used or leftover patches. Too much fentanyl can cause severe breathing problems and lead to death in babies, children, pets, and even adults, especially those who have not been prescribed the drug. "Even after a patch is used, a lot of the drug remains in the patch," says Hunter, "so you wouldn't want to throw something in the trash that contains a powerful and potentially dangerous narcotic that could harm others."

Environmental Concerns

Despite the safety reasons for flushing drugs, some people are questioning the practice because of concerns about trace levels of drug residues found in surface water, such as rivers and lakes, and in some community drinking water supplies. However, the main way drug residues enter water systems is by people taking medications and then naturally passing them through their bodies, says Raanan Bloom, Ph.D., an environmental assessment expert in FDA's Center for Drug Evaluation and Research. "Most drugs are not completely absorbed or metabolized by the body, and enter the environment after passing through waste water treatment plants."

A company that wants FDA to approve its drug must submit an application package to the agency. FDA requires, as part of the application package, an assessment of how the drug's use would affect the environment. Some drug applications are excluded from the assessment requirement, says Bloom, based on previous agency actions.

"For those drugs for which environmental assessments have been required, there has been no indication of environmental effects due to flushing," says Bloom. In addition, according to the Environmental Protection Agency, scientists to date have found no evidence of adverse human health effects from pharmaceutical residues in the environment.

Nonetheless, FDA does not want to add drug residues into water systems unnecessarily, says Hunter. The agency reviewed its drug labels to identify products with disposal directions recommending flushing or disposal down the sink. This continuously revised listing can be found at FDA's Web page on Disposal of Unused Medicines (*www.fda.gov/Drugs/ResourcesForYou/Consumers/BuyingUsingMedicineSafely/EnsuringSafeUseofMedicine/SafeDisposalofMedicines/ucm186187.htm*).

Another environmental concern lies with inhalers used by people who have asthma or other breathing problems, such as chronic obstructive pulmonary disease. Traditionally, many inhalers have contained chlorofluorocarbons (CFC's), a propellant that damages the protective ozone layer. The CFC inhalers are being phased out and replaced with more environmentally friendly inhalers.

Depending on the type of product and where you live, inhalers and aerosol products may be thrown into household trash or recyclables, or may be considered hazardous waste and require special handling. Read the handling instructions on the label, as some inhalers should not be punctured or thrown into a fire or incinerator. To ensure safe disposal, contact your local trash and recycling facility.

Find this and other Consumer Updates at *www.fda.gov/ForConsumers/ConsumerUpdates*

Sign up for free e-mail subscriptions at *www.fda.gov/consumer/consumerenews.html*

INSPECTIONAL SERVICES NOTIFICATION

Purpose

The purpose of this policy is to establish a system of reporting building and life safety code violations, fire protection system failures and structural integrity issues to the Hanover Park Fire Department Inspectional Division which may affect the safety and wellbeing of the general public and employees within the Village of Hanover Park.

Scope

All fire department personnel will be responsible to notify the appropriate supervisor and/or the Inspectional Services Division when any of the following conditions are found involving any building (commercial, industrial or residential) within the Village while in the course of their duties and responsibilities:

- Fire protection systems that have a trouble indication or have been taken out of service due to mechanical or electrical failure (Commercial/Industrial only). Physical damage to fire department connections (FDC), standpipes or blocked access to FDCs and fire protections systems.

- Building and Life Safety Code violations which if uncorrected pose an immediate threat to life safety and property – Health code violations, obstructed egress, exposed, damaged or unprotected utilities (gas, water, electric), etc.

- Building structural integrity issues due to weather, impact, water leak, fire or natural deterioration, which may result in structural failure endangering life safety and property.

- Building fires resulting in substantial damage to structural members or utility components (gas, electric, water).

- Any construction or service work being completed without proper building permits.

- Any conditions not covered by this policy in which at the discretion of the employee may pose a reasonable threat to life safety and property.

1. Responsibilities

1.1. Firefighter

1.1.1. Gather information regarding fire protection system failures, building/life safety code violations, or structural issues including building address, building owner/occupant contact information and building status and systems status.

1.1.2. Report conditions to the immediate supervisor as soon as possible

1.2. Fire Officer (Lieutenant, Chief Officer)
   1.2.1. Report any of the qualifying conditions to the Inspectional Services Division utilizing the procedures listed below.

2. Procedure

2.1. Issues posing an immediate threat to life safety and property must be immediately reported to the Inspectional Services Division supervisor at 630-823-5860. An Inspectional Services Notification form (Appendix A) shall be completed noting all actions taken and sent via e-mail to inspectionalservices@hpil.org with a copy e-mailed to both the Fire Chief and Assistant Fire Chief.

2.2. Examples of immediate life safety and property threat may include but not limited to:
   2.2.1. Fire protection systems out of service - High hazard occupancies
   2.2.2. Building integrity issues that pose an immediate threat to life safety, structural collapse or threat to adjacent structures.

2.3. Issues not posing an immediate threat to life safety or property shall be reported to the Inspectional Services Division utilizing the Inspectional Services Notification form (Appendix A) send via e-mail to inspectionalservices@hpil.org in the soonest practical time frame. The Inspectional Services Division supervisor may also be contacted directly at 630-823-5860 during normal Village business hours.
   2.3.1. KNOX Box damage, missing or damaged keys
   2.3.2. Building code violations
   2.3.3. Unpermitted construction/service work
   2.3.4. Access to utilities & fire protection panels
   2.3.5. Fire protection system trouble indications (Commercial/Industrial/High Occupancy)
   2.3.6. Fire protection systems out of service – Low hazard occupancies (Commercial/Industrial/High Occupancy)*
   2.3.7. Building damage from fire, weather, impact, water leak, etc.*

   *When fire protections systems are out of service or substantial structural damage is sustained, the Inspectional Service Division supervisor shall be contacted when practical.

2.4. Additional notifications to the Police Department, Code Enforcement, or Public Works shall be made as necessary.

2.5. All notifications to the Inspectional Services Division shall be documented into FIREHOUSE Software® notes stating the nature of the problem and who/how notifications were made. All items shall be passed on at morning roll call.

Appendix A

HANOVER PARK FIRE DEPARTMENT

Inspectional Services Notification

Date: _____ Time: _____

Occupancy Name: _____ Occupancy ID: _____

Address: _____

Submitted by: _____

Please follow-up for the following condition(s)

	Fire Damage		Obstructed Exit / Isle		Access to Alarm Panel
	Structural Damage		Obstructed Sprinkler Head		Access to Utilities
	Health & Safety		Knox Box: Keys / Damaged		Work with no permit
	FDC: Damaged / Obstructed		Fire Alarm: Trouble / OOS		Other:

Problem Description:

Actions taken:

	Notified Battalion Chief		Notified Police Department
	Notified Inspectional Services		Notified Property Owner / Occupant
	Other:		

Follow-up actions taken:

	Notified Fire Chief		Notified Police Department
	Notified Inspectional Services		Notified Community Development
	Notified Property Owner / Occupant		Re-inspection Date _____
	Other:		

Fire Response To The Claremont Building

Purpose

This policy outlines options and considerations that should be taken when responding and handling fire emergencies at the Claremont, 2000 W. Lake Street, Hanover Park.

Scope

This policy pertains to all fire department personnel and all emergency incidents involving fire, smoke, explosions and/or collapses within the Claremont facility. All personnel shall be familiar with the pre-plan for the Claremont, which should be reviewed on a regular basis.

1. Tactical Objectives

1.1. **Secure and maintain exit stairwells**-Exit stairwells must be maintained not only for firefighting operations but more importantly evacuation of the occupants. Stairwells shall be designated “B” (west), “C” (north) and “D” (east).

1.2. **Rescue any immediately threatened occupants**-Rescue/removal of people beginning on the fire floor or in immediate danger to life shall be completed first with the remaining occupants kept in place or removed to a safe portion of the building.

1.3. **Fire extinguishment**-Continuous application of the sufficient amount of water in the proper manner.

1.4. **Management of smoke, heat and fire gasses**-Timely removal of the products of combustion in order to aide in the fire attack and prevent their migration to adjacent patient areas.

1.5. **Property conservation**-Rapid transition to salvage tactics will aid in the evacuation/relocation process

2. Initial Alarm Considerations

2.1. Request additional resources if evidence of fire is found.

2.2. Establish command and have Ducomm notify the key holders. These are the administrative director and the maintenance director.

2.3. Establish level I and level II staging. Hanover Park Police may have to be utilized to shut down Lake St. Staging areas and access to the scene should incorporate the potential need for multiple ambulances to form a transportation sector.

2.4. Provide or verify a continuous water supply (ensure fire pump is operating) and/or supply the standpipe system if it is to be used.

2.5. Identify the fire floor and area of origin.

2.6. Provide for life safety of persons in immediate danger.

2.7. Recall and assume control of the elevators ensuring they are not occupied. Elevators are **NOT TO BE USED** for fire operations.

2.8. Designate attack and rescue stairwells.

2.9. Establish RIT in a safe, forward position with immediate access to the fire area.

2.10. Maintain accountability and firefighter safety.

2.11. Consideration must be taken with regard to the exposures of the South and East. Single family homes will be affected by a large fire as well as the Elm Court apartments. A tower company may have to be utilized from the Elm Court parking lot.

2.12. The Incident Commander may elect to fulfill the following assignments on the initial dispatch: Operations, Interior/Fire Attack, Staging, Safety, and EMS Branch Director.

3. Engine Company Operations

3.1. Standpipes shall be used when the size of the fire and/or the location exceeds the limitations of our hose loads.

3.2. Engineers need to be cognizant that they are supplying a combination standpipe/sprinkler system with one supply connection. The Sprinkler system is constructed of PVC; caution should be taken not to over pressurize the system.

3.3. When utilizing the standpipe system the minute man load should be deployed with the 1 3/8 smooth bore tip.

3.4. A high rise/standpipe kit shall be present when connecting the attack line and/or back up line to the standpipe system.

3.5. When a large volume of fire is present (more than two rooms involved), a back up line shall be in place prior to advancing the first line into the hallway.

3.6. When two lines are being deployed simultaneously, the primary line should be staged in the stairwell above the fire floor and the backup line stretched below.

3.7. Combining two crews of personnel on the initial attack line is strongly recommended when manpower is available.

3.8. Communication with the ventilation crew and incident command is paramount to a safe and effective coordinated attack.

3.9. A safe, quick and coordinated fire attack may be the most important factor to limiting fire deaths.

4. Search and Rescue Operations

4.1. The tower company will attempt to place the turntable where the highest amount of victims can be reached. Not necessarily in the front of the building. If the fire is located in the North wing, extensive ground ladder usage will be expected.

4.2. The search team will attempt to locate and remove victims starting closest to the fire area and working away.

4.3. The initial search and recon team will relay to command the need for additional search and rescue resources.

4.4. Search rope shall be utilized when conducting the primary search any time there is limited visibility on the fire floor.

4.5. Contact with Claremont staff should be made as soon as possible in order to ascertain the number of potential victims that may be present in the fire area. The decision to protect in place will be made based on location and extent of the fire. Fire personnel can utilize the “white phone” paging system in the building to communicate with the Claremont staff.

4.6. Claremont staff will begin to remove residents from the fire area. Their policy is to move the effected residents to a safe area that is separated by the hallway fire doors. Immediate instructions will be needed for the staff, an order to protect in place vs. evacuate via stairwell will be given.

4.7. A three phase search system will be utilized which includes a primary, secondary, and final search. While conducting a thorough search, emphasis should be placed on looking for victims in stairwells and elevators.

5. Ventilation

5.1. All ventilation efforts will be coordinated with the primary attack crew.

5.2. The maintenance director should be utilized in order to control the HVAC system.

5.3. Due to the possibility of a wind blown fire, horizontal ventilation may be withheld. This decision must be based on location of the fire within the building as well as the environmental conditions.

6. Incident Remediation

6.1. If not already on the scene contact with the Claremont Director will be made. All notifications to IDPH and licensing persons will be made through the Claremont Corporate Office.

6.2. Notification of the Inspectional Services Division shall be made, who will be responsible for assessing occupancy and safety of the structure.

6.3. In the event of a Mass Casualty Incident the Medical Branch Director will be responsible for all patient documentation.

6.4. When the need for relocation exists, St. Alexius Medical Center in Hoffmann Estates will be the primary medical facility accepting patients.

6.5. If the fire alarm must be taken out of service a fire watch will be implemented. See Appendix A.

6.6. If a system specialist is needed, a contractor list that the Claremont uses is attached as Appendix B.

Appendix A

Fire Watch

GENERAL: The facility will implement measures to protect occupants when the fire alarm is not functioning. When the system malfunctions, an alert "beep" is emitted from the control panel near the 1-O nursing station.

RESPONSIBLE PARTY: Administrator, Maintenance, Nursing Administration.
House Supervisors, all employees

POLICY: When the fire alarm system is not working, staff will implement the Fire Watch Program described below:

PROCEDURE:

1. When the fire alarm malfunction alert signal sounds, the Administrator, Maintenance, Nursing Administration, and/or House Supervisor will double page MOD. During off hours, the administrator and maintenance director will be notified that the fire alarm system is not working.

2. Nursing Department staff in resident care areas will inspect hallways and exits to ensure they are unobstructed.

3. The charge nurse of the unit will name a staff member to do room checks every half hour. Use the Fire Watch Form to sign off that resident care areas have been checked for signs of fire. The ranking housekeeping worker will do every half hour checks in the basement area and also record their findings on the form.

4. **Smoke or fire should be reported to the fire department by 911. Call a code Red page overhead.**
   Give location information Begin RACE:

   a. Remove residents/staff from danger

   b. Pull boxes will not work

   c. Contain the fire by closing room doors and *fire doors. The fire doors will not close automatically if the alarm system is disabled.*

   d. Evacuate only on orders by the fire department

5. From office staff (house supervisor during off hours) will check the front driveway to ensure that the fire department has free access to the building. Page visitors or delivery personnel to clear their vehicles from in front of the building. Call the Hanover Park Police Department to tow/ticket any remaining vehicles. Hourly checks should be done to keep the area free of vehicles.

6. The maintenance director will release the building from fire watch with a page of "Fire Watch is over". Return the Fire Watch forms to the safety committee chair when the fire watch is over.

   This policy should be practiced quarterly.

Appendix B

Emergency Contact List

Chain of Command

Lisa Ulm: Administrator
Elizabeth Kreplin
William VIGISKI

Emergency	Contact	phone	cell/fax
GENERATOR	PATTEN INDUSTRIES	(847)548-1177	800-952-7767
HVAC	SHERMAN MECHANICAL	(847) 462-1020	815-482-0724
MEDICAL GASES			
ELEVATOR	THYSSENKRUPP AMERICAS	(708)236-7500	(708)236-7500
PLUMBING	HOGAN PLUMBING	(630)393-7660	(630)393-7660
POLICE DEPARTMENT			
FIRE DEPARTMENT			
FIRE ALARM SYSTEM	AFFILIATED	(630)434-7900	(630)434-7900
EVACUATION SITE			
SPRINKLER SYSTEM	VALLEY	**(630)761-3168**	(630)768-0797
KITCHEN EQUIPMENT			
LAUNDRY EQUIPMENT			
SNOW PLOW			
OFFICE EQUIPMENT	MARK HARTMAN	(847)745-6218	
PHONE SYSTEM	BCI	(888)742-9332	
PARKING LOT LIGHTS			
ADMINISTRATOR	LISA ULM		(312)914-0128
DIRECTOR OF NURSING	Elizabeth Kreplin		
MAINTENANCE	WILLIAM VIGISKI	(630)582-0251	(630)696-6373
MAINTENANCE	OLIVER FORMAN	(847)740-3695	P-312-735-4077

CARE AND MAINTENANCE OF FIRE HYDRANTS

Purpose

This policy serves as a guideline to ensure that all fire hydrants within the Village of Hanover Park are maintained properly, and are kept in proper working order.

Scope

This policy is applicable to all fire department members.

1. Hydrant Maintenance

1.1. All personnel should make an effort to report any hydrants within the Village in need of maintenance, including but not limited to:
- 1.1.1. Cracked / broken housings
- 1.1.2. Missing caps
- 1.1.3. Cracked / broken caps
- 1.1.4. Damaged threads on caps or ports

1.2. If any personnel find a hydrant in need of maintenance, the battalion chief and lieutenants/acting company officers on duty shall be notified. All the required maintenance shall be documented and forwarded to the water department liaison. If the water department liaison is not on duty, the on-duty lieutenant shall also forward the information to public works.

1.3. If the maintenance issue has not been repaired by the end of the shift a note should be entered in FIREHOUSE software ®, and shall be passed on at roll call.

1.4. The water department liaison shall follow up with public works in a timely manner to see that any necessary maintenance has been completed, or in the process of being completed.

2. Water Main Breaks

2.1. When notified of a water main break the battalion chief and lieutenants / acting company officers on duty shall be notified, and duty personnel shall be made aware of the location of the break. All reported water main breaks shall be documented and forwarded to the water department liaison.

2.2. If the water main break was discovered by department personnel, and the water department liaison is not on duty, the on-duty lieutenant shall also forward the information to public works.

3. Hydrants Out-of-Service

3.1. When notified of a fire hydrant out-of-service, the battalion chief and lieutenants/acting company officers on duty shall be notified, and duty personnel shall be made aware of the hydrant location. All out-of-service fire hydrants shall be documented and forwarded to the water department liaison.

3.2. If the break has not been repaired by the end of the shift a note should be entered in FIREHOUSE software ®, and shall be passed on at roll call.

3.3. If the out-of-service hydrant was discovered by department personnel, and the water department liaison is not on duty, the on-duty lieutenant shall also forward the information to public works.

3.4. If the hydrant has not been placed back in service by the end of the shift, a note should be entered in FIREHOUSE software ®; and the information shall be passed on at roll call.

4. Fire Hydrant Marker Signs

4.1. All personnel should make an effort to report any fire hydrant marker signs within the Village in need of maintenance or repair, including but not limited to:
- 4.1.1. Missing sign or post
- 4.1.2. Damaged sign or post
- 4.1.3. Signs that are faded or otherwise unreadable

4.2. If any personnel find a hydrant marker sign in need of maintenance, the required maintenance shall be documented and forwarded to the Water Department Liaison.

5. Snow Removal

5.1. Snow removal will be conducted around fire hydrants at the discretion of lieutenants and chief officers. When conducting snow removal around fire hydrants, crews shall:
- 5.1.1. Clear a path to the hydrant approximately three (3) feet in width
- 5.1.2. Clear an area around the hydrant, approximately three (3) feet in width on all sides

6. Documentation

6.1. Fire Hydrant Maintenance Request Form

STANDARD HOSE-LAY PRACTICES

Purpose

This policy outlines options and procedures for deploying pre-determined hose lines of various sizes and uses. The Incident Commander must be fully cognizant of all tactical options available in addition to standard hose-lay deployments. All fireground operations in all buildings during an aggressive interior attach shall use the "vent and enter" method when at all possible.

Scope

This policy pertains to all fire department personnel and all emergency incidents involving fires, explosions, collapses or other catastrophic events in buildings, buildings, dwellings, residences, or vehicles, whether occupied, unoccupied, vacant or abandoned.

1. Tactical Fire Attack Plans

1.1. Tactical Fire Attack Plans shall consist of sufficient personnel to conduct safe operations while providing support for the following pre-designed hose configuration:

1.1.1. Plan 1 – consisting of any one 1 ¾" pre-connected hose line operating with tank water
1.1.2. Plan 2 – consisting of one 2 ½" hose line connected to a playpipe and 100' of 1 ¾" hose operating from a sustained water source.
1.1.3. Plan 3 – consisting of any one or two 2 ½" or 1 ¾" (or combination) hose lines connected to a gated wye operating from a sustained water supply.
1.1.4. Plan 4 – consisting of both a Plan 2 and a Plan 3.

1.2. Plans 2, 3 & 4 are sometimes referred to as "Lead Outs"

2. Incident Command Considerations

2.1. The Incident Commander must maintain an acute awareness of all hose lines deployed during a fire operation. Hose line deployment must be determined using factors such as the distance from the engine to seat of the fire, gallons per minute versus BTU production, ease of movement, available personnel, friction losses and hydrant pressures, and readiness of other hose lines.

2.2. The Incident Commander must realize the time necessary to deploy various hose lines and that each fire department engine is capable of supplying hose lines exceeding the normal staffing.

3. Single Family Dwellings

3.1. Rapid Attack

3.1.1. Size-up will be conducted in accordance with the provisions of the incident command policy.

3.1.2. Decision to lead-out or "rapid attack" must be made based on the size-up.

3.1.3. Plan 1, or sometimes referred to as "Rapid Attack", is an operation where the first due engine stops in front of the building, leads out a pre-connected 1 3/4" line and uses tank water.

3.1.4. The second due engine must be notified of this operation so a hydrant can be secured if necessary.

3.1.5. A "Rapid Attack", Plan 1 will not be used when, at the discretion of the company officer, the volume of fire is such that an expected sustained fire flow greater than 200 gallons per minute is expected.

3.2. First Line - Interior Attack

3.2.1. Generally advanced through the unburned portion of the building and/or regular entry doorway into the building.

3.2.2. Typical lead-out for an involved building is a Plan 2. The play-pipe should be near the entrance of the building with sufficient 2 ½" reserve to allow for its advancement, if necessary, with the 1 ¾" line (100') attack on the fire.

3.2.3. The objectives of the first line are:

3.2.3.1. Protect the control the open stairway (if present) to the upper floors.

3.2.3.2. Position the line between any possible victims and the fire.

3.2.3.3. Commit to an aggressive interior attack in order to confine the fire.

3.3. **Second line – Interior Attack**

3.3.1. Advance through the unburned portion of the house, or as directed by the Incident Commander.

3.3.2. Back-up to the first line if it is inadequate for the main body of the fire, or if multiple fires.

3.3.3. Position at an upper floor to cut off fire extension and/or over haul.

3.3.4. Position the line at an entrance to the basement to back up and protect the first line during a basement fire.

3.3.5. The back-up line shall be equal to or greater than the first hose line.

3.4. **Third Line – Interior Attack**

3.4.1. Purpose and objective usually determined by the incident commander.

3.4.2. When numerous concealed space fires throughout the house are found.

3.4.3. Mishap such as burst line, rescue, or structural collapse.

3.4.4. To cover exposures as necessary.

3.5. Exterior Attack

3.5.1. First Line – Exterior Attack

3.5.1.1. Affect any obvious rescue by fast knowndown of heavily involved interior of building.

3.5.1.2. Protect any involved exposures.

3.5.1.3. Exterior attack on the building when building is totally involved.

3.5.2. Second Line – Exterior Attack

3.5.2.1. Concentrate on another part of the exposure, or a second exposure.

3.5.2.2. Concentrate on the fire building while the first line is protecting exposures.

3.5.2.3. Add to the water flow of the first line to confine the fire building. (Paired hand lines directed into same area).

3.6. Deck Gun "Blitz Attack"

3.6.1. Used as an initial rapid exterior attack:

3.6.2. Immediate high water flow on a fast spreading exterior fire.

3.6.3. Used to slow or stop a fast spreading exterior fire, usually from a fully involved house.

3.6.4. Provides a rapid flow of water on an involved exposure.

3.6.5. Used in conjunction with adequate hose line to further confine and extinguish the house after the “Blitz Attack”.

3.6.6. Precautions of the “Deck Gun Blitz Attack”:

3.6.6.1. When a possible life hazard exists inside building this attack may “push” fire into uninvolved areas or spaces. Hand lines must be prepared to enter quickly.

3.6.6.2. No hydrants in the immediate area.

3.6.6.3. Must be used with a solid stream only – No Fog patterns.

3.6.6.4. ENGINE COMPANY MUST BE ALERT TO INTERIOR ATTACK COMPANIES (WARN BEFORE APPLICATION)

4. Multi-Family Dwellings

4.1. Any multiple housing building no greater than 3-stories in height. (Any building greater than 3 stories may require high rise operations.

4.2. Duplex, coach home condominium, townhouse, quad style home, and apartment buildings are considered multiple family dwellings.

4.3. All fireground operations in all buildings using an aggressive interior attack will use the “vent and enter” method.

4.4. In most cases, multi-family dwelling fires will require multiple hose lines and multiple truck company operations.

4.5. Attacks fires on these buildings, should begin as Plan 2’s and may require a Plan 3.

4.6. Size up

4.6.1. The officer will attempt an exterior size-up of all sides of the building. In some cases due to the size of the many multiple family dwellings, a complete exterior size-up may not be possible.

4.6.2. Information will be obtained from civilians, maintenance people, and police concerning the location, extent of fire, and any trapped victims.

4.6.3. Hydrant lead-out will be used in all situations in multi-family buildings. The “Quick Water” operation will only be allowed during unusual situations such as: “Dead” hydrants in a complex (broken water mains), inoperable hydrants (frozen or damaged), or no hydrants in a complex.

4.6.4. Interior size-up should be attempted if practical or possible. During an interior size-up the following should be checked:

4.6.5. Most accessible means to the fire area.

4.6.6. Most appropriate stairwell to reach the fire area.

4.6.7. Length of the lead-out

4.6.8. Smoke, heat and fire conditions

4.6.9. Request for additional help and/or orders for incoming companies via the radio

4.7. Multiple Family Dwelling Interior Attack

4.7.1. First Line Interior– Multiple Family

4.7.1.1. Committed to the fire floor via the usual access to the building or interior stairwell.

4.7.1.2. If stairwell is not needed or available (first floor fire), the line is generally advance through the unburned portion of the building.

4.7.1.3. First line typically recommended to be the 2 ½" line, 1 ¼" play-pipe, connected to the 1 ¾" leader line.

4.7.1.4. Objectives of the first line are:

4.7.1.4.1. Protect and control the stairwell and landings nearest the fire

4.7.1.4.2. Position the stream between the possible victims and the fire

4.7.1.4.3. Commit to an aggressive interior attack to confine the fire and reduce products of combustion

4.7.2. Second Line Interior – Multiple Family

4.7.2.1. Committed to follow the lead-out of the first line, or as directed by the incident commander. This would be a Plan 3 with 1 ¾ or 2 ½ attack line.

4.7.2.2. Objectives of the second line are:

4.7.2.2.1. Cover additional rooms or apartments involved with fire

4.7.2.2.2. Position the line to an upper floor for fire extension and overhaul

4.7.2.2.3. Note: If second line is removed as a back up to the first line, the Incident Commander must be notified.

4.7.2.2.4. Position the line at an entrance to a basement to back up and protect the first line during a basement fire and be available for use on the first floor to cut off extension.

4.7.2.2.5. If medium or heavy fire conditions are sized up, the second line is to be a 2 ½".

4.7.2.2.6. For possible extension or overhaul, the second line is typically a 1 ¾" line.

4.8. Third Line Interior – Multiple Family

4.8.1.1. Third line may generally be committed to the floor above the fire, or as directed by the Incident Commander.

4.8.1.2. Objectives are:

4.8.1.2.1. Confine numerous confided space fires

4.8.1.2.2. Assist with a mishap such as a burst line, rescue, or structural collapse

4.8.1.2.3. Assist with an interior exposure problem

4.9. Exterior Attack – Multiple Family

4.9.1. First Line Exterior – Multiple Family

4.9.1.1. Effect any obvious rescue situation

4.9.1.2. Protect any involved exposures

4.9.1.3. Exterior attack on the fire building

4.9.1.4. 2 ½" line is line of choice

4.9.2. Second Line Exterior – Multiple Family

4.9.2.1. Attempt an interior attack if the first line had an effective "knockdown" from the exterior

4.9.2.2. Provide a supply of water for ground or aerial deluge operations (first line can also be converted to a supply line).

4.9.3. Other exterior lines

4.9.3.1. Second due engine should position and locate a hydrant to supply a ground or aerial deluge operation.

4.9.3.2. Placement will be under orders of the incident commander.

4.9.3.3. May need to provide a relay to the first due engine.

5. Industrial and Commercial Fires:

5.1. All fire ground operations in all structures during an aggressive interior attack will use the “vent and enter” method when at all possible.

5.2. In most cases, an interior fire location may be difficult to locate and activated sprinklers should be utilized if present. Most structure fires of this type may require multiple hose lines, a sprinkler Siamese connection, multiple truck operations, and an exterior command post.

5.3. Size Up

5.3.1. The officer in charge will attempt to see all exterior sides of the structure. In most cases this may not be possible due to the size of most industrial and commercial structures, although pre-plans can be used if time permits.

5.3.2. The officer of the first due engine will obtain any available information from civilians, maintenance people, building engineers or fire brigade personnel or police concerning the location, extent of the fire, and any trapped victims.

5.3.3. ALL INDUSTRIAL AND SOME COMMERCIAL STRUCTURE FIRES MUST BE CONSIDERED AS POTENTIAL HAZARDOUS MATERIALS INCIDENTS.

5.3.4. Hydrant lead-out will be used on all fire situations involved industrial/commercial fires. The “Rapid Attack” operation will be allowed only for very unusual circumstances such as: “Dead” hydrants in the area (broken water main), inoperable hydrants (frozen or damaged)’ or no available hydrants in the area

5.3.5. While waiting for additional engine companies to provide relayed sustained water supply.

5.3.6. Interior size-up should be attempted if practical or possible. During the interior size-up the following should be checked:

5.3.7. Interior size-up should be attempted if practical or possible. During the interior size-up the following should be checked:

5.3.8. The most accessible means to the fire area

5.3.9. The length of the lead-out or availability of standpipes

5.3.10. The smoke, heat and/or fire conditions, i.e.: Light, Moderate, Heavy

5.3.11. The condition of the roof:

5.3.12. If possible from interior, visual sign of weakness fire in contact with roof support

5.3.13. Size-up from the truck operations on the roof signs of fire break through roof sponge, sinking in

5.3.13.1.1. IF THE TRUCK CANNOT OPERATE ON THE ROOF THEN THE ENGINE(S) SHOULD NOT OPERATE UNDER THE ROOF.

5.4. First Due Engine

5.4.1. Committed to attacking the fire with hand lines or heavy caliber streams.

5.4.2. First due engine will initially position to the side of the structure that is most advantageous for the fire attack and in sprinkler or standpiped buildings connect to the fire department connection.

5.4.3. On any lead-out for an industrial/commercial structure, a consideration to drop the right and left hose beds should be made (Plan 4). Although both lines may not be manned, a second line will be immediately available for another hand line or master stream device. This is normally a Plan 3.

5.4.4. Objectives of the first line or heavy caliber stream are:

5.4.4.1. Position the stream between the possible victims and the fire.

5.4.4.2. Position the stream to slow or stop any spread of fire.

5.4.4.3. At the discretion of the company officer commit to an aggressive interior attach to confine or extinguish the fire while supplying the automatic sprinkler or standpipe systems.

5.4.4.4. Beware of the structural integrity and collapsing interior contents (i.e. high rack storage)

5.4.4.5. The engine must connect to a municipal hydrant

5.5. Second due Engine

5.5.1. At the discretion of the company officer commit to supplying the sprinkler/standpipe system using both the right and left hose beds hydrant (as opposed to an industrial yard or private hydrant). Manpower from the second engine will:

5.5.2. Assist with the first line or heavy caliber stream

5.5.3. Relieve manpower on the first interior line

5.5.4. Provide a second line to:

5.5.4.1. Backup the first line

5.5.4.2. Provide another point of vantage for the fire attack

5.6. Third and fourth due engines

5.6.1. Positions and assignments will be made at the discretion of the incident Commander.

RETRAINING REQUIREMENT

Purpose

Extended absence from duty, in particular training, may allow necessary skills to decline. This Policy will establish a standard that defines the requirements for members to return to duty after an extended absence from duty. This requirement is to ensure that they are able to perform their assigned duties in a safe manner that does not present a hazard to either themselves or another member.

1. Definition

1.1 Absence from duty:

The term “absence from duty” shall be defined as an excused leave from duty involving:

1.1.1 An injury on duty
1.1.2 An injury and/or illness that is not related to duties and/or occurred while off duty
1.1.3 A personal request for extended time off

1.2 Training Requirement

The Fire Department has determined that any absence from duty for a period of six (6) or more months will require the individual firefighter to undergo re-training, and/or EMT recertification.

The type of training will be determined by the length of time the individual firefighter is absent from duty.

1.2.1 **0-6 Months:** The training requirement would be coordinated by the Training Officer and is intended to re-familiarize the firefighter with any operational changes or procedures.

1.2.2 **6-12 Months:** The training would be coordinated by the Training Officer, involving requirements for the Firefighter to pass all minimum standards (Levels I and II), as well as familiarize himself with all operational changes or procedures. This could result in the Firefighter completing these requirements before he is reassigned to shift duty.

1.3 Responsibilities

1.3.1 It shall be the responsibility of the Assistant Fire Chief to monitor all incidents involving personnel absent from duty for 30 days.

1.3.2 The Assistant Fire Chief shall submit to the Fire Chief a written report prior to reassigning any fire personnel to routine emergency service duties. The report will include the following:

1.3.2.1 All pertinent information regarding the amount of training required to return to duty. Cause of absence from duty, i.e., type of incident, cause, total duty time lost and recommendation on his training needs as set forth in this procedure.

HOSE TESTING

Purpose

This policy defines the fire hose testing procedures, which help assure the readiness and reliability of the fire hose. This policy meets the minimum requirements of NFPA 1962.

Scope

This policy is applicable to all members of the department and applies to hose testing of all fire hose used during an emergency incident. This policy does not apply to house lines, filler hoses, garden hoses or other hose used for non-emergency purposes.

1. Responsibilities

1.1. The Fire Department Equipment Coordinator shall be responsible for the hose-testing program, including the inventory of hoses and the scheduling of testing. The Equipment Coordinator shall be responsible for the repair of fire hose by a third party vendor.

1.2. Company Officers shall be responsible for the safe and proper testing of fire hoses and shall ensure that all hose on their respective equipment have completed and passed annual testing.

2. Procedure

2.1. Hose shall be removed when the engines and tower are scheduled for pump tests.

2.2. The hose will be rolled and placed on the racks.

2.3. The hose on the rack will be assigned test dates.

2.4. Testing shall be done by the assigned date.

2.5. Hose numbers, test date and testing employees shall be recorded.

2.6. A reserve engine, connected to a sustainable water supply, shall be used to conduct hose testing.

2.7. Hoses of equal diameter shall be connected to a maximum of 300 feet per hose line. Couplings should be marked to help identify any slippage.

2.8. Hose shall be filled at idle or hydrant pressure and re-positioned to be as straight as possible. Leaking couplings shall be checked for worn gaskets and replaced if necessary. Tighten all couplings. Bleed off any trapped air.

2.9. Increase the engine pressure at a rate of 15 psi per second until the desired test pressure of 250 psi is attained. For LDH (>=4') use a test pressure of 200 psi.

2.10. Maintain the test pressure for 5 minutes. Observe for any hose leakage or coupling slippage.

2.11. Identify any defects in outer jackets by type and exact location. *Example: 2 in. cut 18" from male end.*

2.12. Record test results on appropriate form. Test data shall be submitted to the Equipment Coordinator.

2.13. Company Officers will enter data on hose that passed in Firehouse software.

2.14. Hose that failed shall be rolled with the male coupling out and placed aside. Hose that passed shall be hung in the hose tower to dry. Attach the designated marking to the female end. (Storz couplings on both ends).

3. Safety Considerations

3.1. Gloves shall be worn when handling hose and couplings to guard against cuts from embedded objects or jagged edges.

3.2. Do not straddle a charged hose line. Do not stand on a charged hose line.

3.3. Inspections shall be done by walking along the left side of the hose 10-15 feet away.

3.4. Beware of the possibility of a sudden rupture.

AUTOMOBILE FIRES

Purpose

This procedure identifies operational tactics and considerations for combating automobile fires in a safe manner.

Scope

This policy applies to all fire department personnel and applies to all incidents involving fires, explosions, fuel tank ruptures, or other catastrophic events involving passenger sedans, station wagons, SUVs, pick-up trucks, limousines, or any other passenger carrying road vehicles.

1. Apparatus Response

1.1. Apparatus response to a passenger vehicle fire shall be a minimum of one Engine Company, supported by either an ambulance company or truck company.

1.2. Apparatus arriving on the scene of a vehicle fire shall size-up the incident and identify whether the vehicle is occupied.

1.3. Apparatus should be placed uphill and upwind so as to protect against potential gasoline runoff and vapors.

1.4. When the incident occurs in or near traffic lanes, the apparatus shall be placed in a manner that affords the greater protection for crews operating at the scene, including the apparatus operator. Road closings should be requested from the police department whenever necessary.

1.5. All warning lights are to remain lit and directional cones and turbo lights should be placed as available. The use of flares is prohibited.

2. Water Supply

2.1. If the Incident Commander determines that additional water will be needed the engine company may stretch a supply line only if it can be done without having crews cross uncontrolled traffic. If the supply line can not be placed on the same traffic side of the road as the fire, consideration should be given to requesting an additional engine company or tanker.

2.2. If the fire is on a bridge or overpass consider using the tower ladder as a standpipe and attack the fire from a remote location.

Fire Attack

2.3. All firefighters shall wear full protective clothing including SCBA and shall be on air whenever they enter or are proximate to the products of combustion.

2.4. The minimum hose size for combating vehicles fires shall be 1 ¾" flowing a minimum of 100 gallons per minute.

2.5. A working fire involving the passenger compartment of a vehicle will damage the vehicle beyond repair, and should be considered a total loss when evaluating a risk/benefit analysis.

2.6. If people are trapped in a vehicle, all efforts and water should be utilized for the prompt removal of the victims.

2.7. If rescue is not a factor, the first water should be applied to cool any impingement upon the fuel tank or fuel pump system. Beware that alternative fuels such as Liquefied Petroleum Gas (LPG) or Liquefied Natural Gas (LNG) may be present.

3. Safety Considerations

3.1. If alternative fuels are involved or present beware of the potential for a BLEVE or sudden rupture. A "blow torch" effect may occur from an unusual part of the vehicle.

3.2. Vehicle overhaul should be limited to that necessary to extinguish all fire. Care must be taken to avoid potential injuries from such things as undeployed airbags, energy-absorbing bumper systems, side air curtains, or vehicle contents.

3.3. Vehicle batteries may explode or emit hydrogen sulfide gas; disconnecting the battery should be done by cutting the negative cable first in order to remove the ground.

3.4. Never place a hose line into the gasoline tank or fuel tank fill neck. Overfilling the fuel tank may cause product to spill out, increasing the chance for ignition because it is lighter than water.

3.5. Fires involving metal fires will intensify when hose streams are applied. Copious amounts of water will be needed to cool the burning metal below its ignition temperature. A dry chemical extinguisher may be more effective.

3.6. Vehicle engine compartment hoods, hatches and fifth doors may have gas cylinders or tension springs and should be secured when opened. If the device fails, the door or hatch will drop suddenly.

3.7. Fires involving the trunk or cargo space should be approached with extreme precautionary suspicion until the contents are identified.

3.8. Vehicle tires may burst and make the vehicle drop suddenly. Avoid placing items under the vehicle unless it is secured using chocks.

CONFINED SPACE OPERATIONS

1. Purpose

This policy outlines practices and procedures for operations in a confided space environment.

2. Scope

This policy applies to all department members and at any incident or training functions where a scene can be classified as a confined space by OSHA regulations using a conservative interpretation.

3. Definition

3.1 OSHA regulation 29 CFR 1910.146 defines a ***Confined Space*** as a space that:

- 3.1.1 Is large enough and so configured that an employee can bodily enter and perform assigned work; and
- 3.1.2 Has limited or restricted means for entry or exit (for example, tanks, vessels, silos, storage bins, hoppers, vaults, and pits that may have limited means of entry); and
- 3.1.3 Is not destined for continuous employee occupancy

3.2 All three (3) parameters of the above definition must be met for a space to be classified as a ***Confined Space***.

4. Incident Command Considerations

4.1 Any incident in which a person is trapped, injured, experiencing a medical emergency, or is deceased or unresponsive and meets the definition of confined space shall be dispatched as a General Alarm and subsequent MABAS TRS Box Alarm.

4.2 The Incident Commander shall broadcast a size-up describing the type of confined space and number of victims, if known.

4.3 The Incident Commander shall develop an Incident Action Plan which includes a minimum of the following sectors as personnel become available: Safety Officer, TRS Sector Officer, Entry Officer, and Air Quality Officer. The Incident Action Plan shall be expanded as the situation warrants.

4.4 The Incident Commander shall establish safe work zones.

4.5 The Incident Commander shall provide for sufficient personnel for a back-up team member for each entry team member and sufficient support personnel.

5. Procedures

5.1 Only those members who are trained to the TRA Technician level shall enter a confined space except when approved by the Incident Commander.

5.2 Any member entering a confined space shall have a supply of air either by SCBA or mobile cascade with an escape bottle.

5.3 Any member entering a confined space shall be tethered with a lifeline attached for a Class III harness.

5.4 The atmosphere shall be monitored at all times. Adverse atmospheric conditions shall be defined as:

5.4.1 Oxygen Deficient <19.5%
5.4.2 Oxygen Enriched >23.5%
5.4.3 Flammable >10% of Lower Flammable Limit
5.4.4 Toxic >any Permissible Exposure Limit (PEL)
5.4.4.1 Carbon Monoxide (CO) >35ppm
5.4.4.2 Hydrogen Sulfide H_2S >10ppm

5.5 Any atmosphere determined to be adverse shall cause the operation to be suspended until such condition can be corrected.

5.6 Entry teams shall be assigned a radio frequency dedicated solely for the entry team.

5.7 At least one ALS ambulance shall be assigned to standby for entry crew members.

6. Documentation

6.1 The Incident Commander shall ensure that all entry times, participating agencies, entry personnel and scene conditions are documented using MABAS approved or supplied forms.

6.2 The incident shall be fully documented in the *Narrative* portion of the NFIRS Incident Report.

Mobile Data Terminals

Purpose

This guideline shall serve as the usage parameters for all fire department mobile computers and associated software and/or hardware.

Scope

This guideline shall apply to all fire department members at all times. The Mobile Data Terminal (MDT) shall include any/all vehicle mounted or stored computers, modems, chargers, docking station and all accessory hardware and software. All other policies and/or procedures established with the Village of Hanover Park pertaining to electronics, radios and computer usage shall apply.

1. Usage

1.1. All communications to and from the MDT shall be recorded by DuComm and are subject to review and/or subpoena. There is no expectation of privacy for any application using the fire department MDT.

1.2. The MDTs shall be considered an integral part of the emergency dispatch and response system within the fire department. The MDT's Premier MDC software shall be used to communicate dispatch information to and from DuComm and may be used in conjunction with standard radio protocols.

1.3. The MDTs shall be used only for official fire department business. The primary software application is Premier MDC and may only be minimized in order to run other fire department application. Premier MDC should be exited only when necessary to re-boot the system or program.

1.4. The MDTs shall be used only for dispatch and reporting purposes only and may be used in conjunction with GEAC I-EMS® software, FIREHOUSE Software® and mapping software provided by DuComm.

1.5. The MDTs may also be used for accessing department provided software and files installed for emergency use.

2. Prohibited Uses

2.1. The MDTs and associated hardware/software shall not be used for personal business or any non-fire department related activity.

2.2. The MDTs shall not be used to play computer games, whether or not installed by the employee or a part of another software application such as MS Windows®

2.3. The MDTs shall not be used to text message, e-mail or otherwise communicate with any other agency, vehicle, or employee that is not part of the Hanover Park Fire Department or DuComm.

2.4. The MDTs shall not be connected to the internet except for the proper uploading/downloading of GEAC I-EMS related data.

2.5. No employee shall download, or otherwise install, any programs, software, files or other electronic media onto the MDTs without the expressed permission of the Operations Chief and the IT manager.

2.6. Except for printers owned and operated by area hospitals, no employee may connect any storage device, hardware, printer, network card or drive device to the MDT.

3. Care and Maintenance

3.1. The responsibility for the care, routine maintenance and operational readiness of the MDT shall rest with the company officer and shall be part of the daily apparatus service check including battery life and cord connections.

3.2. The computer shall not be used as a resting point for any food and/or drink.

3.3. The computer keyboard and screen shall be cleaned according to the manufacturer's direction.

3.4. Unless otherwise necessary, the computer shall remain in the docking station.

3.5. Problems with the MDT and accessories shall be documented within FIREHOUSE software and the duty chief shall be notified of any needed repairs.

Annual Apparatus Testing

Purpose

This policy outlines actions that are needed when the Village of Hanover Park Fleet Services Department schedules fire department apparatus for annual testing by a third-party vendor.

Scope

This policy is applicable to all members of the department and applies to all fire department engines and/or aerial ladder towers.

1. Responsibilities

1.1 The Fire Department Equipment Coordinator shall coordinate with Fleet Services and the Chief of Operations to schedule testing. The Equipment Coordinator shall ensure that substitute or reserve equipment is ready for service prior to the expected out-of-service date of the apparatus to be tested.

1.2 Company Officers shall ensure that all duties contained in this policy are carried out in a safe and orderly manner.

1.3 Company Officers shall notify the Equipment Coordinator of any problems encountered during the process of equipment removal, cleaning or replacement.

2. Procedures

2.1 The Equipment Coordinator shall enter the test date in FIREHOUSE® Daily Reminders when a date has been selected by Fleet Services.
2.2 The Company Officers shall be responsible for monitoring the Daily Reminders for any changes in apparatus scheduling,
2.3 The Company Officer working the shift prior to the scheduled test date shall have all equipment removed so that the unit is prepared to go to Fleet at 07:00 on the day scheduled.
2.4 All hose shall be removed, rolled and properly placed in the hose racks.
2.5 All tools shall be placed on the racks provided.
2.6 EMS equipment shall be placed in the area as designated by the EMS Chief.
2.7 SCBAs shall be placed in an area as designated by the SCBA Coordinator.
2.8 All map books, radios, clipboards and any small items shall be placed in an orderly fashion in the storage bins.
2.9 Hose bed covers shall be cleaned, dried, folded and placed on the storage rack.
2.10 Hurst® tools shall be placed on the lower shelves of the rack.
2.11 Ladders shall be placed in their designated areas (Station 1 will be the mezzanine; Station 2 will be the hose tower).

3. Cleaning of Tools

3.1 All nozzles, hand tools, ladders, and Hurst tools shall be cleaned, lubricated and in a service-ready condition.

3.2 The Equipment Coordinator shall be notified of any tools found to be in need of repair by completing the *Damaged/Missing Equipment Form*.

4. Return to Service

4.1 Upon return of the apparatus from Fleet the following will be competed

4.1.1 The unit will be filled with fuel.
4.1.2 The water tank will be filled.
4.1.3 The pump will be given a daily checkout.
4.1.4 All lights will be checked.
4.1.5 The unit will be washed, the cab will be cleaned, and the hose beds and compartments cleaned and dried.
4.1.6 The hose will be bedded with tested hose and a new hose chart completed.
4.1.7 All equipment will be returned to the proper places on the unit.
4.1.8 All EMS equipment will be checked and resealed, as necessary, prior to being placed on the apparatus.
4.1.9 SCBAs will be given a complete service check and all bottles (including spares) will be filled.

4.2 Upon completion, the Company Officer will document in FIREHOUSE® that the unit has been returned to service. The note will contain the officer's name and 6-day expiration.

5. Safety Consideration

5.1 All work will be done using appropriate personal protective equipment.
5.2 Eye and hand protection shall be worn during the cleaning and servicing of all Hurst® tools.
5.3 Gloves shall be worn for all handling of fire hose.
5.4 Climbing atop the apparatus cab is prohibited. A properly heeled step ladder and long handled brushes shall be used for hard-to-reach areas.
5.5 All department safety procedures shall apply.

Carbon Monoxide Detector Distribution

Purpose

To define guidelines of the carbon monoxide detector distribution program, enabling fire department personnel to provide and maintain a consistent presentation.

Scope

This policy shall apply to all members of the Hanover Park Fire Department at all times, and shall be administered under the direction of the Public Education Coordinator.

1. Procedure

1.1 All requests for carbon monoxide detectors shall be submitted to the Public Education Coordinator.

1.1.1. Members shall have individuals requesting a detector complete an application form (Appendix B). Copies of the application form shall be kept readily available in the Operations office.
1.1.2. All completed applications shall be submitted to the Prevention Services Division.
1.1.3. The Prevention Services Division shall review all applications and contact applicants with a response in a timely manner.

2. Eligibility

2.1. Requests for carbon monoxide detectors shall be based on the following factors:

2.1.1. Applicant must reside in Hanover Park.
2.1.2. Applicant must provide a brief statement in support of the request.
2.1.3. Applicant does not have a working carbon monoxide detector.
2.1.4. **ALL** applicants currently participating in the Circuit Breaker Program receive automatic eligibility.

3. Detector Installation

3.1. Once a request for a carbon monoxide detector has been approved, and the applicant has been notified, installation of the detector shall be completed as outlined below:

3.1.1. A representative of the Prevention Services Division shall call the applicant to schedule installation of the detector and notify the respective Lieutenants and Battalion Chiefs.
3.1.2. Installation will normally be completed by companies within their still districts.
3.1.3. Company officers shall be responsible for obtaining the proper information and documentation and shall submit all documentation to the Public Education Coordinator.
3.1.4. ***The "Invisible" Killer*** carbon monoxide awareness pamphlet shall be included as part of the detector installation process. This pamphlet will be available in both English and Spanish and shall be kept readily available in the Operations office with the detectors.

3.1.5. No carbon monoxide detector shall be installed or issued as a substitute for monitoring equipment in any building where carbon monoxide has been detected.

3.1.6. In the event a carbon monoxide detector activates immediately upon installation, the installer shall promptly monitor the environment with fire department monitors and take all reasonable steps to correct the problem. All fire department procedures for carbon monoxide investigations shall apply.

4. Reports

4.1 The Public Education Coordinator shall submit informational reports as requested. These reports may include, but not limited to:

4.1.1 Number of Carbon Monoxide incidents.

4.1.1.1 Unfounded
4.1.1.2 Detector malfunction present
4.1.1.3 Caron monoxide detected
4.1.1.3.1 Illness present
4.1.1.3.2 No illness present

4.1.1.4 Per station/district

4.1.2 Number and type of presentation conducted.

4.1.3 Response comparison to evaluate trends.

4.1.3.1 Quarterly
4.1.3.2 Annually

Hanover Park Fire Department
Public Education Division
Carbon Monoxide Awareness Program

Appendix A

Description

- The purpose of the program is to promote the awareness of carbon monoxide within our community. Through education we will increase the knowledge of our residents in the following areas: 1) recognition and prevention of carbon monoxide incidents, 2) the associated risks of illness and/or death, 3) the importance of having functioning carbon monoxide detectors in the home, 4) the proper use, care and maintenance of detectors, and 5) the Carbon Monoxide Alarm Detector Act (#094-0741) effective January 1, 2007.

Goals

- To promote the awareness of potential hazards due to carbon monoxide within our community.
- To increase public knowledge as to the risks of illness and/or death associated with carbon monoxide.
- To assist residents with the installation of their detectors when possible.

Objectives

- Development and implementation of a carbon monoxide awareness audio/visual presentation, to be presented to various social groups within the community (senior citizens, homeowners associations, etc.).
- Development and implementation of an informational link on the village website directed to carbon monoxide awareness web pages.
- Development and implementation of carbon monoxide awareness pamphlets / literature to be distributed to residents, and posted on the village website.
- Development and implementation of a system to evaluate the effectiveness of the program.

Authority / Responsibility

- The Public Education Coordinator, who shall report to the Fire Prevention Chief as necessary, shall direct the program.
- All members of the department shall be responsible for conducting program presentations and/or activities as a function of the Public Education Division.
- The Public Education Coordinator or his/her designee shall be responsible for the development of all program content.

Implementation

- Program implementation shall be as follows:
  1. Fire department personnel will be trained on all aspects of the program, and the proper procedure for presentation of the program.
  2. Media may be used to increase public awareness of the program.
  3. Civic groups within the area may be contacted and advised of this program.
  4. Pamphlets / literature will be distributed to residents within the community as available.

Administration

- All requests for public education presentations or activities shall be directed to the Public Education Division, and members of the Public Education Division shall schedule all activities.
- In the event that these members are not available within a reasonable amount of time, the request may be scheduled by the on-duty Lieutenant or Battalion Chief.
- All information regarding completed public education presentations or activities shall be documented and submitted as directed by the Public Education Division.
- All presentations or activities shall be conducted in a professional manner.
- All materials used at a presentation or activity shall be replenished as necessary upon completion of the event.
- Packaged programs may be made available for distribution to civic groups.

Evaluation

- Development and implementation of an evaluation / reporting system in an effort to measure the effectiveness of the program. Reports will be compiled as requested and will include, but not be limited to:
  1. Number of carbon monoxide incidents
     - A. Unfounded
     - B. Detector malfunction present
     - C. Carbon monoxide detected
       1. Illness present
       2. No illness present
  2. Number and type of presentations conducted
  3. Response comparisons to evaluate trends
     - A. To previous quarter
     - B. To same quarter of previous year

Hanover Park Fire Department
Prevention Services Division
Smoke/Carbon Monoxide Detector Program

Appendix B

The Hanover Park Fire Department has a program to provide free detectors to eligible homeowners for their safety. Failure to have operable detectors is the leading cause of fire injuries and deaths in the State of Illinois.

To be eligible you must be a Hanover Park resident, not have a working detector and unable to afford or properly install a detector. Please complete the following;

Name: _____

Address: _____

Phone: _____

Why do you need to participate in the Village's detector program?

_____

_____

_____

I live in a single family home [ ] townhouse or duplex [ ] or apartment [ ]

I currently participate in the Illinois Circuit Breaker program [ ]

I acknowledge my responsibility to test and provide general maintenance of the detector(s) including the replacement of batteries or the detector(s) and to comply with the location requirements on the reverse side.

I for myself and my successors and assigns hereby release and hold harmless the Village of Hanover Park, its officials and employees and the manufacturer of the detector(s) from any and all liability from the installation or use of the detector(s).

Signed Name: _____ Date: _____

****

Fire Department Use:
Reason detector(s) provided: _____

_____

Installed by: _____ Date: _____

ABANDONED NEWBORN GUIDELINES

PURPOSE

This Standard Operating Guideline establishes procedures, consistent with the mandates of the Abandoned Newborn Infant Protection Act (the Act), to be followed in the event that an infant is abandoned at a Hanover Park Fire Department fire station; ensures Hanover Park Fire Department's compliance with the Abandoned Newborn Infant Protection Act; and becomes effective immediately.

SCOPE

The Illinois General Assembly has created the Abandoned Newborn Infant Protection Act (325 ILCS 2/) (the Act) which establishes procedures to be followed when a parent relinquishes a newborn infant to a hospital, police station or other designated facility. The Act, attached to this Standard Operating Guideline, is intended to enable the parent(s) of a newborn to relinquish the infant to a safe environment, to remain anonymous, and to avoid civil or criminal liability for relinquishing the infant.

The Act specifically designates fire stations as such a "facility" under the Act. Both Village of Hanover Park fire stations meet the definition of a designated facility under the Act. This guideline applies to all personnel at all times.

1. POLICY

Pursuant to the Act, every fire station within the State of Illinois that is staffed by at least one full-time emergency medical professional must:

1.1. Accept and provide all necessary emergency services and care to a relinquished newborn infant, in accordance with this Act;
1.2. Arrange for the transportation of a relinquished infant to the nearest hospital as soon as possible;
1.3. Inform the parent(s) of the name and location of the hospital to which the infant was transported, if the parent returns to the fire station within 72 hours after relinquishing the infant;
1.4. Allow the relinquishing parent to remain anonymous and to leave the fire station without being pursued provided that the infant shows no sign of abuse or neglect;
1.5. Tell the parent that by relinquishing the child anonymously, he/she will have to petition the court if he/she wants to prevent the termination of parental rights and retain custody;
1.6. Attempt to offer the parent(s) an information packet containing prescribed materials; and
1.7. Make a report to the state within 12 hours of accepting a relinquished newborn.

2. PROCEDURES AND RESPONSIBILITIES

2.1. All personnel shall be trained with respect to the requirements of the Act as they apply to the Hanover Park Fire Department and the Greater Elgin Area MIC System
2.2. All officers and supervisors shall be responsible for the following procedures set forth in this Standard Operating Guideline.
2.3. The EMS Chief will be responsible for the distribution of information packets to each fire station as required by the Act.
2.4. In the event that a parent comes to a firehouse for the purpose of relinquishing an infant, pursuant to the Act, Hanover Park Fire Department personnel shall adhere to the following procedures:
2.4.1. The company officer shall contact DUCOMM and report that the ambulance has a walk-in patient. If the ambulance is not in quarters, the company officer shall direct DUCOMM to dispatch the next ambulance available based upon the channel guide
2.4.2. If signs of child abuse or child neglect are present, the company officer shall immediately notify the Hanover Park Police Department.
2.4.3. The company officer shall orally advise the relinquishing parent(s) that he/she may remain anonymous but, that if he/she chooses to do so, he/she will have to petition the court to prevent the termination of parental rights and regain custody;
2.4.4. The company officer shall attempt to give the parent(s) an information packet which includes all the information required by the Act;
2.4.5. The company officer shall make a detailed record of the event in the NFIRS Incident Report. The transporting ambulance shall complete all medical records.
2.4.6. If the parent elects to complete adoption registry forms contained in the information packet, the company officer shall be responsible for securing the forms and ensuring that they are forwarded immediately to the on-duty Battalion Chief or Actor.
2.4.7. The on-duty Battalion Chief or Actor shall be responsible for making required notifications to the state officials (DCFS), forwarding completed adoption registry forms to the appropriate state office and maintaining all Hanover Park Fire Department documentation of the incident

3. INFORMATION PACKET

The Information packet shall contain the following documents:

3.1.1. Summary of Abandoned Newborn Protection Act Appendix A
3.1.2. Explanation of Illinois Adoption Registry Appendix B
3.1.3. Illinois Adoption Registry Application Attachment
3.1.4. Illinois Adoption Registry Application Section C (2 pages) Attachment
3.1.5. Birth Parent Registration Identification Attachment
3.1.6. Information Exchange Authorization Attachment
3.1.7. Denial of Information Exchange Attachment

3.1.8. Illinois Adoption Registry Medical Questionnaire (2 pages) Attachment
3.1.9. Illinois Adoption Registry Web site and toll-free telephone number Appendix B
3.1.10. Written notice of procedures related to termination of parental rights. Appendix C
3.1.11. Illinois Adoption Registry & Medical Exchange Brochure Attachment
3.1.12. Post Partum Care Brochure Attachment
3.1.13. Safe Haven Brochure Attachment
3.1.14. Newborn Flyer – English (2 pages) Attachment
3.1.15. Newborn Flyer – Spanish (2 pages) Attachment

APPENDIX A

Legislative summary of Illinois' Abandoned Newborn Infant Protection Act

The Abandoned Newborn Infant Protection Act allows a parent to anonymously relinquish her or his newborn infant to the care and custody of a safe haven. It provides a safe alternative to parents who may be under severe emotional distress or are unable to provide for the basic needs of an infant. The law provides immunity from prosecution for parents who relinquish their unharmed newborn to a safe haven under the terms of this law.

A "newborn" is defined as 7 days old or younger. "Relinquish" means leaving an infant with the personnel of a hospital, emergency medical facility, staffed fire station, or police station (designated safe havens). This law states that a parent may relinquish an infant anonymously, and it provides procedures that the designated safe havens and government agencies must follow when a parent relinquishes an infant.

If a newborn infant is taken to a staffed fire or police station, personnel will examine the newborn infant and, if there is no sign of abuse or neglect, will transport the infant to the nearest hospital for further examination. If abuse is determined, the fire or police station personnel must inform law enforcement officials. The hospital is required to report the relinquishment of a newborn infant to the Department of Children and Family Services (DCFS) State Central Registry (1-800-252-2873) within 12 hours of acceptance of the infant.

The hospital will have temporary protective custody of the newborn infant. The newborn infant will be examined by an emergency room doctor and will receive medical treatment, if needed. As long as there is no abuse present, there will be no attempt made to locate the birth parent. Designated safe haven personnel must provide an information packet to the relinquishing parent containing information about the Illinois Adoption Registry and Medical Information Exchange, written notice of the process to terminate parental rights (which will take place no sooner than 60 days after the relinquishment), and a list of counselors. Hospital personnel must inform the relinquishing parent that they may complete the information packet voluntarily and anonymously.

Within 24 hours, DCFS must contact law enforcement officials to ensure that the relinquished newborn infant is not a missing child. DCFS will then contact a licensed adoption agency, which will seek an order for legal custody and take physical custody of the newborn infant. Within three days of assuming custody, the adoption agency shall file a petition in the circuit court stating that the newborn infant was relinquished and the agency intends to place the newborn infant in an adoptive home. The adoption agency will also file for termination of parental rights and appoint a guardian for the infant.

APPENDIX B

Explanation of Illinois Adoption Registry

The Adoption Registry provides a means by which registrants may authorize or prohibit the release of identifying information, including a copy of the adopted person's original birth certificate, to others involved in their surrender or adoption. Confidential facts may be released to registrants only after at least two specified parties to the adoption have each filed explicit mutual consent for the exchange of this information.

Vital medical information may be exchanged anonymously throughout the life of an adopted or surrendered person (a person given up for adoption, but not adopted) or birth family through the new Medical Information Exchange. The availability of medical information is dependent on an adopted or surrendered person, birth parent, birth sibling, adoptive parent(s) or legal guardian(s) voluntarily filing and agreeing to exchange these facts.

For more information, please contact the Illinois Adoption Registry at 877-323-5299 (TOLL FREE within Illinois) or at 217-557-5159, or visit online at http://www.idph.state.il.us/vitalrecords/adoptioninfo.htm.

APPENDIX C

NOTICE TO RELINQUISHING PERSON UNDER ABANDONED NEWBORN INFANT PROTECTION ACT

Be advised that:

No sooner than 60 days following the date of the initial relinquishment of the infant to a hospital, fire station, or emergency medical facility, the child-placing agency or the Department of Children and Family Services (DCFS) will commence proceedings for the termination of parental rights and placement of the infant for adoption.

Failure of a parent of the infant to contact the Department of Children and Family Services (DCFS) and petition for the return of custody of the infant before termination of parental rights bars any future action asserting legal rights with respect to the infant.

El Acta Para la Notificacion par alas Personas Que Abandoman o Reuncian a sus Ninos Nacidos

Sea usted informado que:

Una ves hayan pasado los primeros 60 dias a la fecha inicial de la renuncia y abandono de un nino recien nacido en un hospital, estacion de bomberos o en una sala de emergencia de una facilidad medica, el Departamento de Servicios Para Ninos y Familias del Estado de Illinois (IDCFS) comenzara los procedimientos legales para terminar los derechos paternales y logar la colocacion del infante para su adopcion.

Fallo de los padres del nino recien nacido a comunicarse con el Departamento de Servicios Para Ninos y familias del Estado de Illinois (IDCFS) o el de solicitor una peticion para el regreso de la custodia del nino antes de la terminar los derechos de los padres, prohibira cualquier accion future afirmando los derechos legales con respecto al nino.

CHILDREN

(325 ILCS 2/) Abandoned Newborn Infant Protection Act.

(325 ILCS 2/1)

Sec. 1. Short title. This Act may be cited as the Abandoned Newborn Infant Protection Act.

(Source: P.A. 92-408, eff. 8-17-01; 92-432, eff. 8-17-01.)

(325 ILCS 2/5)

Sec. 5. Public policy. Illinois recognizes that newborn infants have been abandoned to the environment or to other circumstances that may be unsafe to the newborn infant. These circumstances have caused injury and death to newborn infants and give rise to potential civil or criminal liability to parents who may be under severe emotional distress. This Act is intended to provide a mechanism for a newborn infant to be relinquished to a safe environment and for the parents of the infant to remain anonymous if they choose and to avoid civil or criminal liability for the act of relinquishing the infant. It is recognized that establishing an adoption plan is preferable to relinquishing a child using the procedures outlined in this Act, but to reduce the chance of injury to a newborn infant, this Act provides a safer alternative.

A public information campaign on this delicate issue shall be implemented to encourage parents considering abandonment of their newborn child to relinquish the child under the procedures outlined in this Act, to choose a traditional adoption plan, or to parent a child themselves rather than place the newborn infant in harm's way.

(Source: P.A. 92-408, eff. 8-17-01; 92-432, eff. 8-17-01.)

(325 ILCS 2/10)

Sec. 10. Definitions. In this Act:

"Abandon" has the same meaning as in the Abused and Neglected Child Reporting Act.

"Abused child" has the same meaning as in the Abused and Neglected Child Reporting Act.

"Child-placing agency" means a licensed public or private agency that receives a child for the purpose of placing or arranging for the placement of the child in a foster family home or other facility for child care, apart from the custody of the child's parents.

"Department" or "DCFS" means the Illinois Department of Children and Family Services.

"Emergency medical facility" means a freestanding emergency center or trauma center, as defined in the Emergency Medical Services (EMS) Systems Act.

"Emergency medical professional" includes licensed physicians, and any emergency medical technician-basic, emergency medical technician-intermediate, emergency medical technician-paramedic, trauma nurse specialist, and pre-hospital RN, as defined in the Emergency Medical Services (EMS) Systems Act.

"Fire station" means a fire station within the State with at least one staff person.

"Hospital" has the same meaning as in the Hospital Licensing Act.

"Legal custody" means the relationship created by a court order in the best interest of a newborn infant that imposes on the infant's custodian the responsibility of physical possession of the infant, the duty to protect, train, and discipline the infant, and the duty to provide the infant with food, shelter, education, and medical care, except as these are limited by parental rights and responsibilities.

"Neglected child" has the same meaning as in the Abused and Neglected Child Reporting Act.

"Newborn infant" means a child who a licensed physician reasonably believes is 30 days old or less at the time the child is initially relinquished to a hospital, police station, fire station, or emergency medical facility, and who is not an abused or a neglected child.

"Police station" means a municipal police station or a county sheriff's office.

"Relinquish" means to bring a newborn infant, who a licensed physician reasonably believes is 30 days old or less, to a hospital, police station, fire station, or emergency medical facility and to leave the infant with personnel of the facility, if the person leaving the infant does not express an intent to return for the infant or states that he or she will not return for the infant. In the case of a mother who gives birth to an infant in a hospital, the mother's act of leaving that newborn infant at the hospital (i) without expressing an intent to return for the infant or (ii) stating that she will not return for the infant is not a "relinquishment" under this Act.

"Temporary protective custody" means the temporary placement of a newborn infant within a hospital or other medical facility out of the custody of the infant's parent.
(Source: P.A. 96-345, eff. 1-1-10.)

(325 ILCS 2/15)

Sec. 15. Presumptions.

(a) There is a presumption that by relinquishing a newborn infant in accordance with this Act, the infant's parent consents to the termination of his or her parental rights with respect to the infant.

(b) There is a presumption that a person relinquishing a newborn infant in accordance with this Act:

(1) is the newborn infant's biological parent; and

(2) either without expressing an intent to return for the infant or expressing an intent not to return for the infant, did intend to relinquish the infant to the hospital, police station, fire station, or emergency medical facility to treat, care for, and provide for the infant in accordance with this Act.

(c) A parent of a relinquished newborn infant may rebut the presumption set forth in either subsection (a) or subsection (b) pursuant to Section 55, at any time before the termination of the parent's parental rights.
(Source: P.A. 92-408, eff. 8-17-01; 92-432, eff. 8-17-01; 93-820, eff. 7-27-04.)

(325 ILCS 2/20)

Sec. 20. Procedures with respect to relinquished newborn infants.

(a) Hospitals. Every hospital must accept and provide all necessary emergency services and care to a relinquished newborn infant, in accordance with this Act. The hospital shall examine a relinquished newborn infant and perform tests that, based on reasonable medical judgment, are appropriate in evaluating whether the relinquished newborn infant was abused or neglected.

The act of relinquishing a newborn infant serves as implied consent for the hospital and its medical personnel and physicians on staff to treat and provide care for the infant.

The hospital shall be deemed to have temporary protective custody of a relinquished newborn infant until the infant is discharged to the custody of a child-placing agency or the Department.

(b) Fire stations and emergency medical facilities. Every fire station and emergency medical facility must accept and provide all necessary emergency services and care to a relinquished newborn infant, in accordance with this Act.

The act of relinquishing a newborn infant serves as implied consent for the fire station or emergency medical facility and its emergency medical professionals to treat and provide care for the infant, to the extent that those emergency medical professionals are trained to provide those services.

After the relinquishment of a newborn infant to a fire station or emergency medical facility, the fire station or emergency medical facility's personnel must arrange for the transportation of the infant to the nearest hospital as soon as transportation can be arranged.

If the parent of a newborn infant returns to reclaim the child within 72 hours after relinquishing the child to a fire station or emergency medical facility, the fire station or emergency medical facility must inform the parent of the name and location of the hospital to which the infant was transported.

(c) Police stations. Every police station must accept a relinquished newborn infant, in accordance with this Act. After the relinquishment of a newborn infant to a police station, the police station must arrange for the transportation of the infant to the nearest hospital as soon as transportation can be arranged. The act of relinquishing a newborn infant serves as implied consent for the hospital to which the infant is transported and that hospital's medical personnel and physicians on staff to treat and provide care for the infant.

If the parent of a newborn infant returns to reclaim the infant within 72 hours after relinquishing the infant to a police station, the police station must inform the parent of the name and location of the hospital to which the infant was transported.

(Source: P.A. 92-408, eff. 8-17-01; 92-432, eff. 8-17-01; 93-820, eff. 7-27-04.)

(325 ILCS 2/22)

Sec. 22. Signs. Every hospital, fire station, emergency medical facility, and police station that is required to accept a relinquished newborn infant in accordance with this Act must post a sign in a conspicuous place on the exterior of the building housing the facility informing persons that a newborn infant may be relinquished at the facility in accordance with this Act. The Department shall prescribe specifications for the signs and for their placement that will ensure statewide uniformity.

This Section does not apply to a hospital, fire station, emergency medical facility, or police station that has a sign that is consistent with the requirements of this Section that is posted on the effective date of this amendatory Act of the 95th General Assembly.

(Source: P.A. 95-275, eff. 8-17-07.)

(325 ILCS 2/25)

Sec. 25. Immunity for relinquishing person.

(a) The act of relinquishing a newborn infant to a hospital, police station, fire station, or emergency medical facility in accordance with this Act does not, by itself, constitute a basis for a finding of abuse, neglect, or abandonment of the infant pursuant to the laws of this State nor does it, by itself, constitute a violation of Section 12-21.5 or 12-21.6 of the Criminal Code of 1961.

(b) If there is suspected child abuse or neglect that is not based solely on the newborn infant's relinquishment to a hospital, police station, fire station, or emergency medical facility, the personnel of the hospital, police station, fire station, or emergency medical facility who are mandated reporters under the Abused and Neglected Child Reporting Act must report the abuse or neglect pursuant to that Act.

(c) Neither a child protective investigation nor a criminal investigation may be initiated solely because a newborn infant is relinquished pursuant to this Act.

(Source: P.A. 92-408, eff. 8-17-01; 92-432, eff. 8-17-01; 93-820, eff. 7-27-04.)

(325 ILCS 2/27)

Sec. 27. Immunity of facility and personnel. A hospital, police station, fire station, or emergency medical facility, and any personnel of a hospital, police station, fire station, or emergency medical facility, are immune from criminal or civil liability for acting in good faith in accordance with this Act. Nothing in this Act limits liability for negligence for care and medical treatment.

(Source: P.A. 92-408, eff. 8-17-01; 92-432, eff. 8-17-01; 93-820, eff. 7-27-04.)

(325 ILCS 2/30)

Sec. 30. Anonymity of relinquishing person. If there is no

evidence of abuse or neglect of a relinquished newborn infant, the relinquishing person has the right to remain anonymous and to leave the hospital, police station, fire station, or emergency medical facility at any time and not be pursued or followed. Before the relinquishing person leaves the hospital, police station, fire station, or emergency medical facility, the hospital, police station, fire station, or emergency medical facility personnel shall (i) verbally inform the relinquishing person that by relinquishing the child anonymously, he or she will have to petition the court if he or she desires to prevent the termination of parental rights and regain custody of the child and (ii) shall offer the relinquishing person the information packet described in Section 35 of this Act. However, nothing in this Act shall be construed as precluding the relinquishing person from providing his or her identity or completing the application forms for the Illinois Adoption Registry and Medical Information Exchange and requesting that the hospital, police station, fire station, or emergency medical facility forward those forms to the Illinois Adoption Registry and Medical Information Exchange.
(Source: P.A. 92-408, eff. 8-17-01; 92-432, eff. 8-17-01; 93-820, eff. 7-27-04.)

(325 ILCS 2/35)
Sec. 35. Information for relinquishing person.
(a) A hospital, police station, fire station, or emergency medical facility that receives a newborn infant relinquished in accordance with this Act must offer an information packet to the relinquishing person and, if possible, must clearly inform the relinquishing person that his or her acceptance of the information is completely voluntary. The information packet must include all of the following:
(1) Blank.
(2) Written notice of the following:
(A) No sooner than 60 days following the date of the initial relinquishment of the infant to a hospital, police station, fire station, or emergency medical facility, the child-placing agency or the Department will commence proceedings for the termination of parental rights and placement of the infant for adoption.
(B) Failure of a parent of the infant to contact the Department and petition for the return of custody of the infant before termination of parental rights bars any future action asserting legal rights with respect to the infant.
(3) A resource list of providers of counseling services including grief counseling, pregnancy counseling, and counseling regarding adoption and other available options for placement of the infant.
Upon request of a parent, the Department of Public Health shall provide the application forms for the Illinois Adoption Registry and Medical Information Exchange.
(b) The information packet given to a relinquishing parent in accordance with this Act shall include, in addition to

other information required under this Act, the following:

(1) A brochure (with a self-mailer attached) that describes this Act and the rights of birth parents, including an optional section for the parent to complete and mail to the Department of Children and Family Services, that shall ask for basic anonymous background information about the relinquished child. This brochure shall be maintained by the Department on its website.

(2) A brochure that describes the Illinois Adoption Registry, including a toll-free number and website information. This brochure shall be maintained on the Office of Vital Records website.

(3) A brochure describing postpartum health information for the mother.

The information packet shall be designed in coordination between the Office of Vital Records and the Department of Children and Family Services, with the exception of the resource list of providers of counseling services and adoption agencies, which shall be provided by the hospital, fire station, police station, sheriff's office, or emergency medical facility.

(Source: P.A. 96-1114, eff. 7-20-10.)

(325 ILCS 2/37)

Sec. 37. Public disclosure of information prohibited. Emergency medical professionals, employees, or other persons engaged in the administration or operation of a fire station, police station, hospital, emergency medical facility, child placing agency, or the Department where a baby has been relinquished or transferred under this Act, are prohibited from publicly disclosing any information concerning the relinquishment of the infant and the individuals involved, except as otherwise provided by law.

(Source: P.A. 95-549, eff. 6-1-08.)

(325 ILCS 2/40)

Sec. 40. Reporting requirements.

(a) Within 12 hours after accepting a newborn infant from a relinquishing person or from a police station, fire station, or emergency medical facility in accordance with this Act, a hospital must report to the Department's State Central Registry for the purpose of transferring physical custody of the infant from the hospital to either a child-placing agency or the Department.

(b) Within 24 hours after receiving a report under subsection (a), the Department must request assistance from law enforcement officials to investigate the matter using the National Crime Information Center to ensure that the relinquished newborn infant is not a missing child.

(c) Once a hospital has made a report to the Department under subsection (a), the Department must arrange for a licensed child-placing agency to accept physical custody of the relinquished newborn infant.

(d) If a relinquished child is not a newborn infant as defined in this Act, the hospital and the Department must

proceed as if the child is an abused or neglected child.
(Source: P.A. 92-408, eff. 8-17-01; 92-432, eff. 8-17-01; 93-820, eff. 7-27-04.)

(325 ILCS 2/45)

Sec. 45. Medical assistance. Notwithstanding any other provision of law, a newborn infant relinquished in accordance with this Act shall be deemed eligible for medical assistance under the Illinois Public Aid Code, and a hospital providing medical services to such an infant shall be reimbursed for those services in accordance with the payment methodologies authorized under that Code. In addition, for any day that a hospital has custody of a newborn infant relinquished in accordance with this Act and the infant does not require medically necessary care, the hospital shall be reimbursed by the Department of Healthcare and Family Services at the general acute care per diem rate, in accordance with 89 Ill. Adm. Code 148.270(c).
(Source: P.A. 95-331, eff. 8-21-07.)

(325 ILCS 2/50)

Sec. 50. Child-placing agency procedures.

(a) The Department's State Central Registry must maintain a list of licensed child-placing agencies willing to take legal custody of newborn infants relinquished in accordance with this Act. The child-placing agencies on the list must be contacted by the Department on a rotating basis upon notice from a hospital that a newborn infant has been relinquished in accordance with this Act.

(b) Upon notice from the Department that a newborn infant has been relinquished in accordance with this Act, a child-placing agency must accept the newborn infant if the agency has the accommodations to do so. The child-placing agency must seek an order for legal custody of the infant upon its acceptance of the infant.

(c) Within 3 business days after assuming physical custody of the infant, the child-placing agency shall file a petition in the division of the circuit court in which petitions for adoption would normally be heard. The petition shall allege that the newborn infant has been relinquished in accordance with this Act and shall state that the child-placing agency intends to place the infant in an adoptive home.

(d) If no licensed child-placing agency is able to accept the relinquished newborn infant, then the Department must assume responsibility for the infant as soon as practicable.

(e) A custody order issued under subsection (b) shall remain in effect until a final adoption order based on the relinquished newborn infant's best interests is issued in accordance with this Act and the Adoption Act.

(f) When possible, the child-placing agency must place a relinquished newborn infant in a prospective adoptive home.

(g) The Department or child-placing agency must initiate proceedings to (i) terminate the parental rights of the relinquished newborn infant's known or unknown parents, (ii) appoint a guardian for the infant, and (iii) obtain consent to

the infant's adoption in accordance with this Act no sooner than 60 days following the date of the initial relinquishment of the infant to the hospital, police station, fire station, or emergency medical facility.

(h) Before filing a petition for termination of parental rights, the Department or child-placing agency must do the following:

(1) Search its Putative Father Registry for the purpose of determining the identity and location of the putative father of the relinquished newborn infant who is, or is expected to be, the subject of an adoption proceeding, in order to provide notice of the proceeding to the putative father. At least one search of the Registry must be conducted, at least 30 days after the relinquished newborn infant's estimated date of birth; earlier searches may be conducted, however. Notice to any potential putative father discovered in a search of the Registry according to the estimated age of the relinquished newborn infant must be in accordance with Section 12a of the Adoption Act.

(2) Verify with law enforcement officials, using the National Crime Information Center, that the relinquished newborn infant is not a missing child.

(Source: P.A. 92-408, eff. 8-17-01; 92-432, eff. 8-17-01; 93-820, eff. 7-27-04.)

(325 ILCS 2/55)

Sec. 55. Petition for return of custody.

(a) A parent of a newborn infant relinquished in accordance with this Act may petition for the return of custody of the infant before the termination of parental rights with respect to the infant.

(b) A parent of a newborn infant relinquished in accordance with this Act may petition for the return of custody of the infant by contacting the Department for the purpose of obtaining the name of the child-placing agency and then filing a petition for return of custody in the circuit court in which the proceeding for the termination of parental rights is pending.

(c) If a petition for the termination of parental rights has not been filed by the Department or the child-placing agency, the parent of the relinquished newborn infant must contact the Department, which must notify the parent of the appropriate court in which the petition for return of custody must be filed.

(d) The circuit court may hold the proceeding for the termination of parental rights in abeyance for a period not to exceed 60 days from the date that the petition for return of custody was filed without a showing of good cause. During that period:

(1) The court shall order genetic testing to establish maternity or paternity, or both.

(2) The Department shall conduct a child protective investigation and home study to develop recommendations to the court.

(3) When indicated as a result of the Department's

investigation and home study, further proceedings under the Juvenile Court Act of 1987 as the court determines appropriate, may be conducted. However, relinquishment of a newborn infant in accordance with this Act does not render the infant abused, neglected, or abandoned solely because the newborn infant was relinquished to a hospital, police station, fire station, or emergency medical facility in accordance with this Act.

(e) Failure to file a petition for the return of custody of a relinquished newborn infant before the termination of parental rights bars any future action asserting legal rights with respect to the infant unless the parent's act of relinquishment that led to the termination of parental rights involved fraud perpetrated against and not stemming from or involving the parent. No action to void or revoke the termination of parental rights of a parent of a newborn infant relinquished in accordance with this Act, including an action based on fraud, may be commenced after 12 months after the date that the newborn infant was initially relinquished to a hospital, police station, fire station, or emergency medical facility.

(Source: P.A. 92-408, eff. 8-17-01; 92-432, eff. 8-17-01; 93-820, eff. 7-27-04.)

(325 ILCS 2/60)

Sec. 60. Department's duties. The Department must implement a public information program to promote safe placement alternatives for newborn infants. The public information program must inform the public of the following:

(1) The relinquishment alternative provided for in this Act, which results in the adoption of a newborn infant under 7 days of age and which provides for the parent's anonymity, if the parent so chooses.

(2) The alternative of adoption through a public or private agency, in which the parent's identity may or may not be known to the agency, but is kept anonymous from the adoptive parents, if the birth parent so desires, and which allows the parent to be actively involved in the child's adoption plan.

The public information program may include, but need not be limited to, the following elements:

(i) Educational and informational materials in print, audio, video, electronic or other media.

(ii) Establishment of a web site.

(iii) Public service announcements and advertisements.

(iv) Establishment of toll-free telephone hotlines to provide information.

(Source: P.A. 94-941, eff. 6-26-06.)

(325 ILCS 2/65)

Sec. 65. Evaluation.

(a) The Department shall collect and analyze information regarding the relinquishment of newborn infants and placement of children under this Act. Police stations, fire stations,

emergency medical facilities, and medical professionals accepting and providing services to a newborn infant under this Act shall report to the Department data necessary for the Department to evaluate and determine the effect of this Act in the prevention of injury or death of newborn infants. Child-placing agencies shall report to the Department data necessary to evaluate and determine the effectiveness of these agencies in providing child protective and child welfare services to newborn infants relinquished under this Act.

(b) The information collected shall include, but need not be limited to: the number of newborn infants relinquished; the services provided to relinquished newborn infants; the outcome of care for the relinquished newborn infants; the number and disposition of cases of relinquished newborn infants subject to placement; the number of children accepted and served by child-placing agencies; and the services provided by child-placing agencies and the disposition of the cases of the children placed under this Act.

(c) The Department shall submit a report by January 1, 2002, and on January 1 of each year thereafter, to the Governor and General Assembly regarding the prevention of injury or death of newborn infants and the effect of placements of children under this Act. The report shall include, but need not be limited to, a summary of collected data, an analysis of the data and conclusions regarding the Act's effectiveness, a determination whether the purposes of the Act are being achieved, and recommendations for changes that may be considered necessary to improve the administration and enforcement of this Act.

(Source: P.A. 92-408, eff. 8-17-01; 92-432, eff. 8-17-01; 93-820, eff. 7-27-04.)

(325 ILCS 2/70)

Sec. 70. Construction of Act. Nothing in this Act shall be construed to preclude the courts of this State from exercising their discretion to protect the health and safety of children in individual cases. The best interests and welfare of a child shall be a paramount consideration in the construction and interpretation of this Act. It is in the child's best interests that this Act be construed and interpreted so as not to result in extending time limits beyond those set forth in this Act.

(Source: P.A. 92-408, eff. 8-17-01; 92-432, eff. 8-17-01.)

ILLINOIS DEPARTMENT OF PUBLIC HEALTH
Illinois Adoption Registry and Medical Information Exchange Application

This registration is _____ a **NEW** registration _____ an **UPDATE** to a previous registration (please note any updates must be accompanied by ID)

I am registering/registered as (check whichever applies) ___ an adult adopted or surrendered person; ___ a birth parent; ___ an adoptive parent of a minor adopted child; __ a legal guardian of an adopted or surrendered person; __ a non-surrendered birth sibling as stated on the registration identification form included.

Section A. REGISTRANT INFORMATION

Name: _____ **Today's Date:** _____
(first) (middle) (maiden if applicable) (last)

Mailing address: _____
(street) (city) (state) (zip code)

Sex: _____ **Soc. Sec. #:**_____-____-_____ **Phone: (____)** _____
(optional)

Section B: SIGN WHEN OPTIONAL PHOTOGRAPH(S) ARE BEING FILED

The enclosed photograph(s) is to be released to the person(s) specified on my Information Exchange Authorization form. The photograph(s) do not include identifying information pertaining to any person other than myself, and do not include anyone else.

(NOTE: Photograph(s) are to be no larger than 8 ½ x 11)

_____
Applicant Signature/Date

Section C: SIGN WHEN AN OPTIONAL WRITTEN STATEMENT IS BEING FILED

An optional written statement (on the prescribed form) is enclosed and is to be released to the person(s) specified on my Information Exchange Authorization form. This statement does not include any identifying information pertaining to any person other than myself and does not include any specific names, dates or places.

_____
Applicant Signature/Date

Section D: SIGN WHEN REQUESTING NON-IDENTIFYING INFORMATION BE RELEASED

I, the undersigned, request that any non-identifying information, as identified in 750 ILCS 50/18.4(a)(c), be released to me. I understand that non-identifying information can only be provided to an adopted person, adoptive parent or legal guardian who is a registrant of the Illinois Adoption Registry.

Adopted/Surrendered Name: _____
Date of Birth: _____

_____
Applicant Signature/Date

Section E: SIGN WHEN REQUESTING ACTUAL DATE AND PLACE OF BIRTH BE RELEASED TO BIRTH PARENT

I, the undersigned, request that I be provided with the actual date and place of birth of the child I placed for adoption per 750 ILCS 50/18.4(d).

_____
Applicant Signature/Date

CHECKLIST OF ITEMS BEING SUBMITTED

___ Registration Identification form (**Required**)
___ Adoption Registry Application form (**Required**)
___ Photocopy of photo identification (**Required**)
___ Notarized Information Exchange Authorization form
___ Notarized Denial of Information Exchange form
___ Medical Questionnaire forms
___ Optional Photograph(s) if section B is signed
___ Optional Written Statement form(s) if section C is signed

If you are an adopted/surrendered person or non-surrendered birth sibling and NOT born in Illinois (Required)
___ A certified copy of your birth record

If you are a non-surrendered birth sibling (Required)
___ A certified copy of the common birth parent(s) death certificate

If you are a legal guardian of an adopted/surrendered person (Required)
___ A certified copy of the court ordered guardianship

___ $40.00 registration fee –**Required if you do not complete the medical questionnaire and authorize its release on the Information Exchange Authorization form.** If you are paying the registration fee, it may be paid by personal check or money order made payable to the Illinois Department of Public Health.

Illinois Department of Public Health

ILLINOIS ADOPTION REGISTRY APPLICATION

Section C - Optional written statement

This optional written statement is authorized for release as specified in Section C of the Adoption Registry Application. This statement is limited to the space (two pages) provided on this form and cannot include information that would identify any person other than the registrant submitting the statement. This written statement will be reviewed by registry staff to verify compliance with the law. Registry staff must remove prohibited identifying information or return the statement to the registrant for compliance. Please type, write clearly or print in dark blue or black ink. A lined and unlined page are provided for your convenience. Both pages may be used.

Illinois Department of Public Health

ILLINOIS ADOPTION REGISTRY APPLICATION

Section C - Optional written statement

This optional written statement is authorized for release as specified in Section C of the Adoption Registry Application. This statement is limited to the space (two pages) provided on this form and cannot include information that would identify any person other than the registrant submitting the statement. This written statement will be reviewed by registry staff to verify compliance with the law. Registry staff must remove prohibited identifying information or return the statement to the registrant for compliance. Please type, write clearly or print in dark blue or black ink. A lined and unlined page are provided for your convenience. Both pages may be used.

Illinois Department of Public Health

BIRTH PARENT REGISTRATION IDENTIFICATION

(Enter all known information.)

I, _____, state that I am
(present name) (first) (middle) (last)
the _____ of the following child:
(birth mother or birth father)
Child's original name _____
(first) (middle) (last)
Hour of birth _____ a.m./p.m. Date of birth _____
(circle one)
City and state of birth _____ Sex _____
Name of hospital _____

Birth father's full name _____
(first) (middle) (last)
Date of birth _____ Race _____
City and state of birth _____

Name of birth mother as
shown on original birth certificate _____
(first) (middle) (last)
Date of birth _____ Race _____
City and state of birth _____
My birth child was surrendered to _____
(name of agency)
_____
(city and state of agency)
Approximate date child was surrendered _____
My birth child was placed for adoption on _____
(date)
City and state _____
Names of adoptive parents (if known) _____
Other identifying information _____
_____
_____

Provide name(s) at birth and ages of siblings(s) having a common birth parent with surrendered person (if known). If more than one sibling, please give information requested below on reverse side of this form.

_____
(first) (middle) (last)
Date of birth _____ Sex _____ Race _____
(or approximate age)
City and state of birth _____

_____
(signature of birth parent)

_____ _____
(date) (printed or typed name of birth parent)

Illinois Department of Public Health, Division of Vital Records, 605 W. Jefferson St., Springfield, IL 62702-5097

Illinois Department of Public Health

STATE OF ILLINOIS ADOPTION REGISTRY

INFORMATION EXCHANGE AUTHORIZATION

I, _____, state that I am the person who completed the Registration Identification; that I am _____ years of age; that I hereby authorize the Department of Public Health to give the following person(s) (birth mother) (birth father) (birth sibling) (adopted/surrendered person) (adoptive mother) (adoptive father) (legal guardian(s)) the following information:

(please check the information authorized for exchange)

- ☐ 1. Only my name and last known address (as given below).
- ☐ 2. A copy of my Illinois Adoption Registry application.
- ☐ 3. A copy of the original birth certificate of the adopted person.
- ☐ 4. A copy of the completed medical questionnaire.

I am fully aware that I can only be supplied with any information about the individual(s) who has duly executed an Information Exchange Authorization for the information which authorization has not been revoked. I can be contacted by writing to:

(insert your own name, complete mailing address and telephone number
or this same information for another person to contact)

NAME		TELEPHONE NUMBER ( )
STREET ADDRESS		
CITY	STATE	ZIP CODE

Dated _____, _____
(insert date)

_____
APPLICANT'S SIGNATURE

If adoption agency representative, please state title
_____
Name of agency _____
City _____
State _____ Zip Code _____

STATE OF_____

COUNTY OF_____

I, a Notary Public, in and for the said county, in the state aforesaid, do hereby certify that _____ personally known to me to be the same person whose name is subscribed to the foregoing Information Exchange Authorization, appeared before me in person and acknowledged that he/she signed such authorization at his/her free and voluntary act and that the statements in such authorization are true.

Given under my hand and notarial seal on _____, _____
(insert date)

_____
SIGNATURE OF NOTARY

Illinois Department of Public Health

STATE OF ILLINOIS ADOPTION REGISTRY

DENIAL OF INFORMATION EXCHANGE

I, _____, state that I am the person who completed the Registration Identification; that I am _____ years of age; that I hereby instruct the Department of Public Health ***not*** to give any information about me to the following person(s) (circle as applicable) (birth mother) (birth father) (birth sibling) (adopted/surrendered person) (adoptive mother) (adoptive father) (legal guardian(s)).

(Insert your own name, complete mailing address and telephone number or this same information for another person you wish us to contact. This information is for administrative purposes only and will be used to provide written confirmation that this denial has been filed.)

NAME		TELEPHONE NUMBER ( )
STREET ADDRESS		
CITY	STATE	ZIP CODE

Dated _____, _____
(insert date)

_____
APPLICANT'S SIGNATURE

If adoption agency representative, please state title
_____
Name of agency _____
City _____
State _____ Zip Code _____

STATE OF_____

COUNTY OF_____

I, a Notary Public, in and for the said county, in the state aforesaid, do hereby certify that _____ personally known to me to be the same person whose name is subscribed to the foregoing Denial of Information Exchange, appeared before me in person and acknowledged that he/she signed such authorization as his/her free and voluntary act and that the statements in such authorization are true.

Given under my hand and notarial seal on _____, _____
(insert date)

_____
SIGNATURE OF NOTARY

Illinois Department of Public Health

ILLINOIS ADOPTION REGISTRY – MEDICAL QUESTIONNAIRE

(Enter all known information and add explanation/comments as necessary.)

If answering "yes" to any item, specify item number (for example, A2, B4, etc.) and indicate self or family member.

	Yes	No
A. CONGENITAL IMPAIRMENTS		
1. Club foot or any other orthopedic problem	❑	❑
2. Cleft lip or cleft palate	❑	❑
3. Chromosome abnormality (explain)	❑	❑
4. Down's syndrome	❑	❑
5. Muscular dystrophy	❑	❑
6. Spina bifida	❑	❑
7. Congenital heart defect	❑	❑
8. Tay-Sachs disease	❑	❑
9. Fetal alcohol syndrome	❑	❑
10. Trisomy 21	❑	❑
11. Ambiguous genitalia	❑	❑
12. Hydrocephalus	❑	❑
13. Macrocephalus	❑	❑
14. Amencephalus	❑	❑
15. Microcephalus	❑	❑
16. Other (explain)	❑	❑
B. ALLERGIES		
1. Eczema or other skin condition	❑	❑
2. Hay fever or other allergy	❑	❑
3. Drug allergy (to what drugs?)	❑	❑
4. Other (explain)	❑	❑
C. EYE AND EAR DISORDERS		
1. Blindness, glaucoma, color blindness or other visual problems	❑	❑
2. Deafness or other ear problems	❑	❑
3. Other (explain)	❑	❑
D. BLOOD AND CIRCULATORY DISORDERS		
1. Hemophilia	❑	❑
2. Sickle cell anemia or trait	❑	❑
3. Anemia	❑	❑
4. Hypertension (high blood pressure)	❑	❑
5. Stroke	❑	❑
6. Heart attack	❑	❑
7. Arthritis	❑	❑
8. Kidney disease	❑	❑
9. Other (explain)	❑	❑
E. RESPIRATORY DISORDERS		
1. Asthma	❑	❑
2. Tuberculosis	❑	❑
3. Emphysema	❑	❑
4. Cystic fibrosis	❑	❑
5. Bronchial pulmonary disposia	❑	❑
6. Other (explain)	❑	❑

Illinois Department of Public Health

ILLINOIS ADOPTION REGISTRY – MEDICAL QUESTIONNAIRE

If answering "yes" to any item, specify item number (for example, A2, B4, etc.) and indicate self or family member.

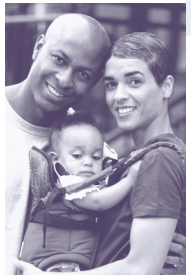
	Yes	No
F. HORMONAL DISORDERS		
1. Diabetes	❑	❑
2. Thyroid disorder	❑	❑
3. Other (explain)	❑	❑
G. MENTAL AND BEHAVIORAL DISORDERS		
1. Schizophrenia	❑	❑
2. Manic depressive (bi-polar)	❑	❑
3. Clinical depression	❑	❑
4. Substance abuse (adopted person or birth parent) (list type and explain)	❑	❑
5. Obsessive-compulsive disorders	❑	❑
6. Eating disorders	❑	❑
7. Drug usage	❑	❑
8. Autism	❑	❑
9. Other (explain)	❑	❑
H. MALIGNANT DISORDERS		
1. Cancer (specify site)	❑	❑
2. Tumors	❑	❑
3. Hodgkin's disease	❑	❑
4. Other (explain)	❑	❑
I. NERVOUS SYSTEM DISORDERS		
1. Multiple sclerosis	❑	❑
2. Huntington's disease	❑	❑
3. Cerebral palsy	❑	❑
4. Seizures or convulsions	❑	❑
5. Epilepsy	❑	❑
6. Other (explain)	❑	❑
J. INFECTIONS AND HOSPITALIZATION (explain)		
1. Repeated attacks of fever with known infection	❑	❑
2. Repeated severe infection requiring hospitalization	❑	❑
3. Hospitalizations or operations, if any	❑	❑
4. HIV/STDs (herpes, syphillis, etc.)	❑	❑
5. Hepatitis	❑	❑
6. Other (explain)	❑	❑
K. DEVELOPMENTAL DELAYS		
1. Speech challenged	❑	❑
2. Learning challenged	❑	❑
3. Mentally challenged	❑	❑
4. Physically challenged	❑	❑
5. Other (explain)	❑	❑
L. OTHER IMPAIRMENTS, DISEASE OR DISORDERS (metabolic, genetic or other) [Including ALS (Lou Gehrig's disease), gout, obesity, etc.] (list and explain)	❑	❑

RELEASE: On the Information Exchange Authorization Form, the registrant may authorize the release of the information from this medical questionaire.

DISCLAIMER: The Illinois Department of Public Health cannot guarantee the accuracy of medical information exchanged through the Adoption Registry as the information is submitted by the registrants, not the Department.

Can my medical information be shared anonymously?

In order to receive medical information through the registry, the adopted or surrendered person, birth parent or sibling, adoptive parent or legal guardian must complete the medical questionnaire and agree to exchange this information with other eligible registrants. Persons who wish to exchange medical background information without revealing their identity may do so if they indicate this in their application.



Is there a fee for registering with the Adoption Registry?

Yes. There is a $40 filing fee. However, the fee will be waived if the registrant completes the Medical Information Exchange Questionnaire at the time of the initial application and agrees to the release of the medical questionnaire to at least one other party to the adoption.

The $40 fee is also waived for adoptive parents who register with the IARMIE within 12 months of the finalization of their child's adoption.

May I update or amend my registration in the future?

Yes. Any registrant (including all those who registered with the Illinois Adoption Registry prior to January 1, 2000) may update or amend information on file free of charge. However, updates and amendments must be accompanied by proof of identification (a photocopy of the registrant's driver's license or other state-or government-issued ID).

I A R M I E registration forms are available a number of ways.

- Download the forms from the Department's Web site: <www.idph.state.il.us>.
- E-mail a request for forms to <dph.vitals@illinois.gov>.
- Fax a request for forms to 217-557-5279.
- Call the registry at 217-557-5159, toll-free, 877-323-5299, TTY (hearing impaired use only) 800-547-0466.
- Mail a request for forms to the Illinois Department of Public Health, Illinois Adoption Registry and Medical Information Exchange, Division of Vital Records, 925 E. Ridgely Ave., Springfield, IL 62702-2737.

Other Adoption Information Resources

Adoption Advocates of America
P.O. Box 215
Highland Park, IL 60035

The Adoption Information Center of Illinois
188 W. Randolph St., Ste. 600
Chicago, IL 60601

Adoptive Families Today
P.O. Box 1726
Barrington, IL 60011-1726

American Adoption Congress
1904 W. Dickens Ave.
Chicago, IL 60614

Catholic Conference of Illinois
65 E. Wacker Place, Ste. 1620 Chicago, IL 60601

Children's Home and Aid Society of Illinois
1279 N. Milwaukee
Chicago, IL 60602

Confidential Intermediary Services of Illinois
3158 Des Plaines River Road, Ste. 120
Des Plaines, IL 60018

The Cradle
2049 Ridge Ave.
Evanston, IL 60201

Illinois Department of Children and Family Services
406 E. Monroe St.
Springfield, IL 62701

Jewish Children's Bureau
1 S. Franklin Ave., Ste. 301
Chicago, IL 60606

Lutheran Social Services of Illinois
300 W. Rohmann Ave.
West Peoria, IL 61604

Midwest Adoption Center
Illinois Department of Children and Family Services
Post Adoption Program
3158 Des Plaines River Road, Ste. 120
Des Plaines, IL 60018

Missing Pieces
P.O. Box 7541
Springfield, IL 62794-8450

Stars of David
3175 Commercial Ave., Ste. 100
Northbrook, IL 60062-1915

Truth Seekers in Adoption
4356 Forest Ave.
Downers Grove, IL 60515

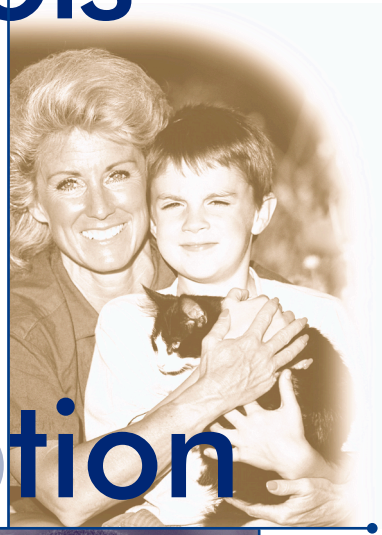
For more information, contact
Illinois Department of Public Health
Illinois Adoption Registry and Medical Information Exchange
925 E. Ridgely Ave., Springfield, IL 62702-2737
217-557-5159 • TTY (hearing impaired use only) 800-547-0466

100C

State of Illinois
Illinois Department of Public Health

Illinois Adoption Registry and Medical Information Exchange

Illinois has put the option back in adoption



Illinois Department of Public Health

The Illinois Adoption Registry *now offers Illinois adoptees and their birth and adoptive families a new post-adoption option –* **the Medical Information Exchange.**

What is
the Illinois Adoption Registry and Medical Information Exchange?

Recent changes to the adoption registry law provide for additional information to be shared. Previously, registrants were able to authorize or prohibit the release of identifying information to others involved in their surrender or adoption. While that option remains, under new provisions, the Illinois Adoption Registry and Medical Information Exchange (IARMIE) now also allows mutually consenting and adopted and surrendered persons and members of their birth and adoptive families to voluntarily exchange a wealth of information without petitioning the courts.

What
information can be exchanged?

- the identity and last known address of other birth and adoptive family members who have registered with the IARMIE
- medical background information filed with the registry
- pictures and written statements filed with the registry
- the adoptee's original birth certificate *(providing he or she was born in Illinois)*

Who
may register?

Registration is open to –

- Birth parents of eligible adopted persons
- Adopted or surrendered persons 21 years of age or older who were born, adopted or surrendered in Illinois
- Non-surrendered brothers and sisters over age 21 of those who were adopted or surrendered and a common parent is deceased
- Adoptive parents of eligible adopted persons under age 21
- Legal guardians of adopted or surrendered persons
- Surviving sister or brother of a deceased birth parent
- Surviving adult child of a deceased adopted person
- Surviving spouse of a deceased adopted person with a minor child

What is
required for the release of information?

Registrants must initially provide sufficient information about their identities and the circumstances surrounding the adoption or surrender to enable registry staff to determine that a "match" exists. For example, if a woman who placed a child for adoption 30 years ago wishes to reveal her identity or to exchange medical information with her surrendered son or daughter, she must file her consent to the release of this information with the registry. The adoptee also must have filed a consent for the release of the same information with the registry. If the birth mother and the adopted person have not both registered and consented to the release of medical and/or identifying information, no data can be released. All registry applications must be accompanied by proof of the registrant's identity (photocopy of the registrant's driver's license or other state-or government-issued ID). Non-adopted birth siblings also are required to provide proof of death for the birth parent they have in common with the adopted person.

How are
written statements and photographs submitted?

The Illinois Adoption Registry and Medical Information Exchange application includes two pages for submitting an optional written statement. Written statements filed with the registry may not include identifying information regarding anyone other than the registrant. If the written statement includes identifying information pertaining to someone other than the registrant, it will be removed by registry staff or the statement will be returned to the registrant for compliance with the law.

Photographs can be submitted by enclosing them in an unsealed envelope no larger than 8.5" x 11." Photographs filed with the registry may not identify anyone other than the registrant who submits them. Photographs that do not meet these requirements will be returned to the applicant.

How is
the medical information filed?

Medical information is filed with the registry by completing the Medical Information Exchange Questionnaire. The questionnaire includes a list of diseases and conditions that medical professionals believe may be inherited or genetically linked (i.e., illnesses that tend to "run in the family"). Each applicant is asked to indicate on the questionnaire the diseases and conditions with which he/she or other biological relatives have been diagnosed. This information may be of vital interest to other registered birth family members and their physicians. Knowing about the existence of certain inherited conditions and diseases allows the registrant and his/her doctor to be alert for associated symptoms and, if possible, to take preventive action.

Additional Resources

Mayo Clinic
Postpartum Care: What to Expect After a Vaginal Birth
www.mayoclinic.org

Association of Women's Health, Obstetric and Neonatal Nurses
Patient Education: Postpartum Changes and Postpartum Self Care
www.awhonn.org

American Pregnancy Association
www.americanpregnancy.org

Postpartum Support International
www.postpartum.net

The information provided in this brochure is not medical advice. You should seek IMMEDIATE medical attention by calling your health care provider or going to an emergency room if you experience any of the signs described.

Save Abandoned Babies Foundation©
SaveAbandonedBabies.org

DCFS
Illinois Department of Children & Family Services

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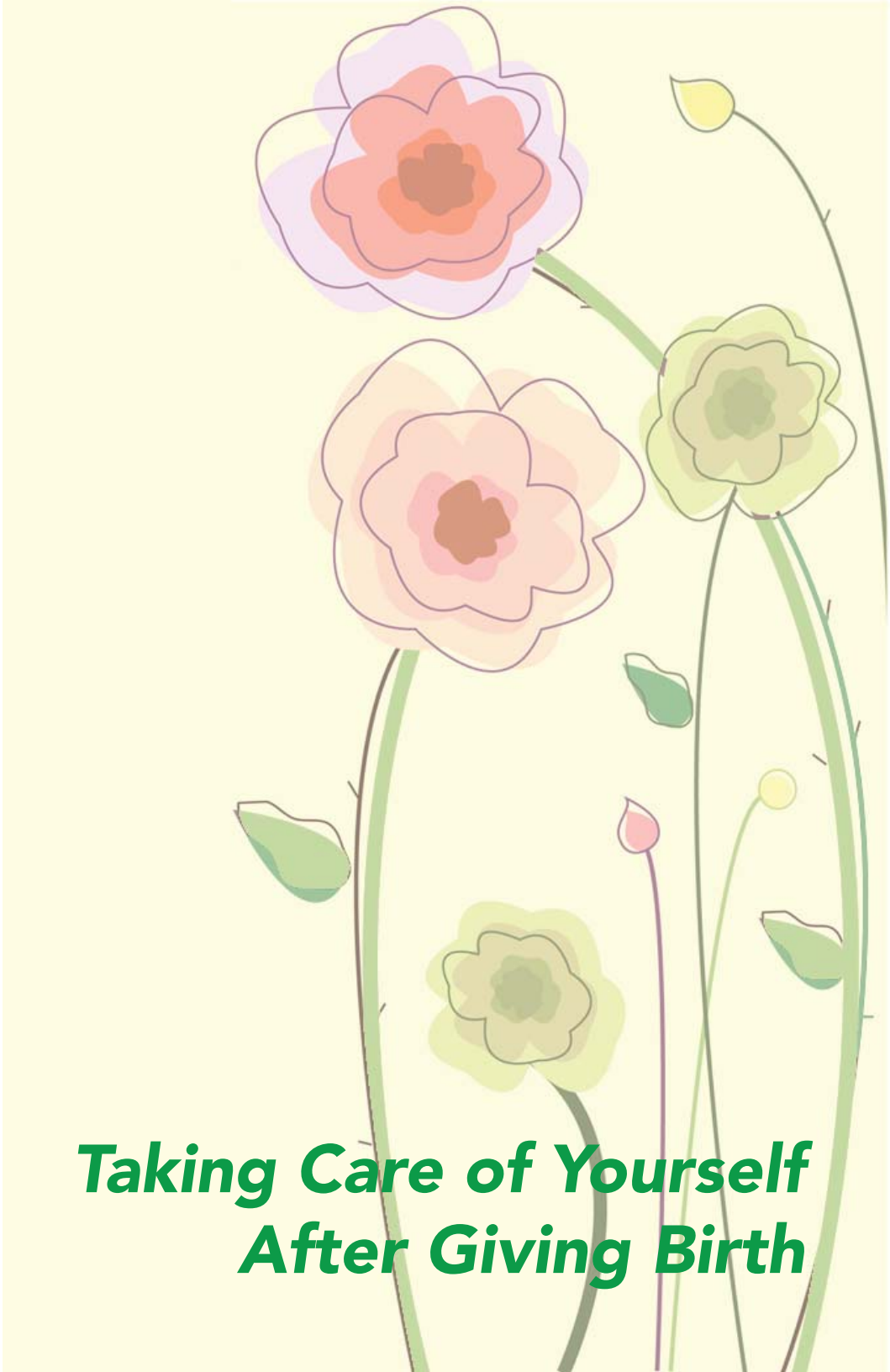

Taking Care of Yourself After Giving Birth

Giving birth is very hard work and takes a toll on your body. You will need time and rest to be yourself again. This brochure explains physical and emotional changes that may happen after you give birth.

Physical and emotional changes you may experience after delivery:

Bleeding from your vagina will be bright red, like a period. Over a few days, the blood will lessen and fade to brown then pink, finally becoming clear in about 4 to 6 weeks. If bleeding continues to be heavy (filling more than one sanitary pad in 1 hour), turns bright red, contains clots bigger than a quarter, or produces a foul odor, then you need to call a doctor or go to the emergency room. This could be a sign of infection or that the placenta was not fully discharged.

When you go to the bathroom, it may sting when your urine comes out or it may come out in small trickles until you regain full bladder control. It is important to urinate at least once every 6 hours. When your bladder is empty, your uterus (womb) can return to its normal position in your body. If you have difficulty urinating, experience pain or burning when urinating, or feel a need to urinate often but only a small amount comes out, then you need to drink more fluids and notify a doctor. You could have a urinary tract infection.

Some women have cramps after the birth. These "afterpains" can last 2-5 days and mean that your uterus is contracting normally.

About 5 days after giving birth, if you have pain in your lower abdomen, then you need to call a health care provider. This could be a sign that you did not completely discharge the placenta.

It is normal to have a temperature between 97 to 100 degrees Fahrenheit. At any time following delivery, if your temperature goes over 100.4 degrees Fahrenheit, then call a health care provider. This could be a sign of infection.

Severe headache, blurred vision, or swelling of the face, ankles, or fingers could be a sign of toxemia or pre-eclampsia. Go to the emergency room to see a doctor.

Sharp pain in your chest, shortness of breath, concentrated pain, or redness/swelling in your thigh or calf might indicate a blood clot. Call a doctor. If you are unable to reach a doctor, have someone take you to the emergency room or call 911 for an ambulance.

Your breasts will stop producing milk about 7-10 days after you give birth. Using cold compresses, wearing a supportive bra 24 hours/day, not touching the breasts, and taking a pain reliever, such as ibuprofen, may help with the discomfort.

If you have pain, swelling, tenderness, redness, heat, or a lump in your breast, you may have an infection called "mastitis." Call a doctor as soon as possible to get treatment before the infection gets worse.

You may feel hemorrhoids on your bottom and may have itching, bleeding, or pain while having a bowel movement. Hemorrhoids are common during pregnancy. The strain of pushing during birth may cause more swelling. These hemorrhoids are usually most painful the first few days after giving birth. There are several ways you can make yourself more comfortable:

- Use a donut-shaped pillow to sit on,
- Sit in a few inches of cool water in a clean bathtub,
- Use Tucks pads,
- Drink 8 glasses of water a day, and
- Eat foods containing fiber, such as whole grain products, raw fruits, and vegetables, and avoid sweets and cheese.

Many women experience changes in their moods following childbirth. You may feel happy one moment and weepy the next. If these moods last more than 2 weeks and you feel depressed most of the time, have thoughts of harming yourself, or are unable to cope with everyday stresses, you should talk to a health care professional immediately. You may have postpartum depression, which can be treated.

Fold Here

Place Stamp Here

DCFS STATE CENTRAL REGISTER
406 E MONROE ST #30
SPRINGFIELD IL 62701

Additional Resources

Illinois Department of Children and Family Services
www.state.il.us/dcfs

Advocacy Office for Children and Family Services: 800-232-3798
(weekdays 8:30 a.m. - 5 p.m.)

Hotline: 800-252-2873 (24-hours)

Save Abandoned Babies Foundation
www.saveabandonedbabies.org
312-440-0229

Illinois Department of Human Services
www.dhs.state.il.us
Help Line: 800-843-6154
(TTY 800-447-6404)

Midwest Adoption Center
www.macadopt.org
847-298-9096

Illinois Adoption Registry and Medical Information Exchange (IARMIE) Program
www.idph.state.il.us/vitalrecords/index.htm
877-323-5299 (toll-free) or
217-557-5159

The IARMIE program allows birth parents to authorize or prohibit the release of identifying information. Confidential facts may be released to registrants only after at least two parties to the adoption have filed explicit mutual consents for the exchange of this information. If you register with the IARMIE, you must provide your name and a photocopy of a State-issued ID, but this information will be kept confidential if you wish. The Department of Public Health also provides application forms to register with IARMIE.

Vital medical information may be exchanged anonymously through the Medical Information Exchange. This information can only be exchanged if you and your adult adopted child (or your child's adoptive parent, if the child is under age 21) voluntarily register and agree to exchange these facts.

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help is here.

and "here" is anywhere you see this sign.

You're scared and alone, but you're not out of options.

You have come to the right place to get help!

This brochure explains your rights and what happens next.

DCFS Illinois Department of Children & Family Services

Save Abandoned Babies Foundation®

Thank you for bringing your baby to a Safe Haven. You have made a difficult but responsible decision. Your baby will be adopted by a family that is waiting for the opportunity to love and care for a child. Please provide some background information to us now. It will help your baby have a healthy future. You can do this anonymously. It's OK if you don't know all the answers, but whatever you do know will be a big help to both your baby and his or her adoptive family.

Illinois law (325 ILCS 2/1-70) says:

- You can leave your unharmed baby, who can be up to 30 days old, and
- You can walk away with no questions asked, and
- Remain anonymous and protected from prosecution.
- You must hand the baby to a staff person at a hospital, staffed fire station, police station, or sheriff's office, and
- If you leave the baby with someone at a staffed fire, police, or sheriff station, the baby will be transported to a nearby hospital and seen by a doctor.
- If you leave your baby with a person at a Safe Haven, there is a legal presumption that you are the baby's biological parent, that you consent to the termination of your parental rights and you are relinquishing your baby for adoption.

A check will be done to make sure the baby has not been reported missing. The Illinois Department of Children and Family Services (DCFS) will contact an Illinois adoption agency, which will place the baby with an adoptive family. The adoption agency will go to court to be appointed the baby's legal guardian until the adoption is finalized. During the adoption proceeding, the birthparents' legal rights to the baby will be terminated.

If you leave your baby at a fire, police, or sheriff station and return within 72 hours, the facility must inform you of the name and location of the hospital the baby was taken to. If you change your mind after leaving your baby at a Safe Haven, call DCFS at 800-252-2873.

- When you call DCFS, request the name of the adoption agency your baby was placed with and find out where the adoption proceeding is taking place.
- If you want to try to get your baby back, you must petition the court for a return of custody. This must be done before your parental rights are terminated by the court.
- You have a limited time before your parental rights are terminated. The court can terminate your parental rights 60 days after you abandon your baby.
- If you do petition the court to get your baby back before your parental rights have been terminated, the court may put the adoption on hold for up to 60 more days and require:
  - genetic testing to see if the baby is yours, and
  - that DCFS conduct an investigation and home study with recommendations for the court
- If you don't try to get your baby back before your parental rights are terminated, you are barred from any future attempts to get your baby back or assert your rights as a parent.

Please answer these questions and return this form by mail to the DCFS State Central Register, 406 East Monroe Street, Station 30, Springfield, IL 62701. You do not need to give your name unless you wish to do so. It's okay to answer some of the questions and leave others blank. Any information you are able to provide will be helpful. If you do provide identifying information, it will remain confidential. This is an anonymous, safe and legal process. In the future, you and your child (or your child's adoptive parents, if the child is under age 21) may want to exchange information anonymously or have contact. If you do provide identifying information here, it will not be given to anyone else without your consent first.

Date you brought your baby to the Safe Haven: _____

Location of Safe Haven: _____

Mother's age: _____ Father's age: _____

Mother's race and ethnicity: _____

Father's race and ethnicity: _____

Date baby was born: _____

Was the baby premature? ❑ Yes ❑ No

Describe any problems with the pregnancy or delivery _____

Where was the baby born (city/state)? _____

During the pregnancy did you use any of the following?

❑ Cigarettes: How much and at what point in the pregnancy? _____

❑ Alcohol: How much and at what point in the pregnancy? _____

❑ Drugs/Medications: Which and at what point in the pregnancy? _____

Did you receive any prenatal care? If so, please describe: _____

Do you have any other children? ❑ Yes ❑ No
If so, how old are they? _____

Blood Relatives: This means the baby's mother, father, sister, brother, grandparents, aunts, uncles, nieces, nephews, or cousins. Please circle if any blood relative has any of these medical conditions:

Allergies	Diabetes	Mental Illness
Asthma	Down Syndrome	Muscular Dystrophy
Cancer	Heart Disease	Seizures
Depression	High Blood Pressure	

Other: _____

If you would like to write your child and/or your child's adoptive family a note, please use the space below or attach a separate page. **You may do so even if you do not want to provide your identifying information.** _____

Optional identifying information:

Today's Date: _____

Mother's name: _____

Mailing Address: _____

State: _____ Zip Code: _____

E-Mail Address: _____

Phone: _____

Social Security Number: _____

Mother's Date of Birth: _____

Father's name: _____

Mailing Address: _____

State: _____ Zip Code: _____

E-Mail Address: _____

Phone: _____

Social Security Number: _____

Father's Date of Birth: _____

Give your baby a chance.

Kelli's Story

My name is Kelli and I found out I was pregnant when I was a freshman in high school. I was so scared that I hid my pregnancy from my family and friends. I worried that people would reject me or be angry with me if they found out I was pregnant. I was wrong.

I delivered my baby by myself. Because I was still too frightened to talk to anyone and ask for help, I made a terrible mistake that I can never take back. I left my newborn on a neighbor's porch. My baby died there, and my life will never be the same. I don't want the same thing to happen to you and your baby.

Please, if you are pregnant, talk to a parent, a teacher, a parent of your friend or other adult that you trust. I know that talking about your pregnancy is difficult, but there are people who can help you.

If you don't want to keep your child, please give him or her a chance to grow up. The law in Illinois allows you to leave your unharmed newborn baby at a staffed police or fire station, hospital or emergency care facility. Babies up to seven days old will be given a health exam and medical care, and then adopted by a loving family.

For confidential information or help, please call 1-888-510-2229

For confidential information or help, please contact:

1-888-510-2229 (Toll-free)

or visit the Save Abandoned Babies Foundation at:
www.SaveAbandonedBabies.org

For information about adoption, contact:

Illinois Adoption Registry
Toll-free • 1-877-323-5299
www.idph.state.il.us/vital/iladoptreg.htm

How you can help

- After you read this brochure, pass it on to someone else.
- Become a "voice" for the children by sharing information about the Abandoned Newborn Infant Protection Act with people in your school, community or family.
- Encourage your organization, school, or club to write a story about the Abandoned Newborn Infant Protection Act.

Tell a friend. Talk about it.
You might save a life.

Save Abandoned Babies Foundation®
SaveAbandonedBabies.org

DCFS
Illinois Department of Children & Family Services

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No Shame. No Blame. No Names.

Illinois has a safe place for your newborn.

No one knew you were pregnant.
No one knows about your baby.
You can't take care of your baby.
What are you going to do?

An unwanted pregnancy can be a traumatic experience. You may have overwhelming feelings of isolation, fear, or shame that could lead to irrational thoughts or acts, such as unsafely abandoning your baby.

Each year in Illinois, there are disturbing reports of newborn babies found in dumpsters and other unsafe places. Under the Illinois Abandoned Newborn Infant Protection Act, unharmed infants seven days old or younger can be left at safe havens. No questions will be asked. You don't have to give your name. The police will not be called. Your baby will get medical care and be adopted.

Where are safe havens?

In Illinois, the safe havens for newborns are:

- Staffed fire stations
- Staffed police stations
- Hospitals
- Emergency care facilities

What does the law do?

The law is intended to provide an alternative to the parents of newborn infants to relinquish their unharmed infants to staff in safe havens while remaining anonymous and avoiding civil or criminal liability. It is recognized that establishing a traditional adoption plan through a private or public adoption agency or choosing to parent the child is a preferable parenting plan to abandonment or relinquishment of an infant. However, the purpose of this law is to reduce the risk of harm to a newborn by a parent who may be under undue stress.

What happens at a safe haven?

Newborns can be brought to a hospital, emergency care facility, staffed police station or staffed fire station. Staff members at emergency care facilities, fire stations and police stations will make arrangements for transportation of the infant to the nearest hospital.

Hospital personnel will conduct a physical examination of the relinquished newborn infant and provide any needed medical care. The hospital is deemed to have temporary protective custody of the newborn infant until the infant is discharged to an adoption agency.

If you wish, you can fill out forms to provide medical information about your newborn that will help healthcare workers taking care of your baby. The forms may be filled out at the hospital, emergency care facility, fire station or police station. You may also take the forms home and return them by mail, or download the packet from www.saveabandonedbabies.org or www.state.il.us/dcfs. All of the information that you provide remains confidential. You do not need to give your name.

Parental rights

There is a presumption that by relinquishing a newborn infant at a safe haven, the infant's parent consents to the termination of his or her parental rights with respect to the infant.

Consider adoption

Every child deserves a safe, loving, permanent home. You can help provide this by planning to have your baby adopted, even before giving birth. Several public and private agencies in Illinois provide services to those who choose to free their children for adoption. Agency staff carefully interview and check the backgrounds of prospective adoptive parents to make sure that they:

- Have no criminal or child abuse history
- Have room in their home for a child
- Can support the child financially
- Can provide a loving, safe home

For information about adoption, please call the Illinois Adoption Registry: 1-877-323-5299 (toll-free in Illinois) or www.idph.state.il.us/vital/iladoptreg.htm.

Dale una oportunidad a tu bebé.

La Historia de Kelli

Mi nombre es Kelli y descubrí que estaba embarazada cuando estaba en el primer año de la escuela de segundaria. Tenía tanto miedo que escondí mi embarazo de mi familia y de mis amigos. Me preocupaba de que la gente me iba a rechazar o ponerse furiosa conmigo si descubrían que estaba embarazada. Yo estaba equivocada.

Yo di a luz a mi bebé sola. Porque todavía me sentía muy atemorizada y no quería hablar con nadie para pedir ayuda, cometí un error horrible que nunca podré corregir. Yo dejé a mi bebé recién nacido en el porche de un vecino. Mi bebé murió allí y mi vida nunca más será igual. Yo no quiero que esto te pase a ti y a tu bebé.

Por favor, si estás embarazada, habla con tus padres, un maestro, los padres de un amigo u otro adulto en quien puedas confiar. Sé que hablar acerca de tu embarazo es difícil, pero hay gente que te puede ayudar.

Si no quieres quedarte con tu niño, por favor dale la oportunidad de crecer. La ley en Illinois te permite dejar a tu bebé sano y recién nacido en una estación de policía con personal o en una estación de bomberos o en locales de cuidado médico de urgencias. A los bebés de hasta siete días de nacidos se les hará un examen de salud y se les proveerá cuidado médico y entonces serán adoptados por una familia buena y cariñosa.

Para obtener información confidencial o ayuda, por favor llama al 1-888-510-2229

Para información confidencial o ayuda, por favor ponte en contacto con:

1-888-510-2229
Línea gratis

o visita la Fundación para Salvar a los Bebés Abandonados:
www.SaveAbandonedBabies.org

Para información acerca de adopción, ponte en contacto con:
Illinois Adoption Registry
Línea gratis • 1-877-323-5299
www.idph.state.il.us/vital/iladoptreg.htm

¿Cómo puedes ayudar?

- Después de leer este folleto, pásalo a alguien más.
- Conviértete en una "voz" para los niños compartiendo información acerca de la Ley de Protección para Bebés Recién Nacidos Abandonados con personas en tu escuela, comunidad o familia.
- Incita a tu organización, escuela, o club a escribir una historia acerca de la Ley de Protección para Bebés Recién Nacidos Abandonados.

Dile a una amiga. Habla de esto.
Puedes salvar una vida.

Save Abandoned Babies Foundation©
SaveAbandonedBabies.org

DCFS
Illinois Department of Children & Family Services

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Sin Vergüenza. Sin Culpa. Sin Nombres.

Illinois tiene un lugar seguro para tu recién nacido.

Nadie sabía que estabas embarazada.
Nadie sabe acerca de tu bebé.
No puedes cuidar a tu bebé.
¿Qué vas a hacer?

Un embarazo no deseado puede ser una experiencia traumática. Puede que te sientas abrumada por la soledad, el miedo o la vergüenza lo cual puede resultar en que tus pensamientos se vuelvan irracionales o que cometas actos irracionales tal como el de abandonar a tu bebé en un lugar que no sea seguro.

Todos los años en Illinois, se reciben informes perturbadores acerca de bebés que son encontrados en la basura o en otros lugares que no son seguros. De acuerdo con la Ley de Protección para Bebés Recién Nacidos Abandonados, los bebés no heridos menores de siete días de nacidos pueden dejarse en refugios seguros. No se te hará ninguna pregunta. No tienes que dar tu nombre. No se llamará a la policía. Tu bebé obtendrá cuidado médico y será adoptado.

¿Qué son los refugios seguros?

En Illinois, estos lugares seguros para los recién nacidos son:

Bebés Seguros • Lugar Seguro
Refugio Seguro

- Las estaciones de bomberos con personal
- Las estaciones de policia con personal
- Los hospitales
- Los locales de cuidado médico de emergencia

¿Qué es lo que la ley hace?

La ley intenta proporcionar una alternativa a los padres de los bebés recién nacidos para que dejen a sus bebés con el personal en refugios seguros al tiempo que permanecen anónimos y evitan obligaciones civiles o criminales. Se reconoce que el establecer un plan de adopción tradicional a través de una agencia de adopción pública o privada, o elegir el ser padre/madre del bebé es un plan preferible al abandono o renuncia de un bebé. Sin embargo, el propósito de esta ley es reducir el riesgo de daño a un recién nacido por un padre/madre que puede estar bajo estrés excesivo.

¿Qué sucede en un refugio seguro?

Los recién nacidos pueden traerse y dejarse en un hospital, un local de cuidado médico de emergencia, una estación de policia con personal o en una estación de bomberos con personal. Miembros del personal en los locales de cuidados de urgencias, estaciones de bomberos y policía harán arreglos para el transporte del bebé al hospital más cercano.

El personal del hospital conducirá un examen físico al bebé recién nacido que se está entregando y proporcionará cualquier cuidado médico necesario. Se considera que el hospital tiene la custodia de protección temporal del bebé recién nacido hasta que el bebé es entregado a una agencia de adopción.

Si deseas, puedes llenar los formularios para proveer información médica acerca de tu bebé recién nacido, lo cual ayudará a los trabajadores de cuidado médico encargados de cuidar a tu bebé. Los formularios pueden llenarse en el hospital, locales de cuidados de urgencias, o en la estación de bomberos o policia.

También puedes llevarte los formularios a tu casa y enviarlos después por correo o descargarlos de las páginas www.saveabandonedbabies.org o www.state.il.us/dcfs del internet. Toda la información que das es confidencial. No necesitas dar tu nombre.

Derechos de los padres

Existe una presunción de que al dejar a un bebé recién nacido en un refugio seguro, los padres del bebé consienten a la terminación de sus derechos como padres con respecto al bebé.

Considera la adopción

Todo niño merece un hogar seguro, amoroso y permanente. Tu puedes ayudar a proveer esto haciendo planes para que tu bebé sea adoptado, aún antes de tenerlo. Varias agencias públicas y privadas en Illinois proveen servicios para aquéllos que escogen liberar a sus niños para la adopción. Los miembros del personal de la agencia entrevistan cuidadosamente a los padres adoptivos en perspectiva e investigan a fondo sus antecedentes para asegurarse de que ellos:

- No tengan un historial criminal o de abuso de niños
- Tengan espacio en su hogar para el niño
- Puedan mantener al niño desde un punto de vista financiero
- Puedan proveer un hogar seguro y amoroso

Para información acerca de la adopción, por favor llama al Registro de Adopción de Illinois: 1-877-323-5299 (gratis en Illinois) o www.idph.state.il.us/vital/iladoptreg.htm.

Hybrid Vehicle Response

Purpose

To establish a policy to maximize safety and efficiency when responding to collisions/extrications/vehicle fires involving Hybrid (Gas/Electric powered) Vehicles. This policy serves as the fire department's compliance with applicable provisions of NFPA 1500 Standard on Fire Department Occupational Safety and Health Program.

Scope

This policy shall apply to all members at all times throughout emergency and non-emergency training activities involving Hybrid Vehicles. This policy shall serve in conjunction with other specific Hanover Park Fire Department policies when other circumstances, such as extrication or fire are present.

1. Protective Clothing

1.1. Hanover Park Fire Department personnel shall operate at motor vehicle collision scenes with full turnout gear and SCBA if there is smoke or fire present or likely to be present. MSDS-type information sheet (Appendix A) for Ni-MH batteries, a battery fire will produce toxic fumes, including oxides of nickel, cobalt, aluminum, manganese, lanthanum, cerium, neodymium and praseodymium.

2. Extrication Policy

2.1. The goal for responders in securing the scene and providing a safe environment for rescue and incident stabilization is to satisfy the Four I's: Identify the vehicle is a Hybrid, Immobilize the vehicle, Isolate the power sources for the vehicle, and Inspect the vehicle for hazards.

2.2. This is to be accomplished by satisfying the following tactical objectives (described in detail below):

- 2.2.1. Identifying the Hybrid
- 2.2.2. Preventing movement of the Hybrid
- 2.2.3. Gaining access to the Hybrid vehicle's interior
- 2.2.4. Shifting the Hybrid's transmission into Park position
- 2.2.5. Turning off the Hybrid's ignition switch
- 2.2.6. Ensuring the 'ready' light is turned off
- 2.2.7. De-energizing the Hybrid's 12 volt electrical system

3. HYBRID IDENTIFICATION

3.1. Exterior Badges

3.1.1. Look for badges typically found on the vehicle's exterior in various locations. Examples are depicted below.

3.2. Visible Vehicle Components.

3.2.1. Generally bright orange insulation is used to cover the high voltage wiring. If seen, this may be reason to suspect the vehicle is indeed a Hybrid. Often the fact that it is a Hybrid is imprinted on the engine block. The C-pillar in some models is vented to keep electrical system cool and is another identifying feature.

3.3. Computer Software or other resources.

3.3.1. Consult reference material for assistance with identifying a Hybrid. Emergency Response Guides (ERG) are located in each station in printed form and on each MDT. If internet access is available, ERGs can be downloaded or viewed on the manufacturer's web site.

4. PREVENTING MOVEMENT OF THE HYBRID

4.1. Chocking

4.2. Responders should remain away from the area directly in front of, and the rear of a Hybrid vehicle.

4.3. Responders should place wheel chocks of sufficient size and strength to prevent horizontal movement of the Hybrid vehicle. Generally it will be in front and rear of the tires. A minimum of two wheels should be chocked.

5. GAINING ACCESS TO THE HYBRID VEHICLE'S INTERIOR

5.1. Access to Hybrid vehicle interior should be performed expeditiously.

5.2. Responders should avoid the '5-10-20 Inflation Zone'. (Remain 5" away from deployment path of side mounted SRS, 10" away from steering wheel mounted SRS, and 20" away from passenger's dashboard mounted SRS)

5.3. Once access into the passenger compartment is gained, ascertain the need for the operation of any electrically powered features of the vehicle and activate such features as deemed appropriate. For example, unlocking all doors, lowering all windows, and unlocking trunks or hatches. Responders should refrain from moving seats as the potential for SRS deployment exists.

5.4. Operate interior hood release mechanism to release hood if accessible.

6. SHIFTING THE HYBRID'S TRANSMISSION INTO PARK POSITION

6.1. Responders should attempt to place the Hybrid's transmission into Park position. Manually shift the transmission selector into Park position or into gear if the vehicle is a manual transmission.

6.2. Responders should apply the Hybrid's parking brake.

7. TURNING OFF THE HYBRID'S IGNITION SWITCH

7.1. Locate and turn off the ignition switch.

7.2. Remove the ignition key and place it a minimum of 50 feet from the Hybrid. Inform the police officer in charge of the key location.

8. ENSURING THE 'READY' LIGHT IS TURNED OFF

8.1. Most Hybrids are equipped with some form of indicator light showing vehicle is ready for operation. This is important in that the vehicle is virtually silent when starting up. Responders should look for such an indicator on the driver's side of the dashboard and ensure it is turned off. Generally turning off the ignition switch will turn the 'ready' indicator off also.

9. DE-ENERGIZING THE HYBRID'S 12 VOLT ELECTRICAL SYSTEM

9.1. Exterior Responders

9.1.1. Position a charged hoseline between the primary hazard and patients/rescuers

9.1.2. Responders should remain to the side of a Hybrid to access the engine compartment

9.1.3. Release the exterior hood safety catch and open the hood. Consider opening the hood in reverse fashion (nearer the windshield). Once the hood is opened; secure it in an open position.

9.1.4. Determine the location of the battery (ies). If the battery isn't located within the engine compartment find the alternate location and gain access to the battery. Consider the use of available reference materials indicating battery and SRS locations.

9.1.5. Begin hazard mitigation activities if physical damage to the battery has occurred, i.e. electrolyte spillage.

9.1.6. Once the battery has been located and exterior responders are prepared to de-energize the electrical system, inform the interior responder(s) to coordinate the timing of shutdown.

9.2. De-energizing the Electrical System at the Battery

9.2.1. Cut or disconnect the negative (ground) battery cable first using care not to touch any metal part of the chassis with the cable end or cutting tool. Do not cut any portion of orange high voltage harness anywhere in the vehicle.

9.2.2. If cutting the battery cable, cut the same cable twice to remove a 2" section.

9.2.3. If you choose to disconnect the negative cable at the terminal, bend the loose cable end onto itself. Isolate the bare cable clamps from re-establishing a connection. Isolation can be performed with tape or even two exam gloves.

9.2.4. Ascertain if there is any evidence that electrical power from the battery is still supplying the vehicle. Look for lights remaining on (even if dim), horn working, chimes sounding, etc.

9.2.5. In a severe crash make certain that the battery case hasn't been penetrated by metal parts that could re-establish an electrical circuit.

9.2.6. To completely de-energize the electrical system, cut or disconnect all positive (hot) battery cables also. If you're cutting the cable, cut the same cable twice to remove a 2" section. Re-check the vehicle again to make certain that electrical power isn't being supplied to the vehicle.

9.2.7. If the electrical system remains energized after these actions, determine the location of additional batteries and repeat the foregoing procedures.

9.2.8. Responders should look for any other source of electrical power, i.e. items plugged into lighter sockets for charging, etc.

9.3. Note: Hybrid gasoline/electric vehicles pose no additional risks over a conventional vehicle if handled properly at an emergency incident. The electrocution hazard is removed because, by design, the 144-volt or 300-volt DC current is normally isolated from any contact with the vehicle itself. In order to receive a shock, an emergency responder would have to physically contact two separate points within the high-voltage system at the same time.

9.3.1. If the parallel high-voltage cables running under the vehicle to deliver current to the front of the car were damaged as in a severe crash or fully involved fire scenario, the high-voltage battery would short-circuit. This short would de-energize the entire high-voltage battery circuit.

10. Hybrid Vehicle Suppression Policy

10.1. A fire involving a hybrid vehicle can be handled by following normal vehicle firefighting procedures, including

10.2. Fire is to be attacked with an adequate water flow rate (minimum 1 ¾ inch handline)

10.3. When water is used on a burning battery bank, some hydrogen gas may evolve. In this situation, ventilation by leaving the trunk or hatchback lid open is advised. If there is concern that hydrogen gas is present, fire smothering agents such as those used by hazmat teams should be considered.

10.4. Foam should be considered for its smothering properties

10.5. Responders shall work from a safe position of approach (generally 45 degrees from each corner of vehicle)

10.6. Self-contained breathing apparatus (SCBA) shall be worn throughout the fire incident.

10.7. Wheels of the vehicle are chocked to prevent forward or rearward movement as soon as safely possible.

10.8. In the case where the battery compartment has been breached, the following additional steps shall be taken by scene command:

10.8.1. The vehicle shall be identified by Incident Command as a potential hazmat safety concern.

10.8.2. The Incident Commander shall notify the police department and the towing company of the potential hazards.

Appendix A

NiMH SEALED CELL BATTERY

1. HEALTH HAZARD INFORMATION
EFFECTS OF OVEREXPOSURE

Eye Effects: In the case of a fire or cell rupture the electrolyte solution inside battery is extremely corrosive to eye tissue and may result in permanent blindness. Contact with nickel oxide may cause minor irritation.
Skin Effect: Contact with electrolyte solution inside battery may cause serious burns to skin tissues. Contact with nickel compounds may result in chronic eczema or nickel itch.
Ingestion: Ingestion of electrolyte solution causes tissue damage to throat area and gastro/respiratory tract. Ingestion of nickel compounds causes nausea and intestinal disorders.
Inhalation: No exposure possible except in the case of fire of abuse. Effects of inhalation of nickel compounds vary from mild irritation of nasal mucous membranes to damage of lung tissues proper.

2. EMERGENCY FIRST AID
BATTERY ELECTROLYTE

Eye Contact: Flush with plenty of water for at least 15 minutes if abuse causes safety vents to activate. Get immediate medical attention.
Skin Contact: Remove contaminated clothing and flush effected areas with plenty of water for at least 15 minutes. Wash with soap and water.
Ingestion: Do not induce vomiting. Dilute by giving water. Get immediate medical attention. Do not give anything by mouth to an unconscious person.
Inhalation: Remove to fresh air. Give oxygen or artificial respiration if needed.
Get immediate medical attention.

3. REACTIVITY DATA

Incompatibilities: Aluminum, zinc and other active metals, acid, chlorinated and aromatic hydrocarbons, nitro-carbons, halocarbons.
Hazardous Decomposition products:
Nickel oxide, and potassium hydroxide. Hazardous Polymerization will not occur.

4. SPECIAL PROTECTION INFORMATION

Respiratory protection:
Use NOISH/MSHA approved respirator if cell is broken open during a fire to maintain exposure levels below the TWA for hydrogen absorbed nickel compounds.
Eye protection: Use splash goggles of face shield if cell activates due to abuse.
Hand protection: If exposure to electrolyte solution, or dried salts is likely, use any water-insoluble non-performance glove, i.e., synthetic rubber. Do not use leather or wool.
Other protective equipment:
Rubber apron or equivalent if exposed to electrolyte.

5. FIRE AND EXPLOSION HAZARDS

Extinguishing Media
Melting point Boiling point
Nickel 2645° F 4850° F
Nickel Hydroxide N/A 445° F(Decomposes to NiO)
Nickel Oxide 3605° 90° F(Decomposes to Ni and O^2)
Special Fire Fighting Procedure:
Uses self contained breathing apparatus to avoid breathing toxic fumes.
Wear protective clothing and equipment to prevent potential body contact with electrolyte solution or mixture of water and solution.
Fire and Explosion Hazards:
Electrolyte exposure is corrosive to all human tissues. It will react violently with many organic chemicals, especially nitro-carbons and chlorocarbons.
Electrolyte solution reacts with zinc, aluminum and other active materials, releasing flammable hydrogen gas.
Incase of fire do not take in smoke and fume.

6. INGREDIENTS EXPOSURE LIMITS QUANTITY

Rare metal (Hydrogen absorbed alloy) 14.5%
Nickel (as Nickel, Nickel Hydroxide
And Nickel Oxide) 44.0%
K+ 1.3%
Cobalt Hydroxide (as Cobalt Metal) 6.7%
Manganese 2.4%
Aluminum 1.5%
Hydroxyl, Liquid 1.4%
Mercury 0.018 PPM

7. PHYSICAL PROPERTIES

Boiling Point: Not applicable
Melting pointing: Not applicable
Vapor Pressure: Not applicable
Vapor Density: Not applicable
Specific Gravity: 1.17-1.250(electrolyte)
Evaporation Rate: Not determined
Solubility in water: Electrolyte solution is completely soluble
Remainder: Insoluble

8. SPILL MANAGEMENT PROCEDURES

Electrolyte Spill: Flush with water and neutralize with dilute vitriol.

9. DISPOSAL INFORMATION

The storage battery is a hazardous waste under RCRA. It may be returned to BYD for recycling. Battery is TCLP Toxic. Battery and electrolyte solution are corrosive. If not recycled, must be disposed of in accordance with all international, national, provincial regulations.

11. PRECAUTIONS AND COMMENTS

These cells and batteries manufactured from them may be highly charged and are capable of high-energy discharge. Care should be taken to handle cells properly to avoid shorting or misuse that will result in rapid uncontrolled electrical, chemical, or heat energy release.
Do not short circuit---may cause burns.
Do not break open cell.

Vehicle Accidents with Extrication

Purpose

Accidents involving extrication pose a unique hazard to rescuers due to the many ways that vehicles, and vehicle parts can entrap occupants making their removal particularly dangerous. The power and force of extrication tools compounds this danger. This Standard Operating Guideline establishes practices and procedures for operating at accident scenes involving the extrication of trapped victims. This guideline is in reference to Section 8.7 of NFPA 1500, *Fire Department Occupational Safety and Health Program*.

Scope

This guideline shall apply to all personnel at all times and to all incidents, trainings, drills or other instances where victims are extricated from vehicles, regardless of the duration. The Incident Command system established by the department shall be used at all times throughout the incident. The Greater Elgin Area Mobile Intensive Care Program policies and procedures shall apply at all times. This guideline shall be implemented in conjunction with all other department polices including traffic control and fire suppression procedures.

1. Command Considerations

1.1. Upon arrival the Incident Commander (IC) shall perform and report a complete size-up of the incident which shall include:
- 1.1.1. Exact location of incident
- 1.1.2. Number and types of vehicles involved
  - 1.1.2.1. Special attention should be given to Hybrid vehicles
- 1.1.3. Number of victims, both needing extrication and/or ambulatory
- 1.1.4. Condition of vehicles
- 1.1.5. Scene approach instruction

1.2. The IC shall request additional resources as may be necessary to administer ALS patient care, remove trapped victims, and transport all victims while establishing a safe work environment.

1.3. The Incident Commander shall serve as the Incident Safety Officer (SO) until one is appointed.

1.4. The Incident Commander shall establish a safe work zone by restricting traffic flow utilizing department vehicles (lane blocking), restricting access of non-essential personnel and/or closing of roads utilizing temporary barricades in accordance with Control of Traffic at Traffic Incidents SOG.

- 1.4.1. If the police department is used to provide lane closures or detours, the police commander should be given complete instructions or requests as to the exact need of the incident work area and the police participation must be monitored regularly throughout the incident as they may leave on other business without notification.

1.5. The Incident Commander may assign work groups and group officers in order to organize tasks. With the highest group priority being EMS, other work groups such as Extrication, Traffic Control, Suppression, Staging, and Helicopter should be utilized as necessary.

2. Company Officer (Actors) Considerations

2.1. Upon arrival the first Company Officer shall assume command until relieved by the Battalion Chief or Shift Commander.
2.2. Company Officers shall ensure that all members operating in their crew utilize the appropriate Personal Protective Equipment, including reflective vests.
2.3. Company Officers shall address critical needs using SMART (S.T.A.R.T.) Triage
2.4. Company Officers shall be responsible for their crews and the tools and equipment from their company unless otherwise assigned.
2.5. Company Officers shall be the Group Officers of work groups when assigned and shall be responsible for all task level functions of their respective group.
2.6. Company Officers shall direct the activities of their assigned work group and report to the Incident Commander.

3. Work Groups

3.1. Work groups should be utilized when similar tasks are necessary and may include, but not be limited to:
3.1.1. EMS Group which shall be in charge of all patient care issues and shall appoint the following as is necessary
3.1.1.1. Triage Officer
3.1.1.2. Treatment Officer
3.1.1.3. Transportation Officer
3.1.2. Suppression Group shall be in charge of fire suppression and protection and shall report the potential for fire to the Incident Commander.
3.1.3. Extrication Group shall be in charge of the removal of victims and shall determine the methods and tools necessary to complete such removals.
3.1.3.1. The Extrication Group shall ensure proper tool selection, placement and care in order to prevent further injury to both patients and rescuers.
3.1.3.2. Tool care should include a tool staging area on an even, tarped surface in a well-lighted area.
3.1.3.3. The use of powered tools, including electric, battery, pneumatic or hydraulic should be directed by the Extrication Group Officer if appointed.
3.1.3.4. All tools shall be operated in accordance with manufacturer's guidelines and specifications
3.1.3.5. Safety devices shall never be disconnected or overrode.
3.1.3.6. Proper Personal Protection Equipment (PPE) shall be used at all times.

3.1.4. Traffic Group shall work with the Police Department and the Public Works Department in order to provide a barricaded area or altered traffic pattern during prolonged extrications (See Section 1.4).

3.1.4.1. The Traffic Group Officers shall monitor the outside agencies used as they may be called away without notice.

3.1.5. Helicopter Group shall select a safe landing zone (LZ) for helicopter arrivals and shall provide lighting and markers as determined by policy.

3.1.5.1. A Tail Rotor Officer shall be appointed for all helicopter landings.

3.1.6. R.I.T. shall be utilized when necessary and shall report to the Safety Officer

4. Incident Stabilization

4.1. The incident shall be concluded and the roadway opened only after:

4.1.1. All patients have been accounted for, treated and transported

4.1.2. All vehicles are uprighted and removed from the roadway

4.1.3. All other hazards, such as fuel spills, have been mitigated

4.1.4. All tools and equipment have been returned to the apparatus

4.1.5. All disposable products that may have been exposed to bodily fluids are gathered and removed from the scene for proper disposal.

5. Documentation

5.1. All extrication incidents are to be fully documented in FIREHOUSE® software including:

5.1.1. Vehicle information including Vehicle Identification Numbers

5.1.2. Patient data and locations

5.1.3. Extrication tools used

5.1.4. Damaged equipment

5.1.5. All other known and/or pertinent information

5.2. A NFIRS report shall be forwarded to the EMS Chief for billing issues

APPENDIX B

CONFINED SPACE PROGRAM

Village of Hanover Park
Department of Public Works
2121 West Lake Street
Hanover Park, Illinois 60103

Revision Number: 1
Date: November 10, 2000

CONFINED SPACE PROGRAM

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1.0 INTRODUCTION

Every year, millions of workers enter into confined spaces to perform special or routine duties required by their employer. In many instances, employees who work in confined spaces also face increased risk of exposure to serious physical injury from hazards such as entrapment, engulfment, and hazardous atmospheric conditions.

Confined space work has been known to be dangerous for many years. The inherent danger was the reason for the promulgation of the Confined Space regulation (29 CFR 1910.146) by the Occupational Safety and Health Administration (OSHA). As a result of this regulation, employers have an additional responsibility to provide a safe workplace for all employees. This responsibility increases significantly when employees are required to enter into confined or enclosed work areas with limited openings, poor natural ventilation, a hazardous atmosphere, or designs not meant for human occupancy.

In order to provide employees with optimal protection against the hazards evolving from confined spaces, the Hanover Park Public Works Department has established and incorporated the following confined space program into department policy. This program was designed in accordance with regulations on confined space entry promulgated by the Occupational Safety and Health Administration, subsequently adopted by the Illinois Department of Labor.

The program, when implemented and utilized properly, protects employees from hazards that can arise from confined space entry, substantially minimizing or eliminating the chance of illness, injury, or death. This program will also assist the Department in complying with all aspects of state and federal health and safety regulations regarding confined space entry work.

2.0 POLICY STATEMENT

The Village of Hanover Park Department of Public Works management is responsible for enforcing policies to protect the health and safety of Public Works' employees. Employees are responsible for following policies and procedures. This Confined Space Program has been developed to establish safety practices employees must follow where there is danger to employees from confined space entry work. The confined space policy for the Hanover Park Department of Public Works includes the following provisions:

- Perform the work from outside the confined space if possible. Perform entry only as a last resort. Never enter a confined space if the work can be done from outside the space, or if the space contains, or potentially contains, an atmosphere or other hazard that is immediately dangerous to life and health (IDLH)
- All employees must be trained and authorized before being allowed entry into a confined space. A list of employees authorized to enter confined spaces at Public Works facilities is provided in Appendix D
- All confined spaces at Public Works facilities must be identified
- Each confined space entry must be assessed for hazards at the time of entry, before the Entrant(s) enters the space
- A permit is required to be completed before entry into a permit-required confined space
- Fall protection must be used where required
- Unauthorized entry into a confined space is strictly prohibited
- Due to the isolation of many of the confined spaces at Public Works, a minimum of two authorized employees are required for confined space entries, including entry into non-permit confined spaces
- All confined space rescues must either be non-entry rescues, or be performed by the designated outside rescue service
- Smoking or open flames are strictly prohibited in confined spaces

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Attachments:

A. Confined Space Listing and Hazard Assessment
B. Non-Permit Entry Log
C. Confined Space Entry Permit
D. List of Authorized Employees
E. Training Documentation Form

3.0 PURPOSE

The Confined Space Program goal is to fully analyze all hazards of confined spaces on Public Works' premises and determine appropriate safeguards to eliminate or control hazards that could result in serious personal injury or death. This written Confined Space Program explains how the Village of Hanover Park Department of Public Works implements the applicable OSHA requirements regarding entry into permit-required confined spaces. Entry into non-permit spaces is covered as well.

4.0 APPLICABILITY

This Program applies to all Public Works' employees who are authorized to enter confined spaces on Public Works' property. Since contractors' work may expose them to unique and unanticipated confined space hazards, contractors are expected to have their own Confined Space Program to address the confined space hazards of their particular work.

5.0 AVAILABILITY OF PROGRAM

This Program is available for inspection by employees and their authorized representatives, and is kept in the Public Works office.

6.0 REFERENCES

The Illinois Department of Labor regulates employee health and safety for Public Works employees using federal OSHA regulations. Specific OSHA regulations which have applicability to this Program include the following:

- 29 CFR 1910.146: Permit-Required Confined Spaces
- 29 CFR 1910, Subpart D: Walking and Working Surfaces
- 29 CFR 1910.147: The Control of Hazardous Energy (Lockout/Tagout)
- 29 CFR 1926, Subpart M: Fall Protection
- 29 CFR 1910.38: Employee Emergency Plans
- 29 CFR 1910, Subpart I: Personal Protective equipment
- 29 CFR 1910.1200: Hazard Communication

Also consult the Hanover Park Employees' Public Works Safety Manual for information on other topics which may relate to confined space entry including trenching and excavating, protective clothing and equipment, tool safety, and ladder usage.

7.0 DEFINITIONS

Acceptable entry conditions: The conditions that must exist in a permit space to allow entry and to ensure that employees involved with a permit-required confined space entry can safely enter into and work within the space.

Blanking or blinding: The absolute closure of a pipe, line, or duct by the fastening of a solid plate (such as a spectacle blind or a skillet blind) that completely covers the bore and that is capable of withstanding the maximum pressure of the pipe, line, or duct with no leakage beyond the plate.

Confined Space: Any space that is large enough and configured so that an employee can bodily enter and perform assigned work, has limited means for entry or exit, and is not designed for continuous employee occupancy.

Combustible Dust: A dust capable of undergoing combustion or burning when subjected to a source of ignition.

Double Block and Bleed: The closure of a line, duct, or pipe by closing and locking or tagging two in-line valves and by opening and locking or tagging a drain or vent valve in the line between the two closed valves.

Engulfment: The surrounding and effective capture of a person by a liquid or finely divided (flowable) solid substance that can be aspirated to cause death by filling or plugging the respiratory system or that can exert enough force on the body to cause death by strangulation, constriction, or crushing.

Entrapment: This occurs when the internal configuration of the space or falling debris traps or suffocates an Entrant.

Entry: The action by which a person passes through an opening into a permit-required confined space. Entry includes ensuring work activities in that space and is considered to have occurred as soon as any part of the entrant's body breaks the plane of an opening into the space.

Entry Permit: The written or printed document that the employer provides which contains the necessary information to allow and control entry into a permit space.

Hazardous Atmosphere: An atmosphere that may expose employees to the risk of death, incapacitation, impairment or ability to self-rescue, injury, or acute illness from one or more of the following causes:

- A flammable atmosphere in excess of 10% of the LFL (lower flammable limit) for the material
- Airborne combustible dust at a concentration that meets or exceeds its LFL
- Atmospheric oxygen concentration below 19.5% or above 23.5%
- Exposure to an atmospheric concentration of any substance published by the Occupational Safety and Health Administration (OSHA) that may result in excessive employee exposure to the substance
- Any other atmospheric condition that is immediately dangerous to life or health (IDLH)

Hot Work: Any work involving burning, welding, riveting, or similar fire-producing operations, as well as work which produces a source of ignition, such as drilling, abrasive blasting, and space heating.

Immediately Dangerous to Life and Health (IDLH): Means any condition that poses an immediate or delayed threat to life or that would cause irreversible adverse health effects or that would interfere with an individual's ability to escape unaided from a permit space.

Isolation: A process whereby the confined space is removed from service and completely protected against the inadvertent release of material by the following: blanking off (skillet type metal blank between flanges), misaligning sections of all lines and pipes, locking out all sources of power, and blocking or disconnecting all mechanical linkages.

Lower Explosive Limit: The lower limit of flammability of a gas or vapor at ordinary ambient temperature expressed in a percentage of the gas/vapor in air by volume.

Line Breaking: Means the intentional opening of a pipe, line, or duct that is or has been carrying flammable, corrosive, or toxic material, an inert gas, or any fluid at a volume, pressure, or temperature capable of causing death or serious physical harm.

Non-permit confined space: Means a confined space that does not contain or, with respect to atmospheric hazards, have the potential to contain any hazard capable of causing death or serious physical harm.

Oxygen Deficiency: When the level of oxygen is less than 19.5%. Normal air at sea level contains approximately 21% oxygen.

Oxygen Enriched: Any oxygen concentration greater than 23.5%.

Permissible Exposure Limit: Permissible exposure limits (PELs) are 8-hour time-weighted averages (TWA) enforced by OSHA for exposure to hazardous air contaminants. Employees' exposure is not allowed to exceed the PEL as defined by OSHA.

Permit-Required Confined Space: Any space designated as a confined space that also meets any one of the following descriptions:

- Contains or has the potential to contain a hazardous atmosphere
- Contains a material that has the potential for engulfing an entrant
- Has an internal configuration that can trap or asphyxiate an entrant by means of inwardly converging walls or a floor that slopes downward and tapers to a smaller cross section
- Contains any other recognized serious safety or health hazard

Purging: The method by which gases, vapors, or other airborne impurities are displaced from a confined space.

Threshold Limit Value (TLV): The airborne concentration of a substance representing a condition under which it is believed that nearly all workers may be repeatedly exposed without adverse effect.

8.0 CONFINED SPACE HAZARDS

8.1 What is a Confined Space?

A confined space has special qualities that help define it and set it apart from other work areas. A confined space:

- Is large enough to enter
- Has limited ways to enter and exit and;
- Is not meant to be an everyday work area or have continuous employee occupancy

8.2 Confined Spaces at Hanover Park Public Works Facilities

Examples of confined spaces at Hanover Park Public Works facilities include the following:

- Sewers (both sanitary and storm)
- Manholes
- Vaults
- Wet well lift stations
- Dry well lift stations
- Storage tanks (for example, the elevated tanks)
- Ground storage reservoirs
- Pits, trenches, and excavations

Trenches and excavations can also be confined spaces. If trenching or excavating, follow procedures in the Hanover Park Employees' Public Works Safety Manual in addition to applicable procedures contained within this program.

Confined spaces can be very hazardous to work in. Some confined spaces can contain hazardous atmospheres or other types of hazards such as electrical or mechanical hazards. These are called *permit-required spaces* and they require a permit before entry.

Some spaces do not contain any hazards capable of causing death or serious physical harm. They do not require a permit for entry and are called non-permit spaces. Many of the confined spaces at Hanover Park Public Works' facilities are non-permit-required confined spaces. Appendix A contains a list of confined spaces by type at Hanover Park Public Works facilities and wastewater treatment plants, their associated hazards, and their initial classification as either a permit or non-permit space. *Keep in mind that you and your supervisor must evaluate each space before entry to determine what hazards are likely, and must eliminate and/or control these hazards before entry into the space.*

The best policy for any confined space is to work from the outside whenever possible.

8.3 Hazards of Confined Spaces

Confined spaces can contain both atmospheric hazards (unsafe air) and physical hazards. Atmospheric hazards include:

- Oxygen deficiency due to the presence of other gases or rust (consumes oxygen)
- Excess oxygen (makes things burn easily)
- Explosive dust atmospheres
- Flammable atmospheres containing methane, propane, or other explosive gases
- Combustion by-products like carbon monoxide(CO) and carbon dioxide (CO_2)
- Hydrogen sulfide (H_2S), methane, and oxygen deficiency from decaying waste, sewage, or stagnant water
- An atmospheric concentration of any substance at a level that is greater than the Permissible Exposure Limit (PEL)
- Any other atmospheric condition that immediately dangerous to life and health (IDLH)

Methane, hydrogen sulfide (H_2S), and carbon monoxide (CO) are all flammable and explosive gases. Hydrogen sulfide and carbon monoxide are toxic at low levels and are frequently encountered in confined spaces. Each confined space must be evaluated before entry to determine potential atmospheric hazards.

Physical confined space hazards include the following:

- Electrical hazards (includes hazards of unguarded conductors or power sources)
- Mechanical exposure (for example, any mechanical equipment or moving parts such as aerators, agitators, grinders or pumps; if working on such equipment, use lockout/tagout procedures)
- Temperature (on hot/humid days, fluid replacement or other measures may be necessary to avoid heat stress issues)
- Engulfment (which is being trapped by a liquid or solid material such as water, wastewater, or sludge
- Entrapment (this occurs when the internal configuration of the space or falling debris traps or suffocates an Entrant
- Other hazards. These may include:
  - Falls from ladders or railings
  - Falling objects
  - Wet surfaces

- Noise from mechanical equipment
- Cold stress
- Becoming wedged in a narrow part of the structure

Physical hazards must be locked out or controlled in some fashion before entry.

8.4 Hazards of Confined Spaces at Hanover Park Public Works Facilities

Confined spaces at Hanover Park Public Works facilities which have the potential for engulfment by water or wastewater or the potential for a hazardous atmosphere (for example, storm or sanitary sewers, wet well lift stations, manholes) are likely to be permit-required confined spaces. There is also the potential of gases migrating into the space, and the potential for mechanical equipment hazards. Other confined spaces (such as dry lift stations) are likely to be non-permit spaces. Each space must be evaluated before entry to determine if permit hazards are present.

8.5 Hazardous Conditions That Prohibit Entry

8.5.1 Hazardous atmospheric conditions that prohibit entry include:

- An oxygen-deficient (less than 19.5%) atmosphere, which can cause suffocation. Always monitor for oxygen before entry into any confined space. Do not enter a confined space if the oxygen level is less than 19.5%
- An oxygen-enriched (greater than 23.5%) atmosphere, which can cause an extreme fire hazard. Do not enter a confined space if the oxygen content is greater tan 23.5%
- A potentially explosive atmosphere caused by the presence of combustible gases (such as methane from sewage and decaying waste), liquids, vapors, or dust at greater than 10% of their lower flammable limit (LFL). (Note: With regard to dust, if the visibility is reduced to five feet or less, assume there is a potentially explosive atmosphere from dust.) Always monitor for combustibles before entry into any confined space. Do not enter a confined space if flammable gas, vapor, or mist is in excess of 10% of its LFL
- A concentration of any hazardous substance above its OSHA Permissible Exposure Limit (PEL) or above the exposure limit given on the MSDS (Material Safety Data Sheet). This situation can occur in confined spaces that are:

    - Associated with combustion processes (for example, there is equipment running in the confined space which

releases combustion products such as hydrocarbons and carbon monoxide). Check these confined spaces for carbon monoxide. Do not enter a confined space if carbon monoxide levels exceed 35 ppm

- Associated with sewage or wastewater operations. This is the greatest atmospheric hazard of confined spaces at Public Works facilities and wastewater treatment plants. Monitor all Public Works confined spaces before entry for hydrogen sulfide in addition, to oxygen, combustibles, and carbon monoxide. Do not enter a confined space if hydrogen sulfide levels exceed 10 ppm

The permit-required confined spaces at Public Works facilities have the potential for hazardous gases such as methane and hydrogen sulfide from the sewage and decaying wastes. There is also the potential for oxygen deficiency. Methane is not only an air contaminant, it is also a very flammable gas that can cause explosions and fires.

Atmospheric hazards also result from chemicals which may be stored or used in the confined space. This includes water treatment chemicals like acids, caustics, and chlorine; or chemicals used for cleaning such as solvents.

8.5.2 Physical Hazards Prohibiting Entry

Entry is also prohibited if there is a physical hazard that is immediately dangerous to life and health (IDLH) such as a liquid or solid that may engulf, exposed conductors that may electrocute, or uncontrolled energy that may have the potential to be in the confined space at the time of entry.

Never enter a confined space if there is a hazardous atmosphere or serious physical hazard that is immediately dangerous to life and health. Identify the cause of the hazards and perform corrective actions before entering.

9.0 IDENTIFICATION AND POSTING

9.1 Identifying Confined Spaces

Confined space training includes training employees on identifying confined spaces. If an employee encounters a non-labeled space that fits the description of a confined space, the employee must immediately contact the Director of Public Works so arrangements can be made for the space's assessment and positive identification as a confined space. If an employee has already entered the space, he or she must leave it immediately until positive identification is made and the space is evaluated and added to the list of confined spaces.

9.2 Labeling Confined Spaces

Where possible, post warning signs identifying confined spaces at the entry points for each space. The signs must distinguish between permit and non-permit spaces and prohibit unauthorized entry. When it is not practical to label a space, (for example, a manhole in a roadway), other provisions may be used to communicate the warning.

10.0 RESPONSIBILITIES

10.1 Director of Public Works

The Director of Public Works is responsible for the following:

- Appointing a qualified individual to coordinate departmental confined space activities
- Ensuring the identification and initial evaluation of confined spaces
- Ensuring the availability of the proper equipment needed to enter confined spaces safely
- Ensuring that the policies and procedures detailed in this program are implemented and enforced
- Coordinating training
- Arranging for annual review of the program
- Acting as a liaison with regulatory authorities as necessary
- Actively soliciting from employees ways to improve the program

10.2 Supervisor-in-Charge

The Supervisor-in Charge is responsible for the following:

- Enforcing the program requirements on a day-to-day basis
- Reporting to the Director of Public Works any employee problems related to confined space entry
- Maintains documentation related to confined space entry including entry logs and permits for the specified time periods

10.3 Entry Supervisor

The Director of Public Works appoints an individual(s) to the position of Entry Supervisor for permit-required entries. An employee may function as an Entry Supervisor if they have been trained in this role and are authorized.

The Entry Supervisor plays an important role under the permit system. The Entry Supervisor must make sure conditions are safe for the entry, know the hazards of the entry and symptoms of exposures, verify that atmospheric and control measures are implemented, oversee the project, and terminate the permit. He or she must also:

- Issue, sign, and post a confined space permit at the entrance to the permit space before allowing anyone to enter it, and keep out unauthorized personnel
- Determine and identify on the permit the actual and potential hazards associated with the entry

- Assure that a safe internal atmosphere is maintained by testing and/or inspecting
- Verify that rescue services and an operating means for summoning them are available
- Notify the Entrant(s) of the hazards involved and precautions to follow
- Ensure the Attendant knows the work, can summon help, and can communicate with the people inside
- Anticipate and protect against hazards that the work might create (for example, hot work, cleaners, water treatment chemicals, and paint/coating removal or application)
- Maintain the safe conditions the permit requires
- Suspend the permit and evacuate Entrant(s) if safe conditions are not maintained
- Return the permit to the supervisor-in-charge. Permits must be retained for twelve months after the activities are completed

10.4 Authorized Entrants

Entrants must be authorized to enter a confined space and do their part to control the hazards in confined spaces. They must:

- Know the hazards inherent to the space and how to handle them
- Know how to use equipment properly, including personal protective equipment (PPE)
- Maintain communications with the Attendant
- Keep in contact with the Attendant
- Exit the space when:
  - Evacuation is called for by the Attendant
  - Alarms sound on monitoring equipment
  - Warning signs are recognized
  - Prohibitive conditions are encountered

10.5 Attendants

Permit-required confined space entries require the use of an Attendant. An Attendant is a trained and authorized employee stationed outside the permit space who monitors the authorized Entrant(s) and confined space conditions and performs all Attendant duties including the following:

- Never entering the space
- Having no other duties that will divert his/her attention

- Knowing the hazards and signs of exposure to the hazards, and monitoring the Entrants for signs of illness, overexposure, or other hazardous conditions
- Maintaining communication with the Entrant(s) at all times
- Informs Entrant(s) of changes in hazardous conditions so they can exit the space
- Remain at the post until entry is completed and the Entrant(s) have left the space
- Keep unauthorized persons out of the space
- Let Entrant(s) know when hazards appear so they can leave the space and order them to leave when conditions warrant evacuation
- Perform non-entry rescue when necessary
- Summon rescue and emergency services when self-rescue is not possible by notifying the Entry Supervisor. The Entry Supervisor directs the outside rescue team to the confined space location
- Informs the outside rescue team of the confined space hazards present when they arrive at the site

10.6 Non-Permit Standby

An attendant is not required per OSHA for non-permit required confined space entries, however, due to the isolation of many of the Public Works confined space sites, Public Works Department Management requires the use of a standby person whenever possible to stand guard outside of the non-permit space in the event of an unanticipated problem. The term "Attendant" is not used with regard to non-permit entries at Public Works' facilities to avoid causing confusion between the requirements for a permit and a non-permit entry.

Duties of the Non-Permit Standby for non-permit confined space entries include the following:

- Stay outside the space to observe working conditions
- Maintain communication with the Entrant(s) at all times
- Remain at the post until entry is completed and the Entrant(s) have left the space
- Summon rescue and emergency services if needed (for example, if an Entrant sustains a fall within a non-permit space)

10.7 Rescue Team

The Village of Hanover Park Department of Public Works uses an outside rescue team (Hanover Park Fire Department) to perform confined space rescues if it is not possible for a self- or non-entry rescue to be performed, or if it would further endanger an Entrant using a non-entry rescue (for example, if the Entrant has fallen). Provisions for rescue are specifically required by OSHA for permit-required confined spaces, and the availability of rescue services must be documented on the confined space entry permit.

The rescue team must:

- Be properly trained and qualified to perform a rescue
- Determine if an entry rescue is required
- Use the appropriate equipment for the rescue
- Use the equipment properly to avoid additional hazards
- Perform the rescue according to established procedures
- Know first aid and CPR (at least one rescue team member must hold valid first aid and CPR certificates)
- Participate in rescue drills annually
- Use a self-contained breathing apparatus (SCBA) to enter the space if there is an atmospheric hazard present

10.8 Performing More Than One Role

An Attendant may also function as the Entry Supervisor during a permit-required confined space entry. Also, Entrants and Attendants may rotate duties if trained in both roles.

11.0 ENTRY PROCEDURES

11.1 General Entry Considerations

To control confined space hazards, entrants must:

- Identify and control external hazards
- Provide guarding for the opening
- Assure that internal hazards do not exist (such as a hazardous atmosphere or physical hazards)
- Be able to recognize any warning signs or symptoms of exposure to a dangerous situation
- Perform air monitoring before entry (do not enter if levels are unacceptable)
- Complete a confined space entry permit for permit spaces, or record entry conditions on the entry log for non-permit spaces before entering
- Periodically monitor the air inside the confined space (the monitor must have both audio and visual alarms)
- Use personal fall protection when required
- Ensure rescue provisions are in place for permit entries
- Report to the Supervisor-in-charge (this can be done verbally) upon leaving the confined space
- Be able to communicate with the Attendant during a permit entry
- Leave the space immediately if a hazard is detected

11.2 Non-Permit-Required Confined Space Entry Procedures

11.2.1 Definition

A non-permit confined space (non-permit space) is a confined space that meets the following conditions:

- All hazards (including mechanical) have been eliminated before entry
- No atmospheric hazards are present that cannot be controlled by forced air ventilation alone
- No work will be done in the space that will create a hazard

11.2.2 Required personnel

Entry into non-permit spaces requires specific authorization from the Supervisor-in-charge (for example, through a work order) and use of a non-permit confined space entry log. Even though these are non-permit

spaces, a "non-permit standby" is required to remain outside the non-permit space to monitor activities and summon emergency assistance if needed (for example, if an Entrant falls in a non-permit space). An Entry Supervisor is not required for non-permit entries into confined spaces.

11.2.3 Pre-Entry Evaluation Procedures

Always evaluate non-permit spaces before entry to ensure conditions have not changed since initial evaluation and that there are no hazards present which may warrant its reclassification to a permit space. Prior to entry, take care to note any unusual odors, liquids, or other indicators that space conditions may warrant its reclassification as a permit space. Also examine the space for dangerous physical conditions such as material or liquid that can cover or drown an employee, or the presence of mechanical hazards. These are examples of hazards that require permit entry procedures. Take into consideration any work that will be done in the confined space that may create hazards (for example, digging, painting, line breaking). Notify the supervisor-in-charge if there may be hazards present or which may be created that warrant reclassification to a permit entry.

Remember that even though non-permit spaces can be entered without implementing permit entry procedures, you may still have to lock out equipment or take other safety measures before entry.

11.2.4 Procedures for Non-Permit Entries

The procedure for entry into non-permit confined spaces is as follows:

1. The Supervisor issues the work order or written authorization
2. Gather all of the equipment, including personal protective equipment and fall protection as required (see sections 16 and 14, respectively). Also, make sure you have whatever tools or equipment are necessary to do the work
3. At least two workers must be present, each equipped with a hand-held radio. One worker functions as the standby who always stays outside the non-permit space, and the other worker(s) enters the space and performs the work
4. Guard the confined space to protect it from external hazards (for example, with barricades or shields)
5. Safely remove any covers to the confined space. Keep in mind covers may be heavy and require the use of a tool to assist in removal
6. Begin documenting the entry on the non-permit entry log (see Appendix B for a copy of the Log). Document the name of the

Entrants, the date, the time, the location of the space, and the space number if it has one

7. Using the designated monitoring instrument, test the air inside the confined space before actually entering it. Make sure you monitor at different levels and in hard to reach spots where gases can accumulate. Use a sampling probe and tubing when doing this following the manufacturer's instructions. Do not put the sample probe into liquids. Monitor for the following:
   - Oxygen (this level should be approximately 20.8%)
   - Combustibles (this reading should be 0)
   - Hydrogen sulfide (H_2S) (This level should be 0)
   - Carbon monoxide (CO) (This level should be 0 also)
8. If you detect levels of air contaminants, or if the oxygen content is not normal (approximately 20.8%), let the supervisor-in-charge know of the situation using the hand-held radio, and begin procedures for a permit-confined space entry detailed in section 11.3. (Note: You may be able to reclassify the confined space back to a non-permit space after ventilating, but the permit process must be initiated first)
9. Entry into the non-permit space may proceed if the following conditions are met:
   - Oxygen is at normal levels within the space
   - No hazardous air contaminants have been detected through air testing
   - All physical hazards have been eliminated
   - All test results have been documented on the entry log and the supervisor-in-charge has approved the entry
   - Any personal protective equipment needed has been donned
   - Any personal fall protection needed is put on (see section 14) on when personal fall protection is required)
   - There will be no hazards created by work done in the space
10. The Standby employee must stay outside the space at all times, continuously monitoring activities within the space, and maintaining contact with the Entrant(s) using the hand-held radio. In the event of an emergency, the standby uses the hand-held radio to summon outside emergency rescue services
11. Entrant(s) should perform periodic air testing during entry. Document all atmospheric monitoring tests on the entry log. The Entrant(s) must leave the confined space if the air monitoring detects a hazard or if additional hazards are discovered or created (for example, a spill or leak). If a hazardous condition occurs in the space, the non-permit entry is canceled. You must exit the space, and notify the supervisor-in-charge immediately. Re-entry is prohibited until a re-evaluation of the space is completed and safe conditions are restored in the space

12. Upon completion of work, remove tools from the space, take and record final instrument readings, and notify the supervisor-in-charge of job completion. Also document exit times and any re-entry times if applicable on the entry log
13. If work is interrupted and the Entrant(s) must leave the space, the space must be re-evaluated before re-entry

11.3 Permit-Required Confined Space Entry

11.3.1 Definition

A permit-required confined space (permit space) is a confined space that has one or more of the following characteristics:

- Contains, or has the potential to contain, a hazardous atmosphere
- Contains a material that has the potential for engulfing an Entrant
- Has an internal configuration such that an Entrant could be trapped or asphyxiated by inwardly converging walls or by a floor which slopes downward and tapers to a smaller cross-section; or
- Contains any other recognized, serious safety or health hazard

The permit spaces at Hanover Park Public Works facilities are permit spaces mainly due to the potential for engulfing an entrant by water or wastewater, and the potential for containing a hazardous atmosphere due to the decomposition of decaying organic matter contained in sewage.

Permit-required confined spaces at Public Works include the following:

- Manholes
- Storm and sanitary sewers
- Wet wells and lift stations
- Elevated tanks and ground storage reservoirs

The entry procedures for permit-required confined spaces are designed to reduce or eliminate the hazards and if at all possible, reclassify the permit space to a non-permit space (see section 12 for circumstances allowing this). If the space cannot be reclassified to a non-permit space, the permit identifies those items, conditions, and controls necessary to make the entry safe (refer to Appendix C for a copy of the permit).

11.3.2 Preparations for Permit Entries

- The Supervisor issues the work order or written authorization to enter the permit space

- Gather all of the equipment, including personal protective equipment and personal fall protection as required for the entry (see sections 16 and 14 respectively). Also, make sure you have whatever tools or equipment is necessary to do the work
- At least two workers must be present, each equipped with a hand-held radio. One worker functions as the Attendant who must always stay outside the space
- The Entry Permit Supervisor initiates the confined space entry permit. The Entry Supervisor may be the Attendant or the Supervisor-in-charge. Follow the steps below for conducting the confined space evaluation and completing the entry permit.

11.3.3 Evaluating the Space/Completing the Permit

Permit Step 1 - 6

Prior to the entry, document the following on the permit in the spaces provided:

- Permit space to be entered
- Identification number of the confined space, if applicable
- Purpose of the entry
- Date of entry
- Authorized duration of entry permit
- The authorized Attendant
- The authorized Entrant(s)
- The name of the Entry Supervisor
- The time

Permit Step 7

Evaluate the confined space for atmospheric and internal/external physical hazards. Check "yes" on the permit for each atmospheric or physical hazard that may be present. The primary atmospheric concerns at Public Works facilities are hydrogen sulfide, methane, and oxygen deficiency from decaying wastes, sewage, or stagnant water. Consider any hazards that may be created by work done within the space or any hazardous materials to be taken into the space (for example, welding or cleaning).

Follow the procedure below for testing the air inside the permit space:

1. Using the designated monitoring instrument, test the air inside the confined space before actually entering it. Make sure you monitor at different levels and in hard to reach spots where

gases can accumulate. Use a sampling probe and tubing when doing this following the manufacturer's instructions. Do not put the sample probe into liquids. Monitor for the following:

- Oxygen
- Combustibles
- Hydrogen sulfide (H_2S)
- Carbon monoxide (CO)

2. If you detect levels of air contaminants, or if the oxygen content is not normal (approximately 20.8%), determine the reason for the abnormal readings and perform the appropriate corrective actions (for example, ventilating, cleaning). Record test results on the permit. Do not enter the confined space unless oxygen content is normal, and there are no hazardous air contaminants present or uncontrolled physical hazards.

Permit Step 8

In step 8 of the permit, document the control measures used to isolate the space and control or eliminate any atmospheric and/or physical hazards identified during the evaluation. Do not enter the confined space if there is a hazardous atmosphere or a serious physical hazard. If any readings are out of the normal range, perform corrective actions before entry. Control measures which may be needed include the following:

a. Ventilation

Follow these procedures for ventilation if a hazardous atmosphere may exist:

- Test the internal atmosphere continuously or provide continuous forced-air ventilation
- Begin ventilation before entering and direct it to the work area. Ventilate until all employees leave the space
- Use only clean air supplies for continuous forced-air ventilation
- Make sure the air supply is not contaminated with engine exhaust or contaminated from adjacent sources
- Use local exhaust ventilation anytime employees weld inside a confined space. Take care in placing the exhaust duct to avoid stripping the inerting gas from the weld
- Where possible, open additional manholes to increase air circulation when working in a confined space associated with a sewer system
- Never use oxygen to purge or ventilate any confined space. Injury or death may occur from the highly combustible atmosphere generated. Do not use nitrogen to inert an atmosphere as this practice displaces oxygen
- Always use continuous ventilation under the following circumstances:

- The hazardous materials cannot be completely isolated and cleaned
- Leaks may occur into the space
- Cleaning, painting, welding, solvent use, or other work inside the space may create an atmospheric hazard
- In a sewer system

b. Lockout/Tagout

Before entry, control or isolate all energy sources using lockout/tagout procedures:

- Electrical, (for example, de-energizing exposed conductors, using grounded equipment and tools, using GFCI in wet areas)
- Mechanical (for example, locking out hazardous machinery, blocking possible movement of mechanical parts like rams, screws, pumps, and valves)
- Hydraulic/pneumatic energy in equipment (bleed lines as needed)
- Water/wastewater pipes, valves, pumps, and lines (disconnect, lockout, blind, cap and/or block, blank off, blind, whichever is appropriate.) *Ensure the space is effectively isolated from any material (such as water or sewage) that could pose a hazard or engulf an Entrant*
- Pipelines must be flushed, drained, and isolated if there is the potential for exposure
- Test locked out equipment to ensure no energy sources remain active

Not all laterals to sewers or storm drains require blocking. *However, where experience or knowledge of industrial use indicates there is a reasonable potential for contamination of air or engulfment into an occupied sewer, then all affected laterals must be blocked.* If blocking and/or isolation requires entry into the space, the provisions for entry into a permit-required confined space must be implemented.

c. Cleaning, Purging, and Flushing

Follow these cleaning procedures for confined spaces containing a liquid or solid material:

- Stay out of the space during cleaning if possible.
- Flush, drain, pump/vacuum out, or otherwise empty the material in the space before entering it. Use the best and most practical method to do this
- Clean out pockets or pools of materials that can be sources of hazardous gas or vapor buildups
- Use water and high pressure hoses to clean efficiently and safely

d. External Barricades and Signs

Guard openings with railings or other temporary barriers when you remove covers. Post signs (Danger—Confined Space—Enter by Permit Only, or equivalent) at each entrance.

e. Weather Conditions

If performing confined space entry into the storm or sanitary sewer system, communicate with the local weather bureau and fire emergency services in the area so that sewer work may be delayed or interrupted and Entrants withdrawn whenever sewer lines might be suddenly flooded by rain or fire suppression activities, or if flammable or other hazardous materials were accidentally released into sewers during emergencies by industrial or transportation accidents.

f. Lighting

Only lights approved and provided by the Department shall be used in permit spaces.

Permit Section 9 and 10

Document that acceptable entry conditions have been achieved after implementation of control measures, and record final atmospheric test results before entry. The employee performing the air testing must initial the permit in the space provided in section 10, and document test times.

Permit Section 11 and 12: Rescue Services and Communication

List the rescue and emergency services available in section 11 of the permit, including telephone numbers. Also describe communication procedures to be used by authorized Entrant(s) and the Attendant.

Section 13: Equipment Needed

In section 13, check the safety and other equipment needed. This includes gas testing, personal protective, personal fall protection, ventilating, communications, lighting, and rescue equipment.

Section 14 and 15: Other information/Additional Permits

List any other information needed for the permit entry to ensure Entrant safety. Examples include measures needed for heat or cold stress. If

welding or other hot work will be performed inside the confined space, a hot work permit must also be completed.

Approving the Entry

Controlling the hazards within a confined space during entry is vitally important. Prior to entry, the Entry Supervisor reviews the control measures taken, the test results, and the required work. The Entry Supervisor certifies through the control measures taken and confirms the classification of the confined space as one of the following:

- Non-permit space
- Permit-required space

If you eliminate all hazards or only atmospheric hazards remain which ventilation controls, and the work will not create any hazards in the confined space, then the Entry Supervisor may reclassify the confined space as a non-permit space. If this is the case, post the permit as a certification that all hazards have been controlled, and the space is classified as a non-permit space. Then follow procedures for non-permit entries defined in section 11.2.4.

If any hazards remain that you cannot eliminate or control by ventilation alone, or if work may release additional hazards, the space is classified as a permit-required confined space. Entry then requires rescue provisions. Entry will proceed as follows after the completed permit is posted at the entrance to the permit space.

Entering and Working Inside the Permit Confined Space

The Entry Supervisor must inform employees of any potential hazards remaining in the permit space before entry, and must also brief the Entrant(s) and Attendant on planned emergency rescue methods and verifies that rescue equipment, procedures, and rescue personnel are available. The Entry Supervisor, all Entrant(s), and the Attendant must read and sign the permit before entry.
Once the space is approved for entry by the Entry Supervisor, the Entrant(s) must do the following:

- Don all necessary personal protective equipment (PPE)
- Ensure the equipment and tools needed to perform the work is present
- Use a hand-held radio to maintain communication with the Attendant at all times (Also, the Attendant must have a ready means of communication with the Public Works Office)
- Set up the non-entry rescue/retrieval system and put on the full body harness attached to a mechanical winch and retrieval line. *This is*

required for vertical permit spaces deeper than five feet. (Do not use a non-entry rescue system if it would increase the overall risk of entry or would not contribute to the rescue.)

Fall Protection

There must be safe access and egress for entry into and exit from confined spaces. Personal fall protection is required for confined space entry under the following circumstances:

- In a vertical confined space where an Entrant can fall six feet or more to a lower level; or
- When the Entrant can fall into or onto dangerous equipment or machinery regardless of the distance of the fall; and
- There is no safe means to climb in or out of the confined space (There is no ladder or stairway available or the ladder/stairway is not in good repair or does not comply with applicable OSHA regulations detailed in 29 CFR 1910, Subpart D) (**note:** always tie off the top of the ladder to a secure surface whenever possible to prevent it from slipping)
- If fall protection is needed for the confined space, the rescue and retrieval system used for non-entry rescues can double as a fall arrest system
- Do not use personal fall protection in a situation when its use may endanger the worker (getting caught in equipment, for example)

Monitoring the Entry Work

Radio communication must exist between the Entrant, Attendant, and the Public Works office. Likewise, the Attendant must regularly check on the welfare of the Entrant(s), stay outside the space at all times, and not perform any other duties that may interfere with his/her role as Attendant.

Self- or Non-Entry Rescue

If the Entrant does not respond when being checked by the Attendant, or if self-rescue or Attendant-rescue is not possible, the Attendant must call the Entry Supervisor using the hand-held radio (or call the Public Works Office) so that the rescue team (The Hanover Park Fire Department) can be notified of the emergency using the 911 system. In all cases, the Attendant must never enter the confined space.

The Entrant(s) must leave the confined space under the following circumstances:

- Air monitoring detects a hazard
- Forced air ventilation stops

- Additional hazards are discovered or created
- The attendant tells the Entrant(s) to leave the space or informs the Entrant(s) of problems; or
- The Attendant is no longer able to remain in attendance

If circumstances dictate interruption in the work, or conditions for which entry was approved change, the Entrant(s) must leave the space, the space must be re-evaluated, and a new permit completed before re-entry.

Ending the Entry

The Attendant or Entrant ends the entry upon work completion or if unsafe conditions are detected. Upon work completion, the Entrant(s) retrieves tools or equipment and cleans up the space as necessary before ending the entry. Check to make sure no one is within the confined space and perform all measures required to bring the confined space back to normal service.

The Entrant may need to reverse lockout or other safety procedures. This may include:

- Unblocking mechanical parts so they can move freely
- Securing the hatch or manhole cover
- Removing blinds from lines and pipes
- Removing locks and tags from energy sources
- Testing to be sure sources are working properly

After ensuring the space is returned to the proper conditions, the Entry Supervisor:

- Removes the permit
- Signs and dates the permit, and notes the time
- Documents problems encountered during the entry and any suggestions to avoid these problems in the future
- Returns the completed permit to the Public Works Office for filing (permits must be retained for one year at a minimum)

12.0 RECLASSIFICATION TO A NON-PERMIT SPACE

A permit space can be designated a non-permit space after testing, evaluation, and hazard elimination have been completed.

If you eliminate all hazards or only atmospheric hazards remain which ventilation controls, and work does not create any hazards in the confined space, then the Entry Supervisor may reclassify the confined space as a non-permit confined space. Follow procedures in section 11.2.4 for non-permit spaces if the space is reclassified as non-permit by the Entry Supervisor.

The Entry Supervisor notes this on the Confined Space Entry Permit, and posts the permit as a certification to those entering the confined space that all hazards are eliminated. *If all hazards are not eliminated, the space must remain permit-required. If any hazards are detected while working in the reclassified confined space, the Entrant(s) must leave the space and it must be re-evaluated and a new permit completed before re-entry.*

Normal work activities can proceed as long as there are no hazards present in the space. Do not take hazardous materials into the confined space or carry out welding activities or open flame work that could introduce new hazards or cause existing hazards to intensify. Conduct periodic air monitoring while in the reclassified space.

13.0 RESCUE PROCEDURES

Entrants must evacuate the confined space if:

- Air monitoring detects a hazard
- Forced air ventilation stops
- Additional hazards are discovered or created
- The attendant tells the Entrant(s) to leave the space or informs the Entrant(s) of problems; or
- The Attendant is no longer able to remain in attendance

Attendants must:

- *Never enter a confined space to perform a rescue*
- Ensure rescue services are available
- Ensure, before entry, that an open line of communication is available to summon emergency services if necessary
- Inform Entrants to evacuate when required
- Use the hand-held radio to summon the Entry Supervisor and inform him/her of the location of the confined space and the extent of the problem. The Entry Supervisor then contacts outside rescue services and directs them to the confined space
- Inform the rescue team of the hazards present once they are at the confined space site. The rescue team determines whether an entry rescue is necessary (as opposed to using non-entry rescue), what equipment is needed, and performs rescue and first aid according to established guidelines

Employees must first use self-rescue procedures in confined spaces if they are able to do so. Prompt rescue depends largely on the air monitoring and communication equipment the Entrant(s) brings into the space. The Attendant must regularly check on the Entrant(s) via radio communication. If the Entrant does not respond, or if self-rescue or Attendant-rescue is not possible, the Attendant must then summon the Rescue Team (in this case, the Hanover Park Fire Department). In all cases, the Attendant must never enter the confined space.

A non-entry rescue is the safest and fastest method for Entrant rescue because the rescuer does not enter the confined space. Use retrieval equipment whenever possible to make a non-entry rescue more feasible. The retrieval equipment must meet the following requirements:

- Use a full body harness with a retrieval line for each Entrant before he/she enters the confined space
- Attach the retrieval line to a mechanical device or fixed point outside the confined space. Use a mechanical winch to remove the Entrant(s) from the space

- When Entrants are not able to wear harnesses or use retrieval lines and equipment, contact the local fire department to let them know a permit-required confined space entry is being performed and entry rescue may be necessary

Although the Attendant is not allowed to enter the confined space, he or she can perform a non-entry rescue. However, without the use of a mechanical winch, it is almost impossible for a person to pull an Entrant out of a confined space more than five feet deep.

There is an exception to Attendant, non-entry rescue. If a worker is disabled due to falling or impact, the Attendant must not remove the worker from the confined space unless there is immediate danger to the life of the Entrant. In this case, leave the rescue up to the outside rescue team.

If a non-entry rescue cannot be performed, the outside rescue services (the Hanover Park Fire Department) has specialized training enabling them to enter the confined space for rescue if necessary. They have extensive training in emergency rescue, SCBA (self-contained breathing apparatus) usage, and CPR and first aid.

14.0 FALL PROTECTION

14.1 General Requirements

Rescue and retrieval systems used for non-entry rescues for permit confined space entries generally also provide protection against fall arrest in a confined space if the manufacturer rates them for this use. Use the approved rescue and retrieval system when personal fall protection is needed in a confined space. This applies to non-permit spaces as well as permit spaces.

Personal fall protection is required for confined space entry under the following circumstances:

- In a vertical confined space in which the Entrant can fall six feet or more to a lower level; or
- When the Entrant can fall into or onto dangerous equipment or machinery regardless of the distance of the fall; and
- There is no safe means to climb in or out of the confined space (There is no ladder or stairway available or the ladder/stairway is not in good repair or does not comply with applicable OSHA regulations detailed in 29 CFR 1910, Subpart D (**note:** always tie off the top of the ladder to a secure surface whenever possible to prevent it from slipping)
- Do not use personal fall protection in a situation when its use may endanger the worker (getting caught in equipment, for example).

The fall arrest system must prevent the Entrant from free falling more than six feet or from reaching the lower level or floor of the confined space. The arresting force on the worker must not exceed 1800 pounds. The support structure (for example, tripod, davit arm or solid surface) must be capable of holding a 5,000 lb. load. Lifelines must support a 3,000 lb. load. Fall arrest components must meet the requirements of 29 CFR 1926.503(d), on personal fall arrest systems.

14.2 Inspection Requirements

An all-points inspection of lifeline systems for wear, damage, or deterioration is required at the following times:

- Prior to each use
- Whenever the lifeline is subjected to a fall
- Annually in the case of non-use

If the system is subjected to a fall, do not use it until a competent person determines the system to be undamaged and suitable for reuse. Immediately remove any damaged components from service.

Follow the manufacturer's instructions for care and maintenance of rescue/retrieval/fall arrest equipment and components.

15.0 PERSONAL PROTECTIVE EQUIPMENT

In carrying out the requirements of the permit system, the entry supervisor evaluates the equipment and clothing that a particular entry requires. The protective equipment an Entrant needs depends on the hazards of the confined space. The entry permit lists required protective equipment.

Inspect protective clothing and equipment before using. Replace broken equipment right away. After use, clean the equipment as instructed and store it in a safe, clean area.

For confined space entries, consider if the following personal protective equipment is needed:

- Eye and face protection
- Hard hat
- Safety shoes or boots
- Protective clothing
- Gloves
- Ice vests or cooling bandanas for protection from heat stress

Personal protective equipment used must comply with the applicable provisions of 29 CFR, 1910, Subpart I.

16.0 SPECIAL PROCEDURES FOR SEWERS

When personnel inspect storm or sanitary sewers by walking through them, the following procedures shall apply:

- Weather conditions must be verified beforehand
- Two manholes ahead of the inspection area must be opened for ventilation
- One man must remain on the surface
- Employees walking the sewer must report to the person on the surface at each manhole
- All persons in the sewer must be equipped with self-contained breathing apparatus complete with full facepiece, designated air monitoring instrument, and waterproof flashlights

Only SCBA-certified personnel are allowed to perform this type of work. All requirements related to SCBA use defined in 29 CFR, 1910.134 must be met including requirements for training, medical approval, fit testing, breathing air quality, and SCBA use and inspection.

17.0 AIR MONITORING PROCEDURES

Atmospheric testing of confined spaces is performed for two reasons:

- Evaluation of the hazards of the confined space
- Verification that acceptable entry conditions for entry into that space exist

Confined space entry requires initial and periodic air testing. Under certain conditions, continuous monitoring is necessary during entry (for example, when the work can cause a hazardous atmosphere, when there is reason to believe air quality can deteriorate, or when in a sewer system confined space and forced air ventilation cannot be used).

Before Entrant(s) can enter a confined space, an authorized and trained person must conduct tests for atmospheric hazards from outside the confined space. The procedure for doing this is detailed below:

- Use a sampling probe and tubing following the manufacturer's instructions for sampling from outside the space
- Test the space at various levels, from top to bottom. Do not put the sample probe into liquid
- Make sure hard to reach spots and unusual configurations are tested where gases can get trapped and accumulate
- When using a continuous monitor for sewer system work, the Entrant should carry and use the instrument to monitor the atmosphere in his/her environment, and in advance in the direction of travel or movement to warn the Entrant of any deterioration in atmospheric conditions. If several Entrants are working together in the same area, the use of one instrument worn by an Entrant is acceptable

If oxygen is outside the normal range (approximately 20.8%), or if combustibles or any hazardous gases or toxic materials are detected, determine the reason for the abnormal readings and perform the appropriate corrective actions (for example, ventilating, cleaning) before entry.

The authorized employee conducting the monitoring must initial the entry permit after documenting each test result on it. Air test results must also be documented on the entry log for non-permit entries.

Regularly field-calibrate air monitoring instruments. Follow the manufacturer's written operating instructions and calibration procedures.

18.0 CONTRACTORS

If a contractor is to enter a confined space at Hanover Park Public Works facilities, the contractor must be notified beforehand of the hazards of the confined space. Contractors must maintain an equivalent confined space program in compliance with 29 CFR 1910.146, provide certifications of training, and use their own equipment and permit for permit-required confined space entries.

Additionally, contractors who carry out work for Public Works must:

- Be informed about the location and hazards of confined spaces in their immediate work area
- Know and follow the procedures and work practices of their confined spaces program. Their program should be similar in content to this program. If not, consider whether they are prepared and qualified to do the work
- Comply with the safety and insurance provisions required by the Village of Hanover Park and related contractual agreements
- Train and supervise their own employees so they can safely enter confined spaces
- Communicate their work activities to Public Works management so that outside emergency responders can be directed to their location if necessary
- Coordinate entries if both Public Works and contractor employees are entering the same confined space at the same time
- Communicate to Public Works management any hazards found or created during any confined space entry

19.0 TRAINING REQUIREMENTS

Only authorized and trained employees are allowed to enter confined spaces. They must be trained in the duties they are authorized to perform with regard to confined space entry. Training provides the understanding, knowledge, and skills necessary for the safe performance of the duties assigned.

Public Works Management provides training at the following times as required by applicable regulations:

- Before the employee is first assigned confined space duties
- Before any change in assigned duties
- Whenever there is a change in operations that affects the employee
- Whenever there is reason to believe there are inadequacies in the employee's knowledge
- If there is a regulatory change affecting the program

Public Works management documents the training and certifies employee training using the form found in Appendix E. Certification includes documentation of the following:

- The date of training
- A brief description of the material covered
- The names and signatures of the employees trained
- The signature of the individual conducting the training

The training certifications are available for inspection by employees and their authorized representatives, and are kept in the Public Works office.

20.0 RECORDKEEPING REQUIREMENTS

Recordkeeping requirements for the confined space program include the following:

- Maintain training certifications for a period of three years
- Maintain confined space entry permits and non-permit entry logs for a period of twelve months after the activities are completed
- Maintain equipment inspection records for a period of one year

21.0 PERIODIC PROGRAM REVIEW

Conduct a periodic program review (at least annually). This includes the following:

- Review procedures, implementation, and related records. Update the written program as needed. (See the checklist below.)
- Review the list of confined spaces and hazard assessment in Appendix A, and update as necessary. Review confined spaces classified as non-permit and re-evaluate to determine that all potential hazards have been addressed
- Verify that employees are following confined space entry procedures and using related equipment properly
- Verify that employees are using fall protection when required per this Program. Verify that there is safe access and egress into and out of confined spaces, and that fall protection/rescue/retrieval equipment is used appropriately when there is not safe access or egress

Always document corrective actions taken as a result of observations, audits, or program reviews.

Use the checklist below to assess compliance with the confined space entry program:

- Are all confined spaces identified?
- Are there signs posted at entries to confined spaces identifying them as such?
- Are confined space entry procedures followed when entering a confined space?
- Is an evaluation done before each entry? Is a completed permit posted at the entrance to the space during each permit entry?
- Are the additional precautions taken for permit-required confined spaces?
- Are there provisions for rescue during confined space entries?
- Does the Entry Supervisor review and approve the permit before allowing entrance into a permit-required confined space?
- Is all confined space entry equipment available and in good working order for confined space entry? Is equipment inspected before and after use?
- Are contractors notified as to confined space entry requirements, and required to follow an equivalent program?
- Are all Entrants, Attendants, and Entry Supervisors trained in their duties as they relate to confined space entry?

APPENDIX A

List of Confined Spaces and Hazard Assessment

VILLAGE OF HANOVER PARK DEPARTMENT OF PUBLIC WORKS

LIST OF CONFINED SPACES AND HAZARD ASSESSMENT

Location/ Description	Potential Hazards							
	Combustion Byproducts	Decay Waste	Chemical	Mechanical	Engulfment	Entrapment	Electrical	Pressure/ Heat
*Manholes		X			X			
*Sanitary Sewers		X			X			
*Storm Sewers		X			X			
*Wet Well Lift Stations		X		X	X		X	
Dry Well Lift Stations				X			X	
Valve vaults				X	X		X	

NOTE: * GENERALLY PERMIT-REQUIRED. THIS IS AN INITIAL ASSESSMENT. HAZARDS CAN CHANGE. ALWAYS EVALUATE HAZARDS OF ALL SPACES (BOTH PERMIT AND NONPERMIT) PRIOR TO ENTRY.

ENVIRONMENTAL

Combustion Byproducts (CO, CO_2, oxygen deficiency)
Decay Waste Decaying waste (sewage, stagnant water: H_2S, methane, oxygen deficiency)
Chemical (acids, caustics, water treatment chemicals, solvents)

OTHER

Mechanical (Grinders, agitators, other moving parts inside space)
Engulfment (space can contain liquids or solids)
Entrapment (sloping shape or other feature which could trap a person)
Electrical
Pressure/heat

VILLAGE OF HANOVER PARK DEPRTMENT OF PUBLIC WORKS

LIST OF CONFINED SPACES AND HAZARD ASSESSMENT

Location/ Description	Potential Hazards							
	Comb. Byproducts	Decay Waste	Chemical	Mechanical	Engulfment	Entrapment	Electrical	Pressure/ Heat
*Elevated Storage Tanks					X			
Sludge Digestion Tanks		X			X			
*Ground Storage Reservoirs					X			
*Submersible Wet Wells		X		X	X		X	
Sewage Pumping Stations		X		X	X		X	

NOTE: * GENERALLY PERMIT-REQUIRED. THIS IS AN INITIAL ASSESSMENT. HAZARDS CAN CHANGE. ALWAYS EVALUATE HAZARDS OF ALL SPACES (BOTH PERMIT AND NONPERMIT) PRIOR TO ENTRY.

ENVIRONMENTAL

Combustion Byproducts (CO, CO_2, oxygen deficiency)
Decay Waste Decaying waste (sewage, stagnant water: H_2S, methane, oxygen deficiency)
Chemical (acids, caustics, water treatment chemicals, solvents)

OTHER

Mechanical (Grinders, agitators, other moving parts inside space)
Engulfment (space can contain liquids or solids)
Entrapment (sloping shape or other feature which could trap a person)
Electrical, Pressure, Heat

VILLAGE OF HANOVER PARK DEPARTMENT OF PUBLIC WORKS

LIST OF CONFINED SPACES AND HAZARD ASSESSMENT

Location/ Description	Potential Hazards							
	Comb. Byproducts	Decay Waste	Chemical	Mechanical	Engulfment	Entrapment	Electrical	Pressure/ Heat
Filter Backwash Tank		X			X			
Floatable Product Grinding Station		X		X	X		X	
Sludge Holding Tank		X			X			
Return Sludge Pumping Station		X		X	X		X	
Scum Pumping Station		X		X	X		X	
Excess Flow Pumping Station		X		X	X		X	

NOTE: * GENERALLY PERMIT-REQUIRED. THIS IS AN INITIAL ASSESSMENT. HAZARDS CAN CHANGE. ALWAYS EVALUATE HAZARDS OF ALL SPACES, BOTH PERMIT AND NONPERMIT, PRIOR TO ENTRY.

ENVIRONMENTAL

Combustion Byproducts Production byproducts (CO, CO_2, oxygen deficiency)
Decay Waste Decaying waste (sewage, stagnant water: H_2S, methane, oxygen deficiency)
Chemical (acids, caustics, water treatment chemicals, solvents)

OTHER

Mechanical (Grinders, agitators, other moving parts inside space)
Engulfment (space can contain liquids or solids)
Entrapment (sloping shape or other feature which could trap a person)
Electrical
Pressure/heat

VILLAGE OF HANOVER PARK DEPARTMENT OF PUBLIC WORKS

LIST OF CONFINED SPACES AND HAZARD ASSESSMENT

Location/ Description	Potential Hazards							
	Comb. Byproducts	Decay Waste	Chemical	Mechanical	Engulfment	Entrapment	Electrical	Pressure/ Heat
Interconnecting Vaults				X	X		X	
JAWA Metering				X	X		X	
*Pump Wet wells				X	X		X	
*Underground Sludge Storage		X			X			

NOTE: * GENERALLY PERMIT-REQUIRED. THIS IS AN INITIAL ASSESSMENT. HAZARDS CAN CHANGE. ALWAYS EVALUATE HAZARDS FOR ALL SPACES, BOTH PERMIT AND NONPERMIT, PRIOR TO ENTRY.

ENVIRONMENTAL

Combustion Byproducts (CO, CO_2, oxygen deficiency)
Decay Waste Decaying waste (sewage, stagnant water: H_2S, methane, oxygen deficiency)
Chemical (acids, caustics, water treatment chemicals, solvents)

OTHER

Mechanical (Grinders, agitators, other moving parts inside space)
Engulfment (space can contain liquids or solids)
Entrapment (sloping shape or other feature which could trap a person)
Electrical
Pressure/heat

APPENDIX B

COPY OF NON-PERMIT ENTRY LOG

VILLAGE OF HANOVER PARK
PUBLIC WORKS DEPARTMENT

CONFINED SPACE NON-PERMIT ENTRY LOG

Location: _____ Month: _____19 ____

Date	Initials of Person Entering	Initials of Person Entering	Tri-Meter-Readings			Time
			Oxygen	Flammables	Toxic	

APPENDIX C

COPY OF CONFINED SPACE ENTRY PERMIT

CONFINED SPACE ENTRY PERMIT

Village of Hanover Park
2121 W. Lake Street • Hanover Park, IL 60103
(630) 372-4440 • Fax (630) 372-4462

1. Permit Space To Be Entered _____
2. Purpose of Entry _____
3. Date of Entry _____ Authorized Duration of Entry Permit _____
4. Authorized Entrants _____ _____
5. Attendant(s) _____ _____
6. Name of Current Entry Supervisor(s) 1. _____ Time _____
   2. _____ Time _____

   Entry Supervisor Who Originally Authorized Entry _____
   Signature or Initials

7. Record hazards of the permit space to be entered.				8. Check list of the measures used to isolate the permit space and to eliminate or control permit space hazards before entry.
Hazard	Yes	No	N/A	☐ A. Purge-Flush and Vent
A. Lack of Oxygen				
B. Combustible Gases				☐ B. Ventilation
C. Combustible Vapors				
D. Combustible Dusts				☐ C. Lockout/Tag Out
E. Toxic Gases				
F. Toxic Vapors				☐ D. Inerting
G. Chemical Contact				
H. Electrical Hazards				☐ E. Blanking, Blocking, Bleeding
I. Mechanical Exposure				
J. Temperature				☐ F. External Barricades
K. Engulfment				
L. Entrapment				☐ G. Confined Space Identification/Signs
M. Others				

DO NOT DESTROY THIS PERMIT
AFTER CANCELLATION THIS ENTRY PERMIT MUST BE RETAINED BY EMPLOYER FOR AT LEAST ONE YEAR

APPENDIX D

List of Authorized Employees

VILLAGE OF HANOVER PARK
PUBLIC WORKS DEPARTMENT

AUTORIZED EMPLOYEE LIST FOR SPECIFIC CONFINED SPACES

Description	Authorized Employees
Sanitary or Storm Manholes	Street Division Wastewater Treatment Division Water/Meter/Sewer Division
Sanitary Sewers	Water/Meter/Sewer Division with Director of Public Works Approval
Storm Sewers	Street Division with Director of Public Works Approval
Wet Well Lift Stations	Wastewater Treatment Division with Director of Public Works Approval
Dry Well Lift Stations	Wastewater Treatment Division
Valve Vaults	Wastewater Treatment Division Water/Meter/Sewer Division Water Treatment Division
Interconnecting Vaults	Water Treatment Division
JAWA Metering	Water Treatment Division
Pump Wet Wells	Water Treatment Division
Underground Sludge Storage	Wastewater Treatment Division with Director of Public Works Approval
Filter Backwash Tank	Wastewater Treatment Division
Floatable Product Grinding Station	Wastewater Treatment Division
Sludge Holding Tank	Wastewater Treatment Division
Return Sludge Pumping Station	Wastewater Treatment Division
Scum Pumping Station	Wastewater Treatment Division
Excess Flow Pumping Station	Wastewater Treatment Division
Elevated Storage Tanks	Water Treatment Division with Director of Public Works Approval
Sludge Digestion Tanks	Wastewater Treatment Division
Ground Storage Reservoirs	Water Treatment Division
Submersible Wet Wells	Wastewater Treatment Division
Sewage Pumping Stations	Wastewater Treatment Division

APPENDIX E

TRAINING DOCUMENTATION FORM

VILLAGE OF HANOVER PARK DEPARTMENT OF PUBLIC WORKS

CONFINED SPACE PROGRAM RECORD OF EMPLOYEE TRAINING

Date:	**Time:**	**Instructor:**
Topics Covered:		
Materials Used (Booklets, Manuals, Videos, etc.)		

Instructors Statement: *The following list of _____(number) employees have been trained in the requirements of the OSHA confined space regulations, and the Village of Hanover Park Department of Public Works Confined Spaces Program.*

Signature: _____ *Date:*_____

Employee Name (printed)	Employee Number	Employee Signature
1.		
2.		
3.		
4.		
5.		
6.		
7.		

630-372-4440

VILLAGE OF HANOVER PARK

PUBLIC WORKS DEPT	CONFINED SPACE EVALUATION/PERMIT	No.

1. IDENTIFY SPACE AND WORK TO BE DONE

Space to be Entered: _____

Location/Building: _____

Hazardous materials to be taken into or hazardous work to be done in space: _____

Purpose of Entry: _____

Authorized Duration of Permit:

Date: _____ to _____

Time: _____ to _____

2. IDENTIFY CONFINED SPACE HAZARDS

(Indicate specific hazards which may be present)

__ Unsafe to remove cover, excess pressure
__ Excess heat
__ Oxygen deficiency (less than 19.5%)
__ Oxygen enrichment (greater than 23.5%)
__ Flammable gases or vapors (greater than 10% of LEL)
__ Airborne combustible dust (greater than 10% of LEL)
__ Toxic gases or vapors (greater than PEL)
__ Mechanical hazards
__ Electrical shock
__ Materials harmful to skin
__ Engulfment, entrapment, falling slag
__ Other: (examples: noise, wet surfaces, heat, cold, falls, falling objects) _____

4. MAKE SPACE SAFE BEFORE ENTRY

(Check after steps have been taken)

__ Notify affected departments of service interruption

__ Blank/block/blind/bleed
__ Inert
__ Lockout/tagout
__ Ventilate
__ Other

__ Fall protection
__ Purge/flush/clean
__ Atmospheric testing
__ Barriers/Signs

Personnel Awareness:

__ Pre-entry briefing on specific hazards, control methods, and emergency action plan
__ Notify contractors of hazard conditions
__ Test/verify hazardous energy control
__ Other
__ Additional permits required and/or attached:
__ Hotwork __ Other: _____

3. TEST SPACE BEFORE INITIAL ENTRY & REGULARLY THEREAFTER (and before open flamework)

Material	Normal Air	Acceptable Entry Conditions	Initial Test : AM/PM	Result : AM/PM	Result : AM/PM
Oxygen-min/max	20.9	> 19.5% < 23.5%			
Flammability	0	< 10% LEL/LFL			
Hydrogen Sulfide	0	< 10 ppm			
Carbon monoxide	0	< 50 ppm			
Other (Specify)					
Tester Initials					

Always investigate before entry if conditions do not match normal air

5. CERTIFY CONTROL MEASURES TAKEN, CLASSIFY SPACE, AND POST THIS FORM

__ **Nonpermit space**: All hazards eliminated, none to be released by work. Follow basic safety precautions for the work. **COMPLETE SECTIONS 6 AND 7 BELOW. SKIP PAGE 2.**

__ **Forced Ventilation Controlled:** Only environmental hazards remain or will be released by work, which are controllable by ventilation. Ventilate before and during entry, with regular tests to ensure safety of air in the space. **COMPLETE SECTIONS 6 AND 7 BELOW. SKIP PAGE 2.**

__ **Permit Required:** Atmospheric and/or physical hazards remain. **SKIP SECTIONS 6 AND 7 BELOW. GO TO PAGE 2 AND COMPLETE.**

Entrant Printed Name: _____ Signature: _____ Date/Time: _____

6. AUTHORIZATION BY SUPERVISOR IN CHARGE TO ENTER NONPERMIT SPACE

I certify that all required precautions have been taken and necessary equipment (including personal fall protection as required) is provided for safe entry and work in this confined space and that the space is not permit required.

Supervisor in Charge Printed Name: _____ Signature: _____ Date/Time: _____

7. END ENTRY (For nonpermit spaces)

I have checked the space to make sure no one is in it, and all measures required to return it back to normal service have been performed. I authorize the return of this space to normal service.

Problems that occurred: _____

Suggestions: _____

Supervisor in Charge Printed Name: _____ Signature: _____ Date/Time: _____

THIS FORM MUST BE POSTED AT SPACE ENTRANCE • PERMIT GOOD ONLY FOR THE DURATION OF THE JOB
NO LIMIT ON NONPERMIT OR FORCED VENTILATION SPACE UNLESS HAZARDS CHANGE

VILLAGE OF HANOVER PARK 630-372-4440

PUBLIC WORKS DEPT	CONFINED SPACE EVALUATION/PERMIT	No.

8-1. LISTING/SIGNATURE OF AUTHORIZED ENTRANTS
(List by name or attach roster)

_____
_____
_____
_____

8-2. LISTING/SIGNATURE OF AUTHORIZED ATTENDANT
(List by name)

_____
_____
_____
_____

8-3. ENSURE EMERGENCY RESCUE AVAILABLE

Name: _____

Method of Contact: _____

Phone number: _____

8-4 OBTAIN EQUIPMENT REQUIRED FOR ENTRY AND WORK

Establish communication procedures to be used by attendants and entrants: _____
_____
_____

Specify as required:
Personal Protective Equipment: _____
_____
_____

Continuous or Periodic Atmospheric Testing/Monitoring: _____
_____
_____

Respiratory Protection Equipment (if applicable): _____
_____

Rescue Equipment: _____
_____

Other (such as lighting, ladders for safe access/egress): _____
_____
_____

9. AUTHORIZATION BY ENTRY SUPERVISOR TO ENTER PERMIT REQUIRED SPACE

I certify that all required precautions have been taken and necessary equipment is provided for safe entry and work in this confined space and that the space is permit required.

Entry Supervisor Printed Name: _____ Signature: _____ Date/Time: _____

10. END ENTRY (For permit spaces)

I have checked the space to make sure no one is in it, and all measures required to return it back to normal service have been performed. I authorize the return of this space to normal service.

Problems that occurred: _____
_____

Suggestions: _____
_____

Entry Supervisor Printed Name: _____ Signature: _____ Date/Time: _____

THIS FORM MUST BE POSTED AT SPACE ENTRANCE • PERMIT GOOD ONLY FOR THE DURATION OF THE JOB
NO LIMIT ON NONPERMIT OR FORCED-VENTILATION SPACE UNLESS HAZARDS CHANGE

11/16/98

APPENDIX A

Regulations (Standards - 29 CFR)

Permit-required confined spaces - 1910.146

Regulations (Standards - 29 CFR) - Table of Contents

• **Part Number:**	1910
• **Part Title:**	Occupational Safety and Health Standards
• **Subpart:**	J
• **Subpart Title:**	General Environmental Controls
• **Standard Number:**	1910.146
• **Title:**	Permit-required confined spaces
• **Appendix:**	A , B , C , D , E , F

1910.146(a)

Scope and application. This section contains requirements for practices and procedures to protect employees in general industry from the hazards of entry into permit-required confined spaces. This section does not apply to agriculture, to construction, or to shipyard employment (Parts 1928, 1926, and 1915 of this chapter, respectively).

1910.146(b)

Definitions.

"Acceptable entry conditions" means the conditions that must exist in a permit space to allow entry and to ensure that employees involved with a permit-required confined space entry can safely enter into and work within the space.

"Attendant" means an individual stationed outside one or more permit spaces who monitors the authorized entrants and who performs all attendant's duties assigned in the employer's permit space program.

"Authorized entrant" means an employee who is authorized by the employer to enter a permit space.

"Blanking or blinding" means the absolute closure of a pipe, line, or duct by the fastening of a solid plate (such as a spectacle blind or a skillet blind) that completely covers the bore and that is capable of withstanding the maximum pressure of the pipe, line, or duct with no leakage beyond the plate.

"Confined space" means a space that:

(1) Is large enough and so configured that an employee can bodily enter and perform assigned work; and

(2) Has limited or restricted means for entry or exit (for example, tanks, vessels, silos, storage bins, hoppers, vaults, and pits are spaces that may have limited means of entry.); and

(3) Is not designed for continuous employee occupancy.

"Double block and bleed" means the closure of a line, duct, or pipe by closing and locking or tagging two in-line valves and by opening and locking or tagging a drain or vent valve in the line between the two closed valves.

"Emergency" means any occurrence (including any failure of hazard control or monitoring equipment) or event internal or external to the permit space that could endanger entrants.

"Engulfment" means the surrounding and effective capture of a person by a liquid or finely divided (flowable) solid substance that can be aspirated to cause death by filling or plugging the respiratory system or that can exert enough force on the body to cause death by strangulation, constriction, or crushing.

"Entry" means the action by which a person passes through an opening into a permit-required confined space. Entry includes ensuing work activities in that space and is considered to have occurred as soon as any part of the entrant's body breaks the plane of an opening into the space.

"Entry permit (permit)" means the written or printed document that is provided by the employer to allow and control entry into a permit space and that contains the information specified in paragraph (f) of this section.

"Entry supervisor" means the person (such as the employer, foreman, or crew chief) responsible for determining if acceptable entry conditions are present at a permit space where entry is planned, for authorizing entry and overseeing entry operations, and for terminating entry as required by this section.

NOTE: An entry supervisor also may serve as an attendant or as an authorized entrant, as long as that person is trained and equipped as required by this section for each role he or she fills. Also, the duties of entry supervisor may be passed from one individual to another during the course of an entry operation.

"Hazardous atmosphere" means an atmosphere that may expose employees to the risk of death, incapacitation, impairment of ability to self-rescue (that is, escape unaided from a permit space), injury, or acute illness from one or more of the following causes:

(1) Flammable gas, vapor, or mist in excess of 10 percent of its lower flammable limit (LFL);

(2) Airborne combustible dust at a concentration that meets or exceeds its LFL;

NOTE: This concentration may be approximated as a condition in which the dust obscures vision at a distance of 5 feet (1.52 m) or less.

(3) Atmospheric oxygen concentration below 19.5 percent or above 23.5 percent;

(4) Atmospheric concentration of any substance for which a dose or a permissible exposure limit is published in Subpart G, Occupational Health and Environmental Control, or in Subpart Z, Toxic and Hazardous Substances, of this Part and which could result in employee exposure in excess of its dose or permissible exposure limit;

NOTE: An atmospheric concentration of any substance that is not capable of causing death, incapacitation, impairment of ability to self-rescue, injury, or acute illness due to its health effects is not covered by this provision.

(5) Any other atmospheric condition that is immediately dangerous to life or health.

NOTE: For air contaminants for which OSHA has not determined a dose or permissible exposure limit, other sources of information, such as Material Safety Data Sheets that comply with the Hazard Communication Standard, section 1910.1200 of this Part, published information, and internal documents can provide guidance in establishing acceptable atmospheric conditions.

"Hot work permit" means the employer's written authorization to perform operations (for example, riveting, welding, cutting, burning, and heating) capable of providing a source of ignition.

"Immediately dangerous to life or health (IDLH)" means any condition that poses an immediate or delayed threat to life or that would cause irreversible adverse health effects or that would interfere with an individual's ability to escape unaided from a permit space.

NOTE: Some materials -- hydrogen fluoride gas and cadmium vapor, for example -- may produce immediate transient effects that, even if severe, may pass without medical attention, but are followed by sudden, possibly fatal collapse 12-72 hours after exposure. The victim "feels normal" from recovery from transient effects until collapse. Such materials in hazardous quantities are

considered to be "immediately" dangerous to life or health.

"Inerting" means the displacement of the atmosphere in a permit space by a noncombustible gas (such as nitrogen) to such an extent that the resulting atmosphere is noncombustible.

NOTE: This procedure produces an IDLH oxygen-deficient atmosphere.

"Isolation" means the process by which a permit space is removed from service and completely protected against the release of energy and material into the space by such means as: blanking or blinding; misaligning or removing sections of lines, pipes, or ducts; a double block and bleed system; lockout or tagout of all sources of energy; or blocking or disconnecting all mechanical linkages.

"Line breaking" means the intentional opening of a pipe, line, or duct that is or has been carrying flammable, corrosive, or toxic material, an inert gas, or any fluid at a volume, pressure, or temperature capable of causing injury.

"Non-permit confined space" means a confined space that does not contain or, with respect to atmospheric hazards, have the potential to contain any hazard capable of causing death or serious physical harm.

"Oxygen deficient atmosphere" means an atmosphere containing less than 19.5 percent oxygen by volume.

"Oxygen enriched atmosphere" means an atmosphere containing more than 23.5 percent oxygen by volume.

"Permit-required confined space (permit space)" means a confined space that has one or more of the following characteristics:

(1) Contains or has a potential to contain a hazardous atmosphere;

(2) Contains a material that has the potential for engulfing an entrant;

(3) Has an internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls or by a floor which slopes downward and tapers to a smaller cross-section; or

(4) Contains any other recognized serious safety or health hazard.

"Permit-required confined space program (permit space program)" means the employer's overall program for controlling, and, where appropriate, for protecting employees from, permit space hazards and for regulating employee entry into permit spaces.

"Permit system" means the employer's written procedure for preparing and issuing permits for entry and for returning the permit space to service following termination of entry.

"Prohibited condition" means any condition in a permit space that is not allowed by the permit during the period when entry is authorized.

"Rescue service" means the personnel designated to rescue employees from permit spaces.

"Retrieval system" means the equipment (including a retrieval line, chest or full-body harness, wristlets, if appropriate, and a lifting device or anchor) used for non-entry rescue of persons from permit spaces.

"Testing" means the process by which the hazards that may confront entrants of a permit space are identified and evaluated. Testing includes specifying the tests that are to be performed in the permit space.

NOTE: Testing enables employers both to devise and implement adequate control measures for the protection of authorized entrants and to determine if acceptable entry conditions are present immediately prior to, and during, entry.

1910.146(c)

General requirements.

1910.146(c)(1)

The employer shall evaluate the workplace to determine if any spaces are permit-required confined spaces.

NOTE: Proper application of the decision flow chart in Appendix A to section 1910.146 would facilitate compliance with this requirement.

1910.146(c)(2)

If the workplace contains permit spaces, the employer shall inform exposed employees, by posting danger signs or by any other equally effective means, of the existence and location of and the danger posed by the permit spaces.

NOTE: A sign reading DANGER -- PERMIT-REQUIRED CONFINED SPACE, DO NOT ENTER or using other similar language would satisfy the requirement for a sign.

..1910.146(c)(3)

1910.146(c)(3)

If the employer decides that its employees will not enter permit spaces, the employer shall take effective measures to prevent its employees from entering the permit spaces and shall comply with paragraphs (c)(1), (c)(2), (c)(6), and (c)(8) of this section.

1910.146(c)(4)

If the employer decides that its employees will enter permit spaces, the employer shall develop and implement a written permit space program that complies with this section. The written program shall be available for inspection by employees and their authorized representatives.

1910.146(c)(5)

An employer may use the alternate procedures specified in paragraph (c)(5)(ii) of this section for entering a permit space under the conditions set forth in paragraph (c)(5)(i) of this section.

1910.146(c)(5)(i)

An employer whose employees enter a permit space need not comply with paragraphs (d) through (f) and (h) through (k) of this section, provided that:

1910.146(c)(5)(i)(A)

The employer can demonstrate that the only hazard posed by the permit space is an actual or potential hazardous atmosphere;

1910.146(c)(5)(i)(B)

The employer can demonstrate that continuous forced air ventilation alone is sufficient to maintain that permit space safe for entry;

1910.146(c)(5)(i)(C)

The employer develops monitoring and inspection data that supports the demonstrations required by paragraphs (c)(5)(i)(A) and (c)(5)(i)(B) of this section;

1910.146(c)(5)(i)(D)

If an initial entry of the permit space is necessary to obtain the data required by paragraph (c)(5)(i)(C) of this section, the entry is performed in compliance with paragraphs (d) through (k) of this section;

1910.146(c)(5)(i)(E)

The determinations and supporting data required by paragraphs (c)(5)(i)(A), (c)(5)(i)(B), and (c)(5)(i)(C) of this section are documented by the employer and are made available to each employee who enters the permit space under the terms of paragraph (c)(5) of this section or to that employee's authorized representative; and

1910.146(c)(5)(i)(F)

Entry into the permit space under the terms of paragraph (c)(5)(i) of this section is performed in accordance with the requirements of paragraph (c)(5)(ii) of this section.

NOTE: See paragraph (c)(7) of this section for reclassification of a permit space after all hazards within the space have been eliminated.

1910.146(c)(5)(ii)

The following requirements apply to entry into permit spaces that meet the conditions set forth in paragraph (c)(5)(i) of this section.

1910.146(c)(5)(ii)(A)

Any conditions making it unsafe to remove an entrance cover shall be eliminated before the cover is

removed.

..1910.146(c)(5)(ii)(B)

1910.146(c)(5)(ii)(B)

When entrance covers are removed, the opening shall be promptly guarded by a railing, temporary cover, or other temporary barrier that will prevent an accidental fall through the opening and that will protect each employee working in the space from foreign objects entering the space.

1910.146(c)(5)(ii)(C)

Before an employee enters the space, the internal atmosphere shall be tested, with a calibrated direct-reading instrument, for oxygen content, for flammable gases and vapors, and for potential toxic air contaminants, in that order. Any employee who enters the space, or that employee's authorized representative, shall be provided an opportunity to observe the pre-entry testing required by this paragraph.

1910.146(c)(5)(ii)(C)(1)

Oxygen content,

1910.146(c)(5)(ii)(C)(2)

Flammable gases and vapors, and

1910.146(c)(5)(ii)(C)(3)

Potential toxic air contaminants.

1910.146(c)(5)(ii)(D)

There may be no hazardous atmosphere within the space whenever any employee is inside the space.

1910.146(c)(5)(ii)(E)

Continuous forced air ventilation shall be used, as follows:

1910.146(c)(5)(ii)(E)(1)

An employee may not enter the space until the forced air ventilation has eliminated any hazardous atmosphere;

1910.146(c)(5)(ii)(E)(2)

The forced air ventilation shall be so directed as to ventilate the immediate areas where an employee is or will be present within the space and shall continue until all employees have left the space;

1910.146(c)(5)(ii)(E)(3)

The air supply for the forced air ventilation shall be from a clean source and may not increase the hazards in the space.

1910.146(c)(5)(ii)(F)

The atmosphere within the space shall be periodically tested as necessary to ensure that the continuous forced air ventilation is preventing the accumulation of a hazardous atmosphere. Any employee who enters the space, or that employee's authorized representative, shall be provided with an opportunity to observe the periodic testing required by this paragraph.

1910.146(c)(5)(ii)(G)

If a hazardous atmosphere is detected during entry:

1910.146(c)(5)(ii)(G)(1)

Each employee shall leave the space immediately;

1910.146(c)(5)(ii)(G)(2)

The space shall be evaluated to determine how the hazardous atmosphere developed; and

1910.146(c)(5)(ii)(G)(3)

Measures shall be implemented to protect employees from the hazardous atmosphere before any subsequent entry takes place.

1910.146(c)(5)(ii)(H)

The employer shall verify that the space is safe for entry and that the pre-entry measures required by paragraph (c)(5)(ii) of this section have been taken, through a written certification that contains the date, the location of the space, and the signature of the person providing the certification. The certification shall be made before entry and shall be made available to each employee entering the space or to that employee's authorized representative.

1910.146(c)(6)

When there are changes in the use or configuration of a non-permit confined space that might increase the hazards to entrants, the employer shall reevaluate that space and, if necessary, reclassify it as a permit-required confined space.

..1910.146(c)(7)

1910.146(c)(7)

A space classified by the employer as a permit-required confined space may be reclassified as a non-permit confined space under the following procedures:

1910.146(c)(7)(i)

If the permit space poses no actual or potential atmospheric hazards and if all hazards within the space are eliminated without entry into the space, the permit space may be reclassified as a non-permit confined space for as long as the non-atmospheric hazards remain eliminated.

1910.146(c)(7)(ii)

If it is necessary to enter the permit space to eliminate hazards, such entry shall be performed under paragraphs (d) through (k) of this section. If testing and inspection during that entry demonstrate that the hazards within the permit space have been eliminated, the permit space may be reclassified as a non-permit confined space for as long as the hazards remain eliminated.

NOTE: Control of atmospheric hazards through forced air ventilation does not constitute elimination of the hazards. Paragraph (c)(5) covers permit space entry where the employer can demonstrate that forced air ventilation alone will control all hazards in the space.

1910.146(c)(7)(iii)

The employer shall document the basis for determining that all hazards in a permit space have been eliminated, through a certification that contains the date, the location of the space, and the signature of the person making the determination. The certification shall be made available to each employee entering the space or to that employee's authorized representative.

1910.146(c)(7)(iv)

If hazards arise within a permit space that has been declassified to a non-permit space under paragraph (c)(7) of this section, each employee in the space shall exit the space. The employer shall then reevaluate the space and determine whether it must be reclassified as a permit space, in accordance with other applicable provisions of this section.

1910.146(c)(8)

When an employer (host employer) arranges to have employees of another employer (contractor) perform work that involves permit space entry, the host employer shall:

1910.146(c)(8)(i)

Inform the contractor that the workplace contains permit spaces and that permit space entry is allowed only through compliance with a permit space program meeting the requirements of this section;

1910.146(c)(8)(ii)

Apprise the contractor of the elements, including the hazards identified and the host employer's experience with the space, that make the space in question a permit space;

1910.146(c)(8)(iii)

Apprise the contractor of any precautions or procedures that the host employer has implemented for the protection of employees in or near permit spaces where contractor personnel will be working;

1910.146(c)(8)(iv)

Coordinate entry operations with the contractor, when both host employer personnel and contractor personnel will be working in or near permit spaces, as required by paragraph (d)(11) of this section; and

..1910.146(c)(8)(v)

1910.146(c)(8)(v)

Debrief the contractor at the conclusion of the entry operations regarding the permit space program followed and regarding any hazards confronted or created in permit spaces during entry operations.

1910.146(c)(9)

In addition to complying with the permit space requirements that apply to all employers, each contractor who is retained to perform permit space entry operations shall:

1910.146(c)(9)(i)

Obtain any available information regarding permit space hazards and entry operations from the host employer;

1910.146(c)(9)(ii)

Coordinate entry operations with the host employer, when both host employer personnel and contractor personnel will be working in or near permit spaces, as required by paragraph (d)(11) of this section; and

1910.146(c)(9)(iii)

Inform the host employer of the permit space program that the contractor will follow and of any hazards confronted or created in permit spaces, either through a debriefing or during the entry operation.

1910.146(d)

Permit-required confined space program (permit space program). Under the permit space program required by paragraph (c)(4) of this section, the employer shall:

1910.146(d)(1)

Implement the measures necessary to prevent unauthorized entry;

1910.146(d)(2)
Identify and evaluate the hazards of permit spaces before employees enter them;
1910.146(d)(3)
Develop and implement the means, procedures, and practices necessary for safe permit space entry operations, including, but not limited to, the following:
1910.146(d)(3)(i)
Specifying acceptable entry conditions;
1910.146(d)(3)(ii)
Providing each authorized entrant or that employee's authorized representative with the opportunity to observe any monitoring or testing of permit spaces;
1910.146(d)(3)(iii)
Isolating the permit space;
1910.146(d)(3)(iv)
Purging, inerting, flushing, or ventilating the permit space as necessary to eliminate or control atmospheric hazards;
1910.146(d)(3)(v)
Providing pedestrian, vehicle, or other barriers as necessary to protect entrants from external hazards; and
1910.146(d)(3)(vi)
Verifying that conditions in the permit space are acceptable for entry throughout the duration of an authorized entry.
1910.146(d)(4)
Provide the following equipment (specified in paragraphs (d)(4)(i) through (d)(4)(ix) of this section) at no cost to employees, maintain that equipment properly, and ensure that employees use that equipment properly:
..1910.146(d)(4)(i)

1910.146(d)(4)(i)
Testing and monitoring equipment needed to comply with paragraph (d)(5) of this section;
1910.146(d)(4)(ii)
Ventilating equipment needed to obtain acceptable entry conditions;
1910.146(d)(4)(iii)
Communications equipment necessary for compliance with paragraphs (h)(3) and (i)(5) of this section;
1910.146(d)(4)(iv)
Personal protective equipment insofar as feasible engineering and work practice controls do not adequately protect employees;
1910.146(d)(4)(v)
Lighting equipment needed to enable employees to see well enough to work safely and to exit the space quickly in an emergency;
1910.146(d)(4)(vi)
Barriers and shields as required by paragraph (d)(3)(iv) of this section;
1910.146(d)(4)(vii)
Equipment, such as ladders, needed for safe ingress and egress by authorized entrants;
1910.146(d)(4)(viii)
Rescue and emergency equipment needed to comply with paragraph (d)(9) of this section, except to the extent that the equipment is provided by rescue services; and
1910.146(d)(4)(ix)
Any other equipment necessary for safe entry into and rescue from permit spaces.
1910.146(d)(5)
Evaluate permit space conditions as follows when entry operations are conducted:
1910.146(d)(5)(i)
Test conditions in the permit space to determine if acceptable entry conditions exist before entry is authorized to begin, except that, if isolation of the space is infeasible because the space is large or is part of a continuous system (such as a sewer), pre-entry testing shall be performed to the extent feasible before entry is authorized and, if entry is authorized, entry conditions shall be continuously monitored in the areas where authorized entrants are working;
1910.146(d)(5)(ii)
Test or monitor the permit space as necessary to determine if acceptable entry conditions are being maintained during the course of entry operations; and
1910.146(d)(5)(iii)
When testing for atmospheric hazards, test first for oxygen, then for combustible gases and vapors, and then for toxic gases and vapors.
1910.146(d)(5)(iv)
Provide each authorized entrant or that employee's authorized representative an opportunity to

observe the pre-entry and any subsequent testing or monitoring of permit spaces;
1910.146(d)(5)(v)
Reevaluate the permit space in the presence of any authorized entrant or that employee's authorized representative who requests that the employer conduct such reevaluation because the entrant or representative has reason to believe that the evaluation of that space may not have been adequate;
1910.146(d)(5)(vi)
Immediately provide each authorized entrant or that employee's authorized representative with the results of any testing conducted in accord with paragraph (d) of this section.

NOTE: Atmospheric testing conducted in accordance with Appendix B to section 1910.146 would be considered as satisfying the requirements of this paragraph. For permit space operations in sewers, atmospheric testing conducted in accordance with Appendix B, as supplemented by Appendix E to section 1910.146, would be considered as satisfying the requirements of this paragraph.
1910.146(d)(6)
Provide at least one attendant outside the permit space into which entry is authorized for the duration of entry operations;

NOTE: Attendants may be assigned to monitor more than one permit space provided the duties described in paragraph (i) of this section can be effectively performed for each permit space that is monitored. Likewise, attendants may be stationed at any location outside the permit space to be monitored as long as the duties described in paragraph (i) of this section can be effectively performed for each permit space that is monitored.
..1910.146(d)(7)

1910.146(d)(7)
If multiple spaces are to be monitored by a single attendant, include in the permit program the means and procedures to enable the attendant to respond to an emergency affecting one or more of the permit spaces being monitored without distraction from the attendant's responsibilities under paragraph (i) of this section;
1910.146(d)(8)
Designate the persons who are to have active roles (as, for example, authorized entrants, attendants, entry supervisors, or persons who test or monitor the atmosphere in a permit space) in entry operations, identify the duties of each such employee, and provide each such employee with the training required by paragraph (g) of this section;
1910.146(d)(9)
Develop and implement procedures for summoning rescue and emergency services, for rescuing entrants from permit spaces, for providing necessary emergency services to rescued employees, and for preventing unauthorized personnel from attempting a rescue;
1910.146(d)(10)
Develop and implement a system for the preparation, issuance, use, and cancellation of entry permits as required by this section;
1910.146(d)(11)
Develop and implement procedures to coordinate entry operations when employees of more than one employer are working simultaneously as authorized entrants in a permit space, so that employees of one employer do not endanger the employees of any other employer;
1910.146(d)(12)
Develop and implement procedures (such as closing off a permit space and canceling the permit) necessary for concluding the entry after entry operations have been completed;
1910.146(d)(13)
Review entry operations when the employer has reason to believe that the measures taken under the permit space program may not protect employees and revise the program to correct deficiencies found to exist before subsequent entries are authorized; and

NOTE: Examples of circumstances requiring the review of the permit space program are: any unauthorized entry of a permit space, the detection of a permit space hazard not covered by the permit, the detection of a condition prohibited by the permit, the occurrence of an injury or near-miss during entry, a change in the use or configuration of a permit space, and employee complaints about the effectiveness of the program.
1910.146(d)(14)
Review the permit space program, using the canceled permits retained under paragraph (e)(6) of this section within 1 year after each entry and revise the program as necessary, to ensure that employees participating in entry operations are protected from permit space hazards.

NOTE: Employers may perform a single annual review covering all entries performed during a 12-month period. If no entry is performed during a 12-month period, no review is necessary.

Appendix C to section 1910.146 presents examples of permit space programs that are considered to comply with the requirements of paragraph (d) of this section.

1910.146(e)

Permit system.

1910.146(e)(1)

Before entry is authorized, the employer shall document the completion of measures required by paragraph (d)(3) of this section by preparing an entry permit.

NOTE: Appendix D to section 1910.146 presents examples of permits whose elements are considered to comply with the requirements of this section.

1910.146(e)(2)

Before entry begins, the entry supervisor identified on the permit shall sign the entry permit to authorize entry.

1910.146(e)(3)

The completed permit shall be made available at the time of entry to all authorized entrants or their authorized representatives, by posting it at the entry portal or by any other equally effective means, so that the entrants can confirm that pre-entry preparations have been completed.

..1910.146(e)(4)

1910.146(e)(4)

The duration of the permit may not exceed the time required to complete the assigned task or job identified on the permit in accordance with paragraph (f)(2) of this section.

1910.146(e)(5)

The entry supervisor shall terminate entry and cancel the entry permit when:

1910.146(e)(5)(i)

The entry operations covered by the entry permit have been completed; or

1910.146(e)(5)(ii)

A condition that is not allowed under the entry permit arises in or near the permit space.

1910.146(e)(6)

The employer shall retain each canceled entry permit for at least 1 year to facilitate the review of the permit-required confined space program required by paragraph (d)(14) of this section. Any problems encountered during an entry operation shall be noted on the pertinent permit so that appropriate revisions to the permit space program can be made.

1910.146(f)

Entry permit. The entry permit that documents compliance with this section and authorizes entry to a permit space shall identify:

1910.146(f)(1)

The permit space to be entered;

1910.146(f)(2)

The purpose of the entry;

1910.146(f)(3)

The date and the authorized duration of the entry permit;

1910.146(f)(4)

The authorized entrants within the permit space, by name or by such other means (for example, through the use of rosters or tracking systems) as will enable the attendant to determine quickly and accurately, for the duration of the permit, which authorized entrants are inside the permit space;

NOTE: This requirement may be met by inserting a reference on the entry permit as to the means used, such as a roster or tracking system, to keep track of the authorized entrants within the permit space.

1910.146(f)(5)

The personnel, by name, currently serving as attendants;

1910.146(f)(6)

The individual, by name, currently serving as entry supervisor, with a space for the signature or initials of the entry supervisor who originally authorized entry;

1910.146(f)(7)

The hazards of the permit space to be entered;

1910.146(f)(8)

The measures used to isolate the permit space and to eliminate or control permit space hazards

before entry;

NOTE: Those measures can include the lockout or tagging of equipment and procedures for purging, inerting, ventilating, and flushing permit spaces.

1910.146(f)(9)

The acceptable entry conditions;

1910.146(f)(10)

The results of initial and periodic tests performed under paragraph (d)(5) of this section, accompanied by the names or initials of the testers and by an indication of when the tests were performed;

..1910.146(f)(11)

1910.146(f)(11)

The rescue and emergency services that can be summoned and the means (such as the equipment to use and the numbers to call) for summoning those services;

1910.146(f)(12)

The communication procedures used by authorized entrants and attendants to maintain contact during the entry;

1910.146(f)(13)

Equipment, such as personal protective equipment, testing equipment, communications equipment, alarm systems, and rescue equipment, to be provided for compliance with this section;

1910.146(f)(14)

Any other information whose inclusion is necessary, given the circumstances of the particular confined space, in order to ensure employee safety; and (15) Any additional permits, such as for hot work, that have been issued to authorize work in the permit space.

1910.146(g)

Training.

1910.146(g)(1)

The employer shall provide training so that all employees whose work is regulated by this section acquire the understanding, knowledge, and skills necessary for the safe performance of the duties assigned under this section.

1910.146(g)(2)

Training shall be provided to each affected employee:

1910.146(g)(2)(i)

Before the employee is first assigned duties under this section;

1910.146(g)(2)(ii)

Before there is a change in assigned duties;

1910.146(g)(2)(iii)

Whenever there is a change in permit space operations that presents a hazard about which an employee has not previously been trained;

1910.146(g)(2)(iv)

Whenever the employer has reason to believe either that there are deviations from the permit space entry procedures required by paragraph (d)(3) of this section or that there are inadequacies in the employee's knowledge or use of these procedures.

1910.146(g)(3)

The training shall establish employee proficiency in the duties required by this section and shall introduce new or revised procedures, as necessary, for compliance with this section.

1910.146(g)(4)

The employer shall certify that the training required by paragraphs (g)(1) through (g)(3) of this section has been accomplished. The certification shall contain each employee's name, the signatures or initials of the trainers, and the dates of training. The certification shall be available for inspection by employees and their authorized representatives.

1910.146(h)

Duties of authorized entrants. The employer shall ensure that all authorized entrants:

..1910.146(h)(1)

1910.146(h)(1)

Know the hazards that may be faced during entry, including information on the mode, signs or symptoms, and consequences of the exposure;

1910.146(h)(2)

Properly use equipment as required by paragraph (d)(4) of this section;

1910.146(h)(3)

Communicate with the attendant as necessary to enable the attendant to monitor entrant status and to enable the attendant to alert entrants of the need to evacuate the space as required by paragraph

(i)(6) of this section;
1910.146(h)(4)
Alert the attendant whenever:
1910.146(h)(4)(i)
The entrant recognizes any warning sign or symptom of exposure to a dangerous situation, or
1910.146(h)(4)(ii)
The entrant detects a prohibited condition; and
1910.146(h)(5)
Exit from the permit space as quickly as possible whenever:
1910.146(h)(5)(i)
An order to evacuate is given by the attendant or the entry supervisor,
1910.146(h)(5)(ii)
The entrant recognizes any warning sign or symptom of exposure to a dangerous situation,
1910.146(h)(5)(iii)
The entrant detects a prohibited condition, or
1910.146(h)(5)(iv)
An evacuation alarm is activated.
1910.146(i)
Duties of attendants. The employer shall ensure that each attendant:
1910.146(i)(1)
Knows the hazards that may be faced during entry, including information on the mode, signs or symptoms, and consequences of the exposure;
1910.146(i)(2)
Is aware of possible behavioral effects of hazard exposure in authorized entrants;
1910.146(i)(3)
Continuously maintains an accurate count of authorized entrants in the permit space and ensures that the means used to identify authorized entrants under paragraph (f)(4) of this section accurately identifies who is in the permit space;
1910.146(i)(4)
Remains outside the permit space during entry operations until relieved by another attendant;

NOTE: When the employer's permit entry program allows attendant entry for rescue, attendants may enter a permit space to attempt a rescue if they have been trained and equipped for rescue operations as required by paragraph (k)(1) of this section and if they have been relieved as required by paragraph (i)(4) of this section.
1910.146(i)(5)
Communicates with authorized entrants as necessary to monitor entrant status and to alert entrants of the need to evacuate the space under paragraph (i)(6) of this section;
..1910.146(i)(6)

1910.146(i)(6)
Monitors activities inside and outside the space to determine if it is safe for entrants to remain in the space and orders the authorized entrants to evacuate the permit space immediately under any of the following conditions;
1910.146(i)(6)(i)
If the attendant detects a prohibited condition;
1910.146(i)(6)(ii)
If the attendant detects the behavioral effects of hazard exposure in an authorized entrant;
1910.146(i)(6)(iii)
If the attendant detects a situation outside the space that could endanger the authorized entrants; or
1910.146(i)(6)(iv)
If the attendant cannot effectively and safely perform all the duties required under paragraph (i) of this section;
1910.146(i)(7)
Summon rescue and other emergency services as soon as the attendant determines that authorized entrants may need assistance to escape from permit space hazards;
1910.146(i)(8)
Takes the following actions when unauthorized persons approach or enter a permit space while entry is underway:
1910.146(i)(8)(i)
Warn the unauthorized persons that they must stay away from the permit space;
1910.146(i)(8)(ii)
Advise the unauthorized persons that they must exit immediately if they have entered the permit space; and

1910.146(i)(8)(iii)
Inform the authorized entrants and the entry supervisor if unauthorized persons have entered the permit space;
1910.146(i)(9)
Performs non-entry rescues as specified by the employer's rescue procedure; and
1910.146(i)(10)
Performs no duties that might interfere with the attendant's primary duty to monitor and protect the authorized entrants.
1910.146(j)
Duties of entry supervisors. The employer shall ensure that each entry supervisor:
1910.146(j)(1)
Knows the hazards that may be faced during entry, including information on the mode, signs or symptoms, and consequences of the exposure;
1910.146(j)(2)
Verifies, by checking that the appropriate entries have been made on the permit, that all tests specified by the permit have been conducted and that all procedures and equipment specified by the permit are in place before endorsing the permit and allowing entry to begin;
..1910.146(j)(3)

1910.146(j)(3)
Terminates the entry and cancels the permit as required by paragraph (e)(5) of this section;
1910.146(j)(4)
Verifies that rescue services are available and that the means for summoning them are operable;
1910.146(j)(5)
Removes unauthorized individuals who enter or who attempt to enter the permit space during entry operations; and
1910.146(j)(6)
Determines, whenever responsibility for a permit space entry operation is transferred and at intervals dictated by the hazards and operations performed within the space, that entry operations remain consistent with terms of the entry permit and that acceptable entry conditions are maintained.
1910.146(k)
Rescue and emergency services.
1910.146(k)(1)
An employer who designates rescue and emergency services, pursuant to paragraph (d)(9) of this section, shall:
1910.146(k)(1)(i)
Evaluate a prospective rescuer's ability to respond to a rescue summons in a timely manner, considering the hazard(s) identified;

Note to paragraph (k)(l)(i): What will be considered timely will vary according to the specific hazards involved in each entry. For example, §1910.134, Respiratory Protection, requires that employers provide a standby person or persons capable of immediate action to rescue employee(s) wearing respiratory protection while in work areas defined as IDLH atmospheres.
1910.146(k)(1)(ii)
Evaluate a prospective rescue service's ability, in terms of proficiency with rescue-related tasks and equipment, to function appropriately while rescuing entrants from the particular permit space or types of permit spaces identified;
1910.146(k)(1)(iii)
Select a rescue team or service from those evaluated that:
1910.146(k)(1)(iii)(A)
Has the capability to reach the victim(s) within a time frame that is appropriate for the permit space hazard(s) identified;
1910.146(k)(1)(iii)(B)
Is equipped for and proficient in performing the needed rescue services;
1910.146(k)(1)(iv)
Inform each rescue team or service of the hazards they may confront when called on to perform rescue at the site; and
1910.146(k)(1)(v)
Provide the rescue team or service selected with access to all permit spaces from which rescue may be necessary so that the rescue service can develop appropriate rescue plans and practice rescue operations.

Note to paragraph (k)(1): Non-mandatory Appendix F contains examples of criteria which employers

can use in evaluating prospective rescuers as required by paragraph (k)(l) of this section.

1910.146(k)(2)

An employer whose employees have been designated to provide permit space rescue and emergency services shall take the following measures:

1910.146(k)(2)(i)

Provide affected employees with the personal protective equipment (PPE) needed to conduct permit space rescues safely and train affected employees so they are proficient in the use of that PPE, at no cost to those employees;

1910.146(k)(2)(ii)

Train affected employees to perform assigned rescue duties. The employer must ensure that such employees successfully complete the training required to establish proficiency as an authorized entrant, as provided by paragraphs (g) and (h) of this section;

1910.146(k)(2)(iii)

Train affected employees in basic first-aid and cardiopulmonary resuscitation (CPR). The employer shall ensure that at least one member of the rescue team or service holding a current certification in first aid and CPR is available; and

1910.146(k)(2)(iv)

Ensure that affected employees practice making permit space rescues at least once every 12 months, by means of simulated rescue operations in which they remove dummies, manikins, or actual persons from the actual permit spaces or from representative permit spaces. Representative permit spaces shall, with respect to opening size, configuration, and accessibility, simulate the types of permit spaces from which rescue is to be performed.

..1910.146(k)(3)

1910.146(k)(3)

To facilitate non-entry rescue, retrieval systems or methods shall be used whenever an authorized entrant enters a permit space, unless the retrieval equipment would increase the overall risk of entry or would not contribute to the rescue of the entrant. Retrieval systems shall meet the following requirements.

1910.146(k)(3)(i)

Each authorized entrant shall use a chest or full body harness, with a retrieval line attached at the center of the entrant's back near shoulder level, above the entrant's head, or at another point which the employer can establish presents a profile small enough for the successful removal of the entrant. Wristlets may be used in lieu of the chest or full body harness if the employer can demonstrate that the use of a chest or full body harness is infeasible or creates a greater hazard and that the use of wristlets is the safest and most effective alternative.

1910.146(k)(3)(ii)

The other end of the retrieval line shall be attached to a mechanical device or fixed point outside the permit space in such a manner that rescue can begin as soon as the rescuer becomes aware that rescue is necessary. A mechanical device shall be available to retrieve personnel from vertical type permit spaces more than 5 feet (1.52 m) deep

1910.146(k)(4)

If an injured entrant is exposed to a substance for which a Material Safety Data Sheet (MSDS) or other similar written information is required to be kept at the worksite, that MSDS or written information shall be made available to the medical facility treating the exposed entrant.

1910.146(l)

Employee participation.

1910.146(l)(1)

Employers shall consult with affected employees and their authorized representatives on the development and implementation of all aspects of the permit space program required by paragraph (c) of this section.

1910.146(l)(2)

Employers shall make available to affected employees and their authorized representatives all information required to be developed by this section.

[58 FR 4549, Jan. 14, 1993; 58 FR 34845, June 29, 1993; 59 FR 26115, May 19, 1994; 63 FR 66038, Dec. 1, 1998]

Permit Required Confined Space (Rescue)

Purpose

The Hanover Park Fire Department policy on confined space rescue is designed to be consistent with OSHA regulations in regards to working in and around Permit Required Confined Space.

Scope

This Permit Required Confined Space Policy applies to all Fire Department employees working at any incident or training function that is considered a confined space. The U.S. Department of Labor rules and regulations published as 29 CFR 1910.146 which is attached as Appendix A shall apply to all employees. The Hanover Park Fire Department implements the applicable OSHA requirements regarding entry into permit-required confined spaces. The Confined Space Program for the Village of Hanover Park Department of Public Works is attached as appendix B.

1. Definition

1.1. OSHA regulation 29CFR1910.146 defines a Confined Space as a space that meets all three of the following.

1.1.1. Is large enough and so configured that an employee can bodily enter and perform assigned work.
1.1.2. Has limited or restricted means of entry or exit (for example, tanks, vessels, silos, storage bins, hoppers, vaults, and pits that may have limited means of entry).
1.1.3. Is not designed for continuous employee occupancy.

2. Responsibilities

2.1. The Battalion Chief in charge of Training shall be responsible for the following:

2.1.1. Appointing a qualified individual to coordinate departmental confined space activities.
2.1.2. Coordinate training at least once every 12 months.
2.1.3. Arrange for annual review of the program.

2.2. The Battalion Chief on duty shall be responsible for the following:

2.2.1. Ensuring that the policy and procedures in this program are implemented and enforced.
2.2.2. Acting as a liaison with regulatory authorities as necessary.
2.2.3. Ensure that all employees have read and understand all parts of the guideline.
2.2.4. Maintain documentation related to confined space entry including entry logs and permits for the specified time periods.
2.2.5. Ensure that all confined space entry procedures outlined in Appendix A are followed.

3. Procedures

3.1. The first arriving Officer on the scene shall identify and broadcast a description of the type of confined space and how many victims if known.

3.2. The Incident Commander shall establish a safe work zone.

3.3. The first arriving crews should check with other workers on site to find out where the trapped or injured person was last located.

3.4. Hanover Park Public Works shall be notified of the incident. Incident Command will request the Police Department to notify the Director of Public Works.

3.5. Assign one person to start monitoring air quality.

3.6. Set up a positive air flow into the confined space.

3.7. Determine if the victim can self rescue with rope or ladder being placed in the confined space.

3.8. Only members who are trained to the Technician level shall enter a confined space except when approved by the Incident Commander.

3.9. Elevate the alarm to a MABAS Box alarm for the Technical Rescue Team response.

3.10. Any member entering a confined space shall be tethered with a lifeline attached to class lll harness.

3.11. Any member entering a confined space shall have a supply of air either by SCBA or a mobile cascade with an escape bottle.

3.12. The entry team shall be assigned a radio frequency dedicated solely to the entry team.

3.13. All personnel shall use appropriate PPE and safety equipment for entry into a confined space.

4. Documentation

4.1 Confined space entry log.

4.2 A copy of the Confined space entry permit issued to the Company doing the work.

4.3 Confined space hazard assessment.

4.4 Atmosphere monitoring log.

High Angle / Vertical Rescue

Purpose

The Hanover Park Fire Department policy on high angle/vertical rescue is designed to be consistent with OSHA regulations in regards to response personnel working at high angle/vertical rescue operations.

Scope

The High Angle/Vertical Rescue policy applies to all Fire Department employees working at any incident or training function that is considered as a high angle or vertical rescue operation.

1. Responsibilities

1.1 It shall be the responsibility of the Battalion Chief and Company Officer to ensure compliance with all parts of this guideline during his/her tour of duty and to ensure that all employees have read, understand and been provided an opportunity to ask questions regarding this policy.

1.2 It shall be the responsibility of all employees to know, understand and adhere to the following policy.

2. Procedures

2.1 <u>First-In Unit</u>

2.1.1 The first arriving officer on the scene shall conduct and communicate a description of the scene to responding units.
2.1.2 Determine the number and location of victims.
2.1.3 Attempt to establish contact with the victim(s) while remaining in a safe area. Once established, Make every attempt to maintain contact with the victim(s) throughout the call.
2.1.4 Locate a supervisor/foreman or witness, and escort them to Incident Command.
2.1.5 Determine the location of all possible access points to the victim(s) and/or area(s) of rescue.
2.1.6 Determine if alternate rescue possibilities exist (i.e. ground ladders, aerial ladders, etc.), and if an attempt to rescue the victim(s) can be made without working on-line and endangering fire department personnel.
2.1.7 Determine the nature of the incident (i.e. medical emergency, equipment failure, etc.)
2.1.8 Determine if the victim(s) are wearing a harness, are attached to their line, and are properly anchored.
2.1.9 Consider set-up of initial rigging operations.
2.1.10 All personnel shall use appropriate PPE and safety equipment while operating at the scene of a high angle/vertical rescue incident, and shall wear a minimum of bunker pants and boots, gloves, helmet and a class 1 harness at all times while conducting operations on an aerial apparatus.
2.1.11 A Tactical Worksheet shall be completed and forwarded to Incident Command and/or the Technical Rescue Branch/Sector Team Leader as soon as possible.

2.2 Second-In Unit (Site Control)

2.2.1 Shut down all equipment capable of endangering victim(s) and rescue personnel.
2.2.2 Determine possible hazardous atmospheres or conditions in the area (i.e. Chemical, Mechanical, etc.)
2.2.3 Keep spectators, unnecessary personnel and unnecessary equipment away from the area.
2.2.4 Request police assistance with site control and re-routing and/or stopping traffic in the area.
2.2.5 Ensure access for Technical Rescue Team vehicles, personnel and equipment.
2.2.6 Ensure ambulance access to the site.
2.2.7 Ensure adequate exterior lighting if needed.

2.3 Incident Command

2.3.1 Assume command, establish a visible command post, and assign sectors as needed.
2.3.2 The Incident Commander shall establish a safe work zone.
2.3.3 The Incident Commander shall ensure that unauthorized or untrained personnel, including Fire Department personnel, do not enter the area or attempt a rescue.
2.3.3 Once the scene is determined to be a high angle/vertical rescue incident, the Incident Commander shall notify DuComm, requesting the activation of a MABAS Technical Rescue TRS Box Alarm. Hanover Park Public works shall also be notified of the incident. Incident Command will request the Police Department to notify the Director of Public Works.
2.3.4 The Incident Commander shall keep a direct line of communication with the Technical Rescue Branch/Sector Team Leader to ensure there is adequate manpower and equipment on scene to conduct the rescue of victim(s).

3. Documentation

3.1. First-In Unit Tactical worksheet

Hanover Park Fire Department
High Angle/Vertical Rescue
First-In Unit Tactical Worksheet

Incident Notes

Foreman / Supervisor / Witness _____ Number of victims _____

Location of victim(s) _____

Possible points of access _____

Nature of incident if known (i.e. medical emergency, equipment failure, etc.)

_____

Condition of victim if known (i.e. responsive, unresponsive, etc.)

_____

Potential hazards to victim(s) and/or rescue personnel

_____

_____

Incident Diagram

This worksheet should be completed and forwarded to Incident Command and/or the Technical Rescue Branch/Sector Team Leader as soon as possible.

Sen. Gary Forby

Filed: 3/5/2008

APPENDIX A

AMENDMENT TO SENATE BILL 2488

AMENDMENT NO. _____. Amend Senate Bill 2488 on page 1, by replacing lines 7 through 12 with the following:

"(625 ILCS 5/11-213 new)

Sec. 11-213. Power of a fire department officer; highway or lane closure. In the absence of a law enforcement officer or a representative of the highway agency having jurisdiction over the highway, an officer of a fire department, in the performance of his or her official duties, has the authority to close to traffic a highway, or a lane or lanes of a highway, as necessary to protect the safety of persons or property. In order to promote the safe implementation of this Section, the fire department officer shall utilize an official fire department vehicle with lighted red or white oscillating, rotating, or flashing lights in accordance with Section 12-215 of this Code and proper temporary traffic control in accordance with the sections of the Illinois Manual on Uniform Traffic

Control Devices concerning temporary traffic control and incident management. The officer should also receive training in safe practices for accomplishing these tasks near traffic. This Section does not apply to highways under the jurisdiction of the Illinois State Toll Highway Authority. As used in this Section, "highway" has the meaning set forth in Section 1-126 of this Code.".

CHAPTER 6I. CONTROL OF TRAFFIC THROUGH TRAFFIC INCIDENT MANAGEMENT AREAS

Section 6I.01 General

Support:

Whenever the acronym "TTC" is used in this Chapter, it refers to "temporary traffic control".

Standard:

The needs and control of all road users (motorists, bicyclists, and pedestrians within the highway, including persons with disabilities in accordance with the Americans with Disabilities Act of 1990 (ADA), Title II, Paragraph 35.130) through a TTC zone shall be an essential part of highway construction, utility work, maintenance operations, and the management of traffic incidents.

Support:

A traffic incident is an emergency road user occurrence, a natural disaster, or other unplanned event that affects or impedes the normal flow of traffic.

A traffic incident management area is an area of a highway where temporary traffic controls are imposed by authorized officials in response to a road user incident, natural disaster, hazardous material spill, or other unplanned incident. It is a type of TTC zone and extends from the first warning device (such as a sign, light, or cone) to the last TTC device or to a point where vehicles return to the original lane alignment and are clear of the incident.

Traffic incidents can be divided into three general classes of duration, each of which has unique traffic control characteristics and needs. These classes are:

A. Major—expected duration of more than 2 hours;
B. Intermediate—expected duration of 30 minutes to 2 hours; and
C. Minor—expected duration under 30 minutes.

The primary functions of TTC at a traffic incident management area are to move road users reasonably safely and expeditiously past or around the traffic incident, to reduce the likelihood of secondary traffic crashes, and to preclude unnecessary use of the surrounding local road system. Examples include a stalled vehicle blocking a lane, a traffic crash blocking the traveled way, a hazardous material spill along a highway, and natural disasters such as floods and severe storm damage.

Guidance:

In order to reduce response time for traffic incidents, highway agencies, appropriate public safety agencies (law enforcement, fire and rescue, emergency communications, emergency medical, and other emergency management), and private sector responders (towing and recovery and hazardous materials contractors) should mutually plan for occurrences of traffic incidents along the major and heavily traveled highway and street system.

On-scene responders should be trained in safe practices for accomplishing their tasks in and near traffic. Responders should always be aware of their visibility to oncoming traffic and take measures to move the traffic incident as far off the traveled roadway as possible or to provide for appropriate warning.

Responders arriving at a traffic incident should, within 15 minutes of arrival on-scene, estimate the magnitude of the traffic incident, the expected time duration of the traffic incident, and the expected vehicle queue length, and then should set up the appropriate temporary traffic controls for these estimates.

Option:

Warning and guide signs used for TTC traffic incident management situations may have a black legend and border on a fluorescent pink background (see Figure 6I-1).

Support:

While some traffic incidents might be anticipated and planned for, emergencies and disasters might pose more severe and unpredictable problems. The ability to quickly install proper temporary traffic controls might greatly reduce the effects of an incident, such as secondary crashes or excessive traffic delays. An essential part of fire, rescue, spill clean-up, highway agency, and enforcement activities is the proper control of road users through the traffic incident management area in order to protect responders, victims, and other personnel at the site while providing reasonably safe traffic flow. These operations might need corroborating legislative authority for the implementation and enforcement of appropriate road user regulations, parking controls, and speed zoning. It is desirable for these statutes to provide sufficient flexibility in the authority for, and implementation of, TTC to respond to the needs of changing conditions found in traffic incident management areas.

Figure 6I-1. Examples of Traffic Incident Management Area Signs

Option:

For traffic incidents, particularly those of an emergency nature, TTC devices on hand may be used for the initial response as long as they do not themselves create unnecessary additional hazards.

Section 6I.02 Major Traffic Incidents

Support:

Major traffic incidents are typically traffic incidents involving hazardous materials, fatal traffic crashes involving numerous vehicles, and other natural or man-made disasters. These traffic incidents typically involve closing all or part of a roadway facility for a period exceeding 2 hours.

Guidance:

If the traffic incident is anticipated to last more than 24 hours, applicable procedures and devices set forth in other Chapters of Part 6 should be used.

Support:

A road closure can be caused by a traffic incident such as a road user crash that blocks the traveled way. Road users are usually diverted through lane shifts or detoured around the traffic incident and back to the original roadway. A combination of traffic engineering and enforcement preparations is needed to determine the detour route, and to install, maintain or operate, and then to remove the necessary traffic control devices when the detour is terminated. Large trucks are a significant concern in such a detour, especially when detouring them from a controlled-access roadway onto local or arterial streets.

During traffic incidents, large trucks might need to follow a route separate from that of automobiles because of bridge, weight, clearance, or geometric restrictions. Also, vehicles carrying hazardous material might need to follow a different route from other vehicles.

Some traffic incidents such as hazardous material spills might require closure of an entire highway. Through road users must have adequate guidance around the traffic incident. Maintaining good public relations is desirable. The cooperation of the news media in publicizing the existence of, and reasons for, traffic incident management areas and their TTC can be of great assistance in keeping road users and the general public well informed.

The establishment, maintenance, and prompt removal of lane diversions can be effectively managed by inter-agency planning that includes representatives of highway and public safety agencies.

Guidance:

All traffic control devices needed to set up the TTC at a traffic incident should be available so that they can be readily deployed for all major traffic incidents. The TTC should include the proper traffic diversions, tapered lane closures, and upstream warning devices to alert approaching traffic of the end of a queue.

Attention should be paid to the end of the traffic queue such that warning is given to road users approaching the end of the queue.

If manual traffic control is needed, it should be provided by qualified flaggers or uniformed law enforcement officers.

Option:

If flaggers are used to provide traffic control for an incident management situation, the flaggers may use appropriate traffic control devices that are readily available or that can be brought to the traffic incident scene on short notice.

Guidance:

When flares are used to initiate TTC at traffic incidents, more permanent traffic control devices should replace them as soon as practical. Both the flare and its supporting device should then be removed from the roadway.

On-scene responders should be trained in safe practices for accomplishing their tasks in and near traffic. Responders should always be aware of their visibility to oncoming traffic and take measures to move the traffic incident as far off the traveled roadway as possible or to provide for appropriate warning.

Section 6I.03 Intermediate Traffic Incidents

Support:

Intermediate traffic incidents typically affect travel lanes for a time period of 30 minutes to 2 hours, and usually require traffic control on the scene to divert road users past the blockage. Full roadway closures might be needed for short periods during traffic incident clearance to allow traffic incident responders to accomplish their tasks.

The establishment, maintenance, and prompt removal of lane diversions can be effectively managed by inter-agency planning that includes representatives of highway and public safety agencies.

Guidance:

All traffic control devices needed to set up the TTC at a traffic incident should be available so that they can be readily deployed for intermediate traffic incidents. The TTC should include the proper traffic diversions, tapered lane closures, and upstream warning devices to alert approaching traffic of the end of a queue.

Attention should be paid to the end of the traffic queue such that warning is given to road users approaching the end of the queue.

If manual traffic control is needed, it should be provided by qualified flaggers or uniformed law enforcement officers.

Option:

If flaggers are used to provide traffic control for an incident management situation, the flaggers may use appropriate traffic control devices that are readily available or that can be brought to the traffic incident scene on short notice.

Guidance:

When flares are used to initiate TTC at traffic incidents, more permanent traffic devices should replace them as soon as practical. Both the flare and its supporting device should then be removed from the roadway.

On-scene responders should be trained in safe practices for accomplishing their tasks in and near traffic. Responders should always be aware of their visibility to oncoming traffic and take measures to move the traffic incident as far off the traveled roadway as possible or to provide for appropriate warning.

Section 6I.04 Minor Traffic Incidents

Support:

Minor traffic incidents are typically disabled vehicles and minor crashes that result in lane closures of less than 30 minutes. On-scene responders are typically law enforcement and towing companies, and occasionally highway agency service patrol vehicles.

Diversion of traffic into other lanes is often not needed or is needed only briefly. It is not generally possible or practical to set up a lane closure with traffic control devices for a minor traffic incident. Traffic control is the responsibility of on-scene responders.

Guidance:

When a minor traffic incident blocks a travel lane, it should be removed from that lane to the shoulder as quickly as possible.

Section 6I.05 Use of Emergency-Vehicle Lighting

Support:

The use of emergency-vehicle lighting (such as high-intensity rotating, flashing, oscillating, or strobe lights) is essential, especially in the initial stages of a traffic incident, for the safety of emergency responders and persons involved in the traffic incident, as well as road users approaching the traffic incident. Emergency-vehicle lighting, however, provides warning only and provides no effective traffic control. It is often confusing to road users, especially at night. Road users approaching the traffic incident from the opposite direction on a divided facility are often distracted by emergency-vehicle lighting and slow their vehicles to look at the traffic incident posing a hazard to themselves and others traveling in their direction.

The use of emergency-vehicle lighting can be reduced if good traffic control has been established at a traffic incident scene. This is especially true for major traffic incidents that might involve a number of emergency vehicles. If good traffic control is established through placement of advanced warning signs and traffic control devices to divert or detour traffic, then public safety agencies can perform their tasks on scene with minimal emergency-vehicle lighting.

Guidance:

Public safety agencies should examine their policies on the use of emergency-vehicle lighting, especially after a traffic incident scene is secured, with the intent of reducing the use of this lighting as much as possible while not endangering those at the scene. Special consideration should be given to reducing or extinguishing forward facing emergency-vehicle lighting, especially on divided roadways, to reduce distractions to on-coming road users.

Vehicle headlights not needed for illumination, or to provide notice to other road users of the incident response vehicle being in an unexpected location, should be turned off at night.

Control of Traffic at Traffic Incidents

Purpose

It shall be the policy of the Hanover Park Fire Department to position apparatus and other emergency vehicles at a vehicle related incident on any street, road, highway, or expressway in a manner that best protects the incident scene and the work area. Such positioning shall afford protection to fire department personnel and the motoring public from the hazards of working in or near moving traffic as provided in the National Manual on Uniform Traffic Control Devices Chapter 6I - Attachment A, any Illinois Supplement to the Manual and the Illinois Manual on Uniform Traffic Control Devices concerning temporary traffic control and incident management.

Scope

This guideline applies to all personnel at all times. All fire department personnel should understand and appreciate the high risk that personnel are exposed to when operating in or near moving vehicle traffic. Fire department responders should always operate within a protected work zone at any vehicle related roadway incident and the authority of Section 11-213 of the Illinois Vehicle Code (625 ILCS 5/11-213).

1. Responsibilities

1.1. Personnel Safety

1.1.1. Never trust approaching traffic.

1.1.2. Avoid turning your back to approaching traffic.

1.1.3. Establish an initial “block” with the first arriving emergency vehicle or fire apparatus.

1.1.4. Always wear ANSI Class III high visibility reflective vests during daylight operations.

1.1.5. Wear full protective clothing plus the highway safety vest at all vehicle-related emergencies while working within the protected work zone and between the hours of dusk and dawn or whenever lighting levels are reduced due to inclement weather conditions.

1.1.6. Turn off all sources of vision impairment to approaching motorists at nighttime incidents including vehicle headlights and spotlights.

1.1.7. Use fire apparatus to initially redirect the flow of moving traffic.

1.1.8. Establish advance warning and adequate transition area traffic control measures upstream of incident to reduce travel speeds of approaching motorists.

1.1.9. Use traffic cones and/or cones illuminated by turbo flares where appropriate for sustained highway incident traffic control and direction. Cones should be deployed at 15 foot intervals.

1.1.10. Whenever possible establish a fire department member assigned to the “Flagger” function to monitor approaching traffic and activate an emergency signal if the actions of a motorist do not conform to established traffic control measures in place at the highway scene.

1.1.11. For prolonged extrication consider the use of the barricade and other equipment in the public works barricade trailer.

2. Apparatus and Emergency Vehicle Placement

2.1.1. Always position first arriving apparatus to protect the scene, patients, and emergency personnel.

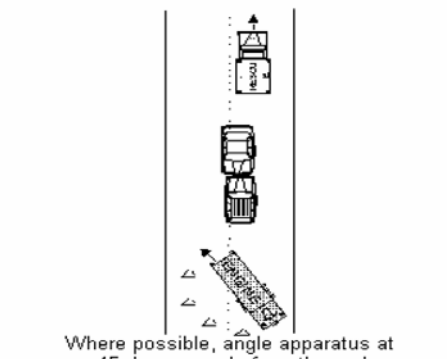
2.1.2. Initial apparatus placement should provide a work area protected from traffic approaching in at least one direction.

2.1.3. Angle apparatus on the roadway with a block to the left or block to the right to create a physical barrier between the crash scene and approaching traffic.

2.1.4. Allow apparatus placement to slow approaching motorists and redirect them around the scene.

2.1.5. Use fire apparatus to block at least one additional traffic lane more than that already obstructed by the crashed vehicle(s).

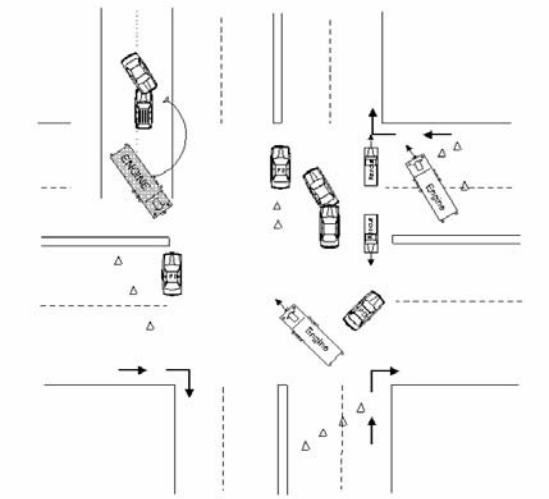
2.1.6. When practical, position apparatus in such a manner to protect the pump operator position from being exposed to approaching traffic.



Where possible, angle apparatus at a 45 degree angle from the curb.

2.1.7. Positioning of large apparatus must create a safe parking area for EMS units and other fire vehicles. Operating personnel, equipment and patients should be kept within the “shadow” created by the blocking apparatus at all times.

2.1.8. When blocking with apparatus to protect the emergency scene, establish a sufficient size work zone that includes all damaged vehicles, roadway debris, the patient triage and treatment area, the extrication work area, personnel and tool staging area and the ambulance loading zone.

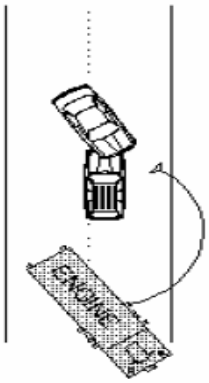


2.1.9. Ambulance should be positioned within the protected work area with their rear patient loading door area angled away from the nearest lanes of moving traffic.

2.1.10. At all intersections, or where the incident may be near the middle lane of the roadway, two or more sides of the incident will need to be protected.

2.1.10.1. The goal is to effectively block all exposed sides of the work zone. The blocking of the work zone must be prioritized, from the most critical or highest traffic volume flow to the least critical traffic direction.

2.1.10.2. For first arriving engine or truck companies where a charged hoseline may be needed, block so that the pump panel is “down stream”, on the opposite side of on-coming traffic. This will protect the pump operator.



2.1.10.3. At intersection incidents, consider requesting police response. Provide specific directions to the police officers as to exactly what your traffic control needs are.

3. **Staging**

3.1. Command shall stage unneeded emergency vehicles off the roadway or return these units to service whenever possible.

4. **Lane Marking**

4.1. Traffic cones (or barricades) shall be deployed from the rear of the blocking apparatus toward approaching traffic to increase the advance warning provided for approaching motorists. Cones identify and only suggest the transition and tapering actions that are required of the approaching motorist.

4.1.1.1. Personnel shall place cones and turbo flares and retrieve cones while facing oncoming traffic.

4.1.1.2. Traffic cones shall be deployed at 15 foot intervals upstream of the blocking apparatus with the furthest traffic cone approximately 75 feet upstream to allow adequate advance warning to drivers.

5. **Incident Command**

5.1.1. The initial-arriving company officer and/or the Incident Commander must complete critical benchmarks to assure that a safe and protected work environment for emergency scene personnel is established and maintained including;

5.1.2. Assure that the first-arriving apparatus establishes an initial block to create an initial safe protected work zone.

5.1.3. Assign a staging location for all ambulances as well as later-arriving apparatus.

5.1.4. Lanes of traffic shall be identified numerically as “Lane 1”, “Lane 2”, etc., beginning from the right to the left when right and left are considered from the approaching motorist’s point of view. Typically, vehicles travel a lower speed in the lower number lanes.

5.1.5. Directions “Right” and “Left” shall be as identified as from the approaching motorist’s point of view left or right.

5.1.6. Instruct the driver of the ambulance to “block to the right” or “block to the left” as it is parked at the scene to position the rear patient loading area away from the closest lane of moving traffic.

5.1.7. Assure that all ambulances on-scene are placed within the protected work area of the larger apparatus.

5.1.8. Assure that all patient loading into ambulance units is done from within a protected work area.

5.1.9. The initial company officer and/or Incident Commander must operate as the Scene Safety Officer until this assignment is delegated.

5.1.10. Command shall assure that Opticom strobe systems are turned OFF and that other emergency lighting remains ON.

5.1.11. Command should establish a liaison with the Police Department as soon as possible to jointly coordinate a safe protected work zone and to determine how to most efficiently resolve the incident and establish normal traffic flows.

5.1.12. The termination of the incident must be managed with the same aggressiveness as initial actions. Crews, apparatus, and equipment must be removed from the highway promptly, to reduce exposure to moving traffic and minimize traffic congestion.

6. Definitions

6.1. **Advance Warning-** notification procedures that advise approaching motorists to transition from normal driving status to that required by the temporary emergency traffic control measures ahead of them.

6.2. **Block-** positioning a fire department apparatus on an angle to the lanes of traffic creating a physical barrier between upstream traffic and the work area. Includes ‘block to the right’ or’ block to the left’.

6.3. **Buffer Zone-** the distance or space between personnel and vehicles in the protected work zone and nearby moving traffic.

6.4. **Downstream-** the direction that traffic is moving as it travels away from the incident scene.

6.5. **Flagger-** a fire department member assigned to monitor approaching traffic and activate an emergency signal if the actions of a motorist do not conform to established traffic control measures in place at the highway scene.

6.6. **Shadow-** the protected work area at a vehicle-related roadway incident that is shielded by the block from apparatus and other emergency vehicles.

6.7. **Taper-** the action of merging several lanes of moving traffic into fewer moving lanes.

6.8. **Temporary Work Zone**- the physical area of a roadway within which emergency personnel perform their fire, EMS and rescue tasks at a vehicle-related incident.

6.9. **Transition Zone-** the lanes of a roadway within which approaching motorists change their speed and position to comply with the traffic control measures established at an incident scene.

6.10. **Upstream-** the direction that traffic is traveling from as the vehicles approach the incident scene.

Hearing Protection and Conservation

Purpose

This Standard Operating Guideline establishes practices and procedures consistent with the Occupational Safety and Health Administration rules and regulations with regards to protecting the hearing of employees. This guideline serves as the department's compliance with NFPA 1500 Fire Department Occupational Safety and Health Program.

Scope

The U.S. Department of labor has enacted rules and regulations governing the protection of employees and employee's hearing and has published 29 CFR 1910.95, Occupational Noise Exposure regulations. These regulations and this Standard Operating Guideline shall apply to all employees at all times. No part of this guideline shall be interpreted as to diminish the rights of the employee under 29 CFR 1910.95 which is attached as Appendix A. All items herein shall comply with NFPA 1500, Section 7.18.

1. Responsibilities

   1.1. It shall be the responsibility of the shift Battalion Chief to comply with this guideline during his/her tour of duty.

   1.2. It shall be the responsibility of the company officer to comply with this guideline during station activities and emergency incidents

   1.3. It shall be the responsibility of all employees to know and understand this guideline and to adhere to proper hearing conservation practices

2. Procedures

   2.1. Employees should follow manufacturer's guidelines when operating equipment that may produce an unacceptable high decibel (dB) level defined as greater than 85 dBs
   2.2. Hearing conservation measures shall be taken into account when purchasing new equipment or tools in compliance with NFPA 1500 Section 6.2

   2.3. Employees shall wear earplugs or muffled earphones when appropriate and shall notify the company officer of any need or replacement of hearing protection devices. Stereo headphones or other listening devices not designed for hearing protection shall not qualify as hearing protection

2.4. Employees shall operate/service noise-producing equipment outdoors whenever possible

2.5. Employees shall never operate the vehicle's siren or air horns indoors or when people are standing in close proximity to the front of the apparatus

2.6. When riding in the apparatus during an emergency response all employees shall wear the provided radio headset

2.7. Employees who suspect that they may have a hearing problem or think that they have suffered any hearing loss, shall contact their Battalion Chief immediately upon such suspicion who shall then advise the Human Resource Director.

Appendix A

29 CFR 1910.95

1910.95(a)
Protection against the effects of noise exposure shall be provided when the sound levels exceed those shown in Table G-16 when measured on the A scale of a standard sound level meter at slow response. When noise levels are determined by octave band analysis, the equivalent A-weighted sound level may be determined as follows:

Equivalent sound level contours. Octave band sound pressure levels may be converted to the equivalent A-weighted sound level by plotting them on this graph and noting the A-weighted sound level corresponding to the point of highest penetration into the sound level contours. This equivalent A-weighted sound level, which may differ from the actual A-weighted sound level of the noise, is used to determine exposure limits from Table 1.G-16.

1910.95(b)(1)
When employees are subjected to sound exceeding those listed in Table G-16, feasible administrative or engineering controls shall be utilized. If such controls fail to reduce sound levels within the levels of Table G-16, personal protective equipment shall be provided and used to reduce sound levels within the levels of the table.
1910.95(b)(2)
If the variations in noise level involve maxima at intervals of 1 second or less, it is to be considered continuous.

TABLE G-16 - PERMISSIBLE NOISE EXPOSURES (1)

Duration per day, hours	Sound level dBA slow response
8	90
6	92
4	95
3	97
2	100
1 1/2	102
1	105
1/2	110
1/4 or less	115

Footnote(1) When the daily noise exposure is composed of two or more periods of noise exposure of different levels, their combined

effect should be considered, rather than the individual effect of each. If the sum of the following fractions: C(1)/T(1) + C(2)/T(2) C(n)/T(n) exceeds unity, then, the mixed exposure should be considered to exceed the limit value. Cn indicates the total time of exposure at a specified noise level, and Tn indicates the total time of exposure permitted at that level. Exposure to impulsive or impact noise should not exceed 140 dB peak sound pressure level.

1910.95(c)
"Hearing conservation program."
1910.95(c)(1)
The employer shall administer a continuing, effective hearing conservation program, as described in paragraphs (c) through (o) of this section, whenever employee noise exposures equal or exceed an 8-hour time-weighted average sound level (TWA) of 85 decibels measured on the A scale (slow response) or, equivalently, a dose of fifty percent. For purposes of the hearing conservation program, employee noise exposures shall be computed in accordance with appendix A and Table G-16a, and without regard to any attenuation provided by the use of personal protective equipment.
1910.95(c)(2)
For purposes of paragraphs (c) through (n) of this section, an 8-hour time-weighted average of 85 decibels or a dose of fifty percent shall also be referred to as the action level.

1910.95(d)
"Monitoring."
1910.95(d)(1)
When information indicates that any employee's exposure may equal or exceed an 8-hour time-weighted average of 85 decibels, the employer shall develop and implement a monitoring program.
1910.95(d)(1)(i)
The sampling strategy shall be designed to identify employees for inclusion in the hearing conservation program and to enable the proper selection of hearing protectors.
1910.95(d)(1)(ii)
Where circumstances such as high worker mobility, significant variations in sound level, or a significant component of impulse noise make area monitoring generally inappropriate, the employer shall use representative personal sampling to comply with the monitoring requirements of this paragraph unless the employer can show that area sampling produces equivalent results.
1910.95(d)(2)(i)
All continuous, intermittent and impulsive sound levels from 80 decibels to 130 decibels shall be integrated into the noise measurements.
1910.95(d)(2)(ii)
Instruments used to measure employee noise exposure shall be calibrated to ensure measurement accuracy.
1910.95(d)(3)
Monitoring shall be repeated whenever a change in production, process, equipment or controls increases noise exposures to the extent that:

1910.95(d)(3)(i)
Additional employees may be exposed at or above the action level; or
1910.95(d)(3)(ii)
The attenuation provided by hearing protectors being used by employees may be rendered inadequate to meet the requirements of paragraph (j) of this section.

1910.95(e)
"Employee notification." The employer shall notify each employee exposed at or above an 8-hour time-weighted average of 85 decibels of the results of the monitoring.

1910.95(f)
"Observation of monitoring." The employer shall provide affected employees or their representatives with an opportunity to observe any noise measurements conducted pursuant to this section.

1910.95(g)
"Audiometric testing program."
1910.95(g)(1)
The employer shall establish and maintain an audiometric testing program as provided in this paragraph by making audiometric testing available to all employees whose exposures equal or exceed an 8-hour time-weighted average of 85 decibels.
1910.95(g)(2)
The program shall be provided at no cost to employees.
1910.95(g)(3)
Audiometric tests shall be performed by a licensed or certified audiologist, otolaryngologist, or other physician, or by a technician who is certified by the Council of Accreditation in Occupational Hearing Conservation, or who has satisfactorily demonstrated competence in administering audiometric examinations, obtaining valid audiograms, and properly using, maintaining and checking calibration and proper functioning of the audiometers being used. A technician who operates microprocessor audiometers does not need to be certified. A technician who performs audiometric tests must be responsible to an audiologist, otolaryngologist or physician.
1910.95(g)(4)
All audiograms obtained pursuant to this section shall meet the requirements of Appendix C: "Audiometric Measuring Instruments."
1910.95(g)(5)
"Baseline audiogram."
1910.95(g)(5)(i)
Within 6 months of an employee's first exposure at or above the action level, the employer shall establish a valid baseline audiogram against which subsequent audiograms can be compared.
1910.95(g)(5)(ii)
"Mobile test van exception." Where mobile test vans are used to meet the audiometric testing obligation, the employer shall obtain a valid baseline audiogram within 1 year of an employee's first exposure at or above the action level. Where baseline audiograms are obtained more than 6 months after the employee's first exposure at or above the action level, employees shall wear

hearing protectors for any period exceeding six months after first exposure until the baseline audiogram is obtained.
1910.95(g)(5)(iii)
Testing to establish a baseline audiogram shall be preceded by at least 14 hours without exposure to workplace noise. Hearing protectors may be used as a substitute for the requirement that baseline audiograms be preceded by 14 hours without exposure to workplace noise.
1910.95(g)(5)(iv)
The employer shall notify employees of the need to avoid high levels of non-occupational noise exposure during the 14-hour period immediately preceding the audiometric examination.
1910.95(g)(6)
"Annual audiogram." At least annually after obtaining the baseline audiogram, the employer shall obtain a new audiogram for each employee exposed at or above an 8-hour time-weighted average of 85 decibels.
1910.95(g)(7)
"Evaluation of audiogram."
1910.95(g)(7)(i)
Each employee's annual audiogram shall be compared to that employee's baseline audiogram to determine if the audiogram is valid and if a standard threshold shift as defined in paragraph (g)(10) of this section has occurred. This comparison may be done by a technician.
1910.95(g)(7)(ii)
If the annual audiogram shows that an employee has suffered a standard threshold shift, the employer may obtain a retest within 30 days and consider the results of the retest as the annual audiogram.
1910.95(g)(7)(iii)
The audiologist, otolaryngologist, or physician shall review problem audiograms and shall determine whether there is a need for further evaluation. The employer shall provide to the person performing this evaluation the following information:
1910.95(g)(7)(iii)(A)
A copy of the requirements for hearing conservation as set forth in paragraphs (c) through (n) of this section;
1910.95(g)(7)(iii)(B)
The baseline audiogram and most recent audiogram of the employee to be evaluated;
1910.95(g)(7)(iii)(C)
Measurements of background sound pressure levels in the audiometric test room as required in Appendix D: Audiometric Test Rooms.
1910.95(g)(7)(iii)(D)
Records of audiometer calibrations required by paragraph (h)(5) of this section.
1910.95(g)(8)
"Follow-up procedures."
1910.95(g)(8)(i)
If a comparison of the annual audiogram to the baseline audiogram indicates a standard threshold shift as defined in paragraph (g)(10) of this section has occurred, the employee shall be informed of this fact in writing, within 21 days of the determination.
1910.95(g)(8)(ii)

Unless a physician determines that the standard threshold shift is not work related or aggravated by occupational noise exposure, the employer shall ensure that the following steps are taken when a standard threshold shift occurs:

1910.95(g)(8)(ii)(A)
Employees not using hearing protectors shall be fitted with hearing protectors, trained in their use and care, and required to use them.
1910.95(g)(8)(ii)(B)
Employees already using hearing protectors shall be refitted and retrained in the use of hearing protectors and provided with hearing protectors offering greater attenuation if necessary.
1910.95(g)(8)(ii)(C)
The employee shall be referred for a clinical audiological evaluation or an otological examination, as appropriate, if additional testing is necessary or if the employer suspects that a medical pathology of the ear is caused or aggravated by the wearing of hearing protectors.
1910.95(g)(8)(ii)(D)
The employee is informed of the need for an otological examination if a medical pathology of the ear that is unrelated to the use of hearing protectors is suspected.
1910.95(g)(8)(iii)
If subsequent audiometric testing of an employee whose exposure to noise is less than an 8-hour TWA of 90 decibels indicates that a standard threshold shift is not persistent, the employer:
1910.95(g)(8)(iii)(A)
Shall inform the employee of the new audiometric interpretation; and
1910.95(g)(8)(iii)(B)
May discontinue the required use of hearing protectors for that employee.
1910.95(g)(9)
"Revised baseline." An annual audiogram may be substituted for the baseline audiogram when, in the judgment of the audiologist, otolaryngologist or physician who is evaluating the audiogram:
1910.95(g)(9)(i)
The standard threshold shift revealed by the audiogram is persistent; or
1910.95(g)(9)(ii)
The hearing threshold shown in the annual audiogram indicates significant improvement over the baseline audiogram.
1910.95(g)(10)
"Standard threshold shift."
1910.95(g)(10)(i)
As used in this section, a standard threshold shift is a change in hearing threshold relative to the baseline audiogram of an average of 10 dB or more at 2000, 3000, and 4000 Hz in either ear.
1910.95(g)(10)(ii)
In determining whether a standard threshold shift has occurred, allowance may be made for the contribution of aging (presbycusis) to the change in hearing level by correcting the annual audiogram according to the procedure described in Appendix F: "Calculation and Application of Age Correction to Audiograms."

1910.95(h)

"Audiometric test requirements."
1910.95(h)(1)
Audiometric tests shall be pure tone, air conduction, hearing threshold examinations, with test frequencies including as a minimum 500, 1000, 2000, 3000, 4000, and 6000 Hz. Tests at each frequency shall be taken separately for each ear.
1910.95(h)(2)
Audiometric tests shall be conducted with audiometers (including microprocessor audiometers) that meet the specifications of, and are maintained and used in accordance with, American National Standard Specification for Audiometers, S3.6-1969, which is incorporated by reference as specified in Sec. 1910.6.
1910.95(h)(3)
Pulsed-tone and self-recording audiometers, if used, shall meet the requirements specified in Appendix C: "Audiometric Measuring Instruments."
1910.95(h)(4)
Audiometric examinations shall be administered in a room meeting the requirements listed in Appendix D: "Audiometric Test Rooms."
1910.95(h)(5)
"Audiometer calibration."
1910.95(h)(5)(i)
The functional operation of the audiometer shall be checked before each day's use by testing a person with known, stable hearing thresholds, and by listening to the audiometer's output to make sure that the output is free from distorted or unwanted sounds. Deviations of 10 decibels or greater require an acoustic calibration.
1910.95(h)(5)(ii)
Audiometer calibration shall be checked acoustically at least annually in accordance with Appendix E: "Acoustic Calibration of Audiometers." Test frequencies below 500 Hz and above 6000 Hz may be omitted from this check. Deviations of 15 decibels or greater require an exhaustive calibration.
1910.95(h)(5)(iii)
An exhaustive calibration shall be performed at least every two years in accordance with sections 4.1.2; 4.1.3.; 4.1.4.3; 4.2; 4.4.1; 4.4.2; 4.4.3; and 4.5 of the American National Standard Specification for Audiometers, S3.6-1969. Test frequencies below 500 Hz and above 6000 Hz may be omitted from this calibration.

1910.95(i)
"Hearing protectors."
1910.95(i)(1)
Employers shall make hearing protectors available to all employees exposed to an 8-hour time-weighted average of 85 decibels or greater at no cost to the employees. Hearing protectors shall be replaced as necessary.
1910.95(i)(2)
Employers shall ensure that hearing protectors are worn:
1910.95(i)(2)(i)
By an employee who is required by paragraph (b)(1) of this section to wear personal protective equipment; and

1910.95(i)(2)(ii)
By any employee who is exposed to an 8-hour time-weighted average of 85 decibels or greater, and who:

1910.95(i)(2)(ii)(A)
Has not yet had a baseline audiogram established pursuant to paragraph (g)(5)(ii); or
1910.95(i)(2)(ii)(B)
Has experienced a standard threshold shift.
1910.95(i)(3)
Employees shall be given the opportunity to select their hearing protectors from a variety of suitable hearing protectors provided by the employer.
1910.95(i)(4)
The employer shall provide training in the use and care of all hearing protectors provided to employees.
1910.95(i)(5)
The employer shall ensure proper initial fitting and supervise the correct use of all hearing protectors.

1910.95(j)
"Hearing protector attenuation."
1910.95(j)(1)
The employer shall evaluate hearing protector attenuation for the specific noise environments in which the protector will be used. The employer shall use one of the evaluation methods described in Appendix B: "Methods for Estimating the Adequacy of Hearing Protection Attenuation."
1910.95(j)(2)
Hearing protectors must attenuate employee exposure at least to an 8-hour time-weighted average of 90 decibels as required by paragraph (b) of this section.
1910.95(j)(3)
For employees who have experienced a standard threshold shift, hearing protectors must attenuate employee exposure to an 8-hour time-weighted average of 85 decibels or below.
1910.95(j)(4)
The adequacy of hearing protector attenuation shall be re-evaluated whenever employee noise exposures increase to the extent that the hearing protectors provided may no longer provide adequate attenuation. The employer shall provide more effective hearing protectors where necessary.

1910.95(k)
"Training program."
1910.95(k)(1)
The employer shall institute a training program for all employees who are exposed to noise at or above an 8-hour time-weighted average of 85 decibels, and shall ensure employee participation in such program.
1910.95(k)(2)

The training program shall be repeated annually for each employee included in the hearing conservation program. Information provided in the training program shall be updated to be consistent with changes in protective equipment and work processes.

1910.95(k)(3)
The employer shall ensure that each employee is informed of the following:
1910.95(k)(3)(i)
The effects of noise on hearing;
1910.95(k)(3)(ii)
The purpose of hearing protectors, the advantages, disadvantages, and attenuation of various types, and instructions on selection, fitting, use, and care; and
1910.95(k)(3)(iii)
The purpose of audiometric testing, and an explanation of the test procedures.

1910.95(l)
"Access to information and training materials."
1910.95(l)(1)
The employer shall make available to affected employees or their representatives copies of this standard and shall also post a copy in the workplace.
1910.95(l)(2)
The employer shall provide to affected employees any informational materials pertaining to the standard that are supplied to the employer by the Assistant Secretary.
1910.95(l)(3)
The employer shall provide, upon request, all materials related to the employer's training and education program pertaining to this standard to the Assistant Secretary and the Director.

1910.95(m)
"Recordkeeping" -
1910.95(m)(1)
"Exposure measurements." The employer shall maintain an accurate record of all employee exposure measurements required by paragraph (d) of this section.
1910.95(m)(2)
"Audiometric tests."
1910.95(m)(2)(i)
The employer shall retain all employee audiometric test records obtained pursuant to paragraph (g) of this section:
1910.95(m)(2)(ii)
This record shall include:
1910.95(m)(2)(ii)(A)
Name and job classification of the employee;
1910.95(m)(2)(ii)(B)
Date of the audiogram;
1910.95(m)(2)(ii)(C)
The examiner's name;

1910.95(m)(2)(ii)(D)
Date of the last acoustic or exhaustive calibration of the audiometer; and
1910.95(m)(2)(ii)(E)
Employee's most recent noise exposure assessment.
1910.95(m)(2)(ii)(F)
The employer shall maintain accurate records of the measurements of the background sound pressure levels in audiometric test rooms.
1910.95(m)(3)
"Record retention." The employer shall retain records required in this paragraph (m) for at least the following periods.
1910.95(m)(3)(i)
Noise exposure measurement records shall be retained for two years.
1910.95(m)(3)(ii)
Audiometric test records shall be retained for the duration of the affected employee's employment.
1910.95(m)(4)
"Access to records." All records required by this section shall be provided upon request to employees, former employees, representatives designated by the individual employee, and the Assistant Secretary. The provisions of 29 CFR 1910.1020 (a)-(e) and (g)-
1910.95(m)(4)(i)
apply to access to records under this section.
1910.95(m)(5)
"Transfer of records." If the employer ceases to do business, the employer shall transfer to the successor employer all records required to be maintained by this section, and the successor employer shall retain them for the remainder of the period prescribed in paragraph (m)(3) of this section.

1910.95(n)
"Appendices."
1910.95(n)(1)
Appendices A, B, C, D, and E to this section are incorporated as part of this section and the contents of these appendices are mandatory.
1910.95(n)(2)
Appendices F and G to this section are informational and are not intended to create any additional obligations not otherwise imposed or to detract from any existing obligations.

1910.95(o)
"Exemptions." Paragraphs (c) through (n) of this section shall not apply to employers engaged in oil and gas well drilling and servicing operations.

FIRE CORPS RESPONSE

Purpose

This Standard Policy & Procedure shall serve as a guideline for the response of Fire Corps members when responding to provide Rehab services to and for the Fire Department.

Scope

This guideline shall apply to all members of the Hanover Park Fire Department Fire Corps and shall apply at all times. This policy may be changed or amended from time to time and shall remain in effect until rescinded.

1. **Authority**
   1.1. DuComm has the responsibility to dispatch the Rehab unit based on the initial information received from the caller or other fire department.
   1.2. DuComm will dispatch the Rehab unit at the request of the Fire Chief, Incident Commander, or Company Officer.
   1.3. The Fire Corps Rehab team shall operate utilizing the Incident Management System under the direction of the Incident Commander

2. **Procedure**
   2.1. Upon dispatch of a General Alarm or the Rehab unit on the Chief Tones, all active Fire Corps members in good standing may respond back to staff the Rehab vehicle.
   2.2. All Fire Corps members, while responding back to the fire station to staff the Rehab vehicle, will obey all traffic laws and traffic control devices.
   2.3. All Fire Corps members who respond to an incident in the Rehab unit or any other department vehicle, unless otherwise authorized, will respond Non-Emergency without the use of emergency lights and/or siren and will obey all traffic laws and devices.
   2.4. Fire Corps members shall possess a valid driver's license for the weight and class of vehicle for which they are operating.
   2.5. All Fire Corps members who respond back to staff the Rehab unit and find that the unit has already responded may utilize other department vehicles to respond (non-emergency). All Fire Corps Members must ask the Shift Commander which vehicle is available for them to use. If the Shift Commander is not present Fire Corps members must ask the available officer. If no Shift Commander or Officer is present members may use the department pick-up truck, if available.
   2.6. Fire Corps members who respond back for an alarm will remain on duty until released by the Fire Chief or Shift Commander.
   2.7. Vehicles used by Fire Corps members shall be returned to a service-ready state upon completion of the alarm. The on-duty shift officer shall be notified of any needed vehicle maintenance or out-of-stock supplies.

DRIVING AND OPERATING VEHICLES

Purpose

This document provides policies and procedures required to support the safe and effective operation of all fire and emergency vehicles; this includes fire apparatus, rescue vehicles, ambulances, command and support units, privately owned vehicles (POVs), and any other vehicles operated by fire department members in the performance of their duties. This policy serves as the department's compliance with the Illinois Vehicle Code and NFPA 1500 *Standard on Fire Department Occupational Safety and Health Program.* 2007 Sec. 6.1.1.1.

Scope

This policy shall apply to all employees at all times. This policy applies to all public and private roads, alleys, garages, and parking lots, including those at both fire stations and village hall. If a conflict exists between this policy and any other Illinois Rules of the Road, laws, ordinances, or other statutes, the stricter shall apply. Violations of any part of this policy or any State of Illinois Motor Vehicle Code provision, or any Village Of Hanover Park ordinance may subject the employee to disciplinary measures.

1. Seatbelt Policy

1.2. All persons driving or riding in fire department vehicles shall be seated in approved riding positions with seatbelts or safety restraints fastened at all times when the vehicle is in motion.

1.3. The driver shall not begin to move the vehicle until all passengers are seated and properly secured. All passengers shall remain seated and secured as long as the vehicle is in motion. Seatbelts shall not be loosened or released while enroute to dress or don equipment.

1.4. Members shall not attempt to mount or dismount from a moving vehicle under any circumstances.

1.5. Exception:

A fire department member who is providing direct patient care inside an ambulance shall be permitted to release momentarily the seat belt while the vehicle is in motion. This temporary release is to be made solely for the delivery of life-saving measures which cannot be performed while belted. When the procedure has been completed, the fire department member shall refasten the seatbelt. Time without the protection of a seat belt shall be minimized.

2. Regulatory & Statute Compliance

2.1. The State of Illinois traffic laws include specific provisions for emergency vehicles, while they are engaged in emergency operations. The Hanover Park Fire Department policies and procedures specify when and how these exceptions will be applied. The fire department driving policies and standard operating procedures may be, in some cases, more restrictive than state traffic laws.

2.2. Responding to emergency incidents does not in any manner reduce the responsibility to operate vehicles safely. While prompt response to emergency incidents is an organizational priority, safety is always a higher priority. The responding units must arrive safely at the location where they are needed before they can deliver the required services. Unsafe operation of an emergency vehicle creates an unacceptable risk to fire department members, to the public, and to the individuals who are in need of assistance.

2.3. The motor vehicle laws of State of Illinois grant specific allowances and exemptions to emergency vehicles, when they are responding to emergency incidents and using the required warning devices. These provisions only apply to officially recognized emergency vehicles, while they are responding to emergency incidents in compliance with all of the applicable laws and regulations.

2.4. Notwithstanding such allowances and exemptions, the driver of the emergency vehicle is required to operate responsibly at all times. The emergency vehicle driver has a duty to drive with due regard for the safety of all other persons and property.

2.5. The State of Illinois traffic laws require an emergency vehicle to be equipped with warning lights and audible warning devices *(refer to the applicable state law to determine what is required, what is permitted, and what is prohibited.)* The traffic laws also require drivers to yield the right-of-way to an emergency vehicle when the warning lights and audible warning devices are in operation.

2.6. The use of warning lights and audible warning devices does not automatically grant the right-of-way to an emergency vehicle. These devices are intended to make other drivers aware of the presence of an emergency vehicle. Other drivers are required to yield the right-of way to an emergency vehicle; however, they cannot be expected to yield the right-of-way if they do not see or are not aware of the emergency vehicle.

2.7. The emergency vehicle driver must never assume that another vehicle will yield the right-of-way; it is always the emergency vehicle driver's responsibility to ensure that the other driver has yielded the right-of-way. The emergency vehicle driver is responsible for operating in a safe and prudent manner, recognizing that other drivers could be distracted, inattentive, or simply uncooperative. The emergency vehicle driver is not permitted to employ aggressive driving techniques to force another driver to yield the right-of-way.

2.8. While responding in an emergency mode, drivers are required to make their presence evident using audible and visual warning devices. Emergency vehicle drivers should also endeavor to make their intentions as clear as possible and their vehicles as visible as possible to other drivers.

3. Traffic Laws – Emergency Vehicles

3.1. The Hanover Park Fire Department has established the following policies that apply to employees/members who are driving fire department vehicles in an emergency response mode. (The same policies apply to the emergency operation of any other vehicle within the scope of a driver's fire department duties.)

4. Use of Warning Device Policy

4.1. Warning lights and audible warning devices shall be used when fire department vehicles are responding in an emergency mode. Both warning lights and audible devices must be operated in order to meet the legal definition of an emergency vehicle.

4.2. Warning lights shall be used at all times when fire department vehicles are operating in an emergency response mode. Audible warning devices (siren and/or horn) shall be used as necessary to warn other drivers and pedestrians of the approach of an emergency vehicle and request the right-of-way. Audible warning devices shall be used in moderation when they are not required to provide warning (light traffic or open road situations).

4.3. Audible warning devices shall not be used when a vehicle is operating in a non-emergency mode. Warning lights shall be used when the fire department vehicle is maneuvering or stopped in a location where it creates a traffic hazard.

5. Speed Limitations Policy

5.1. The driver shall never exceed a speed that is safe and prudent, based on road and weather conditions and other circumstances, including the design and capabilities of the vehicle. The posted speed limit may be exceeded only when the required warning devices are in use and when weather, traffic, and road conditions are favorable. The posted speed limit shall not be exceeded under any other conditions.

5.1.1. The <u>maximum</u> speed for any Hanover Park Fire Department vehicle, under favorable conditions, shall not exceed the posted speed limit by more than 10 miles-per-hour.

5.1.2. When conditions are unfavorable, the posted speed limit shall not be exceeded and actual speed shall be determined by the conditions.

5.1.3. The posted advisory speed for a curve shall be considered the maximum allowable speed under all conditions, regardless of response condition.

6. Intersection Navigation Policy

6.1. The fire department emergency vehicle shall come to a full stop before entering a negative right-of-way intersection (red light, flashing red light, or stop sign), blind intersection, or any intersection where hazards are present and/or the driver cannot account for all oncoming traffic lanes. The emergency vehicle shall not enter the intersection until all approaching traffic has yielded the right-of-way and it is safe to proceed. The emergency vehicle driver shall ensure that all approaching vehicles in all lanes have yielded the right-of-way before advancing.

6.2. If necessary, due to traffic conditions or visual obstructions, the emergency vehicle driver shall cross the intersection in stages, treating each lane as a separate intersection. The driver shall stop the vehicle, as necessary, to ensure that each lane may be crossed safely

6.3. When passing through an intersection where the emergency vehicle has the right-of-way, by virtue of a green light in the direction of travel and/or a stop signal (stop sign) for cross-traffic, the emergency vehicle shall not exceed the posted speed limit. Emergency vehicle drivers should not assume that oncoming/opposing traffic has stopped, even when facing a green signal or “clear” route; emergency vehicle drivers must visually confirm that oncoming/opposing traffic is stopped while approaching any intersection, and be prepared to stop immediately, if necessary.

7. Traveling in Opposing Traffic Lanes

7.1. Operating emergency vehicles in opposing traffic lanes is extremely hazardous under all conditions and should only be considered under exceptional circumstances (i.e., if there is no alternate route of travel).

7.2. When an emergency vehicle must travel in an opposing traffic lane, or in a center turn lane to maneuver around slow moving or stopped traffic, the emergency vehicle shall not exceed 30 miles-per-hour, at a maximum. If there is a median separating the emergency vehicle from the slow or stopped traffic, the emergency vehicle shall not exceed a maximum of 20 miles-per-hour. (Actual speed should depend on the road, traffic, and weather conditions.)

7.3. When approaching a controlled intersection (traffic lights or stop signs) in an opposing traffic lane or center turn lane, the emergency vehicle shall come to a full stop before entering the intersection, even if the traffic light is green in the direction of travel.

8. Travel in an Opposing Direction

8.1. Operating emergency vehicles against the normal flow of traffic is extremely hazardous under all conditions and should only be considered under exceptional circumstances (i.e., if there is no alternate route of travel).

8.2. Travel against the normal direction of traffic flow on a one-way street shall be limited to short distances. Emergency vehicle drivers must proceed slowly and with extreme caution in these situations.

8.3. The emergency vehicle must come to a full stop before entering an intersection while traveling in an opposing direction.

9. Passing Traffic in an Emergency Vehicle

9.1. When overtaking traffic that is moving in the same direction, the emergency vehicle driver shall give other drivers an opportunity to yield the right-of-way before passing. If it is necessary to pass a vehicle that has not yielded the right-of-way, the emergency vehicle shall provide as wide a clearance as possible.

9.2. A fire department emergency vehicle shall not overtake another emergency vehicle that is traveling in the same direction unless the driver of the lead vehicle has indicated that the other may pass. A following vehicle may contact a leading vehicle by radio to request permission to pass.

10. Railroad Crossing Policy

10.1. The emergency vehicle shall come to a full stop at unguarded railway grade crossings. Caution shall be exercised at grade crossings where warning lights and/or gates are provided.

10.2. It is not always possible to hear an approaching train, due to the Doppler Effect* and the type of locomotives used on some rail lines (particularly electric locomotives); otherwise “normal” appearing highway vehicles, equipped with rail wheels, are also used by railroads and may be encountered at grade crossings. Emergency vehicle drivers should become familiar with the specific characteristics of the rail lines in their area.

10.3. Warning devices and crossing gates are generally reliable, but can fail due to the harsh conditions to which they are exposed—these devices are designed to fail in the “safe” mode. When approaching a grade crossing with lowered gates and/or active lights and no apparent rail traffic, the emergency vehicle shall come to a full stop prior to the crossing; before proceeding, the emergency vehicle driver shall visually confirm that no train or other rail vehicle is approaching on the tracks. Complete confirmation may require that members physically dismount the vehicle to visually check the tracks.

*The "Doppler Effect" is the perceptible change in the frequency and wavelength of a sound wave as it moves relative to an observer.

11. Stopped School Bus

11.1. The emergency vehicle shall not pass a school bus that has stopped with red lights flashing to load or discharge passengers, unless the bus driver clearly signals that it is safe to pass.

11.2. When clearly signaled by the bus driver that it is safe to pass a stopped school bus, the emergency vehicle shall proceed slowly and with extreme caution past the school bus; all members must be vigilant for children while approaching and passing the bus. The emergency vehicle driver must be prepared to stop immediately while approaching, passing, and leaving the area in which the school bus is stopped.

12. Pedestrian Crosswalk

12.1. The emergency vehicle shall not exceed the posted speed limit when approaching a pedestrian crosswalk. If the crosswalk is occupied, the emergency vehicle shall slow down and be prepared to stop if the pedestrian does not yield the right-of-way.

13. Law Enforcement Directions

13.1. The emergency vehicle shall comply with the directions of a sworn law enforcement officer, including a signal to stop.

13.2. Law enforcement officials may also direct the specific positioning, or repositioning, of emergency vehicles on an incident scene to maintain traffic flow, reduce bottlenecks, enhance scene safety, and prevent secondary collisions. Compliance with such direction is generally required of emergency vehicle drivers and their supervisors or chiefs; if a difference of opinion regarding scene safety arises, it should be raised in a cooperative fashion with the ranking law enforcement officer on the scene.

14. Aggressive Driving

14.1. Emergency vehicle drivers shall not employ aggressive driving techniques to force other drivers to yield the right-of-way.

14.2. Emergency vehicles must be operated with due regard for the safety of civilian traffic at all times, and under all circumstances; the elimination of aggressive driving techniques is also critical for protecting the safety of other crew members assigned to the vehicle.

14.3. Emergency vehicle drivers have been cited, fined, and sentenced to imprisonment for causing harm through aggressive driving.

15. Backing Policy

15.1. Before backing a fire department vehicle, the driver shall ensure that the intended path is clear of hazards or obstructions.

15.2. During non-emergency vehicle operation there shall be at least one back-up spotter positioned towards the rear of the vehicle prior to any backward vehicle movement.

15.3. One or more spotters shall be employed as guides in all situations. Two spotters should be assigned when backing large or heavy apparatus–one covering each side of the vehicle. When available, a third spotter can be used to monitor traffic or, especially in the case of aerial apparatus, watch the front of the vehicle for overhead obstructions.

15.4. A spotter is responsible for guiding the driver and ensuring that any potential hazards are avoided. Standard signals shall be used to communicate with the driver during the backing maneuver; hand signals or voice signals transmitted over a portable radio can be employed for this purpose. The spotter shall direct the driver to stop at any time the backing maneuver cannot be completed safely.

15.5. The spotter(s) shall be on the ground, to the rear of the vehicle, and shall remain visible to the driver at all times. If the driver loses sight of the spotter(s) at any time, the driver shall immediately stop the vehicle. Portable radios or tethered vehicle-mounted intercom systems are recommended for spotters' safety. In no case are cameras or safety devices a substitute for a spotter. (NFPA 1500 requires at least one spotter to have contact with the driver.)

15.6. If it is essential to back a vehicle with limited rearward visibility and no spotter is available, the driver shall stop, dismount, and visually perform a 360-degree check around the vehicle before backing, with emphasis on the area behind and to both sides. After checking the area, the driver shall back the vehicle at slow speed and with extreme caution, prepared to stop immediately if necessary.

16. Signals

16.1. **Straight Back**: One hand above the head with palm toward face, waving back. Other hand at your side. (Left or right hand optional)

16.2. **Turn**: Both arms pointing the same direction with index fingers extended. (Driver will advise the spotter which way the turn will be made. The spotter then assists the driver in backing apparatus. The driver's intentions must be verbally communicated to the spotter.)

16.3. **Stop**: Both arms crossed with hands in fist. Be sure to yell the stop order loud enough that the driver can hear the warning.

17. Night Backing

17.1. Signals will be the same. The spotter will ensure that the spotlights on rear of apparatus are turned on before allowing apparatus to be backed. A flashlight may be carried, but at no time will it be directed toward the mirror.

18. Maneuvering at an Incident Scene

18.1. Drivers shall exercise extreme caution while maneuvering emergency vehicles at an incident scene; other drivers and pedestrians may be distracted or preoccupied by events and a variety of hazards (e.g., downed or low-hanging wires, limited visibility, hazardous materials, etc.) may be encountered. Vehicles shall be moved slowly and cautiously, with spotters assigned to guide the driver in tight situations.

18.2. When streets have been closed to regular traffic, the emergency vehicle driver remains fully responsible for the safe and prudent operation of the vehicle at all times.

18.3. When operating at an incident scene where the streets have not been closed to regular traffic, fire department vehicles shall be positioned, parked, or staged in a manner that considers safety as a primary factor.

18.4. Check for Unsecured Personnel: Before moving an emergency vehicle in any location, the driver shall ensure that all occupants are seated and properly secured in approved riding positions. The driver shall also ensure that no one is in the process of mounting, dismounting, standing on top of, or on the outside of, the vehicle.

18.5. Under no circumstances shall members be allowed to ride on the outside of a moving apparatus, including the tailboard, roof, aerial platform/bucket, or a top-mounted pump panel.

19. Return to Roadway

19.1. Fire department vehicle operators shall be aware of the actions to be taken if the wheels of the vehicle leave the paved surface of the roadway. In these situations, the vehicle shall be slowed to a speed below 20 miles-per-hour before any attempt is made to return it to the roadway.

19.2. Depending on road conditions and the condition of the off-road surface on which the vehicle is moving, it may be necessary to carefully bring the vehicle to a complete stop before attempting a return to the roadway; under many circumstances, particularly involving heavy apparatus, this may be the safest course of action.

20. Emergency Vehicle Drivers

20.1. Basic Driver Training

20.1.1. Basic driver training shall be completed before a member is authorized to drive any fire department vehicle or to drive a privately owned vehicle on fire department business. The fire department shall ensure that the individual is properly licensed and insured and has the necessary knowledge, skills, and abilities to operate a vehicle safely. The initial driver training program shall include:

20.1.1.1. Traffic laws
20.1.1.2. Traffic and highway safety
20.1.1.3. Basic vehicle dynamics
20.1.1.4. Inspection and maintenance procedures
20.1.1.5. Competency course
20.1.1.6. Over-the-road evaluation

20.2. Upon completion of the basic driver program, a member is authorized to drive light duty vehicles in a non-emergency mode. This classification includes passenger vehicles, SUVs, vans, and pick-up trucks. Additional training shall be required before the member is qualified to drive larger vehicles or to operate any vehicle in the emergency response mode.

20.3. The department shall periodically review the performance of each member who is authorized to drive fire department vehicles. The authorization to drive may be suspended or revoked as a result of such reviews and/or additional training may be required to maintain driving status. Members, who repeatedly fail to comply with fire department driving policies and procedures or violate traffic laws while driving fire department vehicles, should be re-evaluated or disciplined, if necessary.

21. Driver Training Program

21.1. Department vehicles shall only be driven/operated by individuals who comply with the applicable state driver's license requirements and have been trained and certified to operate the particular vehicle or type/class of vehicle through the Fire Service Vehicle Operator (FSVO) program.

21.2. The Department will train drivers on all apparatus used by the Hanover Park Fire Department, including, but not limited to engines, tower-ladders, ambulances command vehicles, and specialty units (trailers).

21.3. The FSVO Program will meet or exceed the guidelines set forth by the State of Illinois Department of Motor Vehicles Commercial Driver License Program and will prepare

drivers to meet the requirements of NFPA 1002 Standard for Fire Department Vehicle Driver/Operator Professional Qualifications.

21.4. The State of Illinois requires ….

21.4.1. The Department shall periodically review the performance of each member who is authorized to drive fire department vehicles. The authorization to drive may be suspended or revoked as a result of such reviews and/or additional training may be required to maintain driving status. Members, who repeatedly fail to comply with fire department driving policies and procedures or violate traffic laws while driving fire department vehicles may be subject to discipline.

22. Emergency Vehicle Operator's Course

22.1. Before being authorized to operate any fire department vehicle in an emergency response mode, the member shall successfully complete an Emergency Vehicle Operator's Course (EVOC). Following completion of the EVOC program, the individual must demonstrate an appropriate understanding of the specific policies, procedures, and considerations that apply to emergency response, before being authorized to operate vehicles in an emergency response mode. A refresher EVOC training class is required at intervals of not more than three (3) years to maintain emergency vehicle operator status.

23. Traffic Pre-Emption Policy

23.1. Department personnel must use the traffic pre-emption system (Opti-Com) on all dispatched emergency responses and when transporting all emergency class patients to medical facilities to prevent death, injury and property damage. Use of the emitter system DOES NOT GUARANTEE or GRANT right-of-way. Drivers must:

23.1.1. Use traffic preemption devices, when warning lights/sirens are activated
23.1.2. Not use the emitter during non-emergency functions, e.g., parades, community functions, store/food runs, etc.
23.1.3. Attend training before operating a vehicle with an emitter
23.1.4. The emitter device is installed so that it will automatically turn off when transmission is in the park position, or when the vehicle parking or emergency brake is applied, the emitter is turned off automatically

24. Alcohol & Substance Abuse Policy

24.1. Fire department members are not permitted to be on duty, to respond to emergency incidents, to drive or operate fire department vehicles, nor to perform any other duty-related functions while under the influence of alcohol or drugs.

24.2. Fire department members shall not perform any duty-related functions for a minimum of eight (8) hours following the consumption of any alcoholic beverages. A longer period waiting period may be required to ensure that the individual is free of impairment. A blood alcohol concentration of 0.02 percent or higher, while on duty, shall create the presumption that the member is under the influence of alcohol.

24.3. The driver and the officer in charge of any fire department vehicle that is involved in an accident that causes measurable property damage, injury or death shall be tested for the presence of alcohol or drugs with the least possible delay. In addition, a chief officer may require a member to be tested for the presence of drugs or alcohol at any time, upon reasonable suspicion that the member could be under the influence of such substances.

25. Accident Reporting & Investigation

25.1. All Department vehicular accidents should be reported to Ducomm and the on-duty Battalion Chief immediately.

25.2. The report should include the following:

- 25.2.1. Apparatus Number
- 25.2.2. Exact accident location
- 25.2.3. An indication for need for additional medical assistance
- 25.2.4. Indication on whether the vehicle is drivable
- 25.2.5. Indication of need for cover assignment

25.3. While at the accident scene:

- 25.3.1. Initiate appropriate medical care
- 25.3.2. Do not discuss the incident with anyone other than fire and police representatives
- 25.3.3. Do not move your vehicle unless it is creating a traffic hazard
- 25.3.4. If you must move your vehicle, chalk the position of your tires prior to moving.
- 25.3.5. Obtain witness names and contact information
- 25.3.6. Remain at the scene until the police and fire representatives have completed their investigation
- 25.3.7. Take photographs if a camera is available; document if someone else has taken photographs

25.4. All department vehicle accidents will be investigated. The process will include the following:

- 25.4.1. Fact Finding Review
  - 25.4.1.1. Separate interviews with the driver, all crew members, accident witnesses
  - 25.4.1.2. Notes recorded at each interview
  - 25.4.1.3. Contact Information recorded at each interview

25.4.2. Notification of all accidents to Human Resources Director and Village Attorney within 24 hours.
25.4.3. Department employees involved in the incident should be isolated from the general public, the other parties involved in the incident, and the media.
25.4.4. Village of Hanover Park Safety Review Board hearing.

25.5. The Battalion Chief should attempt to collect the following:
25.5.1. Photographs/Video of the incident
25.5.2. Police Report
25.5.3. Name and badge# of investigating Police Officer
25.5.4. Names and contact information for all parties involved (including witnesses)
25.5.5. Applicable Hanover Park Fire Department or Village of Hanover Park Accident Reports/Forms (IRMA)

25.6. The Battalion Chief shall ensure that all appropriate IRMA Accident forms and statements are completed in a timely manner and forwarded to the Legal Department.

Appendix A

Illinois Motor Vehicle Code Text
(625 ILCS 5/12-603.1)(from Ch. 95 1/2, par. 12-603.1)

Sec. 12-603.1. Driver and passenger required to use safety belts, exceptions and penalty.

(a) Each driver and passenger of a motor vehicle operated on a street or highway in this State shall wear a properly adjusted and fastened seat safety belt. A child less than 8 years of age shall be protected as required pursuant to the Child Passenger Protection Act. Each driver of a motor vehicle transporting a child 8 years of age or more, but less than 16 years of age, shall secure the child in a properly adjusted and fastened seat safety belt as required under the Child Passenger Protection Act. Each driver of a motor vehicle transporting a passenger who is unable, due to infirmity, illness, or age, to properly adjust and fasten a seat safety belt and is not exempted from wearing a seat safety belt under subsection (b) shall secure the passenger in a properly adjusted and fastened seat safety belt as required under this Section.

(b) Paragraph (a) shall not apply to any of the following:

1. A driver or passenger frequently stopping and leaving the vehicle or delivering property from the vehicle, if the speed of the vehicle between stops does not exceed 15 miles per hour.

2. A driver or passenger possessing a written statement from a physician that such person is unable, for medical or physical reasons, to wear a seat safety belt.

3. A driver or passenger possessing an official certificate or license endorsement issued by the appropriate agency in another state or country indicating that the driver is unable for medical, physical, or other valid reasons to wear a seat safety belt.

4. A driver operating a motor vehicle in reverse.

5. A motor vehicle with a model year prior to 1965.

6. A motorcycle or motor driven cycle.

7. A moped.

8. A motor vehicle which is not required to be equipped with seat safety belts under federal law.

9. A motor vehicle operated by a rural letter carrier of the United States postal service while performing duties as a rural letter carrier.

10. A driver or passenger of an authorized emergency vehicle, except this exception does not apply to vehicles of the fire department; vehicles of the Office of the State Fire Marshal; or ambulances, unless the delivery of life-saving measures prohibits the use of a seat safety belt.

11. A back seat passenger of a taxicab.

(c) Failure to wear a seat safety belt in violation of this Section shall not be considered evidence of negligence, shall not limit the liability of an insurer, and shall not diminish any recovery for damages arising out of the ownership, maintenance, or operation of a motor vehicle.

(d) A violation of this Section shall be a petty offense and subject to a fine not to exceed $25.

(e) (Blank).

(f) A law enforcement officer may not search or inspect a motor vehicle, its contents, the driver, or a passenger solely because of a violation of this Section.

(Source: P.A. 97-16, eff. 1-1-12; 97-333, eff. 8-12-11; 98-451, eff. 8-16-13.)

APPENDIX B

VILLAGE OF HANOVER PARK

LOCK-OUT/TAG-OUT

Statement of Purpose

The purpose of the Village of Hanover Park Public Works Lock-Out Tag-Out Program and Procedures is to ensure the health and safety of our employees and electrical contractors and subcontractors. This program is developed to ensure that a machine or piece of equipment is isolated from all potentially hazardous energy, and locked or tagged out before any service is performed where the unexpected enerization, start-up or release of stored energy could cause injury.

Employees fall into four (4) categories:

1. Authorized Employees
2. Affected Employees
3. Other Employees
4. Contract Personnel

THE OSHA STANDARD DOES NOT APPLY IN THE FOLLOWING SITUATIONS:

- When work is being done on electrically powered equipment of the ordinary "cord and plug" type where power can be turned off by unplugging the equipment . . . and the plug is under the exclusive control of the employee serving the equipment.

- "Hot Tap" operations on transmission and distribution systems (for substances such as gas, steam, water, oil, etc.) where certain criteria are met within those systems.

VILLAGE OF HANOVER PARK

LOCK-OUT/TAG-OUT

Locations of Affected Electrical Equipment

For detailed electrical source listing per location, please see the attached Exhibit A and B.

These are the locations, as currently identified, where Lock-Out/Tag-Out procedures are in place for the Department of Public Works:

A. Vehicle Maintenance Garage
   1. Main Shop
   2. Wash Bay
   3. Parts Room
   4. Equipment Room
   5. Paint Bay
   6. Electrical Panel

B. Public Works Garage
   1. Garage
   2. Generator Closet
   3. Electrical Control Panel Closet

C. Public Works Electrical/Utility Room
   1. Furnace Room
   2. Electrical Panels

D. Municipal Building
   1. Utility/Furnace Room
   2. Generator Room

E. STP #1 - Control Building
   1. Motor Control Room
   2. Blower Room

F. STP #1 - Pretreatment Building

G. STP #1 – On-Site Facilities
   1. Muffin Monster (Sewage Grinder)
   2. Grit Removal Facility
   3. Oxidation Ditch
   4. Clarifier 1, 2 & 3
   5. Scum Pump Station
   6. Excess Flow
   7. Ultra Violet Disinfection

H. STP #1 - Maintenance Garage

I. Evergreen Well Site
   1. Well #1
   2. Well #2

J. Longmeadow Pump Station

K. Well #4 and Pump Station

L. Schick Road Pump Station

M. Jefferson Lift Station

N. Northway Lift Station

O. Kingsbury Lift Station

VILLAGE OF HANOVER PARK

LOCK-OUT/TAG-OUT

Lock-Out/Tag-Out Procedures

All Public Works electrical sources, as identified in Exhibit B, must be locked out when feasible otherwise a tag out system may be authorized if it provides the same degree of employee protection as given by a lock out.

STEPS THAT MUST BE FOLLOWED DURING THE LOCK-OUT PROCEDURE, IN THE GIVEN WRITTEN CHRONOLOGICAL ORDER.

1. Identify and notify all division employees that the lock-out procedure is in force.
2. Shut off the machine by normal operating procedures.
3. Shut off the circuit breaker or disconnect so the equipment is further isolated from the energy source.
4. Lock-out the energy isolating device with locks.
5. After securing the machine from other personnel, operate the primary control switch (valve, push button) to make certain that the equipment will not operate.
6. Return operating controls to neutral (off).
7. Begin repairs.

If a tag-out system is utilized and in order to prevent accidental energy start-up, affected employees must be informed by the Supervisor of the following:

1. TAGS DO NOT PROVIDE PHYSICAL RESTRAINT.
2. TAGS ARE SIMPLY WARNING DEVICES AND NOT ISOLATING DEVICES.
3. TAGS MUST BE LEGIBLE AND UNDERSTANDABLE TO AFFORD EMPLOYEES AN ADEQUATE LEVEL OF PROTECTION.
4. TAGS AND THEIR SECURING DEVICES MUST BE ABLE TO SURVIVE HARSH ENVIRONMENTAL CONDITIONS.
5. TAGS ARE NOT TO BE BYPASSED, IGNORED OR INVALIDATED.
6. TAGS, TO BE EFFECTIVE, MUST BE STANDARDIZED BY SHAPE, COLOR, DIMENSIONS AND LETTER STYLE, SHAPE AND FORMAT.

VILLAGE OF HANOVER PARK

LOCK-OUT/TAG-OUT

Restoring The Electrical Source

BEFORE electrical sources can be considered operational, the locked out sources must be restored to **"working status".** Follow these necessary steps to restore an electrical source:

After servicing and maintenance is complete and equipment is ready for normal operations:

1. Check the area around the machine or equipment to ensure that no one will be injured by exposure, make sure employees are at a safe distance. Notify affected employees and place observers if necessary.

2. Remove tools from the machine.

3. Reinstall guards.

4. Remove all lock-out/tag-out devices.

5. Operate the energy isolating devices to restore energy to the machine and equipment.

6. Start-up equipment.

VILLAGE OF HANOVER PARK

LOCK-OUT/TAG-OUT

Annual Training

The Public Works Safety Coordinator will conduct an annual Lock-Out/Tag-Out energy control training of all Public Works Department employees. The training will utilize both video, lecture and handout material and will target the following objectives:

- Explain the energy control regulation
- Explain the purpose of the Lock-Out/Tag-Out program
- Explain the specific skills required for the program
- Explain Lock-Out vs. Tag-Out

All Lock-Out/Tag-Out training must be documented.

Aside from annual training, OSHA requires re-training when . . . .

- A change in job assignment
- A change in machines, equipment or process occurs that may present a new hazard
- A change in Energy Control Procedures
- An employee's knowledge or use of Energy Control Procedures is shown to be inadequate

The Division Supervisor will be responsible for this additional training when necessary. See Section 6 which details training procedures due to change in status.

VILLAGE OF HANOVER PARK

LOCK-OUT/TAG-OUT

Changes/Revisions To Lock-Out/Tag-Out Policy

When electrical sources are phased out or replaced with other electrical technologies or . . .

When electrical sources are added to its overall Village Public Works operations . . .

When new equipment becomes subject to the energy control procedures . . .

The Lock-Out/Tag-Out Policy will be revised to incorporate these changes, either phased out or additions, to the electrical sources.

The Division Supervisor, involving the newly affected energy source change, will then train all employees within the division to the proper energy control procedures. It will also be the responsibility of the Supervisor to train and notify division employees and the Safety Coordinator when a new piece of machinery is subject to the energy control procedures.

VILLAGE OF HANOVER PARK

LOCK-OUT/TAG-OUT

Electrical Contractors

All outside electrical contractors hired to work in areas where Lock-Out/Tag-Out operations are ongoing, must be informed of the Lock-Out/Tag-Out procedures and the prohibition against tampering with energy isolating devices by the Department Supervisor who authorized the Lock-Out/Tag-Out procedure.

VILLAGE OF HANOVER PARK

LOCK-OUT/TAG-OUT

Special Circumstances

The following cases are circumstances that would require special procedures aside from the regular operating procedures outlined for Lock-Out/Tag-Out.

1. Lock-Out of Liquids
2. Lock-Out of Gases
3. Discharge of Electricity
4. Shift Changes (N/A in Public Works)
5. Contractors (See Section 7)

VILLAGE OF HANOVER PARK

LOCK-OUT/TAG-OUT

Inventory of Liquid And/Or Gas Sources To Be Locked Out

Location	Description

SPECIFIC PROCEDURES FOR LIQUID/GAS SOURCES

EQUIPMENT: Air Lift

PROCEDURES:

1. Notify affected employees and "other" employees of impending equipment shut-down.
2. Air Lifts are controlled by the shut-off switch at the pump.

EQUIPMENT: Air Compressor

PROCEDURES:

1. Notify affected employees and "other" employees of impending equipment shut-down.
2. Shut-off with the valve clamp.

EQUIPMENT: Fire Hose Sprinkler

PROCEDURES:

1. Notify affected employees and "other" employees of impending equipment shut-down.
2. Shut-off with the valve clamp.

VILLAGE OF HANOVER PARK

LOCK-OUT/TAG-OUT

Definitions

Affected Employees: Any employee whose job requires them to operate or use a machine or piece of equipment on which servicing or maintenance is performed under Lock-Out/Tag-Out . . . or whose job requires them to work in an area where this type of servicing or maintenance is being performed.

Authorized Employee: A person who locks or implements a Tag-Out System procedure on machines or equipment so they can perform the servicing or maintenance on that machine.

An authorized employee and affected employee may be the same person when an employees duties also include performing maintenance or service on a machine which must be locked or have a Tag-Out System implemented.

Contract Personnel: Contractors who do work for your company. Contract personnel who work in company equipment must follow OSHA standards for Lock-Out/Tag-Out. An outside contractor and the employer must inform each other of their program.

Energized: Connected to an energy source or containing residual or stored energy.

Energy Isolating Device: A mechanical device that physically prevents the transmission or release of energy including but not limited to the following:

- Manually operated electrical circuit breaker
- Disconnect switch
- Manually operated switch by which the conductors of circuit can be disconnected from an underground supply
- Line valve
- Block
- Similar device used to block or isolate energy

Lock-Out: Placement of a Lock-Out device on an energy isolating device, in accordance with the established procedure. This placement must ensure that the energy isolating device and the machine or piece of equipment being controlled can not be operated until the Lock-Out device is removed.

Lock-Out Device: A device that utilized a positive means, such as a lock (either key or combination type) to hold an energy isolating device in the "safe" position . . . and prevent the energizing of a machine or piece of equipment.

"Other" Employee: An employee whose work operations are, or may be, in an area where Energy Control Procedures may be utilized.

Tag-Out: The placement of a Tag-Out device on energy isolating device, in accordance with an established procedure, to indicate that the energy isolating device and the equipment being controlled may not be operated.

Tag-Out Device: A prominent warning device, such as a tag and its means of attachment, which can be securely fastened to an energy isolating device in accordance with an established procedure. This device must indicate that the energy isolating device and the equipment being controlled may not be operated until the Tag-Out device is removed.

VILLAGE OF HANOVER PARK

LOCK-OUT/TAG-OUT

OSHA Exceptions

Listed below are OSHA identified exceptions to the Lock-Out/Tag-Out Procedures.

- Machine must have no potential for stored energy.
- Machine must have a single energy source which can easily be identified.
- Machine is isolated from energy source and locked during servicing.
- Isolation and Locking of the energy source will completely de-energize and de-activate the machine.
- A single Lock-Out device will achieve a Lock-Out condition.
- The Lock-Out device is under exclusive control of the authorized employee performing the serving.
- Servicing does not create other hazards for other employees.
- No accidents have happened prior involving the unexpected activation or re-energization of the machine.

VILLAGE OF HANOVER PARK

LOCK-OUT/TAG-OUT

Multiple Employee Lock-Out/Tag-Out Procedures

There may be circumstances in which more than one individual may need to Lock-Out a device. In this case, each employee is to place their lock or tag on the equipment.

When an energy isolating device cannot accept multiple locks, a multi-holed clasp may be used.

As each person no longer needs to maintain their Lock-Out protection, each person will remove their lock from the multiple lock out device or cabinet, whichever is being used.

VILLAGE OF HANOVER PARK

LOCK-OUT/TAG-OUT

Obtaining and Returning These Devices at Central Locations
Standardized Procedures

EMPLOYEES NEEDING LOCK-OUT/TAG-OUT DEVICES MUST:

- Record the devices they are taking.
- Record the date and time when they receive the devices.
- Sign the log to indicate they have the devices in their possession.
- When employees are finished using the devices, they are returned to the central locations and the return date and time recorded.

THE LOCK-OUT/TAG-OUT CENTERS ARE:

1. Building Maintenance Supervisors Office
2. Water Treatment Supervisors Office
3. Wastewater Treatment Supervisors Office

LOCK-OUT/TAG-OUT DEVICE LOG IS ATTACHED AS "EXHIBIT D".

EXHIBIT A

Location and Description

of

Electrical Sources

LOCATION AND DESCRIPTION OF ELECTRICAL SOURCES

A. ______________________________

Location	Description

Exhibit A

EXHIBIT B

EXHIBIT C

VILLAGE OF HANOVER PARK

PUBLIC WORKS DEPARTMENT

INVENTORY OF LOCK-OUT/TAG-OUT DEVICES

All lock-out devices are located in the Building Maintenance, Water Treatment and Wastewater Treatment Supervisor's offices in the Department of Public Works.

DEVICE	QUANTITY	COLOR
Padlocks	3	
Lock-Out Hasps	1	
Gate Valve Lockouts	1	
Ball Valve Lockouts	1	
Plug Lockouts	3	
Wall Switch Lockout	1	
Universal Circuit Breaker	3	
Tags	2	
Signs	1	

EXHIBIT C

EXHIBIT D

Lock-Out/Tag-Out Device Log

VILLAGE OF HANOVER PARK

PUBLIC WORKS DEPARTMENT

LOCK-OUT/TAG-OUT DEVICE LOG

All lock-out/tag-out devices issued from this location are listed below, along with the date and time the device was issued, and with the signature of the employees receiving the device. All devices must be returned to this location after use, at which time the date and time the device is returned will be noted.

DEVICE	OUT DATE/TIME	RETURNED DATE/TIME	EMPLOYEE SIGNATURE

EXHIBIT D

Lock-out/Tag-out

Purpose

This is a statement of the Village of Hanover Park Fire Department policy to establish the process for compliance with the Occupational Safety and Health Administration (OSHA) regulation, "Control of Hazardous Energy", 29 CFR 1910.147 which is attached as Appendix A and Public works policy “Village of Hanover Park Lock-out/Tag-out policy and procedure” attached as Appendix B. It is intended to protect Fire Department employees from the hazards caused by the inadvertent activation of equipment during maintenance or emergency disassembly. This policy establishes the minimum requirements to protect employees from such hazards.

1. Scope

1.1. This policy shall be applied to all employees at all times unless specifically prohibited by contract or law, in which case only those prohibited provisions shall be unenforced and all other remaining provisions shall apply.

1.2. The power source of any equipment, machine or process to be set-up, adjusted, repaired, serviced, installed, where maintenance work or emergency disassembly is to be performed and unintended motion or release of energy would cause personal injury, such a power source shall be locked out by each employee doing the work. Sources of energy, such as springs, air, hydraulic or steam shall be evaluated in advance to determine whether to retain or relieve the pressure prior to starting the work. While on emergency scenes, Servicing, and/or maintenance takes place during normal production operations is covered by this plan if:

1.3. An employee is required to remove or bypass a guard or safety device; or an employee is required to place any part of his or her body into an area of the machine or piece of equipment where work is actually performed upon the material being processed (point of operation) or where an associated danger exists during a machine cycle.

1.4. Minor tool changes and adjustments (e.g., clearing jammed paper from a copier, printer or) and other minor servicing activities, which are routine, repetitive, and take place during normal production operations, are not covered by this plan. This type of maintenance must be completed using alternative safety measures (e.g., proper use of manufacturer-required and recommended machine guards).

1.5. This plan also does not apply to work on cord and plug connected electrical equipment for which exposure to the hazards of unexpected start-up is controlled by unplugging it from the energy source if the plug is under the exclusive control of the employee performing the service.

2. Responsibilities

2.1. During emergency operations the Incident Safety Officer shall be responsible for all Lock Out/Tag Out operations and shall require such locking/tagging whenever crews are operating in or around energized equipment or machinery.

2.2. During non-emergency operations, the shift supervisor shall ensure that all provisions of this policy are followed when working in or around energized equipment or machinery.

2.3. Each supervisor shall train new employees and annually re-instruct all of their employees regarding provisions and requirements of the department lockout procedure(s).

2.4. Each supervisor shall effectively enforce compliance of this lockout procedure including the use of corrective disciplinary action where necessary.

2.5. Each supervisor shall assure that the locks and devices required for compliance with the lockout procedure are provided to their employees.

2.6. Employees shall comply with the lockout procedure.

2.7. Employees shall consult with their supervisor or other appropriate knowledgeable management personnel whenever there are any questions regarding their protection.

2.8. Employees shall obtain and care for the locks and other devices required to comply with the lockout procedure.

3. PROCEDURE

3.1. Safety locks, adapters and "Danger Tags" can be obtained from the Lockout/Tag-out Box located in each front line Fire Engine

3.2. Safety locks are for the personal protection of the employee and are only to be used for locking out equipment.

3.3. The sole purpose of the "Equipment" lock and adaptor is to protect the equipment during periods of time when work has been suspended or interrupted.

3.4. One key of every lock issued shall be retained by the employees to whom it was issued and the only other key to the lock shall be retained by a company designated employee in the respective station.

3.5. Employees shall request assistance from their supervisor if they do not know where or how to lockout equipment.

3.6. Any questions concerning the lockout procedure should be directed to the employee's supervisor.

3.7. Determine what equipment or machinery needs to be "locked out".

3.8. Determine which personnel are affected if an energy source is improperly or accidentally energized or opened.

3.9. If an energy isolating device is not capable of being locked out, a tag only shall be used, and then other means shall be taken to ensure adequate protection for affected personnel.

3.10. A competent person should make a survey to locate and identify all energy isolating devices to be certain that these devices apply to the equipment to be "locked out".

4. LOCKING OUT AND ISOLATING THE POWER SOURCE

4.1. Equipment, machines or processes main disconnect switches shall be turned off and locked in the off position only after the electrical power is shut off at the point of operation control. Failure to follow this procedure may cause arcing, and possibly an explosion.

4.2. A machine connected to a 110-volt source of power by a plug-in cord shall be considered locked out if the plug is disconnected and tagged with a do not start tag.

4.3. After locking out the power source, the employee shall try the equipment, machine or process controls to ensure no unintended motion will occur or test the equipment, machine or process by use of appropriate test equipment to determine that the energy isolation has been effective.

4.4. When two or more employees work on the same equipment, each is responsible for attaching his/her lock. Safety locks and adapters are to be fixed on levers, switches, valves, etc., in the non-operative (off) position.

4.5. An employee who is assigned to a job and upon arrival finds an "Equipment Lock", "Adaptor", and "Danger Tag" affixed to the equipment shall take the following action:

4.6. Affix his/her personal lock to the "Equipment Adaptor".

4.7. Try the controls to ensure no unintended motion will occur before starting work or test the equipment, machine or process by use of appropriate test equipment to determine the energy isolation has been effective.

4.8. When die or safety blocks are required, they shall be used in conjunction with the lockout steps, not as a substitute.

5. REMOVAL OF LOCKS AND RESTORING POWER SOURCE

5.1. Power may be turned on when it is required to perform tests, adjustments or set-up activities. All of the rules pertaining to removing locks and restoring power shall be followed. The equipment or process shall again be locked out if it is necessary to continue work after completing the test, adjustment or set-up activity.

5.2. If the employee leaves the job before its completion, such as job reassignment or shift change, the employee shall remove his/her personal lock and adaptor and replace it with an "Equipment" lock and adaptor, in addition, the employee will prepare and attach a "Danger Tag" indicating the reason the equipment is locked out (should more than one employee be assigned the job, the last employee removing his/her lock will be responsible for affixing the "Equipment" lock, adaptor and the "Danger Tag").

5.3. Upon completion of the work, each employee will remove his/her lock, rendering the machine operable when the last lock is removed.

5.4. The employee responsible for removing the last lock, before doing so, shall assure that all guards

6. Definitions

6.1. Affected Personnel: A person who is required to work on machinery or equipment during installation (set up) or who performs maintenance, servicing, or testing.

6.2. Authorized Person: The person that initiates or implements the Lockout/Tag-out program.

6.3. Energized: Connected to an energy source or containing residual or stored energy.

6.4. Energy source: Any source of electrical, mechanical, hydraulic, pneumatic, steam, chemical, thermal, or other type of energy.

6.5. Lockout: The placement of a lockout device on an energy isolating device in accordance with established procedures, to ensure that the energy isolating device and the equipment or system being controlled cannot be operated until the lockout device is removed.

6.6. Tag-out: The placing of an approved tag on an energy isolating device, in accordance with the established procedures.

6.7. Tag-out device: A prominent warning device, such as a tag and its means of attachment that is made of materials that will withstand all environmental conditions, and be substantial enough to prevent inadvertent or accidental removal. The Tag-out device must be designed to that it can be securely fastened to an energy isolating device. The equipment being controlled may not be operated until the tag-out device is removed. The means of attachment of a tag-out device shall be of a non-reusable type, self-locking, with a minimum unlocking strength of 50 pounds (nylon cable tie).

6.8. Try: The act of an authorized person verifying that all switches, valves, or other devices are in-fact correctly locked and tagged to ensure that all energy sources have been isolated. All affected personnel should observe the "try".

6.9. Competent Person: An individual who is capable, by training and/or experience, of identifying existing and predictable hazards or working conditions in the work place. This person is authorized to take prompt corrective measures to eliminate the unsafe conditions.

APPENDIX A

Regulations (Standards - 29 CFR)

The control of hazardous energy (lockout/tagout). - 1910.147

Regulations (Standards - 29 CFR) - Table of Contents

• **Part Number:**	1910
• **Part Title:**	Occupational Safety and Health Standards
• **Subpart:**	J
• **Subpart Title:**	General Environmental Controls
• **Standard Number:**	1910.147
• **Title:**	The control of hazardous energy (lockout/tagout).
• **Appendix:**	A

1910.147(a)

Scope, application and purpose -

1910.147(a)(1)

Scope

1910.147(a)(1)(i)

This standard covers the servicing and maintenance of machines and equipment in which the **unexpected** energization or start up of the machines or equipment, or release of stored energy could cause injury to employees. This standard establishes minimum performance requirements for the control of such hazardous energy.

1910.147(a)(1)(ii)

This standard does not cover the following:

1910.147(a)(1)(ii)(A)

Construction, agriculture and maritime employment;

1910.147(a)(1)(ii)(B)

Installations under the exclusive control of electric utilities for the purpose of power generation, transmission and distribution, including related equipment for communication or metering; and

1910.147(a)(1)(ii)(C)

Exposure to electrical hazards from work on, near, or with conductors or equipment in electric utilization installations, which is covered by Subpart S of this part; and

..1910.147(a)(1)(ii)(D)

1910.147(a)(1)(ii)(D)

Oil and gas well drilling and servicing.

1910.147(a)(2)

Application.

1910.147(a)(2)(i)

This standard applies to the control of energy during servicing and/or maintenance of machines and equipment.

1910.147(a)(2)(ii)

Normal production operations are not covered by this standard (See Subpart O of this Part). Servicing and/or maintenance which takes place during normal production operations is covered by this standard only if:

1910.147(a)(2)(ii)(A)

An employee is required to remove or bypass a guard or other safety device; or

1910.147(a)(2)(ii)(B)

An employee is required to place any part of his or her body into an area on a machine or piece of equipment where work is actually performed upon the material being processed (point of operation) or where an associated danger zone exists during a machine operating cycle.

Note: **Exception to paragraph (a)(2)(ii):** Minor tool changes and adjustments, and other minor servicing activities, which take place during normal production operations, are not covered by this standard if they are routine, repetitive, and integral to the use of the equipment for production, provided that the work is performed using alternative measures which provide effective protection (See Subpart O of this Part).

1910.147(a)(2)(iii)

This standard does not apply to the following:

..1910.147(a)(2)(iii)(A)

1910.147(a)(2)(iii)(A)

Work on cord and plug connected electric equipment for which exposure to the hazards of unexpected energization or start up of the equipment is controlled by the unplugging of the equipment from the energy source and by the plug being under the exclusive control of the employee performing the servicing or maintenance.

1910.147(a)(2)(iii)(B)

Hot tap operations involving transmission and distribution systems for substances such as gas, steam,

water or petroleum products when they are performed on pressurized pipelines, provided that the employer demonstrates that-

1910.147(a)(2)(iii)(B)(1)

continuity of service is essential;

1910.147(a)(2)(iii)(B)(2)

shutdown of the system is impractical; and

1910.147(a)(2)(iii)(B)(3)

documented procedures are followed, and special equipment is used which will provide proven effective protection for employees.

1910.147(a)(3)

Purpose.

1910.147(a)(3)(i)

This section requires employers to establish a program and utilize procedures for affixing appropriate lockout devices or tagout devices to energy isolating devices, and to otherwise disable machines or equipment to prevent unexpected energization, start up or release of stored energy in order to prevent injury to employees.

1910.147(a)(3)(ii)

When other standards in this part require the use of lockout or tagout, they shall be used and supplemented by the procedural and training requirements of this section.

1910.147(b)

Definitions applicable to this section.

Affected employee. An employee whose job requires him/her to operate or use a machine or equipment on which servicing or maintenance is being performed under lockout or tagout, or whose job requires him/her to work in an area in which such servicing or maintenance is being performed.

Authorized employee. A person who locks out or tags out machines or equipment in order to perform servicing or maintenance on that machine or equipment. An affected employee becomes an authorized employee when that employee's duties include performing servicing or maintenance covered under this section.

Capable of being locked out. An energy isolating device is capable of being locked out if it has a hasp or other means of attachment to which, or through which, a lock can be affixed, or it has a locking mechanism built into it. Other energy isolating devices are capable of being locked out, if lockout can be achieved without the need to dismantle, rebuild, or replace the energy isolating device

or permanently alter its energy control capability.

Energized. Connected to an energy source or containing residual or stored energy.

Energy isolating device. A mechanical device that physically prevents the transmission or release of energy, including but not limited to the following: A manually operated electrical circuit breaker; a disconnect switch; a manually operated switch by which the conductors of a circuit can be disconnected from all ungrounded supply conductors, and, in addition, no pole can be operated independently; a line valve; a block; and any similar device used to block or isolate energy. Push buttons, selector switches and other control circuit type devices are not energy isolating devices.

Energy source. Any source of electrical, mechanical, hydraulic, pneumatic, chemical, thermal, or other energy.

Hot tap. A procedure used in the repair, maintenance and services activities which involves welding on a piece of equipment (pipelines, vessels or tanks) under pressure, in order to install connections or appurtenances. it is commonly used to replace or add sections of pipeline without the interruption of service for air, gas, water, steam, and petrochemical distribution systems.

Lockout. The placement of a lockout device on an energy isolating device, in accordance with an established procedure, ensuring that the energy isolating device and the equipment being controlled cannot be operated until the lockout device is removed.

Lockout device. A device that utilizes a positive means such as a lock, either key or combination type, to hold an energy isolating device in the safe position and prevent the energizing of a machine or equipment. Included are blank flanges and bolted slip blinds.

Normal production operations. The utilization of a machine or equipment to perform its intended production function.

Servicing and/or maintenance. Workplace activities such as constructing, installing, setting up, adjusting, inspecting, modifying, and maintaining and/or servicing machines or equipment. These activities include lubrication, cleaning or unjamming of machines or equipment and making adjustments or tool changes, where the employee may be exposed to the **unexpected** energization or startup of the equipment or release of hazardous energy.

Setting up. Any work performed to prepare a machine or equipment to perform its normal production operation.

Tagout. The placement of a tagout device on an energy isolating device, in accordance with an established procedure, to indicate that the energy isolating device and the equipment being controlled may not be operated until the tagout device is removed.

Tagout device. A prominent warning device, such as a tag and a means of attachment, which can be securely fastened to an energy isolating device in accordance with an established procedure, to indicate that the energy isolating device and the equipment being controlled may not be operated until the tagout device is removed.

..1910.147(c)

1910.147(c)

General -

1910.147(c)(1)

Energy control program. The employer shall establish a program consisting of energy control procedures, employee training and periodic inspections to ensure that before any employee performs any servicing or maintenance on a machine or equipment where the unexpected energizing, startup or release of stored energy could occur and cause injury, the machine or equipment shall be isolated from the energy source and rendered inoperative.

1910.147(c)(2)

Lockout/tagout.

1910.147(c)(2)(i)

If an energy isolating device is not capable of being locked out, the employer's energy control program under paragraph (c)(1) of this section shall utilize a tagout system.

1910.147(c)(2)(ii)

If an energy isolating device is capable of being locked out, the employer's energy control program under paragraph (c)(1) of this section shall utilize lockout, unless the employer can demonstrate that the utilization of a tagout system will provide full employee protection as set forth in paragraph (c)(3) of this section.

1910.147(c)(2)(iii)

After January 2, 1990, whenever replacement or major repair, renovation or modification of a machine or equipment is performed, and whenever new machines or equipment are installed, energy isolating devices for such machine or equipment shall be designed to accept a lockout device.

1910.147(c)(3)

Full employee protection.

1910.147(c)(3)(i)

When a tagout device is used on an energy isolating device which is capable of being locked out, the tagout device shall be attached at the same location that the lockout device would have been attached, and the employer shall demonstrate that the tagout program will provide a level of safety equivalent to that obtained by using a lockout program.

..1910.147(c)(3)(ii)

1910.147(c)(3)(ii)

In demonstrating that a level of safety is achieved in the tagout program which is equivalent to the level of safety obtained by using a lockout program, the employer shall demonstrate full compliance with all tagout-related provisions of this standard together with such additional elements as are necessary to provide the equivalent safety available from the use of a lockout device. Additional means to be considered as part of the demonstration of full employee protection shall include the implementation of additional safety measures such as the removal of an isolating circuit element, blocking of a controlling switch, opening of an extra disconnecting device, or the removal of a valve handle to reduce the likelihood of inadvertent energization.

1910.147(c)(4)

Energy control procedure.

1910.147(c)(4)(i)

Procedures shall be developed, documented and utilized for the control of potentially hazardous energy when employees are engaged in the activities covered by this section.

Note: **Exception:** The employer need not document the required procedure for a particular machine or equipment, when all of the following elements exist: (1) The machine or equipment has no potential for stored or residual energy or reaccumulation of stored energy after shut down which could endanger employees; (2) the machine or equipment has a single energy source which can be readily identified and isolated; (3) the isolation and locking out of that energy source will completely deenergize and deactivate the machine or equipment; (4) the machine or equipment is isolated from that energy source and locked out during servicing or maintenance; (5) a single lockout device will achieve a locker-out condition; (6) the lockout device is under the exclusive control of the authorized employee performing the servicing or maintenance; (7) the servicing or maintenance does not create hazards for other employees; and (8) the employer, in utilizing this exception, has had no accidents involving the unexpected activation or reenergization of the machine or equipment during servicing or maintenance.

1910.147(c)(4)(ii)

The procedures shall clearly and specifically outline the scope, purpose, authorization, rules, and techniques to be utilized for the control of hazardous energy, and the means to enforce compliance including, but not limited to, the following:

1910.147(c)(4)(ii)(A)

A specific statement of the intended use of the procedure;

1910.147(c)(4)(ii)(B)

Specific procedural steps for shutting down, isolating, blocking and securing machines or equipment to control hazardous energy;

1910.147(c)(4)(ii)(C)

Specific procedural steps for the placement, removal and transfer of lockout devices or tagout devices

and the responsibility for them; and

..1910.147(c)(4)(ii)(D)

1910.147(c)(4)(ii)(D)

Specific requirements for testing a machine or equipment to determine and verify the effectiveness of lockout devices, tagout devices, and other energy control measures.

1910.147(c)(5)

Protective materials and hardware.

1910.147(c)(5)(i)

Locks, tags, chains, wedges, key blocks, adapter pins, self-locking fasteners, or other hardware shall be provided by the employer for isolating, securing or blocking of machines or equipment from energy sources.

1910.147(c)(5)(ii)

Lockout devices and tagout devices shall be singularly identified; shall be the only devices(s) used for controlling energy; shall not be used for other purposes; and shall meet the following requirements:

1910.147(c)(5)(ii)(A)

Durable.

1910.147(c)(5)(ii)(A)(1)

Lockout and tagout devices shall be capable of withstanding the environment to which they are exposed for the maximum period of time that exposure is expected.

1910.147(c)(5)(ii)(A)(2)

Tagout devices shall be constructed and printed so that exposure to weather conditions or wet and damp locations will not cause the tag to deteriorate or the message on the tag to become illegible.

1910.147(c)(5)(ii)(A)(3)

Tags shall not deteriorate when used in corrosive environments such as areas where acid and alkali chemicals are handled and stored.

..1910.147(c)(5)(ii)(B)

1910.147(c)(5)(ii)(B)

Standardized. Lockout and tagout devices shall be standardized within the facility in at least one of the following criteria: Color; shape; or size; and additionally, in the case of tagout devices, print and

format shall be standardized.

1910.147(c)(5)(ii)(C)

Substantial -

1910.147(c)(5)(ii)(C)(1)

Lockout devices. Lockout devices shall be substantial enough to prevent removal without the use of excessive force or unusual techniques, such as with the use of bolt cutters or other metal cutting tools.

1910.147(c)(5)(ii)(C)(2)

Tagout devices. Tagout devices, including their means of attachment, shall be substantial enough to prevent inadvertent or accidental removal. Tagout device attachment means shall be of a non-reusable type, attachable by hand, self-locking, and non-releasable with a minimum unlocking strength of no less than 50 pounds and having the general design and basic characteristics of being at least equivalent to a one-piece, all environment-tolerant nylon cable tie.

1910.147(c)(5)(ii)(D)

Identifiable. Lockout devices and tagout devices shall indicate the identity of the employee applying the device(s).

1910.147(c)(5)(iii)

Tagout devices shall warn against hazardous conditions if the machine or equipment is energized and shall include a legend such as the following: **Do Not Start. Do Not Open. Do Not Close. Do Not Energize. Do Not Operate.**

..1910.147(c)(6)

1910.147(c)(6)

Periodic inspection.

1910.147(c)(6)(i)

The employer shall conduct a periodic inspection of the energy control procedure at least annually to ensure that the procedure and the requirements of this standard are being followed.

1910.147(c)(6)(i)(A)

The periodic inspection shall be performed by an authorized employee other than the ones(s) utilizing the energy control procedure being inspected.

1910.147(c)(6)(i)(B)

The periodic inspection shall be conducted to correct any deviations or inadequacies identified.

1910.147(c)(6)(i)(C)

Where lockout is used for energy control, the periodic inspection shall include a review, between the inspector and each authorized employee, of that employee's responsibilities under the energy control procedure being inspected.

1910.147(c)(6)(i)(D)

Where tagout is used for energy control, the periodic inspection shall include a review, between the inspector and each authorized and affected employee, of that employee's responsibilities under the energy control procedure being inspected, and the elements set forth in paragraph (c)(7)(ii) of this section.

..1910.147(c)(6)(ii)

1910.147(c)(6)(ii)

The employer shall certify that the periodic inspections have been performed. The certification shall identify the machine or equipment on which the energy control procedure was being utilized, the date of the inspection, the employees included in the inspection, and the person performing the inspection.

1910.147(c)(7)

Training and communication.

1910.147(c)(7)(i)

The employer shall provide training to ensure that the purpose and function of the energy control program are understood by employees and that the knowledge and skills required for the safe application, usage, and removal of the energy controls are acquired by employees. The training shall include the following:

1910.147(c)(7)(i)(A)

Each authorized employee shall receive training in the recognition of applicable hazardous energy sources, the type and magnitude of the energy available in the workplace, and the methods and means necessary for energy isolation and control.

1910.147(c)(7)(i)(B)

Each affected employee shall be instructed in the purpose and use of the energy control procedure.

1910.147(c)(7)(i)(C)

All other employees whose work operations are or may be in an area where energy control procedures may be utilized, shall be instructed about the procedure, and about the prohibition relating to attempts to restart or reenergize machines or equipment which are locked out or tagged out.

1910.147(c)(7)(ii)

When tagout systems are used, employees shall also be trained in the following limitations of tags:

..1910.147(c)(7)(ii)(A)

1910.147(c)(7)(ii)(A)

Tags are essentially warning devices affixed to energy isolating devices, and do not provide the physical restraint on those devices that is provided by a lock.

1910.147(c)(7)(ii)(B)

When a tag is attached to an energy isolating means, it is not to be removed without authorization of the authorized person responsible for it, and it is never to be bypassed, ignored, or otherwise defeated.

1910.147(c)(7)(ii)(C)

Tags must be legible and understandable by all authorized employees, affected employees, and all other employees whose work operations are or may be in the area, in order to be effective.

1910.147(c)(7)(ii)(D)

Tags and their means of attachment must be made of materials which will withstand the environmental conditions encountered in the workplace.

1910.147(c)(7)(ii)(E)

Tags may evoke a false sense of security, and their meaning needs to be understood as part of the overall energy control program.

1910.147(c)(7)(ii)(F)

Tags must be securely attached to energy isolating devices so that they cannot be inadvertently or accidentally detached during use.

1910.147(c)(7)(iii)

Employee retraining.

..1910.147(c)(7)(iii)(A)

1910.147(c)(7)(iii)(A)

Retraining shall be provided for all authorized and affected employees whenever there is a change in their job assignments, a change in machines, equipment or processes that present a new hazard, or when there is a change in the energy control procedures.

1910.147(c)(7)(iii)(B)

Additional retraining shall also be conducted whenever a periodic inspection under paragraph (c)(6) of

this section reveals, or whenever the employer has reason to believe that there are deviations from or inadequacies in the employee's knowledge or use of the energy control procedures.

1910.147(c)(7)(iii)(C)

The retraining shall reestablish employee proficiency and introduce new or revised control methods and procedures, as necessary.

1910.147(c)(7)(iv)

The employer shall certify that employee training has been accomplished and is being kept up to date. The certification shall contain each employee's name and dates of training.

1910.147(c)(8)

Energy isolation. Lockout or tagout shall be performed only by the authorized employees who are performing the servicing or maintenance.

1910.147(c)(9)

Notification of employees. Affected employees shall be notified by the employer or authorized employee of the application and removal of lockout devices or tagout devices. Notification shall be given before the controls are applied, and after they are removed from the machine or equipment.

..1910.147(d)

1910.147(d)

Application of control. The established procedures for the application of energy control (the lockout or tagout procedures) shall cover the following elements and actions and shall be done in the following sequence:

1910.147(d)(1)

Preparation for shutdown. Before an authorized or affected employee turns off a machine or equipment, the authorized employee shall have knowledge of the type and magnitude of the energy, the hazards of the energy to be controlled, and the method or means to control the energy.

1910.147(d)(2)

Machine or equipment shutdown. The machine or equipment shall be turned off or shut down using the procedures established for the machine or equipment. An orderly shutdown must be utilized to avoid any additional or increased hazard(s) to employees as a result of the equipment stoppage.

1910.147(d)(3)

Machine or equipment isolation. All energy isolating devices that are needed to control the energy to the machine or equipment shall be physically located and operated in such a manner as to isolate the machine or equipment from the energy source(s).

1910.147(d)(4)

Lockout or tagout device application.

1910.147(d)(4)(i)

Lockout or tagout devices shall be affixed to each energy isolating device by authorized employees.

..1910.147(d)(4)(ii)

1910.147(d)(4)(ii)

Lockout devices, where used, shall be affixed in a manner to that will hold the energy isolating devices in a "safe" or "off" position.

1910.147(d)(4)(iii)

Tagout devices, where used, shall be affixed in such a manner as will clearly indicate that the operation or movement of energy isolating devices from the "safe" or "off" position is prohibited.

1910.147(d)(4)(iii)(A)

Where tagout devices are used with energy isolating devices designed with the capability of being locked, the tag attachment shall be fastened at the same point at which the lock would have been attached.

1910.147(d)(4)(iii)(B)

Where a tag cannot be affixed directly to the energy isolating device, the tag shall be located as close as safely possible to the device, in a position that will be immediately obvious to anyone attempting to operate the device.

1910.147(d)(5)

Stored energy.

1910.147(d)(5)(i)

Following the application of lockout or tagout devices to energy isolating devices, all potentially hazardous stored or residual energy shall be relieved, disconnected, restrained, and otherwise rendered safe.

..1910.147(d)(5)(ii)

1910.147(d)(5)(ii)

If there is a possibility of reaccumulation of stored energy to a hazardous level, verification of isolation shall be continued until the servicing or maintenance is completed, or until the possibility of such accumulation no longer exists.

1910.147(d)(6)

Verification of isolation. Prior to starting work on machines or equipment that have been locked out or tagged out, the authorized employee shall verify that isolation and deenergization of the machine or equipment have been accomplished.

1910.147(e)

Release from lockout or tagout. Before lockout or tagout devices are removed and energy is restored to the machine or equipment, procedures shall be followed and actions taken by the authorized employee(s) to ensure the following:

1910.147(e)(1)

The machine or equipment. The work area shall be inspected to ensure that nonessential items have been removed and to ensure that machine or equipment components are operationally intact.

1910.147(e)(2)

Employees.

1910.147(e)(2)(i)

The work area shall be checked to ensure that all employees have been safely positioned or removed.

1910.147(e)(2)(ii)

After lockout or tagout devices have been removed and before a machine or equipment is started, affected employees shall be notified that the lockout or tagout device(s) have been removed.

1910.147(e)(3)

Lockout or tagout devices removal. Each lockout or tagout device shall be removed from each energy isolating device by the employee who applied the device. **Exception to paragraph (e)(3):** When the authorized employee who applied the lockout or tagout device is not available to remove it, that device may be removed under the direction of the employer, provided that specific procedures and training for such removal have been developed, documented and incorporated into the employer's energy control program. The employer shall demonstrate that the specific procedure provides equivalent safety to the removal of the device by the authorized employee who applied it. The specific procedure shall include at least the following elements:

1910.147(e)(3)(i)

Verification by the employer that the authorized employee who applied the device is not at the facility:

1910.147(e)(3)(ii)

Making all reasonable efforts to contact the authorized employee to inform him/her that his/her lockout or tagout device has been removed; and

1910.147(e)(3)(iii)

Ensuring that the authorized employee has this knowledge before he/she resumes work at that facility.

..1910.147(f)

1910.147(f)

Additional requirements.

1910.147(f)(1)

Testing or positioning of machines, equipment or components thereof. In situations in which lockout or tagout devices must be temporarily removed from the energy isolating device and the machine or equipment energized to test or position the machine, equipment or component thereof, the following sequence of actions shall be followed:

1910.147(f)(1)(i)

Clear the machine or equipment of tools and materials in accordance with paragraph (e)(1) of this section;

1910.147(f)(1)(ii)

Remove employees from the machine or equipment area in accordance with paragraph (e)(2) of this section;

1910.147(f)(1)(iii)

Remove the lockout or tagout devices as specified in paragraph (e)(3) of this section;

1910.147(f)(1)(iv)

Energize and proceed with testing or positioning;

1910.147(f)(1)(v)

Deenergize all systems and reapply energy control measures in accordance with paragraph (d) of this section to continue the servicing and/or maintenance.

1910.147(f)(2)

Outside personnel (contractors, etc.).

1910.147(f)(2)(i)

Whenever outside servicing personnel are to be engaged in activities covered by the scope and application of this standard, the on-site employer and the outside employer shall inform each other of their respective lockout or tagout procedures.

..1910.147(f)(2)(ii)

1910.147(f)(2)(ii)

The on-site employer shall ensure that his/her employees understand and comply with the restrictions and prohibitions of the outside employer's energy control program.

1910.147(f)(3)

Group lockout or tagout.

1910.147(f)(3)(i)

When servicing and/or maintenance is performed by a crew, craft, department or other group, they shall utilize a procedure which affords the employees a level of protection equivalent to that provided by the implementation of a personal lockout or tagout device.

1910.147(f)(3)(ii)

Group lockout or tagout devices shall be used in accordance with the procedures required by paragraph (c)(4) of this section including, but not necessarily limited to, the following specific requirements:

1910.147(f)(3)(ii)(A)

Primary responsibility is vested in an authorized employee for a set number of employees working under the protection of a group lockout or tagout device (such as an operations lock);

1910.147(f)(3)(ii)(B)

Provision for the authorized employee to ascertain the exposure status of individual group members with regard to the lockout or tagout of the machine or equipment and

1910.147(f)(3)(ii)(C)

When more than one crew, craft, department, etc. is involved, assignment of overall job-associated lockout or tagout control responsibility to an authorized employee designated to coordinate affected work forces and ensure continuity of protection; and

..1910.147(f)(3)(ii)(D)

1910.147(f)(3)(ii)(D)

Each authorized employee shall affix a personal lockout or tagout device to the group lockout device, group lockbox, or comparable mechanism when he or she begins work, and shall remove those devices when he or she stops working on the machine or equipment being serviced or maintained.

1910.147(f)(4)

Shift or personnel changes. Specific procedures shall be utilized during shift or personnel changes to

ensure the continuity of lockout or tagout protection, including provision for the orderly transfer of lockout or tagout device protection between off-going and oncoming employees, to minimize exposure to hazards from the unexpected energization or start-up of the machine or equipment, or the release of stored energy.

Note: The following appendix to §1910.147 services as a non-mandatory guideline to assist employers and employees in complying with the requirements of this section, as well as to provide other helpful information. Nothing in the appendix adds to or detracts from any of the requirements of this section.

[54 FR 36687, Sept. 1, 1989, as amended at 54 FR 42498, Oct. 17, 1989; 55 FR 38685, 38686, Sept. 20, 1990; 61 FR 5507, Feb. 13, 1996]

Next Standard (1910.147 App A)

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Occupational Safety & Health Administration
200 Constitution Avenue, NW
Washington, DC 20210

Trench Operations

Purpose

This Standard Operating Guideline establishes practices and procedures consistent with the Occupational Safety and Health Administration rules and regulations with regards to employees working in and around a trench. This guideline serves as the department's compliance with NFPA 1500 Fire Department Occupational Safety and Health Program and NFPA 1670 Operations and Training for Technical Rescue Incidents.

Scope

This guide line shall be applicable to all members of the department when operating at any incident or training site involving trench operations. All members will work in conjunction with MABAS Divisions 12 or 2's Technical Rescue Teams. Reference Appendix A, Code of Federal Regulations; 29CFR1926.651.

1. Responsibilities

1.1. The Incident Commander shall be responsible for the proper operation and compliance with this policy during any emergency incident. The Incident Commander shall utilize the National Incident Management System (NIMS) during all operations.

1.2. The Incident Commander shall appoint an Incident safety Officer as soon as practicable early in the incident.

1.3. Company Officers shall be responsible for the safe and efficient operations of their crews and shall maintain a strict accounting of their crew.

1.4. The Incident Commander shall elevate the incident to a MABAS level alarm and shall request sufficient resources and technical Rescue Teams to safely mitigate the incident.

1.5. The Incident Commander shall establish and provide for a Rehab Sector(s).

1.6. The Incident Commander shall request the Village of Hanover Park Public Works Trench trailer along with any additional machinery as needed.

2. Procedures for first-arriving companies

2.1. Establish a safe work environment by establishing safe zones and limiting access to only essential personnel.

2.2. The minimum restricted area to traffic and/or machinery shall be 300 feet in all directions.

2.3. All rail traffic within 1,000 feet shall be monitored and halted as necessary.

2.4. Shut down the contractor's equipment to avoid unnecessary vibrations.

2.5. Locate victim by slowly approaching the trench from the narrow end or unexcavated end.

2.6. Remove victim's fellow workers from the trench and work area.

2.7. Obtain information about the victim such as age, weight, height, clothing description and medical history if known.

2.8. Mark last-known location of victim(s).

2.9. Each victim shall be assigned a complete medic crew.

2.10. Air quality shall be monitored near the victim and at 24 inch vertical intervals. Make-up air shall be provided as necessary.

2.11. Any spoil piles shall be moved to a safe location so as not to add an additional collapse problem.

2.12. All underground utilities shall be promptly notified.

2.13. Support MABAS Technical Rescue Teams as needed.

3. **Documentation**

3.1. Air quality shall be monitored and documented every 15 minutes for:
- 3.1.1. Oxygen, %.
- 3.1.2. Lower Explosive Limit, %.
- 3.1.3. Carbon Monoxide, ppm.
- 3.1.4. Hydrogen Sulfide, ppm.

3.2. Technical Rescue Teams shall document:
- 3.2.1. Entry/Exit times
- 3.2.2. Team member names/department
- 3.2.3. Assignments and actions taken.

3.3. Victim documentation shall include:.
- 3.3.1. Time victim was found.
- 3.3.2. Location found.
- 3.3.3. Position victim was found in.
- 3.3.4. Time victim was removed.

3.4. Hospital destination or coroner's office.

3.5. Specialized equipment used.

3.6. MABAS assets used.

3.7. The Incident scene shall be photographed whenever practicable.

APPENDIX A

Regulations (Standards - 29 CFR)

Specific Excavation Requirements. - 1926.651

Regulations (Standards - 29 CFR) - Table of Contents

• **Part Number:**	1926
• **Part Title:**	Safety and Health Regulations for Construction
• **Subpart:**	P
• **Subpart Title:**	Excavations
• **Standard Number:**	1926.651
• **Title:**	Specific Excavation Requirements.

1926.651(a)

Surface encumbrances. All surface encumbrances that are located so as to create a hazard to employees shall be removed or supported, as necessary, to safeguard employees.

1926.651(b)

Underground installations.

1926.651(b)(1)

The estimated location of utility installations, such as sewer, telephone, fuel, electric, water lines, or any other underground installations that reasonably may be expected to be encountered during excavation work, shall be determined prior to opening an excavation.

1926.651(b)(2)

Utility companies or owners shall be contacted within established or customary local response times, advised of the proposed work, and asked to establish the location of the utility underground installations prior to the start of actual excavation. When utility companies or owners cannot respond to a request to locate underground utility installations within 24 hours (unless a longer period is required by state or local law), or cannot establish the exact location of these installations,the employer may proceed, provided the employer does so with caution, and provided detection equipment or other acceptable means to locate utility installations are used.

..1926.651(b)(3)

1926.651(b)(3)

When excavation operations approach the estimated location of underground installations, the exact location of the installations shall be determined by safe and acceptable means.

1926.651(b)(4)

While the excavation is open, underground installations shall be protected, supported or removed as necessary to safeguard employees.

1926.651(c)

Access and egress -

1926.651(c)(1)

Structural ramps.

1926.651(c)(1)(i)

Structural ramps that are used solely by employees as a means of access or egress from excavations shall be designed by a competent person. Structural ramps used for access or egress of equipment shall be designed by a competent person qualified in structural design, and shall be constructed in accordance with the design.

1926.651(c)(1)(ii)

Ramps and runways constructed of two or more structural members shall have the structural members connected together to prevent displacement.

1926.651(c)(1)(iii)

Structural members used for ramps and runways shall be of uniform thickness.

1926.651(c)(1)(iv)

Cleats or other appropriate means used to connect runway structural members shall be attached to the bottom of the runway or shall be attached in a manner to prevent tripping.

..1926.651(c)(1)(v)

1926.651(c)(1)(v)

Structural ramps used in lieu of steps shall be provided with cleats or other surface treatments o the top surface to prevent slipping.

1926.651(c)(2)

Means of egress from trench excavations. A stairway, ladder, ramp or other safe means of egress shall be located in trench excavations that are 4 feet (1.22 m) or more in depth so as to require no more than 25 feet (7.62 m) of lateral travel for employees.

1926.651(d)

Exposure to vehicular traffic. Employees exposed to public vehicular traffic shall be provided with, and shall wear, warning vests or other suitable garments marked with or made of reflectorized or high-visibility material.

1926.651(e)

Exposure to falling loads. No employee shall be permitted underneath loads handled by lifting or digging equipment. Employees shall be required to stand away from any vehicle being loaded or unloaded to avoid

being struck by any spillage or falling materials. Operators may remain in the cabs of vehicles being loaded or unloaded when the vehicles are equipped, in accordance with 1926.601(b)(6), to provide adequate protection for the operator during loading and unloading operations.

..1926.651(f)

1926.651(f)

Warning system for mobile equipment. When mobile equipment is operated adjacent to an excavation, or when such equipment is required to approach the edge of an excavation, and the operator does not have a clear and direct view of the edge of the excavation, a warning system shall be utilized such as barricades, hand or mechanical signals, or stop logs. If possible, the grade should be away from the excavation.

1926.651(g)

Hazardous atmospheres -

1926.651(g)(1)

Testing and controls. In addition to the requirements set forth in subparts D and E of this part (29 CFR 1926.50 - 1926.107) to prevent exposure to harmful levels of atmospheric contaminants and to assure acceptable atmospheric conditions, the following requirements shall apply:

1926.651(g)(1)(i)

Where oxygen deficiency (atmospheres containing less than 19.5 percent oxygen) or a hazardous atmosphere exists or could reasonably be expected to exist, such as in excavations in landfill areas or excavations in areas where hazardous substances are stored nearby, the atmospheres in the excavation shall be tested before employees enter excavations greater than 4 feet (1.22 m) in depth.

1926.651(g)(1)(ii)

Adequate precautions shall be taken to prevent employee exposure to atmospheres containing less than 19.5 percent oxygen and other hazardous atmospheres. These precautions include providing proper respiratory protection or ventilation in accordance with subparts D and E of this part respectively.

1926.651(g)(1)(iii)

Adequate precaution shall be taken such as providing ventilation, to prevent employee exposure to an atmosphere containing a concentration of a flammable gas in excess of 20 percent of the lower flammable limit of the gas.

..1926.651(g)(1)(iv)

1926.651(g)(1)(iv)

When controls are used that are intended to reduce the level of atmospheric contaminants to acceptable levels, testing shall be conducted as often as necessary to ensure that the atmosphere remains safe.

1926.651(g)(2)

Emergency rescue equipment.

1926.651(g)(2)(i)

Emergency rescue equipment, such as breathing apparatus, a safety harness and line, or a basket stretcher, shall be readily available where hazardous atmospheric conditions exist or may reasonably be expected to develop during work in an excavation. This equipment shall be attended when in use.

1926.651(g)(2)(ii)

Employees entering bell-bottom pier holes, or other similar deep and confined footing excavations, shall wear a harness with a lifeline securely attached to it. The lifeline shall be separate from any line used to handle materials, and shall be individually attended at all times while the employee wearing the lifeline is in the excavation.

1926.651(h)

Protection from hazards associated with water accumulation.

1926.651(h)(1)

Employees shall not work in excavations in which there is accumulated water, or in excavations in which water is accumulating, unless adequate precautions have been taken to protect employees against the hazards posed by water accumulation. The precautions necessary to protect employees adequately vary with each situation, but could include special support or shield systems to protect from cave-ins, water removal to control the level of accumulating water, or use of a safety harness and lifeline.

..1926.651(h)(2)

1926.651(h)(2)

If water is controlled or prevented from accumulating by the use of water removal equipment, the water removal equipment and operations shall be monitored by a competent person to ensure proper operation.

1926.651(h)(3)

If excavation work interrupts the natural drainage of surface water (such as streams), diversion ditches, dikes, or other suitable means shall be used to prevent surface water from entering the excavation and to provide adequate drainage of the area adjacent to the excavation. Excavations subject to runoff from heavy rains will require an inspection by a competent person and compliance with paragraphs (h)(1) and (h)(2) of this section.

1926.651(i)

Stability of adjacent structures.

1926.651(i)(1)

Where the stability of adjoining buildings, walls, or other structures is endangered by excavation operations, support systems such as shoring, bracing, or underpinning shall be provided to ensure the stability of such

structures for the protection of employees.

1926.651(i)(2)

Excavation below the level of the base or footing of any foundation or retaining wall that could be reasonably expected to pose a hazard to employees shall not be permitted except when:

1926.651(i)(2)(i)

A support system, such as underpinning, is provided to ensure the safety of employees and the stability of the structure; or

1926.651(i)(2)(ii)

The excavation is in stable rock; or

..1926.651(i)(2)(iii)

1926.651(i)(2)(iii)

A registered professional engineer has approved the determination that the structure is sufficiently removed from the excavation so as to be unaffected by the excavation activity; or

1926.651(i)(2)(iv)

A registered professional engineer has approved the determination that such excavation work will not pose a hazard to employees.

1926.651(i)(3)

Sidewalks, pavements and appurtenant structure shall not be undermined unless a support system or another method of protection is provided to protect employees from the possible collapse of such structures.

1926.651(j)

Protection of employees from loose rock or soil.

1926.651(j)(1)

Adequate protection shall be provided to protect employees from loose rock or soil that could pose a hazard by falling or rolling from an excavation face. Such protection shall consist of scaling to remove loose material; installation of protective barricades at intervals as necessary on the face to stop and contain falling material; or other means that provide equivalent protection.

..1926.651(j)(2)

1926.651(j)(2)

Employees shall be protected from excavated or other materials or equipment that could pose a hazard by falling or rolling into excavations. Protection shall be provided by placing and keeping such materials or equipment at least 2 feet (.61 m) from the edge of excavations, or by the use of retaining devices that are

sufficient to prevent materials or equipment from falling or rolling into excavations, or by a combination of both if necessary.

1926.651(k)

Inspections.

1926.651(k)(1)

Daily inspections of excavations, the adjacent areas, and protective systems shall be made by a competent person for evidence of a situation that could result in possible cave-ins, indications of failure of protective systems, hazardous atmospheres, or other hazardous conditions. An inspection shall be conducted by the competent person prior to the start of work and as needed throughout the shift. Inspections shall also be made after every rainstorm or other hazard increasing occurrence. These inspections are only required when employee exposure can be reasonably anticipated.

1926.651(k)(2)

Where the competent person finds evidence of a situation that could result in a possible cave-in, indications of failure of protective systems, hazardous atmospheres, or other hazardous conditions, exposed employees shall be removed from the hazardous area until the necessary precautions have been taken to ensure their safety.

1926.651(l)

Fall protection.

1926.651(l)(1)

Walkways shall be provided where employees or equipment are required or permitted to cross over excavations. Guardrails which comply with 1926.502(b) shall be provided where walkways are 6 feet (1.8 m) or more above lower levels.

[59 FR 40730, Aug 9, 1994]

Next Standard (1926.652)

Regulations (Standards - 29 CFR) - Table of Contents

MECHANICAL HOISTS

Purpose

The Hanover Park Fire Department strives to offer its employees the safest possible working environment, both on emergency scenes and at the fire stations. This Standard Operating Guideline establishes practices and procedures consistent with the Occupational Safety and Health Administration rules and regulations with regards to use and inspection of mechanical hoists. All practices and procedures contained herein shall comply with NFPA 1500 Standard on Fire Department Occupational Safety and Health Program.

Scope

The U.S. Department of Labor has enacted rules and regulations governing the protection of employees and safe use of mechanical hoists. The U.S.D.L. has published 29 CFR 1910.179 Overhead and Gantry Cranes. This policy shall adhere to the American Society of Mechanical Engineers (ASME/ANSI) consensus standard B30 series. These guidelines shall be used to ensure safe work practices and proper inspection on all mechanical hoists. This policy shall apply to all members at all times unless prohibited by contract or by law.

1. Responsibilities

1.1. It shall be the responsibility of the Fire Department Safety Coordinator to ensure that all hoisting equipment is inspected according to manufactures requirements.
1.2. All mechanical hoisting equipment shall be included on the monthly IRMA safety inspection.
1.3. It shall be the responsibility of all personnel to ensure that all hoisting equipment and catwalks are inspected and free from storage or clutter prior to use.
1.4. It shall be the responsibility of all employees to know and understand this guideline and adhere to all safety practices.

2. Procedures

2.1. The Training battalion Chief shall establish a training guideline for training of all employees in the safe operation of all hoists.
2.2. Company Officers shall ensure that hoists are operated by trained personnel.
2.3. All employees shall wear appropriate personal protective equipment when operating around or under hoisting equipment.
2.4. All employees shall be familiar with rules contained in 29 CFR 1910.179 and ASME/ANSI B30.16.
2.5. Any defect or required maintenance shall be immediately reported to the Village of Hanover Park Buildings and Grounds supervisor.
2.6. All documentation of hoist maintenance and testing shall be copied and sent to the Buildings and Grounds supervisor.
2.7. Recommended Inspection and testing intervals are included in Appendix A.

APPENDIX A

Table 2 - Inspection for Electric- or Air-Powered Hoists						
	Normal Service		**Heavy Service**		**Severe Service**	
Item	Visual Monthly (Note 1)	Record Yearly (Note 2)	Visual Weekly (Note 1)	Record Semiannually (Note 3)	Visual Daily (Note 1)	Record Quarterly (Note 3)
Frequent Inspection (Refer to para. 16-2.1.2						
All functional operating mechanisms for maladjustment and unusual sounds	x	…	x	…	x	…
Limit devices for operation	x	…	x	…	x	…
Hoist braking system for proper operation	x	…	x	…	x	…
Air lines, valves, and other parts for leakage	x	…	x	…	x	…
Hooks in accordance with ASME B30.10	x	…	x	…	x	…
Hook latch operation, if used	x	…	x	…	x	…
Hook rope in accordance with para. 16-2.4.1(a)	x	…	x	…	x	…
Load chain in accordance with para. 16-2.5.1 or 16-2.6.1	x	…	x	…	x	…
Rope or load chain reeving for compliance with hoist manufacturer's recommendations	x	…	x	…	x	…
Periodic Inspection (Refer to para. 16-2.1.3)						
Requirements of frequent inspections	…	x	…	x	…	x
Hoist rope in accordance with para. 16-2.4.1(a)	…	x	…	x	…	x
Evidence of loose bolts, nuts, or rivets	…	x	…	x	…	x
Evidence of worn, corroded, cracked, or distorted parts such as load blocks, suspension housing, chain attachments, clevises, yokes, suspension bolts, shafts, gears, bearings, pins, rollers,	…	x	…	x	…	x

and locking and clamping devices						
Evidence of damage to hook retaining nuts or collars and pins, and welds or rivets used to secure the retaining numbers	…	x	…	x	…	x
Evidence of damage or excessive wear of load sprockets, idler sprockets, and drums or sheaves	…	x	…	x	…	x
Evidence of excessive wear on motor or load brake	…	x	…	x	…	x
Electrical apparatus for signs of pitting or any deterioration of visible controller contacts	…	x	…	x	…	x
Evidence of damage of supporting structure or trolley, if used	…	x	…	x	…	x
Function labels on pendant control stations for legibility	…	x	…	x	…	x
Label or labels required by para. 16-1.1.4 for legibility	…	x	…	x	…	x
End connections of rope or load chain	…	x	…	x	…	x

NOTES:
1 - By operator or other designated person with records not required.
2 - Visual inspection by a designated person making records of conditions to provide the basis for a continuing evaluation.
3 - As in Note 2 unless conditions indicate that disassembly should be done to permit detailed inspection.

Risk Management Plan

Purpose

The Hanover Park Fire Department has developed and implemented a Risk Management Plan. The goals and objectives of the plan are: To limit the exposure of the fire department to situations and occurrences that could have harmful or undesirable consequences on the department or its members; To provide the safest possible work environment for the members of the fire department, while recognizing the risks inherent to the fire department's mission.

1. Scope

1.1. The Risk Management Plan is intended to comply with the requirements of NFPA 1500, Standard on Fire Department Occupational Safety and Health Program, Section 4.2, 2007 Edition. Nothing in this standard operating procedure shall conflict with applicable state or Federal law. Collective Bargaining Agreements shall not diminish the application of this policy. This policy applies to all personnel at all times.

2. Methodology

2.1. The risk management plan uses a variety of strategies and approaches to address the stated objectives. The specific objectives are identified from the following sources of information:

2.1.1. Records and reports on the frequency and severity of accidents and injuries in the Hanover Park Fire Department.

2.1.2. Reports received from the Village of Hanover Park Human Resource Department and their insurance carrier, Intergovernmental Risk Management Agency (IRMA).

2.1.3. Specific occurrences or incidents that identify a need for risk assessment or management.

2.1.4. National trends and reports that are applicable to the Hanover Park Fire Department.

2.1.5. Knowledge of the inherent risks that are encountered by fire departments and specific situations that are identified by Hanover Park Fire Department through the *Risk Management Observations Standard Operating Procedure* and Appendices 1-9.

2.1.6. Any additional areas identified by fire department staff and/or personnel.

3. Responsibilities

3.1. The Fire Chief shall be responsible for the implementation and operation of the department's risk management plan.

3.2. The Battalion Chief of Training shall serve as the department's Health and Safety Officer (HSO)

3.3. The Health and Safety Officer shall be responsible for developing, managing and annually revising the risk management plan.

3.4. The HSO has the responsibility to modify the risk management plan when warranted by changing exposures, occurrences, and activities.

3.5. All members of the Hanover Park Fire Department have responsibility for ensuring their own health and safety based upon the requirements of the risk management plan and the department's safety and health program.

4. Plan Organization

4.1. The risk management plan includes the following:

4.1.1. Identification of the risks members of the fire department could actually or potentially encounter both emergency and non-emergency.

4.1.2. Emergency risks include those presented at emergency incidents, both fire and non-fire, and Emergency Medical Services (EMS).

4.1.3. Non-emergency risks include those encountered while performing functions such as training, physical fitness, non-emergency vehicle operation and station activities (e.g. vehicle maintenance, station maintenance and daily office functions).

4.1.4. Evaluation of the identified risk activities based upon the frequency and severity factors – **Appendix A**.

4.1.5. Evaluation of the identified injuries and causes - **Appendix B** and **Appendix C**.

4.1.6. Development and implementation of an action plan for controlling each risk, in order of priority- **Appendix A**.

4.1.7. Provisions for monitoring the effectiveness of the controls implemented.

4.1.8. A periodic review of the plan with modifications made as needed.

4.1.9. The Hanover Park Fire Department *Risk Management Observations Standard Operating Procedure* and Appendices 1-9.

5. Risk Management Plan Monitoring

5.1. The Fire Department Safety Committee, consisting of members from the fire department Health and Safety Officer and members of IAFF Local 3452 and SEIU Local 73, shall monitor the Risk Management Plan.

5.2. Recommendations and revisions will be made based upon the following criteria:

5.2.1. Annual accident and injury data for the preceding year.

5.2.2. Significant incidents that occurred during the past year.

5.2.3. Information and/or suggestions from department members.

5.3. Every three (3) years the plan will be evaluated by the Village of Hanover Park Human Resources Department and IRMA. Their recommendations shall be forwarded to the Fire Chief, the Health and Safety Officer and the Safety Committee members.

Appendix A
Activities

Identification	Frequency/Severity	Priority	Control Measures
Vehicle Operations	Medium/High	High	1. Enforce motor vehicle code and department procedures 2. Monitor non-emergency vehicle operations 3. Monitor individual member's driving record 4. Provide training and certification relating to vehicle operations 5. Review all accidents
Operations at Fire Incidents	Low/High	High	1. Require proper PPE use 2. Require SCBA use 3. Require adherence to operational SOPs 4. Require strict adherence to ICS 5. Require annual Live-fire training
Operations at EMS Incidents	High/Medium	High	1. Require proper PPE 2. Develop Infectious Control Policy 3. Develop decontamination policy and procedures 4. Adhere to Sherman Hospital SOPs
Operations on Roadways	Medium/High	High	1. Require adherence to SOPs 2. Require traffic vest usage by all members 3. Require lane blocking and traffic control measures
Facility Safety	Medium/High	Medium	1. Conduct monthly station inspections 2. Monitor infection control measures 3. Provide proper tools & equipment
Natural Disasters	Low/High	High	1. Review Village-wide Emergency Operation Plan 2. Require adherence to ICS and NIMS
HazMat/WMD	Low/High	Medium	1. Departmental compliance with 29 CFR 1910.120 2. HazMat Awareness training for all members 3. Review MABAS XII procedures
Heavy Lifting	High/Medium	Medium	1. Deliver proper lifting training 2. Provide auto-lift stretchers 3. Ensure adequate assistance when needed

Appendix B
NFIRS Injury Causes

NFIRS Code	Description	Frequency	Severity
0	Cause of injury other	High	Medium
1	Fall	High	High
2	Jump	Low	Medium
3	Slip/Trip	High	Medium
4	Exposure to hazard	High	High
5	Struck or assaulted by person/animal/object	High	Medium
6	Contact with object (FF moved into object)	Medium	Medium
7	Overexertion/strain	High	Medium
U	Undetermined	Medium	Medium

Appendix C
NFIRS Injury Primary Symptoms

NFIRS Code	Primary Symptom	Frequency	Severity
00	Other	High	Medium
01	Smoke Inhalation	Medium	High
02	Hazardous fumes inhalation	Low	High
03	Breathing difficulty or shortness of breath	High	Medium
11	Burns and smoke inhalation	Medium	High
12	Burns only: thermal	Medium	High
13	Burns: scald	Medium	Medium
14	Burns: chemical	Low	High
15	Burns: electrical	Medium	High
21	Cut or laceration	High	Medium
22	Stab wound/puncture wound: penetrating	High	Medium
23	Gunshot wound: projectile wound	Low	High
24	Contusion/bruise: minor trauma	High	Medium
25	Abrasion	High	Medium
31	Dislocation	Low	Medium
32	Fracture	Low	Medium
33	Sprain or strain	High	Medium
34	Swelling	High	Low
35	Crushing	Low	High
36	Amputation	Low	High
41	Cardiac symptoms	High	High
42	Cardiac arrest	Low	High
43	Stroke	Low	High
44	Respiratory arrest	Low	High
50	Sickness: other	High	Medium
51	Chills	Medium	Low
52	Fever	Medium	Low
53	Nausea	Low	Low
54	Vomiting	Low	Low
55	Numbness or tingling, paresthesia	Medium	Medium
56	Paralysis	Low	High
57	Frostbite	High	Medium
61	Miscarriage	Low	Medium
63	Eye trauma, avulsion	Medium	Medium
64	Drowning	Low	High
65	Foreign body obstruction	Low	High
66	Electric shock	Medium	High
67	Poison	Low	High
71	Convulsion or seizure	Low	Medium
72	Internal trauma	Low	High
73	Hemorrhaging; bleeding internally	Low	High
81	Disorientation	Medium	Medium

82	Dizziness/fainting/weakness	High	Medium
83	Exhaustion/fatigue, including heat exhaustion	High	Medium
84	Heat stroke	Medium	High
85	Dehydration	High	Medium
91	Allergic reaction, including anaphylactic shock	Low	High
92	Drug overdose	Low	High
93	Alcohol impairment	Low	Low
94	Emotional/psychological stress	High	Medium
95	Mental disorder	Low	Low
96	Shock	Low	High
97	Unconscious	Low	High
98	Pain only	High	Low

Risk Management Observations

Purpose

The Hanover Park Fire Department is committed to ensuring that we have identified safe work practices and that they are being followed. To accomplish this task supervisors are required to formally evaluate employee risk management safety behaviors at a minimum bi-annually.

Scope

This policy must be reviewed by all fire department personnel to familiarize themselves with these guidelines and to promote a safe working environment.

1. Responsibilities

1.1. Battalion Chief
- 1.1.1. Responsible to ensure that the risk management observations are completely documented and targets high loss or exposure risks.
- 1.1.2. Reviews documentation for trends and target areas for re-training.
- 1.1.3. Conducts risk management observations on Lieutenants assigned to them on a bi-annual basis.
- 1.1.4. Documents are to be maintained in employee files.

1.2. Lieutenant
- 1.2.1. Conducts risk management observations on all personnel assigned on a bi-annual basis.
- 1.2.2. Observes that the employee is following all safety rules.
- 1.2.3. Observes that the employee is wearing the appropriate personal protective equipment for the task being performed.
- 1.2.4. If at any time during the observation there is any imminent danger stop the observation and intervene immediately in a caring concerned fashion.
- 1.2.5. Completes all documentation and reviews the risk management behaviors with the employee before forwarding them to the assigned Battalion Chief.
- 1.2.6. Provides reinforcing feedback for the desired safe observations and corrective feedback for any at risk behaviors.

1.3. Firefighter
- 1.3.1. Responsible for following safe work practice behaviors.
- 1.3.2. Reports at risk behaviors to the supervisor.

2. Documentation – Forms

The following forms for documentation can be found in the appendix and must be completed based on the observation being performed.

2.1. Risk Management Observers Form
- 2.1.1. Instructions for conducting observations

2.2. Safe work practices check list
- 2.2.1. Compliance check list

2.3. Driver's vehicle check list for engine, ambulance, and tower
- 2.3.1. Vehicle pre-trip inspection
- 2.3.2. Must be completed for all driving road tests.

2.4. Driving Certification Test
- 2.4.1. Must be completed for all driver road tests.

Hanover Park Fire Department

Risk Management Observers Instructions

(*Important Instructions for Observers*)

Preparation	You will be making one (2) formal observation per year per employee as a minimum; Always follow the safety rules and wear appropriate personal protective equipment for the area you will be in; and Bring adequate number of observation checklists.
Observations	Observe from a point where you will not interfere with the employee, but can still see their work behaviors. Observe long enough to feel comfortable with the process steps; Important! If at <u>any</u> time during the observation you see an imminent danger situation, stop the observation and intervene immediately in a caring, concerned fashion; Place a checkmark in the appropriate column (SAFE or AT-RISK), next to the specific behavior listed. If the behavior is repeated during the process, place additional checkmarks as observed; and For each check in the At-Risk column, explain the reason for the at-risk behavior in the comments column.
Review with Employee	After the observation is complete, review your observations with the employee. Be sure to give reinforcing feedback for the desired safe behaviors observed, and corrective feedback for any at-risk behaviors; and Sign and date your checklist.
Submitting Completed Checklists	Observation worksheets are due within I week of completion.

VILLAGE OF HANOVER PARK

SAFE WORK PRACTICES CHECKLIST

Department: _____

Employee: _____

Task: _____

Elements of Task	Excellent	Above Average	Average	Below Average	Poor
Preparation	5	4	3	2	1
Inspection of Equipment	5	4	3	2	1
Hazard Assessment/Mitigation	5	4	3	2	1
Use of Personal Protective Equipment	5	4	3	2	1
Awareness of Surroundings	5	4	3	2	1
Operation of Equipment	5	4	3	2	1
Compliance with Rules/Procedures	5	4	3	2	1

Comments:

_____

_____

_____

_____

_____

Feedback Given to Employee:

_____

_____

_____

_____

_____

Supervisor: _____

VILLAGE OF HANOVER PARK

SAFE WORK PRACTICES CHECKLIST

Elements of Task	Employee/ Management Directed	Excellent	Above Average	Average	Below Average	Poor
Preparation:						
Knowledge of Task Elements	E	☐	☐	☐	☐	☐
Understanding of Task Elements	E	☐	☐	☐	☐	☐
Prior Training on Task	M	☐	☐	☐	☐	☐
Ability to Perform Task	E	☐	☐	☐	☐	☐
Ability to Prepare for Task	E	☐	☐	☐	☐	☐
Hazard Assessment/Mitigation:						
Awareness of Potential Hazards	E	☐	☐	☐	☐	☐
Mitigation of Potential Hazards	E	☐	☐	☐	☐	☐
Creation of Safe Work Area	E	☐	☐	☐	☐	☐
Use of Personal Protective Equipment:						
Understanding of Appropriate Equipment Needs	E	☐	☐	☐	☐	☐
Initiative to Wear PPE	E	☐	☐	☐	☐	☐
Condition of PPE/Care of PPE	M/E	☐	☐	☐	☐	☐
Awareness of Surroundings:						
Application of Hazard Mitigation Plan	E	☐	☐	☐	☐	☐
Maintenance of Safe Work Area	E	☐	☐	☐	☐	☐
Ability to Adapt to Surroundings	E	☐	☐	☐	☐	☐
Operation of Equipment:						
Training on Use of Equipment	M	☐	☐	☐	☐	☐
Proper Operation of Equipment	E	☐	☐	☐	☐	☐
Proper Maintenance of Equipment	E	☐	☐	☐	☐	☐
Site/Area Clean-Up After Completion of Task	E	☐	☐	☐	☐	☐
Compliance with Rules/Procedures:						
Same Corrective Advice on More Than One Occasion	E	☐	☐	☐	☐	☐

Hanover Park Fire Department
Driving Road Course

Drivers Name: _____

Instructor: _____

Date: ___/___/___

Apparatus: 361/362 381/382 371

Starting Mileage: _____
Ending Mileage:_____

Location	Check Off	Comments
Barrington to Lake Street West	☐	
Lake Street West to Walnut	☐	
Walnut East to Orchard	☐	
Orchard North to Irving Park	☐	
Irving Park West to Barrington	☐	
Barrington South to Wildwood	☐	
Wildwood West to Woodlake	☐	
Woodlake North to Bayside	☐	

Bayside South to Leeward	☐	
Leeward East to Greenbay	☐	
Greenbay East to Woodlake	☐	
Woodlake South to Windward	☐	
Windward East to Nautilus	☐	
Nautilus North to County Farm	☐	
County Farm North to Greenbrook	☐	
Greenbrook East to Lake	☐	
Lake to Elgin O'Hare East	☐	
Exit Elgin O'Hare on to Springinsguth	☐	
Springinsguth to Elgin O'Hare West	☐	
Exit Elgin O'Hare on Lake	☐	
Lake West to Barrington	☐	
Barrington North back to station	☐	

I verify that the named member has passed the Driving Certification Test. My signature indicates this individual qualified to drive the aforementioned apparatus.

Training Officer:

_____

Date:

_____

Hanover Park Fire Department
Ambulance Driver
Qualification Score Sheet

Driver's Name: _____ **Test Date:** _____

Instructor's Name: _____

Beginning Mileage: _____ **Ending Mileage**: _____ **Total Mileage**: _____

<u>Ambulance Inspection, Chassis Controls and Driving:</u>

Objective: *The Ambulance Driver candidate will properly identify each of the systems and components listed below. Where appropriate, the candidate must demonstrate the operations and maintenance checks required.*	**COMMENTS**	
	SATISFACTORY	NEEDS IMPROVEMENT
<u>Fluids Level Capacity, Location and Servicing:</u> [ ] Fuel Level [ ] Coolant System [ ] Transmission Fluid [ ] Power Steering Fluid [ ] Battery Charging Status		
<u>Chassis Lighting:</u> [ ] Headlights [ ] Running Lights [ ] Turn Signals [ ] Marker Lights [ ] Brake Lights [ ] Spot Lights/Scene Lights [ ] Compartment Lights [ ] Back up Lights		

<u>Emergency Warning Systems:</u> [ ] Side Flashers [ ] Front and Rear Light Bar [ ] Strobe Lights [ ] Siren/Horn Switch [ ] Master Warning Switch [ ] Back up Audible Alarm [ ] Radios		
<u>Tire Inflation:</u> [ ] Front Tires [ ] Inside Dual Tires [ ] Outside Dual Tires		
<u>Parking Brake:</u> [ ] Applies Parking Brake [ ] Assures Activation of High Idle [ ] Removes Parking Brake Before Moving Ambulance		
<u>Body and Exterior Equipment:</u> [ ] Compartments Secure [ ] All Doors Closed And Secured		
<u>Cab and Apparatus Inventory:</u> [ ] Demonstrated Knowledge of All Mapping and Reference Resources Carried in Cab. [ ] Demonstrated Knowledge of Complete Cab Inventory [ ] Demonstrated Knowledge of Compartment Inventories. [ ] Demonstrated Complete Exterior Equipment Inventory		
Vehicle Preparation, Starting and Driving in Forward Gear		
Objective: *The Ambulance Driver Candidate shall correctly prepare for driving and safely start the apparatus. The Ambulance Driver shall demonstrate competency while safely driving the apparatus in forward gear on the roadways.*		
<u>Preparation to Drive:</u> [ ] Adjusts Driver's Seat Correctly [ ] Adjusts All Side View Mirrors [ ] Fastens Seat Belt [ ] Requires All Passengers to be Seated With Seat Belts Fastened [ ] Visibly Checks Clearance Around Apparatus Before Starting		

Ignition System: [ ] Safely Starts Engine [ ] Ensures That The Shoreline Was Ejected [ ] Visually and Audibly Checks All Chassis Warning Devices. [ ] Verbalizes if No Warning Lights [ ] Oil Pressure		
Engine Condition Indicators and Gauges: [ ] Fuel Gauge [ ] Engine Coolant Temperature Gauge [ ] Voltmeter		
Shifting and Moving Vehicle: [ ] Release Parking Brake [ ] Selects Drive (Auto Transmission)		
Forward Gear Driving: [ ] Smoothly Accelerates [ ] Smoothly Releases Accelerator [ ] Steers In Steady Hand-Over-Hand Method		
The Ambulance Driver shall demonstrate competence while driving the apparatus in Reverse Gear.		
Preparation for Driving in Reverse Gear: [ ] Posts a Back-Up Man [ ] Checks Side View Mirrors and Visibility [ ] Properly Places Transmission in Reverse [ ] Acknowledges and Checks "Blind Spots" ____[ ] Backs Into Quarters		
ADDITIONAL COMMENTS:		

Ambulance Inspection, Chassis Controls and Driving.

Certification Recommendation

I certify that the Ambulance Certification test was administered to the named member utilizing this score sheet under my supervision on the listed date.

In my opinion the named member is competent in the operating skills to safely drive the Ambulance.

Instructor: _____ Date: _____

I verify that the named member has passed the Ambulance Certification Test.

Training Officer: _____

Date: _____

Hanover Park Fire Department
Engine Driver
Qualification Score Sheet

Driver's Name: _____ **Test Date:** _____

Instructor's Name: _____

Beginning Mileage: _____ **Ending Mileage**: _____ **Total Mileage**: _____

1) Vehicle Inspection, Chassis Controls and Driving:

Objective: *The Engine Driver candidate will properly identify each of the systems and components listed below. Where appropriate the candidate must demonstrate the operations and maintenance checks required.*	**COMMENTS**	
	SATISFACTORY	NEEDS IMPROVEMENT
Fluids Level Capacity, Location and Servicing: [ ] Fuel Level [ ] Oil lLevel [ ] Coolant System [ ] Transmission Fluid [ ] Battery Charging System [ ] Windshield Wiper Fluid		
Chassis Lighting: [ ] Headlights [ ] Running Lights [ ] Turn Signals [ ] Marker Lights [ ] Brake Lights [ ] Quartz Lights [ ] Compartment Lights [ ] Back up Lights		

<u>Chassis Warning Systems:</u> [ ] Low Air Pressure [ ] Transmission Temperature [ ] Coolant Temperature [ ] Gen. Shift [ ] Pump Shift		

<u>Emergency Warning Systems:</u> [ ] Mechanical Siren [ ] Overhead (Cab) Light Bar [ ] Strobe Lights [ ] Siren/Horn Switch [ ] Master Warning Switch [ ] Back up Audible Alarm		
<u>Tire Inflation:</u> [ ] Front Tires [ ] Inside Dual Tires [ ] Outside Dual Tires		
The Engine Driver candidate shall correctly identify and state the proper operations and reset procedure for stopping the engine.		
<u>Engine Stop Devices:</u> [ ] Engine Stop Button		
<u>Body and Exterior Equipment:</u> [ ] Compartments Secure [ ] All Exterior Equipment Secure		
<u>Cab and Apparatus Inventory:</u> [ ] Demonstrated Knowledge of All Mapping and Reference Resources Carried in Cab. [ ] Demonstrated Knowledge of Complete Cab Inventory [ ] Demonstrated Knowledge of Compartment Inventories. [ ] Demonstrated Complete Exterior Equipment Inventory		
Vehicle Preparation, Starting and Driving in Forward Gear/s		
Objective: *The Engine Driver candidate shall correctly prepare for driving and safely start the apparatus. The Engine Driver shall demonstrate competency while safely driving the apparatus on the roadway.*		

<u>Preparation to Drive:</u> [ ] Adjusts Driver's Seat Correctly [ ] Adjusts All Side View Mirrors [ ] Fastens Seat Belt [ ] Requires All Passengers to be Seated With Seat Belts Fastened [ ] Visibly Checks Clearance Around Apparatus Before Starting [ ] Assures all compartment doors are closed.		
<u>Ignition System:</u> [ ] Activates Ignition Switch [ ] Activates Starter Switch [ ] Safely Starts Engine [ ] Visually and Audibly Checks All Chassis Warning Devices. [ ] Verbalizes if No Warning Lights [ ] Air Pressure [ ] Oil Pressure [ ] Located Engine Stop Button		
<u>Engine Condition Indicators and Gauges:</u> [ ] Air Pressure Indicator [ ] Tachometer [ ] Fuel Gauge [ ] Engine Coolant Temperature Gauge [ ] Voltmeter [ ] Pump In-Gear Indicator [ ] Jake on, and On High		
<u>Shifting and Moving Vehicle:</u> [ ] Release Parking Brake [ ] Selects Drive (Auto Transmission)		
<u>Forward Gear Driving:</u> [ ] Smoothly Accelerates [ ] Smoothly Releases Accelerator [ ] Steadily Applies Air Brake [ ] Steers In Steady Hand-Over-Hand Method		
The Engine Driver shall demonstrate competence while driving the apparatus in Reverse. Competence must be demonstrated at several locations within the response area and shall be based on realistic spotting or staging assignment for the Tower.		

Preparation for Driving in Reverse Gear: [ ] Posts a Back-Up Man [ ] Checks Side View Mirrors and Visibility [ ] Properly Places Transmission in Reverse [ ] Acknowledges and Checks "Blind Spots" _____[ ] Backs Into Quarters		
The Engine Driver smoothly operates accelerator and brakes while driving in reverse.		
The Engine Driver demonstrated over-all safety and confidence while operating the vehicle in forward gears.		
ADDITIONAL COMMENTS:		

Engine Vehicle Inspection, Chassis Controls and Driving.

Certification Recommendation

I certify that Engine Driver Certification test was administered to the named member utilizing this score sheet under my supervision on the listed date.

In my opinion the named member is competent at the operating skills to safely drive the Fire Engines.

Instructor: _____ Date: _____

I verify that the named member has passed Engine Driver Certification Test.

Training Officer: _____

Date: _____

Hanover Park Fire Department
Engine Pump Operations
Qualification Score Sheet

Driver's Name: _____ **Test Date:** _____

Instructor's Name: _____

Engine Pump Operations:

	COMMENTS	
	SATISFACTORY	NEEDS IMPROVEMENT
Pumping Operations: [ ] Puts Engine into Neutral [ ] Sets Parking Brake [ ] Engages Pump [ ] Puts Engine Into Drive [ ] Places Wheel Chocks [ ] Grabs Proper Hydrant Tools [ ] Removes Steamer and Flushes Hydrant [ ] Attaches 5” to Hydrant and Engine [ ] Completely Opens Hydrant [ ] Opens Front Suction Valve [ ] Properly Set Electronic Governor Control Unit [ ] Delivers Correct GPM as Noted on Hose Chart For: [ ] Smooth Bore Nozzle [ ] Chief Nozzle [ ] Able to Circulate Water [ ] Able to Pump More Than One Line at Different Pressures		

Shutting Down Pump Operations: [ ] Make Sure Tank is Full [ ] Throttles Down Pump [ ] Closes Front Suction [ ] Shuts Down Discharge Valves [ ] Places Transmission into Neutral [ ] Disengages Electric Pump Switch [ ] Closes Hydrant [ ] Assure That Main Drain was Engaged [ ] Pick Up Wheel Chocks		
The Operator has a thorough understanding of the departments hose loads and operational plan [ ] Plan #1 [ ] Plan #2 [ ] Plan #3 [ ] Plan #4 [ ] 4" Hose		

ADDITIONAL COMMENTS:		

Engine Pump Operations

Certification Recommendation

I certify that Engine Pumping Operations Certification test was administered to the named member utilizing this score sheet under my supervision on the listed date.

In my opinion the named member is competent at the operating skills to safely operate the Pump on the Engines.

Instructor: _____ Date: _____

I verify that the named member has passed Engine Pump Operations Certification Test. My signature indicates this individual is qualified..

Training Officer: _____

Date: _____

Hanover Park Fire Department
Ladder Tower Driver
Qualification Score Sheet

Driver's Name: _____ **Test Date:** _____

Instructor's Name: _____

Beginning Mileage: _____ **Ending Mileage**: _____ **Total Mileage**: _____

1) Vehicle Inspection, Chassis Controls and Driving:

Objective: *The Ladder Tower Driver Candidate will properly identify each of the systems and components listed below. Where appropriate the candidate must demonstrate the operation and maintenance checks required.*	**COMMENTS**	
	SATISFACTORY	NEEDS IMPROVEMENT
Fluids Level Capacity, Location and Servicing: [ ] Fuel Level [ ] Coolant System [ ] Transmission Fluid [ ] Battery Charging System		
Chassis Lighting: [ ] Headlights [ ] Running Lights [ ] Turn Signals [ ] Marker Lights [ ] Brake Lights [ ] Quartz Lights [ ] Compartment Lights [ ] Back up Lights		

<u>Chassis Warning Systems:</u> [ ] Low Air Pressure [ ] Transmission Temperature [ ] Coolant Temperature [ ] Gen. Shift [ ] PTO Shift [ ] Pump Shift		

<u>Emergency Warning Systems:</u> [ ] Mechanical Siren [ ] Overhead (Cab) Light Bar [ ] Strobe Lights [ ] Siren/Horn Switch [ ] Master Warning Switch [ ] Back up Audible Alarm		
<u>Tire Inflation:</u> [ ] Front Tires [ ] Inside Dual Tires [ ] Outside Dual Tires		
The Ladder Tower Driver Candidate shall correctly identify and state the proper operation and reset procedure for stopping the engine.		
<u>Engine Stop Devices:</u> [ ] Engine Stop Button		
<u>Body and Exterior Equipment:</u> [ ] Compartments Secure [ ] All Exterior Equipment Secure		
<u>Cab and Apparatus Inventory:</u> [ ] Demonstrated Knowledge of All Mapping and Reference Resources Carried in Cab. [ ] Demonstrated Knowledge of Complete Cab Inventory [ ] Demonstrated Knowledge of Compartment Inventories. [ ] Demonstrated Complete Exterior Equipment Inventory		
Vehicle Preparation, Starting and Driving in Forward Gear/s		
Objective: *The Ladder Tower Driver Candidate shall correctly prepare for driving and safely start the apparatus. The Ladder Tower Driver shall demonstrate competency while safely driving the apparatus in forward gear on the roadways during various traffic volumes.*		

<u>Preparation to Drive:</u> [ ] Removes Shore Line [ ] Adjusts Driver's Seat Correctly [ ] Adjusts All Rear View Mirrors [ ] Fastens Seat Belt [ ] Requires All Passengers to be Seated With Seat Belts Fastened [ ] Visibly Checks Clearance Around Apparatus Before Starting		
<u>Ignition System:</u> [ ] Activates Ignition Switch [ ] Activates Starter Switch [ ] Safely Starts Engine [ ] Visually and Audibly Checks All Chassis Warning Devices. [ ] Verbalizes if No Warning Lights [ ] Air Pressure [ ] Oil Pressure [ ] Verbal – No Warning Lights		
<u>Engine Condition Indicators and Gauges:</u> [ ] Air Pressure Indicator [ ] Tachometer [ ] Fuel Gauge [ ] Engine Coolant Temperature Gauge [ ] Voltmeter [ ] Pump In-Gear Indicator [ ] PTO Indicator [ ] Jake on, and On High		
<u>Shifting and Moving Vehicle:</u> [ ] Release Parking Brake [ ] Selects Drive (Auto Transmission)		
<u>Forward Gear Driving:</u> [ ] Smoothly Accelerates [ ] Smoothly Releases Accelerator [ ] Steadily Applies Air Brake [ ] Steers In Steady Hand-Over-Hand Method		
The Ladder Tower Driver shall demonstrate competence while driving the apparatus in Reverse Gear. Competence must be demonstrated at several locations within the response area, and shall be based on realistic spotting or staging assignment for the Tower.		

Preparation for Driving in Reverse Gear: [ ] Posts a Back-Up Man [ ] Checks for Basket Clearance [ ] Checks Side View Mirrors and Visibility [ ] Properly Places Transmission in Reverse [ ] Acknowledges and Checks "Blind Spots" _____[ ] Backs Into Quarters		
The Ladder Tower Driver smoothly operates accelerator and brakes while driving in reverse.		
The Ladder Tower Driver demonstrated over-all safety and confidence while operating the vehicle in forward gear.		
ADDITIONAL COMMENTS:		

Section 1 – Vehicle Inspection, Chassis Controls and Driving.

Certification Recommendation

I certify that Section 1 of the Ladder Tower Certification test was administered to the named member utilizing this score sheet under my supervision on the listed date.

In my opinion the named member is competent at the operating skills to safely drive Ladder Tower Apparatus.

Instructor: _____ Date: _____

I verify that the named member has passed Section 1 of the Ladder Tower Certification Test. My signature indicates this individual is recommended to proceed to Section 2 of the Ladder Tower Certification Test.

Training Officer: _____

Date: _____

Hanover Park Fire Department
Ladder Tower Operations
Qualification Score Sheet

Driver's Name: _____ **Test Date:** _____

Instructor's Name: _____

2) Ladder Tower Operations:

	COMMENTS	
	SATISFACTORY	NEEDS IMPROVEMENT
Aerial PTO Operations: [ ] Checks for Hazards [ ] Assures Proper Placement [ ] Places Tower in Park [ ] Sets Parking Brake [ ] Covers Brake Pedal [ ] Engages PTO Switch [ ] Engages Generator [ ] Sets Chocks for Front Wheels		
Outrigger Operations: [ ] Pulls Out Pump Step [ ] Properly Places Jack Pads [ ] Turns On Master Switch to Jacks [ ] Raises Vehicle until Tires Are At Least 2 inches Off The Ground [ ] Checks For Interlock Lights [ ] Checks For Vehicle Being Level [ ] Switches Power from Jacks to Ladder		

<u>Aerial Operations From The Platform:</u> [ ] Verbalizes Maximum Weight Limit For Basket Operations [ ] Verbalizes Operations of Switches, Levers, and Lights Found on the Control Panel [ ] Turns on Intercom System in the Basket at the Base Control Panel [ ] Looks For Hazards [ ] Raises Ladder to an Angle Over 20 Degrees Prior to Rotating Basket [ ] Rotates Basket in Desired Direction [ ] Extends Ladder [ ] Feathers Controls to Avoid Jerking Basket		

<u>Aerial Operations From The Basket:</u> [ ] Describes Maximum Weight For Basket Operation [ ] Verbalizes All Operations of Switches, Levers, and Lights on Control Console [ ] Safety Belt Worn and Secured in Basket [ ] Switches Power From Base to Basket [ ] Looks For Hazards [ ] Raises Ladder to an Angle Over 20 Degrees [ ] Rotates Basket in Desired Direction [ ] Extends Ladder [ ] Feathers Controls to Avoid Jerking Basket [ ] Demonstrates How to Use the On Board SCBA Device		
<u>Ladder Tower Emergency Operations:</u> [ ] Rotates Basket Out of Dangerous Areas [ ] Proper Usage of Electric Hydraulic Pump [ ] Can Locate Manual Valve Controls For Ladder [ ] Knows How to Move Ladder Using Manual Valve Controls		

Bedding Ladder:: [ ] Properly Aligns Turn Table [ ] Checks for Level of Basket [ ] Checks for Hazards [ ] Lowers Ladder Into Cradle		
Bedding Ladder (cont.): [ ] Places Ladder Under 1500 lbs of Pressure [ ] Switches Power From Ladder to Jacks [ ] Raises Left Outriggers [ ] Raises Right Outriggers [ ] Turns Off Master Power Switch to Jacks and Ladder [ ] Secures Pads and Wheel Chocks [ ] Secures Pump Step		
[ ] Performs Walk Around Safety Check		
ADDITIONAL COMMENTS:		

Section 2 – Ladder Tower Operations

Certification Recommendation

I certify that Section 2 of the Ladder Tower Certification test was administered to the named member utilizing this score sheet under my supervision on the listed date.

In my opinion the named member is competent at the operating skills to safely operate the Tower Ladder.

Instructor: _____ Date: _____

I verify that the named member has passed Section 2 of the Ladder Tower Certification Test. My signature indicates this individual is recommended to proceed to Section 3 of the Ladder Tower Certification Test.

Training Officer: _____

Date: _____

Hanover Park Fire Department
Ladder Tower Pump Operations
Qualification Score Sheet

Driver's Name: _____ **Test Date:** _____

Instructor's Name: _____

3) Ladder Tower Pump Operations:

	COMMENTS	
	SATISFACTORY	NEEDS IMPROVEMENT
Ladder Tower Pump Operations: [ ] Puts Tower In Neutral [ ] Sets Parking Brake [ ] Engages PTO [ ] Puts Tower Into Pump [ ] Puts Tower Into Drive [ ] Places Wheel Chocks [ ] Properly Connects to Water Source [ ] Sets Up Ladder Properly [ ] Raises Ladder to a 60 Degree Angle [ ] Opens Butterfly Valve [ ] Opens Discharge to Basket [ ] Sets Electronic Governor [ ] Delivers Proper GPM For: [ ] Smooth Bore Tip [ ] Fog Nozzle [ ] Able To Circulate Water [ ] Demonstrates Knowledge of Tip Sizes and GPM's		

<u>Shutting Down Pump Operations:</u> [ ] Assures Tank Is Full [ ] Throttles Down Pump [ ] Shuts Down Discharge Valve To Basket [ ] Closes Butterfly Valve [ ] Places Tower In Neutral [ ] Disengages Electronic Pump Switch [ ] Properly Drains Waterway [ ] Properly Beds Ladder [ ] Properly Stows Jacks [ ] Picks Up and Stows Jack Pads and Wheel Chocks		
<u>Towers Generator:</u> [ ] Properly Turns On Generator for Scene Lights and Power Cords [ ] Properly Shuts Off Generator [ ] Properly Stows Scene Lights		

<u>ADDITIONAL COMMENTS:</u>		

Section 3 – Ladder Tower Pump Operations

Certification Recommendation

I certify that Section 3 of the Ladder Tower Certification test was administered to the named member utilizing this score sheet under my supervision on the listed date.

In my opinion the named member is competent at the operating skills to safely operate the pump of the Ladder Tower Apparatus.

Instructor: _____ Date: _____

I verify that the named member has passed Section 3 of the Ladder Tower Certification Test. My signature indicates this individual is qualified to drive the Ladder Tower.

Training Officer: _____

Date: _____

Line-of-Duty Death or Serious Injury Procedure

Purpose

This procedure describes the roles, responsibilities, and activities required in the event an employee of the Hanover Park Fire Department is seriously injured or killed in the line-of-duty. It establishes a priority and procedure for conducting notifications, guidelines for interacting with family members, the news media, and provides a funeral protocol.

Scope

This procedure applies to all members of the fire department at all times. Although employees may be members of either IAFF Local 3452 or SEIU Local 73, this procedure dictates the actions of the fire department, which may differ from those of the local union officials.

1. Definitions

1.1. Serious Injury - any injury sustained in the line-of-duty which is, or may become, life threatening or will disable the employee for a sustained period.

1.2. Line-of-duty death (LODD) - The death of any member of the Hanover Park Fire Department while on duty, or while undergoing medical treatment for any injury or disease resulting from such duty, is considered a line-of-duty death. Included in LODD is the death of any member while traveling in connection with such duty.

2. Procedure

2.1. Immediately after a determination that a member has been seriously injured or killed, the Incident Commander shall notify:

2.1.1. The Fire Chief (if not on-scene)
2.1.2. The Assistant Fire Chief (if not on-scene)
2.1.3. Ducomm Fire Desk by telephone only at 630-260-7512

2.2. The Incident Commander shall request an addition level of alarm and the MABAS 12 IMAT.

2.3. Upon arrival of the MABAS 12 IMAT, the Incident Commander shall transfer command of the incident to the first-arriving IMAT Chief.

2.4. All firefighters and officers on the scene will be relieved of duty as soon as practical by mutual aid companies.

2.5. All members shall be instructed to write detailed narratives of the incident prior to being relieved of duty.

2.6. All members shall refrain from publicizing in any way, except official investigators, the events of the incident until permission is granted by the Fire Chief.

2.7. All members shall cooperate fully with local, state, Federal and NIOSH investigators.

2.8. The Incident Commander shall request the police department to secure the scene and impound the belongings and gear of the injured/killed member.

2.9. The Fire Chief, or his designee, shall activate the Hanover Park Fire Department Line-Of-Duty Death Contingency Plan as attached to this policy as Appendix A.

AMERICAN RED CROSS
DISASTER SERVICES

RESPONSE TO FAMILY NEEDS

A FIELD GUIDE TO CULTURAL AND RELIGIOUS BEVERVEMENT PRATICES

COMPILED BY
CINCINNATI AREA CHAPTER DISASTER SERVICES

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DEVELOPED BY THE CINCINNATI AREA CHAPTER DISASTER SERVICES
JULY 2000

African Methodist Church

Funerals and Mourning: Life is eternal. The purpose of funerals: 1) express grief and comfort one another in bereavement; 2) celebrate the life of the deceased; and 3) affirm faith in life with God after death. The service usually lasts 45 minutes to an hour.

Spiritual Caregiver: Pastor

Books used: AME book of Liturgy

Before the Ceremony: Funeral takes place 3-7 days after death. Night services are optional, with a *wake* one hour prior to service. Visitations are scheduled most times. Families may choose simply to have a funeral service, no wake.

Appropriate Attire: Men – jacket and tie. Women – dress.
Somber, dark colors are recommended.

Flowers and Donations: Flowers may be sent to the church or home of the bereaved. Contributions are optional; they may be sent to the church in honor of the individual, or the charity may be mentioned in the obituary. Food may also be sent to the family home. No restrictions on the type of food offered/served.

The Ceremony: Takes place at a church or funeral home. No burials on Sunday mornings. The casket is usually closed. The final viewing occurs just prior to the service. Opening Scripture is taken from the Bible: Gospel John the 14th, beginning first verse. No cameras or tape recorders are allowed.

The Interment: At the graveside, prayers are recited by the pastor and the body is committed to the ground. If there has been a cremation - done privately before the service - the ashes are placed in a vault. After the service, different auxiliaries/church families bring covered dishes and food is served either at the church or at the family home.

Comforting the Bereaved: If one is not a member of the denomination, telephoning or visiting the bereaved, upon hearing of the death, is acceptable. Expressing condolences is a traditional greeting for the family. The Reverend may also go to the house to extend sympathy and pray for the victim and begin the planning process for the final services of the deceased.

Important Facts: Cremation is allowed. Memorial services follow. The African Methodist faith treat the funeral service as a “home going” service – moving from the temporary location, earth, going to their eternal home.

Amish

Funerals and Mourning: Funerals and burials are plain. The act of dying is transformed into a community event. The belief in divine order of all things, including immortality, is a source of comfort to the mourning family. The funeral service lasts 30-90 minutes.

Spiritual Caregiver: bishop

Books used: Bible - Old Testament. Readings – *John 5* and *Revelation 20*, are common.

Before the Ceremony: Generally, funerals are held on the 3rd day following death. A list is made of persons who are to be notified personally and invited to the funeral. Non-relatives are appointed to take charge of all the work and arrangements: choosing a coffin and place of burial, financial worries. Young men take over farm chores, older, married couples manage housing by appointing helpers to clean and prepare food. Relations who live at a great distance are notified by telephone of a non-Amish neighbor. Traditionally, the deceased are clothed in white.

Appropriate Attire: Black is worn by: women for one year if loss occurs in immediate family, 6 months for a grandparent, 3 months for an aunt/uncle and 6 weeks for cousins.

Flowers and Donations: There are no flowers in an Amish funeral service.

The Ceremony: Takes place in the church sanctuary or a funeral home. Funerals are very plain. Bodies are placed in a prie - simple wooden box. Usually the body is embalmed. Typically, the first minister delivers a biblical message, similar to a sermon. The second minister (a guest in the community) gives the principal address, readings, sermon, prayer, benediction, followed by a brief eulogy. Caskets are open for viewing, afterwards.

The Interment: After the funeral, relatives and friends drive in buggies to the burial grounds; usually Amish have their own cemetery. At the graveside, the coffin is lowered into the ground; the pastor reads hymns as pallbearers fill the grave with soil. All men tilt or remove their hats. Usually, married persons and their children are buried side-by-side. Headstones are plain.

Comforting the Bereaved: A brief visit to the home of the bereaved is appropriate. Closest kin spend time in quiet meditation and conversation. Sharing a meal following burial is one that helps the mourners resume their normal roles and responsibilities.

Important Facts: Members practice simple, austere living - style of dress, restraints on modern technology: no electricity or telephones in the home, no driving. There are 3 distinctive languages: English, native Pennsylvania German dialect (primarily oral) and High German (formal, preaching service).

Apostolic

Funerals and Mourning: Death is not the end, but the beginning of eternity. Apostolics are of the Christian faith and believe in the hereafter.

Spiritual Caregiver: Minister

Books used: Bible; Christian Ministers Manual; Starbook for Ministers; and Ministers Service Book

Before the Ceremony: Funeral takes place usually within 3-4 days after death. Some churches have a memorial service at the church the night before the funeral service. Other congregations have visitation the night before the funeral. The next morning or afternoon is the funeral service. Ordinarily, visitation time is from 6:00p.m.-8:00p.m. , but this time period varies with different churches.

Appropriate Attire: No rules.

Flowers and Donations: Flowers may be sent to the church where the funeral service will take place. Food is provided for the family before and after the funeral service. Someone is appointed leader in the church to head other members to help provide the meals. No food restrictions . Alcohol is prohibited.

The Ceremony: Memorial service starts with a song: a trio, solo, music instrument or choir service. This is followed by a reading of the eulogy - which can last 20-30 minutes - by either the minister or someone assisting the minister. The body remains either in a funeral home or at the church, and is usually at the family's discretion as to whether the casket remains open. If the casket is open, the funeral director ushers the guests by the casket after which the casket is closed and is rolled to the church entrance where pallbearers carry the casket to the hearse.

The Interment: The committal service at the graveside is brief. The reading of Scriptures is followed by prayer and then the committal takes place. The guests are then excused. After they leave, the casket is lowered into the ground.

Comforting the Bereaved: Friends and relatives return to the church for a meal – which is provided by the church. Apostolics meet often in the church and seek comfort there.

Important Facts: If there is no body, a memorial service is held. Family is brought together; Scripture reading and songs are the norm followed by the minister eulogizing the deceased. Morticians usually make the funeral arrangements with the family: plot, graves, and the designation of flowers and donations. There are no rituals for observing an anniversary of a death. At the discretion of pastors, family visits can be arranged.

Assemblies of God

Funerals and Mourning: Death is seen as part of life. While physical death is final, spiritual life continues on eternally, in afterlife. When the body dies, the spirit goes immediately. All will be resurrected and will stand a final judgement, even those cremated. A ceremony unto itself, the funeral service lasts 30-60 minutes.

Spiritual Caregiver: Pastor

Books used: Bible – includes both Old and New Testaments

Before the Ceremony: Funerals normally take place within 2-3 days after death. Most times, families will have a visitation prior to the funeral.

Appropriate Attire: Men: jacket and tie. Women: dress or skirt and blouse. Dark, somber colors are advised.

Flowers and Donations: Flowers may be sent to the funeral home or church where the funeral service is held, though the family may designate donations be given to a church organization or charity. The churches woman's group usually provides food. Usually the church does everything based on the family's needs and desires.

The Ceremony: Usually takes place in a church or a funeral home. Funerals begin with singing, prayer and a spiritual message by the pastor. Hymns, worship to God, and a eulogy follows. Music, chosen by the family, is congregational singing, a soloist or it can be both. Passages from the Bible are read (1 Cor.15, Psalm 23, John 11.). The sermon is always intended to encourage the faith and hope of family and friends. A sense of joy in the hope of the resurrection is encouraged. At the close of the service, the coffin is closed and pallbearers carry it out. A committal service at the cemetery follows, at the family's request.

The Interment: At the graveside, the service is brief – 5 minutes. There are Scripture readings and a conclusive prayer. At the close, family members gather informally with friends who hug and comfort each other.

Comforting the Bereaved: Grief is not denied or repressed, it is encouraged. It is normal for church members to gather around the family and offer emotional support. Initially, support is drawn from the comfort of friends and church members. Ultimately, the greatest comfort is through the Bible and Jesus Christ.

Important Facts: Families wishes and desires will be followed closely and carried out. If the family just wants a visitation or a memorial service, the church will plan what the family wants. There is no liturgy or catechism.

Baha'i ("Bah-hi")

Funerals and Mourning: Upon death, the soul is freed from its ties with the physical body and the surrounding physical world, and begins its journey through the spiritual world. Baha'is understand the spiritual world to be a timeless, placeless extension of their own universe, not a physically remote or removed place. Heaven is envisioned partly as a state of nearness to God; hell is a state of remoteness from God.

Spiritual Caregiver: The family may choose whomever they wish to conduct a service, be it a friend, a family member or Baha'i institution.

Books used: Prayer book – usually *Baha'i Prayers;* other religious writings, prose or poetry may also be read. The only required part of the funeral is the "Prayer for the Deceased", if the deceased is 15 years or older.

Before the Ceremony: The sooner the burial takes place the better it will be. Since the Baha'i faith teaches that we are all world citizens and should not be attached to any particular geographical site, the deceased should be buried within one hour's travel time from the place of death.

Appropriate Attire: The body should be wrapped in 5 (or at least 1) sheets of cotton or silk. No rules regarding color. A Baha'i ring with a special inscription ("I came forth from God, and return unto Him, detached from all save Him, holding fast to His Name, the Merciful, the Compassionate") should be placed on the finger of the deceased, if 15 years.

Flowers and Donations: Flowers and food may be sent to the home of the bereaved or to the funeral home. Contributions may also be made to a fund or charity designated by the family of the bereaved. **Non-Baha'is may not contribute to a Baha'i fund**. There are no dietary restrictions.

The Ceremony: Takes place at a local House of Worship, Baha'i Center or a funeral home. Memorial service or funeral consists primarily of prayers and other readings from the Sacred Scriptures (prayers). There may also be spiritual music and a eulogy.

The Interment: At the graveside, a special Baha'i prayer for the deceased is recited aloud while guests are standing. The symbols such as the 9-pointed star, the word Baha'i, or rosette with the word Baha'i in the center may be used for the grave marker. The number 9 has many meanings: one is that the Baha'i Faith is the 9th world religion.

Comforting the Bereaved: Visiting the bereaved at home is appropriate. Food will probably be served, but alcohol will not be available.

Important Facts: Ceremonies are simple and flexible. There are no rituals. The only requirement is a special prayer for the deceased. Embalming is prohibited, unless law requires it. The body must not be cremated. The purpose of life is to develop attributes and virtues and make spiritual progress toward the next world.

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Baptist

Funerals and Mourning: Death is an inevitable part of life, consisting of birth and death cycles. Baptists believe that the afterlife begins immediately after death, with one entering into Heaven. The belief is that the spirit goes immediately. A Baptist looks for a theological rationale for death in the Bible. The funeral generally lasts 30-60 minutes.

Spiritual Caregiver: Pastor

Books used: Several translations of the Bible may be used. Some will only use the *King James* Version. Others will use modern translations such as the *New International* version and the *New Revised Standard* version. The New Testament is also used.

Before the Ceremony: Funeral takes place within one week after death. Visitation is held at the funeral home or church. Casket is brought into the funeral home, it may be open or closed. People greet and comfort the family. The Funeral is held the next morning.

Appropriate Attire: No rules.

Flowers and Donations: Flowers may be sent to the church or funeral home, where the funeral will take place, or to the home of the bereaved. Contributions to a charity may be sent. Such gifts should be presented to the spouse or adult children of deceased. Food may be sent to the home of the bereaved after the funeral. (No restrictions)

The Ceremony: Takes place in a church or funeral home. No funerals on Sunday mornings. Latecomers do not enter when the bereaved family is entering or during prayers. Family may choose the way they want the service to be. Cremation is allowed.

The Interment: At the graveside, a brief service is held, where Scriptures are read, prayers are recited and the casket is committed to the ground. Upon returning from the graveyard cemetery, traditionally, a meal is provided by church members.

Comforting the Bereaved: It is appropriate to visit the home of the bereaved after the burial. Such visits include recalling happy times during the life of the deceased. Food may be served, alcohol is not permitted. Casseroles may be brought to the church and/or the church may bring the food to the home of the bereaved.

Important Facts: Baptists are individualistic, the church does not govern their thoughts or actions. Baptists base their faith on their own personal relationship with Christ. The Pastor is more of a guide/teacher who will lead the church members; he does not dictate to the church.

Brethren Church

Funerals and Mourning: Celebrates the resurrection promised By Jesus Christ. The service also celebrates the individual who has died, providing an opportunity to reflect upon the meaning of life. The funeral service, a ceremony unto itself lasts 30-60 minutes.

Spiritual Caregiver: Pastor

Books used: Bible. Each congregation chooses its own translation.

Before the Ceremony: A funeral is usually held 2-3 days after death, or a Memorial Service can be held (from 1-3 weeks after a death). Usually, a Pastor will make a visit to the home of the bereaved before the funeral, to pray with them and/or help make funeral arrangements.

Appropriate Attire: Men – jacket and tie, business casual. Women – dress, skirt and blouse or pants suit. No rules regarding colors of clothing.

Flowers and Donations: Flowers may be sent to the home of the bereaved or to the funeral service. In lieu of flowers, contributions may be sent to a fund or charity designated by the family or the deceased. Food may be sent to the home of the bereaved.
There are no restrictions on the types of food.

The Ceremony: Takes place in a church or funeral home. Guests sit wherever they wish. The casket may be open. The pastor officiates; the eulogist delivers a eulogy. If it is deemed appropriate, a choir, vocal ensemble or a soloist may sing hymns, while an organist or pianist provides music. Cameras and tape recorders are permitted with prior approval of the Pastor or the bereaved.

The Interment: It is optional for guests to attend. At the graveside, Scripture and prayer of committal are performed prior to the body being committed to the ground. Normally, the body is lowered after services are performed.

Comforting the Bereaved: If visiting the home of the bereaved, it is recommended that the visit be brief. In many congregations, a fellowship meal is served either in the church or at the family's home. Guests, family and friends gather after the funeral or memorial service. Thoughtful and compassionate reflections are encouraged in times of mourning.

Important Facts: There are no rituals for observing the anniversary of a death. Burial or cremation is up to the family.

Buddhism

Funerals and Mourning: Each individual passes through many rebirths. Death is a very important transition. An intermediate state (or transition phase) may last up to 49 days following death. This time is preparation for one's next life. One then enters a new rebirth. Death is seen as transition of consciousness from this temporal body to the next life. The funeral service lasts 45 minutes to an hour. Thai, Cambodian and Sri Lankan traditions may have up to 3 ceremonies, each lasting 45 minutes.

Spiritual Caregiver: A priest officiates in Japanese tradition. A monk officiates in the Cambodian, Thai and Sri Lankan traditions.

Books used: The Tibetan Book of the Dead

Before the Ceremony: The funeral is usually held within 1 week of death, but ideally 3 days. It is considered inappropriate to communicate with the bereaved before the funeral. Immediately after death, the body is always washed, bathed and properly dressed. This occurs before the ceremony.

Appropriate Attire: There are vast differences in Buddhist traditions in America. It would be best to approach all situations conservatively and ask questions. In Japanese traditions, dark somber colors are advised. Cambodian, Thai and Sri Lankan traditions advise wearing white – the symbolic color of death.

Flowers and Donations: Donations are widespread and acceptable. Typically, the bereaved family recommends a specific charity/cause as the recipient of donations.

The Ceremony: Traditions vary as to where the funeral is held. Temples are more common than funeral homes. In Cambodian, Thai and Sri Lankan traditions, the 1st ceremony is at the home of the bereaved, the 2nd is at a funeral home and the 3rd is either at the home of the bereaved or a temple. Sitting will probably be on the floor on meditation cushions. In Tibetan tradition, the body often remains at home; people come to the home to meditate with the body. It is then taken directly to the crematorium. The purpose of a Buddhist funeral is to help the deceased in his/her journey through the intermediate state and also to comfort the bereaved.

The Cremation: is the standard in Buddhist countries. In Japanese and Chinese traditions, the ashes are later buried.

Comforting the Bereaved: It is appropriate to visit the home of the bereaved. In Western traditions, monks lead a "merit transference" ceremony 7 days after the burial or cremation. This generates good energy for the deceased in his or her new rebirth. Impermanence is central to Buddhist teachings. People from an early age learn that death is an inevitable part of life. The reality of death is more acceptable.

Important Facts: Commonly, a year after death, most traditions have “merit transference” ceremonies. In Japanese traditions, death anniversaries are celebrated for many years after death. These are held at the home of the bereaved or at a temple. In some traditions, a body is taken to a monastery to be burned - on a funeral pyre. Meditation plays a big part in Buddhism. Buddhists see death as a transition not as an end. All information above is subject to local customs, as there is a great deal of variation throughout the Buddhist world.

Catholic (Roman Catholic)

Funerals and Mourning: Death is considered a public rather than a private event. It serves as an opportunity for community reaffirmation of faith in life beyond death. A Catholic funeral rite is a mass. A formal ceremony, the mass lasts about an hour.

Spiritual Caregiver: priest

Books used: hymnal; The New American Bible; a prayer book – called a Missal.

Before the Ceremony: The funeral usually takes place within 2-3 days after death. The first day after a death is usually reserved for the family to make arrangements for the funeral. Most churches offer a bereavement minister who can help the family plan the funeral mass. Family's choose readings, songs and etc. The wake can happen at the funeral home or at church – if the church can accommodate it. A vigil service may be provided, where prayers for the deceased can be said. Common to all wakes is an opportunity for community, friends and relatives to gather, pray and express their sympathies to the bereaved.

Appropriate Attire: Respectable clothing.

Flowers and Donations: Flowers are appreciated, and may be sent to the home of the deceased, or to the funeral home, before or after the funeral. Contributions are not customary unless the family indicates they are appropriate; they can be sent to any charity the family supports. Food may be sent to the home of the bereaved, or wherever there may be a reception, after the funeral.

The Ceremony: Takes place at a church or a funeral home. The coffin is closed and draped with a *pall* (white shroud that covers the whole coffin). This symbolizes the white garment received at Baptism. The service emphasizes supportive love from relatives, friends and neighbors, grieving the deceased. Bible readings, the liturgy and prayers of mass address the belief in the Resurrection.

The Interment: After the funeral Mass, the hearse is followed to the cemetery for final graveside farewell. The priest or deacon will say the prayers of final commendation.

Comforting the Bereaved: A brief visit to the home of the bereaved is appropriate. Typically, the reception includes the serving of food and drink. Friends and acquaintances gather to console with their presence and prayers.

Important Facts: Usually, there is a mass on the annual anniversary of the death. Catholics believe in the afterlife. Typically, Catholics will like to have a mass said for the *repose of the soul of the deceased*. Those arrangements can be made through their own church or from the parish where the deceased was from. There are parishes that offer grief support groups.

Christian

Funerals and Mournings: In faith, one can look forward to life with God after death through faith in Jesus Christ. The funeral is a ceremony unto itself and usually lasts 15-30 minutes. A eulogy lasts about 20 minutes.

Spiritual Caregiver: Minister or Pastor

Books used: Bible

Before the Ceremony: Funeral takes place usually within 2-3 days of death. "Lying in State" (viewing the body) is sometimes performed at the church, sometimes at a funeral home. Typically, the family is present while mourners come to offer condolences.

Appropriate Attire: Depends on church culture. Somber, dark colors are recommended.

Flowers and Donations: Flowers may be sent to the home of the bereaved. Contributions are optional, not ordinarily encouraged. Food may be sent to the home of the bereaved. No food restrictions.

The Ceremony: Takes place at a church or funeral home. Sometimes the funeral will be at the home of the bereaved. A memorial service is held in a church. Those arriving late should not enter during prayer. The casket is usually open. There is no official Bible translation. Each church chooses the hymnal and the translation of the Bible it will use. In the culture of most funerals, picture taking is not encouraged.

The Interment: at the graveside, Scriptures and prayers are recited by the minister and the body is committed to the ground.

Comforting the Bereaved: It is appropriate to visit the home of the bereaved, but it is best to call first. A brief visit is typical, unless they are close friends of the bereaved. Alcoholic beverages will NOT be served.

Facts: There are no mourning customs or rituals observed at the anniversary of one's death. Typically, people (friends, relatives or other church members) will offer prayer on behalf of the bereaved.

Christian and Missionary Alliance (CMA)

Funerals and Mourning: Death is the inevitable event of moving from this life to the next. Yet, in Christ it is not something that we have to fear. Peace is always found in knowing that a few short years on earth is not all we have. The ceremony lasts 30-45 minutes.

Spiritual Caregiver: Pastor

Books used: A hymnal and Bible (St. John Chapter 14, verses 1-3)

Before the Ceremony: The funeral typically takes place within 2-3 days. Visitation is followed by a funeral service.

Appropriate Attire: Men – jacket and tie. Women – dress.

Flowers and Donations: Flowers may be sent to the home of the bereaved or to the funeral itself. The family may designate certain charities to which contributions may be donated. Food may be sent to the home of the bereaved upon hearing of the death. (No restrictions).

The Ceremony: Takes place either in a church or a funeral home. Guests should arrive early and ushers will advise where to sit, however if late, one should not enter while prayers are being recited. Whether the casket is open or closed depends on a family. Typically, a funeral service includes Scripture, music and prayer.

The Interment: Guests should attend the interment. At the graveside, prayers are recited, Scripture is read and a short service is held.

Comforting the Bereaved: It is appropriate to visit the home of the bereaved after the funeral, but the visit should be limited to no more than 30 minutes. Food is likely to be served, but no alcohol will be available. Some churches provide a bereavement ministry, where lunch is provided for the family.

Important Facts: There are no mourning customs or rituals observed for the anniversary of a death.

Christian Science (Church of Christ, Scientist)

Funerals and Mourning: Life is understood to be eternal, changeless and entirely spiritual. Death is a transition. The church does not designate special arrangements or rituals for funerals or mourning. A funeral service is optional.

Spiritual Caregiver: Christian Scientist or Christian Science Practitioner. There is no clergy. A church reader or family member or friend may officiate.

Books used: King James version of the Bible; Science and Health with Key to the Scriptures, by Mary Baker Eddy.

Before the Ceremony: It is up to the family, some choose to have visitation. If there is a visitation, it will take place in a funeral home.

Appropriate Attire: There are no rules regarding dress, but slightly subdued colors are preferable. Whatever is appropriate for the occasion.

Flowers and Donations: Both flowers to the bereaved family and contributions in the name of the deceased are appropriate. It is not unusual for the family to encourage donations to a church or favorite charity of the deceased.

The Ceremony: Private funeral or memorial services are arranged by the families and are usually held in their private homes or in a funeral home. While most Christian Scientists do not have open viewing at the memorial service, this is done at the discretion of the individual. Rarely is the casket open. The service usually includes no personal remarks or eulogy. A typical memorial service includes readings from the Bible and Mrs. Eddy's writings (Science and Health with Key to Scriptures) along with music (hymns from the Christian Science Hymnal) and prayer (i.e. The Lord's Prayer or the Silent Prayer).

The Interment: Cremation or burial is solely the bereaved family's decision. There is no set rule as to what is done.

Comforting the Bereaved: Visiting the home, to pay respects to the family is appropriate.

Important Facts: There are no mourning rituals for observing the anniversary of a death. The Christian Science Church is a lay church, where members of the church are elected as readers. Many times there is no service at all, or just a memorial service.

Churches of Christ

Funerals and Mourning: The Bible defines death as separation of the body from the spirit. The spirit lives on while the body returns to dust. In time of death, God will determine one's final judgement. Souls of the faithful Christians are taken to Paradise (Heaven), while the souls who are unfaithful are taken to Tatarus (torment). The funeral service usually lasts 20-30 minutes.

Spiritual Caregiver: minister

Books used: a hymnal and a Bible (the Old and New Testaments). Common hymnals are *Songs of the Church* and *Sacred Selections.*.

Before the Ceremony: Funerals occur within 2-3 days after death, and may be delayed 4-5 days if family cannot arrive immediately. Visitation, viewing of the body is arranged the night before at the mortuary. Visiting time extends from 1 to 5 hours, depending on the age of the deceased and how well known they are. Relatives are present for visitors.

Appropriate Attire: Men – jacket and tie. Women – dress or skirt and blouse. Black or other somber colors or patterns are recommended.

Flowers and Donations: Flowers, plants and cards can be sent to the home of the deceased or the funeral home. Contributions are not customary unless the family indicates. Food may be sent to the home of the bereaved. (Provided by the women in the congregation).

> **The Ceremony:** There are no funerals on Sunday mornings. Funerals take place in a church or a funeral home. If opened at all, the casket is open for viewing and the funeral service but closed immediately after. The service is straightforward. No standard liturgy exists for funerals. The minister tailors the service - songs, prayers or sermonic materials at the family's request. Usually, funeral services are followed by a graveside service.

The Interment: At the graveside, the minister offers prayers, readings from the scriptures and sometimes comments about the deceased.

Comforting the Bereaved: Visiting the bereaved, providing support and friendship is most important to mourners. Food may be served, but there will be no alcohol. The minister is looked to for all sorts of advice and comfort.

Important facts: No instrumental music or dancing in the Church of Christ. In mortuary chapels, if singing is part of the service – acappella or congregation singing - organ music is permissible before and after the service, rarely during the service proper. There is no set creed or doctrine. Special services for veterans – military may provide an honor flag, 21-gun salute and taps.

The Christian Church (Disciples of Christ)

Funerals and Mourning: Death is not the end of life, but the beginning of new life. While Disciples grieve, they do not mourn as do those who have no hope of ever seeing the deceased again or who are without the sure hope that those who die in faith in Jesus Christ are assured eternal life with God. The funeral is a service unto itself. A pastor presides. Pallbearers carry or push the casket on rollers into the funeral home or church sanctuary. The service will last between 15 and 30 minutes. All attending are expected to remain to the end.

Spiritual Caregiver: pastor or minister

Before the Ceremony: The funeral usually takes place within one week. Often, visitation is held at the funeral home the night before the service.

Books used: The New Standard Revised Version of the Bible

Appropriate Attire: Men – jacket and tie or suit. Women - dress or skirt and blouse. Dark somber colors are recommended.

Flowers and Donations: Flowers may be sent to the deceased's home or to the funeral home. Donations to charity, a cause or memorials may also be made in memory of the deceased. Food may also be sent to the home of the bereaved for the family and guests.

The Ceremony: Takes place in the church of the deceased or a funeral home. It is customary to arrive early, however if late do not enter during the procession or during prayer. If there is a casket, it is usually open. The level of participation depends on whether or not the guest is Christian. Christians will generally be expected to stand and sing with congregants and read prayers aloud. Non-Christians are expected to stand with congregants and are invited to sing and pray with them. No cameras or pictures are allowed.

The Interment: At the graveside, the casket is carried to the grave. Prayers and readings are offered. The pastor blesses the earth placed on the casket.

Comforting the Bereaved: Visiting the bereaved after the funeral, even more than once is appropriate. Food will be served. Grace must be said prior to eating. It would not be considered impolite to not eat. Meals and lodging are often provided for family and out-of-town guests by the church and its members.

Facts: There are no mourning customs or rituals for observing the anniversary of a death. Each congregation is autonomous.

Episcopalian and Anglican

Funerals and Mourning: A funeral service can be with or without communion. The belief is that nothing – not even death – can separate Episcopalians from God's love. Funeral services last anywhere from 20 minutes to 1 and 1/2 hours (with a Eucharist, where music is played).

Spiritual Caregiver: priest

Books used: *The Book of Common Prayer* and a hymnal. Bible lessons are always included in the program.

Before the Ceremony: The Funeral is usually within 2-3 days after death. There can be a great deal of flexibility regarding time of funeral service. Many people have a *wake.* Casket may be open for viewing, but it is never open during the funeral service.

Appropriate Attire: Whatever is culturally appropriate.

Flowers and Donations: Obituary notices will indicate if flowers are appropriate. More often, the family designates a specific charity for donations.

The Ceremony: Takes place at a church (preferably) or funeral home. Typically, the casket is closed and covered with a white pall. The "reception of the body" occurs, where the body is received at the church/funeral home and prayers are said. Funerals are relatively different, where there may or may not be a Eucharist (with music). An Episcopalian/Anglican funeral does not require last rights, however it is possible to do. No cameras or tape recorders are allowed. Cremation is allowed.

The Interment: Guests are allowed to attend the burial. At the graveside, the body is committed to the ground. If there has been a cremation, the ashes are either burned or put in a vault. A gathering of friends and family typically follows burial service.

Comforting the Bereaved: Although there is no specific "ritual" for calling or expressing sympathy to the bereaved, it is acceptable to call or visit the home. It is best to say: "we are very sorry for your loss."

Important Facts: If there is no body or ashes available, a Memorial Service – not a funeral – will take place. There are two possible languages for a service: traditional or modern. Some abstain from meat on Fridays and some feast before receiving Holy Communion, which may be daily. Many practice confession of sins and absolution.

Evangelical Free Church

Funerals and Mourning: Members believe that the dead will be resurrected. A person who is a follower of Christ is given eternal life. The funeral service lasts from 30-60 minutes.

Spiritual Caregiver: Pastor, elder, an official person or a friend

Books used: The New International Version, or the New American Standard translations of the Bible; Scriptures; Old and New Testaments – encouraged by the Apostle Paul

Before the Ceremony: Funerals usually take place within 2-3 days after a death. Sometimes, it can be as long as one week. Traditionally, people arrange to have a Lay out, Calling Hours and/or Visitation, unless there is a memorial service instead of a funeral. The casket can be open or closed depending on the family's wishes. Guests may visit with the family, expressing condolences, after signing a guest book. The funeral can be held the day of the viewing or the following day.

Appropriate Attire: Men – jacket and tie. Women – dress or skirt and blouse or pantsuit

Flowers and Donations: Traditionally, flowers may be sent to the home of the bereaved, the funeral home, or the church. Contributions may be made to a memorial fund designated by the family (stated in the obituary). Food may also be sent to the home of the bereaved. No restrictions.

The Ceremony: Takes place at either a church or funeral home. The casket is sometimes open. The service may include music and song, scripture verses and a sermon or talk about life by the pastor. Some funeral services may include family and friends sharing thoughts about the deceased. Afterwards, people get in their cars, the procession leads to the cemetery for a short service.

The Interment: Anyone who attended the funeral or memorial service is invited to go to the graveside service. A short service takes place, whereby prayers are recited and the pastor reads from the Bible. The focus is on the fact that the person is going to be resurrected.

Comforting the Bereaved: After the funeral and graveside service, families and friends are invited back to the church for lunch or light meal. The church may also serve lunch to the family and friends at the home of the bereaved. Food is usually brought to the church or to someone's home all week long. It is also appropriate to visit the home of the bereaved.

Important Facts: Cremation is an option; the Evangelical faith does not oppose it. Not a lot of time is spent eulogizing the deceased. The focus of a funeral or memorial service is on what the Bible says to those who are living.

Greek Orthodox

Funerals and Mourning: Death is the separation of the soul (the spiritual dimension of each human being) from the body (the physical dimension). Upon death, partial judgement- a taste of Heaven or Hell - is based on the way that a person conducted his/her life. The funeral ceremony lasts 30-60 minutes.

Spiritual Caregiver: priest

Books used: Manual for Funerals and Memorials

Before the Ceremony: The funeral generally takes place 2-3 days of death. Visitation and prayer service (*Trisagion*) are conducted the eve of the funeral at the funeral home.

Appropriate Attire: Dark blue and black colors are most appropriate.

Flowers and Donations: Flowers may be sent to the home of the bereaved or to the funeral itself. Monetary contributions can be made to a fund or charity designated by the family of the deceased. It is not appropriate to send food, however the family of the deceased usually provides a “mercy meal” after the funeral for relatives and friends.

The Ceremony: Takes place in a church. Guests arrive early and ushers advise where to sit. The traditional greeting for the family: “Memory Eternal”, or offer condolences. The casket is always open, except in extreme cases. When a Greek Orthodox views the body, they bow in front of the casket and kiss an icon or cross placed on the chest of the deceased. No cameras or tape recorders are appropriate at a funeral service.

The Interment: Guests should attend. At the graveside, there is a five-minute prayer ceremony (*Trisagion*), followed by each person placing a flower on the casket – the flowers come from those sent to the church for the funeral then conveyed to the cemetery with the casket.

Comforting the Bereaved: It is okay to visit the home of the bereaved if only for a brief time. Food will be served. It is traditional for Greek Orthodox to say to the bereaved “May you have an abundant life” and “May their memory be eternal”.

Important Facts: Cremation is not permitted under any circumstances. The Greek Orthodox observe a 40-day period of mourning from the day of death. Autopsies are performed only when required by law or at the request of the survivors.

Hindu

Funerals and Mourning: Life is sacred. Death is inescapable. Although the physical body dies (*atman)* the soul never dies. Divine presence is everywhere; everyone who dies will be reborn. Hindus believe in re-creation: birth, death and rebirth. Funeral services usually last 1-1 1/2 hours.

Spiritual Caregiver: Priest or Senior Care Giver.

Books used: *Vedas*, written in Sanskrit; the *Bhagavad-Gita* and *Ramayana* – 2 holy books.

Before the Ceremony: The funeral usually takes place within 24 hours of death. When someone dies, his or her body is washed and wrapped in a cloth (shroud). A garland of flowers is often placed on the body before being put on a stretcher. It is taken to be cremated on a special fire (funeral pyre). The eldest (or youngest) son walks around the pyre, carrying a lighted torch. The pyre is then set on fire. While lighting the pyre on fire, prayers and readings from the Scriptures are recited.

Appropriate Attire: Casual dress. White clothing is most appropriate.

Flowers and Donations: Flowers and donations are inappropriate, but accepted. It is appropriate to bring food, as long as it is simple. No oils, butter or spices are used in cooking during the mourning period. Breads (Dal) are appropriate but sweets are not.

The Ceremony: The casket is always open, with the body inside for viewing. The service takes place where the cremation is completed. The casket, with the body, is burned in a ceremonial fire. The ceremony proceeds with the priest explaining the ceremony to guests who are not Hindu. The service is intended to liberate the soul of the deceased for its ascent to heaven. The *Shraddha* ceremony is performed at home. No cameras or tape recorders are allowed. A procession takes place afterwards. Food offerings of sweetened rice and milk (and water) may be offered to Brahmins.

The Cremation: Guests may attend the cremation if they wish. The last food offering is symbolically made to the deceased; the body is cremated. The ceremony is called *mukhagni.*

Comforting the Bereaved: Visit the bereaved before the *shraddha* ceremony, which occurs 10 days after the death for members of the Bhrahmin caste, 30 days for other castes. Visitors are expected to bring fruit to the home.

Mourning Customs: 10-30 days after a death, depending on when the shraddha ceremony is, mourners dress, eat and behave austerely. A temple priest performs anniversary rituals.

Important Facts: There is no concept of a “funeral home”. Home is the main place of worship; the body remains there until taken to the place of cremation, usually 24 hours after death. Many Hindus are vegetarian, some eat meat – not beef (cow is a holy animal).

International Church of the Foursquare Gospel

Funerals and Mourning: All Christians who have died will one day rise from their graves and meet the Lord. A ceremony unto itself, the funeral service lasts 30-60 minutes.

Spiritual Caregiver: Pastor

Books Used: None

Before the Ceremony: Funeral takes place usually within 2-3 days after death. The Pastor provides guidance to the family.

Appropriate Attire: No set standard. The family chooses the type of service; the clothing will follow the established service.

Flowers and Donations: Flowers may be sent to the funeral home or church where the funeral service is held. Contributions may be sent to a memorial fund determined by the bereaved. Food may be sent to the home of the bereaved.

The Ceremony: The ceremony takes place in a church or a funeral home. Gospel funeral usually begins with singing, Scripture reading or prayer. This is followed with hymns, prayer and worship to God and a sermon by the pastor. Casket is usually open. The family makes the decisions as to what they would like for the funeral service: music, choosing a certain family member to read a poem, hymns or whatever else suits their desires.

The Interment: At the graveside, there are prayers, songs and Scripture readings, and the casket is buried. The service is basic.

Comforting the Bereaved: Visiting the home of the bereaved is appropriate. Food may be served in the home, but no alcohol will be provided. No restriction on food.

Important Facts: There are no mourning customs or rituals for observing the anniversary of one's death. No prayer books. Handling of the body is always with dignity of the deceased as well as to the family. The funeral service is a memorial to the one who died, and to help the family press on.

International Pentecostal Holiness Church

Funerals and Mourning: All Christians who have died will one day rise from their graves and meet the Lord in the air. All those who have joined with God will live forever. A ceremony unto itself, the funeral service lasts 30-60 minutes.

Spiritual Caregiver: minister

Books used: Bible – most commonly used versions are: Authorized King James Version, the New King James Version, the New International Version and the New American Standard Version. Sometimes a hymnal is used.

Before the Ceremony: The funeral usually takes place within 2-3 days after death.

Appropriate Attire: Men – jacket and tie. Women – dress or skirt and blouse. Dark, somber colors are advised.

Flowers and Donations: Flowers may be sent to the funeral home or the church where the funeral service is held. Contributions may be sent to a memorial fund determined by the bereaved. It is appropriate to send food to the home of the bereaved. No restrictions.

The Ceremony: Takes place in either a church or a funeral home. A funeral usually includes singing, Scripture reading or prayer. This is followed with hymns, prayer and worship to God, and a sermon and tribute to the deceased by the pastor. Family members and close friends deliver eulogies.

The Interment: At the Graveside, there are prayers, songs and Scripture readings, and the minister, family or close friends may make comments about the deceased.

Comforting the Bereaved: If one knows the family well, it is appropriate to visit the family, but it is best to limit the visits to no more than 15 minutes. Food may be served, but no alcoholic beverages.

Important Facts: No rituals for observing the anniversary of the death.

Jain

Funerals and Mourning: There is a strong belief in the sanctity of all life. The body dies but the soul travels into the next life. Jaines believe in the cycle of death and rebirth. A funeral service can last anywhere from 1-4 hours.

Spiritual Caregiver: Family member or a village leader

Books Used: various mantras are recited rather than any books used, at times of death

Before the Ceremony: Ideally, funerals take place as soon as possible after a death. Friends and relatives gather at the funeral home or place of cremation to comfort the bereaved. If the death is a natural one, washing of the body is commonplace, prior to cremation.

Appropriate Attire: Simple colors – white is preferred to black

Flowers and Donations: Jaines believe in not accepting flowers or contributions at time of death. Food may be taken to the family. Jaines are strict vegetarians and alcohol is prohibited.

The Ceremony: The religious service occurs anywhere from 3-13 days after the body is cremated. The service takes place either in a temple or in a private home. Mantras and or prayers are recited during the ceremony.

The Cremation:

Comforting the Bereaved: After the funeral, people visit the bereaved in their home and, for several days, console the family. Friends and family generally bring food to the home. If the deceased is young, there is a long mourning period. There is not much grieving that occurs for an older person who dies.

Important Facts: This religion comes out of India; it is one of the oldest religions of the Indian subcontinent. Jainism is a salvation religion. The rituals are similar to the Hindu. They do not bury the body, they burn the body. The Jaines make non-violence for youngsters a central principle of their religion. Another element of the Jaines is self-control. Jaines are strict vegetarians. Alcohol is prohibited.

Jehovah's Witnesses

Funerals and Mourning: There is faith in God. Jehovah's Witnesses see life as sacred. They view the dead as being asleep awaiting resurrection to life. The funeral service, at the family's discretion, is a ceremony unto itself and lasts from 15-30 minutes.

Spiritual Caregiver: Congregation Elder

Books used: any Bible; a songbook such as *Sing Praises to Jehovah* may be used for singing.

Before the Ceremony: Funeral usually takes place within one week after death. Visitation is at the funeral home, where friends and family comfort the bereaved.

Appropriate Attire: Men – jacket and tie. Women – dress or skirt and blouse. Dress "modestly" and "sensibly". There are no rules regarding colors of clothing, but what is worn should respect the somberness of the occasion.

Flowers and Donations: Flowers may be sent to the home of the bereaved before or after the funeral or to the funeral home. Contributions in memory of the deceased can be donated to a charity or sent to the mourners' home before or after the funeral. Food may be sent to the home of the bereaved. There are no dietary restrictions.

The Ceremony: takes place at a Kingdom Hall (meeting hall for Jehovah's Witnesses), in a funeral home, or any other suitable place. Sometimes, there is just a graveside service. The casket may or may not be open. The *Congregation Elder* delivers a memorial talk from the Bible designed to comfort the bereaved and talk of hope for the future and the resurrection of the dead. The funeral service is not ritualized. If the service is at a funeral home, an organist may supply the music, or have pre-recorded music to accompany the congregation singing.

The Interment: At the graveside, prayer follows brief comments on the Scriptures.

Comforting the Bereaved: Visiting the home of the bereaved is appropriate. Discussing with the bereaved what you appreciated about the deceased is helpful. The congregation is supportive of mourning. Food may be served, but it depends on the preference of the mourners. Jehovah's Witnesses view death as a sad occasion but feel positive about the future of the dead loved one.

Important Facts: No mourning customs or rituals for observing the anniversary of a death. Cremation is okay, but Jehovah's Witnesses wouldn't want to desecrate a dead body. There is no objection to an autopsy. Whether to accept an organ transplant is a personal, medical decision. The same would be true of organ donation. Blood transfusions are forbidden. The emphasis on religion is on Bible study.

Jewish

Funerals and Mourning: A Jewish funeral is a time of intense mourning. A service unto itself, a funeral may last anywhere from 15-60 minutes.

Spiritual Caregiver: rabbi. A cantor – sings

Books Used: None

Appropriate Attire: Men – jacket and tie. Women – modest, a dress or skirt and blouse. A small headcovering called a *yarmulke* ("Ya-ma-kah") is required at Orthodox, Conservative, Reconstructionist and some Reform funerals. Orthodox funerals, clothing should cover the arms, hems should reach below the knees and heads should be covered. It is not respectful to openly wear symbols of other faiths, such as a cross.

Before the Ceremony: Ideally, funeral takes place within 24 hours after death; some reform families can wait 2-3 days. Jewish law discourages public viewing of the body.

Flowers and Donations: Flowers are never appropriate for Orthodox, Conservative or Reconstructionist funerals but may be appropriate for Reform ceremonies. It is customary to send contributions in memory of the deceased. Small contributions are often given to a charity, cause, fund or organization such as the Jewish National Fund (42 E 69th St. Ny,NY 10021; (800) 345-8565) that plants trees in Israel. Food may also be sent to the home of the bereaved after the funeral. However, it is best if the food is kosher – conforms to traditional dietary laws.

The Ceremony: Takes place either at a synagogue/temple, funeral home or in one's private home. Overall guidelines are simple and modest. The service usually consists of psalms and prayers of comfort, an appropriate eulogy and the mourner's *Kaddish* (prayer for the dead), officiated by the rabbi. Generally, the casket is closed, viewing the body prior to burial is against custom of faith.

The Interment: It is expected that only family and close friends attend. The service varies: the simplest service, the rabbi recites prayers and leads the family in the mourner's *kaddish* ("Kah-dish") – prayer for the deceased. In a traditional service, there is a slow procession to the grave, with several pauses along the way. After prayers and *kaddish* have been recited, all present participate by filling in the grave, throwing earth into it.

Comforting the Bereaved: The religious sit in mourning for 7 days after the funeral – *shivah* . Food will probably be served – it is kosher (blessed) in conservative and orthodox homes.

Important Facts: The anniversary of a death – *yahrzeit* ("yart-site") is a service at a temple/synagogue; typically, the mourner's *kaddish* is recited. Embalming is against Jewish custom. Death rituals are accomplished as quickly as possible. Simple and modest are usually the guidelines for funeral arrangements.

Lutheran

Funerals and Mourning: Death is not the end of life, but the beginning of new life. While Lutherans grieve, they do not grieve without hope. There are 2 focuses of a funeral: remember and celebrate the life that has passed, and to bring the comfort and hope of the resurrection to those who are grieving. The funeral, usually a service unto itself, typically lasts 30-45 minutes.

Spiritual Caregiver: pastor

Books used: A hymnal. Examples are *The Lutheran Book of Worship*, which contains hymns, and liturgies, and *The Lutheran Hymnal*.

Before the Ceremony: The Funeral usually takes place within 3 days after death. Visitation at the funeral home the night before the funeral is common. The next morning, the casket is brought to the church, with a service of burial sometimes preceded by an hour of visitation.

Appropriate Attire: No rules.

Flowers and Donations: Often memorial donations are preferred to flowers. Donations may be made to the church or a favorite charity/cause of the deceased.

The Ceremony: The service consists potentially of three parts: Service of the Word, Service of the meal and Commendation. A procession begins with the minister, coffin and pallbearers meeting at the church entrance. The coffin is often open for a last viewing prior to service but remains closed for the duration. In a church service, a white cloth (*pall*, representing Resurrection) is placed on top of the coffin prior to the procession. The pascal candle precedes the casket in both the processional and recessional. The service usually includes readings from Scripture, various prayers (including The Lord's Prayer), special music, a sermon and often the communion meal. After the service, the *pall* is removed and the casket is then placed in the hearse.

The Interment: At the graveside, the Committal is performed. Prayers, Scripture readings and blessings are part of the committal. The service is brief.

Comforting the Bereaved: Visiting the home of the bereaved is appropriate. Very often refreshments or lunch is held at the church, or the family may choose to have this at their home. No restrictions on food.

Important Facts: Some congregations remember the first year anniversary in church prayers. All Saints weekend – the 1st Sunday on November – all those who have died in the preceding year are usually mentioned in the service. Cremation is becoming more common. The body may be donated to science.

Mennonite

Funerals and Mourning: Death is seen as part of God's plan. A funeral or memorial service celebrates the life of the deceased and their passing into eternal spiritual life after death. The funeral service lasts about an hour.

Spiritual Caregiver: pastor

Books used: Various translations of the Bible. Versions of the Bible that are commonly used are the New International Version and the New Revised Standard Version. More conservative denominations may use the King James Version. Hymnals are also used.

Before the Ceremony: Funerals take place within 2-3 days after death. Usually, a viewing occurs at the funeral home or church before the funeral.

Appropriate Attire: Conservative denominations: Men – suit, no tie. Women – dress that covers arms, and hems below the knees. Neither open-toed shoes nor modest jewelry are permissible. Women cover their heads; visitors are not expected to do so. Less conservative denominations: Men – suit or jacket. Women – dress or skirt and blouse, modest jewelry is allowed. Dark, somber colors are advised for all.

Flowers and Donations: No flowers to those in a conservative denomination. However, flowers or food may be sent to the home of the bereaved/church where the funeral will be held for those in less conservative churches. It is recommended to send prepared foods, which can be refrigerated until needed. Contributions may be made in memory of the deceased to a cause designated by the bereaved family.

The Ceremony: Takes place in the church sanctuary or in a funeral home. Caskets are open for some Mennonite groups/churches. A service can be similar to Sunday morning worship, which might include sharing of stories of the deceased and favorite hymns and Scriptures.

The Interment: Is usually attended by family and close friends. At the graveside, the pastor recites Scripture, a brief prayer and words of committal. A final blessing is said. Often following the committal service, people go back to the church for a simple meal – which has been prepared by church members for family and friends.

Comforting the Bereaved: A brief visit to the bereaved is appropriate during the weeks that follow a death. Gestures of condolence such as brief visits to the home, food, notes and flowers would be encouraged.

Important Facts: No mourning customs. Cards remembering the deceased are appreciated upon the one-year anniversary of the death. Not a sacramental church. Keeping the funeral arrangements simple would be considered good stewardship in the Mennonite tradition.

Methodist

Funerals and Mourning: Life is eternal; in faith, one can look to life with God after death. There are diverse beliefs about the afterlife. A funeral's purpose is threefold: to express grief and comfort others in bereavement, to celebrate the life of the deceased, and affirming faith in life with God after death. The average funeral lasts about 20 minutes. Appalachian funerals can last up to 2 hours.

Spiritual Caregiver: Pastor

Books used: Book of Worship

Before the Ceremony: Funeral usually takes place 2-3 days after death. Normally prior to a service, calling hours – where one pays respects to the family – takes place at the funeral home or at the church.

Appropriate Attire: Men – jacket and tie. Women – dress.

Flowers and Donations: Flowers are usually sent to the funeral home. Afterwards, they are taken to the cemetery to be placed on the grave, or they may go home with the family. Contributions are optional; the recommended charity may be mentioned in the deceased's obituary. Food may be sent to the home of the bereaved. There are no food restrictions.

The Ceremony: Takes place in a church or a funeral home. The funeral service is not a private affair. It is a corporate act of the people of God. The proclamation during the service speaks to the persons assembled in terms of confrontation and comfort. Worshipers are comforted in their grief over the death of a loved one and confronted with their own hope in Christ. The casket may or may not be open. For some people, the service is a celebration of the deceased's life. There may be hymns, readings, a eulogy and a tribute paid to the deceased.

The Interment: At the graveside, the pastor recites prayers and the body is committed to the ground. If there has been a cremation, which is done privately before the service, the ashes are either buried or put in a vault. Military or fraternal rites may be part of the service.

Comforting the Bereaved: Help needs to come from the pastoral leadership, church members and neighbors. Comfort and renewed faith must be mediated by a close friend or relative. People may visit as long as is appropriate. When it comes to helping people grieve, one's presence, just being there, is important. Food will not be served during bereavement.

Important Facts: There are no mourning customs or rituals for observing the anniversary of a death, however there may be a service commemorating the deceased. Mourning locates the source of comfort in God. One should not forget about the persons who are grieving.

Mormons (Church of Jesus Christ of Latter-day Saints)

Funerals and Mourning: Latter-day Saints believe all who have lived on earth are literally the spiritual children of God and resided with him in a pre-mortal existence. Through temple ordinances, families can be sealed together for time and eternity. The funeral, a service unto itself, varies in length according to the program outlined by the family, but usually lasts 60-90 minutes.

Spiritual Caregiver: officer of the church, typically the bishop of the congregation.

Books used: The 4 Standard Works: Bible, both New and Old Testaments as one, the Book of Mormon, the Doctrine & Covenents (D&C), and the Pearl of the Great Price.

Before the Ceremony: Funeral takes place within one week after a death. If the deceased has had his/her temple ordinance, he/she is dressed in (sacred) ”temple clothing” – all white.

Appropriate Attire: “Sunday Best”: Men – suit or sport jacket and tie. Women – dress or skirt and blouse with hems below the knees. Modest, conservative and dignified are good.

Flowers and Donations: It is appropriate, but not expected, to send flowers or contributions to the funeral itself or to the home of the bereaved. Food is usually provided by the Relief Society – the oldest woman’s organization in the country.

The Ceremony: Usually takes place in a church or a funeral home. The family chooses whether or not to have an open casket. The officer of the church conducts the service. There is an opening and closing hymn. A prayer is said before and after the speaker talks. A special musical is performed by the Relief Society, followed by talks of the purpose of life and finally a eulogy.

The Interment: At the graveside, the grave is dedicated in a prayer offered by the home teacher. The deceased is then buried.

Comforting the Bereaved: Visiting the home of the bereaved is the norm. A meal is served; alcohol is prohibited. Prior to eating, always give thanks and ask for blessing upon the food. Monthly visits continue by home and visiting teachers (the women).

Important Facts: No mourning customs or rituals for observing an anniversary of a death. Family ties are very strong. *The Word of Wisdom*, a health code divinely revealed in 1833, forbids the use of tobacco, alcoholic beverages, tea and coffee, and emphasizes a health diet and physical and spiritual fitness. The family outlines the funeral service – usually 2-3 speakers and song selection. “Compassionate Service” – the Relief Society – steps in, providing meals, tending to the children and anything else that is helpful to the family.

Muslim (Islam)

Funerals and Mourning: Muslims believe in life after death, and that there is resurrection and judgement in an afterlife. The present life is only a trial preparation for the next realm of existence. Islamic funeral services have a set method but may vary to accommodate family members who may not be Muslims. Services usually last 30-60 minutes. In some cases, a funeral may last more than an hour.

Spiritual Caregiver: *imam* (pronounced: ee-mom) – Muslim leader

Books Used: The Qur'an or Koran – the Bible of Islam; *Hadith* – sayings of the Prophet; *Books of Fiqh* (pronounced: feek) – Islamic rulings extracted from Koran and life of the Prophet, dealing with areas such as funeral prayers and regulation.

Before the Ceremony: Ideally, Muslims should be buried within 24 hours after death. Cleanliness and ritual purification are essential. Of the rituals, one of the most important components of the funerary process is washing and shrouding of the body. The body is put in a simple, inexpensive coffin, facing the NE – which is the direction of Mecca.

Appropriate Attire: Men – casual shirt and slacks. Women – dress. If praying, clothing should cover the arms and hems should reach below the knees. A scarf is required to cover the head. For both men and women who pray, openly wearing pendants with faces, crosses, stars or zodiac signs are discouraged. Bereaved wears black.

Flowers and Donations: It is not common practice to send flowers. However, after the funeral, providing food is a welcome gift for the bereaved. No pork or alcohol is allowed.

The Ceremony: Takes place in a funeral home or in the general-purpose room of the mosque. The casket is usually carried by male relatives and friends and is always closed.

The Interment: Burial takes place within 24 hours of death. At the graveside, the *Janazah* prayers for the dead are recited before the body is lowered into the ground. Prayers are continually recited and a brief sermon may be preached. Small gravestone with the deceased's name is sufficient. Muslims frown on large monuments.

Comforting the Bereaved: The family system is very strong. One may visit the bereaved; talking quietly, shaking hands, hugging and kissing are all acceptable forms of comfort. For widows, the days of mourning are religiously mandated not to exceed 40 days. Visitors and mourners often sit in silence while someone reads aloud from the Qur'an. Usually, women from the local community prepare food for mourners and their guests.

Important Facts: No rituals for observing the anniversary of a death. Consumption of pork or any kind of intoxicating drink is forbidden. *Ramadan* – in December – is the holiest month of the Muslim year. Those who have reached puberty *fast* from sunrise to sunset. Autopsies, cremation and embalming are not acceptable in Islam. Exceptions for autopsies are with consent if it is a legal issue.

Special Circumstances for Hazardous Material spills and Muslim women: Muslim women vary from individual to individual. If there should be a terrorist incident, chemical spill or some other situation where their life is in peril, the question raised about what to do with and to a Muslim female is cause for concern. If one's life is in jeopardy, some Muslims are very strict with men touching them. Therefore, it is important to have a woman available – she need not be Muslim. Most Muslim women need to be covered, whereby no body part can be exposed. The culture dictates that a woman must be covered. It is important to make every attempt possible to make certain the Muslim woman is taken to a private place. If there is a situation whereby a woman must be stripped down and rinsed off (i.e. from a chemical spill), she should be ALONE – no group showers are allowed. IF there is a possibility of a choice for a woman who is contaminated, then she would need to be covered at all times, with others unable to see her body; seeing a woman's body is viewed as culturally wrong. Hence, there may be exceptions in some individuals - as to the varying degrees of situations - as to whether or not the emergency is life threatening.

Native American

Funerals and Mourning: Many believe death is the beginning of another journey into the next world. While death is not necessarily the termination of life, the bereaved still mourn the absence from this life of the one who died. Funerals can last over a 4-day period.

Spiritual Caregiver: No-one in particular

Books Used: None used

Before the Ceremony: Visitation occurs, whereby mourners view the dead body. No autopsies, embalming and re-surfacing the bodies of the deceased.

Appropriate Attire: Modest clothing. Some women, depending upon their religious belief, may cover their heads. In most traditions, people wear white, symbolizing death.

Flowers and Donations: Giving both flowers and donations are considered to be a form of the "give away". Food is provided by everyone in the community, bereaved family included. No pork, poultry or alcohol.

The Ceremony: Takes place anywhere from several minutes to several days after the visitation. Typically, a service begins with an opening followed by readings, music, the eulogy and a final closing. Often, a ceremonial pipe and bowl are used. Sage, sweet grass, cedar, pine and tobacco are burned as a means of purification, and cleansing. The funeral service typically ends with mourners gathering together to share a meal and talk.

The Interment: Often following the funeral service, there is a procession to the cemetery. A short committal service takes place. After the body is interred into the ground, there is a feast, more prayers and people stand up and give testimonies. Finally, there is a "give away", where personal materials are distributed to family and friends.

Comforting the Bereaved: Family is an extension of relatives and friends and is very supportive of each other. Many tribes restrict what bereaved relatives can eat and/or what kind of activities they can engage in after the death of a loved one. This represents a sacrifice by the living for those who have moved on in the circle of life. Different nations have different rituals. (I.e. Lakota wipe away the sorrow – comforting the mourner).

Important Facts: Some cultural characteristics of Native Americans include: a sense of pride – where they won't ask for anything; keeping a physical distance with new acquaintances; children play a central role in their life; a handshake is a sign of respect; direct eye contact can be misinterpreted as a sign of anger and disinterest. All nations occasionally interweave their traditions with Christian burial customs. These include placing such items as a hunting rifle, a blanket, some tobacco and other personal items in an adult male's coffin before interment. Navajo do not touch the deceased or their belongings. Ohio has no recognized tribes. One of the rites of Lakotas is the keeping of the soul. Some make physical sacrifices such as cutting off their hair.

Church of the Nazarene

Funerals and Mourning: Life is eternal. One can look forward to life with God after death. Death may be a time of separation from the body, but the soul and new body will be reunited upon the coming of Christ and the final judgement. The purpose of funerals is threefold: to express grief and comfort one another in bereavement, to celebrate the life of the deceased, and to affirm faith in life with God after death. There is a lot of flexibility involved in the nature of the service. The funeral generally lasts 30-45 minutes.

Spiritual Caregiver: Pastor or Reverend

Books used: Bible

Before the Ceremony: Funeral usually takes place 3-4 days after a death. Visitation can occur the night before or on the same day as the funeral.

Appropriate Attire: No dress code

Flowers and Donations: Family often request contributions be made to the deceased's favorite charity, or church, in memory of the deceased. Close friends of the bereaved, or the church family, usually provide food to the family. No dietary restrictions.

The Ceremony: Takes place in the church sanctuary or a funeral home. The pastor directs the service and musicians provide music. Family decides ceremony – poems, readings, songs, etc.

The Interment: Guests may attend the service. At the graveside, prayers and words of committal are recited. Sometimes a song is sung. Usually, the only participant is the officiating pastor. If the deceased is a veteran, the family may request the presence of an honor guard, who plays taps, assists with a 21-gun salute and performs the ritual of the folding of the flag, which is presented to the bereaved.

Comforting the Bereaved: It is appropriate to visit the bereaved after the funeral. A family meal is always offered at the church following interment. No alcohol will be served.

Important Facts: No set mourning customs or rituals for observing the anniversary of a death. The use of alcohol and tobacco is prohibited, in the church facility. Between time of death and the memorial service, often church members provide meals to the family.

Eastern Orthodox Churches

Funerals and Mourning: Death is the separation of the soul from the body. Upon death, we immediately begin to experience a foretaste of heaven and hell. This experience, known as the partial judgement, is based on the general character of our lives regarding behavior, character and communion of God. The service lasts about an hour.

Spiritual Caregiver: priest. If deceased is an important person, a bishop may be asked to come. Other people in the service are: a deacon, sub-deacon and altar server

Books used: none in particular

Before the Ceremony: The funeral usually takes place within 2-3 days after a death. Western culture includes a viewing; Orthodox culture may or may not have a viewing.

Appropriate Attire: Men – jacket and dark-colored (usually black) tie. Women – dress or skirt and blouse. Clothing should cover arms and hems should reach below the knee. Sober, dark colors are recommended.

Flowers and Donations: It is appropriate to send flowers to the funeral home before the funeral. It is also appropriate to make a contribution in the memory of the deceased to either his or her church or to a fund or charity designated by the family of the deceased.

The Ceremony: Usually takes place at the church. In most cases, the casket is closed. The priest leads the mass, which includes reciting of hymns, prayers and asking for forgiveness on behalf of the deceased.

The Interment: At the graveside, there will be a brief prayer ceremony, followed by the officiating priest usually putting soil on top of the casket so it forms on the casket or spreading soil on the casket. The flowers usually come from those sent to the church for the funeral and then conveyed to the cemetery with the casket. After the burial, usually all return to the home of the bereaved.

Comforting the Bereaved: A Meal of Mercy is often given in the church hall or at the home of the deceased shortly after the burial. Tradition states a brief visit to the bereaved on the same day as the funeral is acceptable. Religious objects that a visitor may see at such a visit are icons, two-dimensional artistic images of saints, a lighted candle and burning incense. Usually close friends bring food for 3 days – the typical length of grieving.

Important Facts: Cremation is not permitted in Orthodox churches. Mourners usually avoid social gatherings for about a year after a death. During the same period, mourners are likely to wear black. A memorial service is held on the Sunday closest to the 40th day after a death. Subsequent memorial services are held on the annual anniversary of the death.

Orthodox Churches

Funerals and Mourning: Death is the separation of the soul from the body. Upon death, we immediately begin to experience a foretaste of heaven and hell. This experience, known as the partial judgement, is based on the general character of our lives regarding behavior, character and communion of God. The service lasts 30-60 minutes.

Spiritual Caregiver: bishop, priest, deacon, sub-deacon and altar server

Books used: none in particular

Before the Ceremony: the funeral usually takes place within 2-3 days after a death.

Appropriate Attire: Men – jacket and tie. Women – dress or skirt and blouse. Clothing should cover arms and hems should reach below the knee. Sober, dark colors are recommended.

Flowers and Donations: It is appropriate to send flowers to the funeral home before the funeral. It is also appropriate to make a contribution in the memory of the deceased to either his or her church or to a fund or charity designated by the family of the deceased. Food may also be sent to the home of the bereaved.

The Ceremony: Takes place at a funeral home or at the house of worship of the deceased. There will be an open casket ceremony.

The Interment: at the graveside, there will be a brief prayer ceremony, followed by the officiating priest or bishop usually putting soil on top of the casket so it forms on the casket or spreading soil on the casket. The flowers usually come from those sent to the church for the funeral and then conveyed to the cemetery with the casket.

Comforting the Bereaved: Tradition states a brief visit to the bereaved on the same day as the funeral is acceptable. Religious objects that a visitor may see at such a visit are icons, two-dimensional artistic images of saints, a lighted candle and burning incense. A Meal of Mercy is often given in the church hall, restaurant of the home of the deceased shortly after the burial. At the home of the Antiochian Orthodox Church, usually coffee, pastries and/or fruit are served.

Important Facts: Cremation is not permitted in Orthodox churches. Mourners usually avoid social gatherings for the first 40 days after a death. They may also wear black during this same period. A memorial service is held on the Sunday closest to the 40th day after a death. Subsequent memorial services are held on the annual anniversary of the death.

United Pentecostal Church

Funerals and Mourning: Members believe that all Christians who have died will one day rise from their graves and meet the Lord. The soul never dies. The real emphasis of a funeral ceremony is based on everlasting/eternal life for the deceased. Immediately upon death, the deceased becomes united with the Lord. A ceremony unto itself, the funeral ceremony lasts about 30-60 minutes.

Spiritual Caregiver: Minister or Pastor

Books used: Nothing in particular.

Before the Ceremony: Funerals usually take place within 2-3 days after death. Visitation may take place an hour prior to the service, however some still choose the evening before the ceremony for a viewing. The Pastor/Minister usually works with the family and helps them decide the funeral service (i.e. the format: Scriptures and speakers to be used).

Appropriate Attire: Men – jacket and tie. Women – dress or skirt and blouse.

Flowers and Donations: Flowers may be sent to the funeral home or church where the funeral ceremony is held. Contributions may be sent to a memorial fund determined by the bereaved. Food may be sent to the home of the bereaved. The church ministry typically provides the meals, which are usually taken to the family's home. Alcohol is prohibited.

The Ceremony: Takes place either in a church or a funeral home. A funeral usually begins with singing, Scripture reading or prayer. Typically, hymns prayer and worship to God follow. The minister delivers a brief sermon and tribute or eulogy to the deceased. Casket may or may not be open. Sometimes family members or other ministers participate in the ceremony, by reading, reciting the eulogy or singing.

The Interment: At the graveside, there is usually a prayer and Scripture readings, and sometimes a song. The casket is committed to the ground.

Comforting the Bereaved: It is appropriate, but not compulsory, to visit the home of the bereaved after the funeral. Occasional phone calls are made to the family of the deceased. The church family as a whole takes the opportunity to provide comfort to the family. Food may be served, alcoholic beverages are not allowed.

Important Facts: There are no mourning customs or rituals for observing the anniversary of the death.

Presbyterian

Funerals and Mourning: In heaven, the souls of the faithful are reunited with God in a warm and loving relationship. The funeral usually lasts 30-60 minutes.

Spiritual Caregiver: Pastor or Minister

Books used: *Presbyterian hymnal,* a Bible and various translations of the Old and New Testaments.

Before the Ceremony: The funeral usually takes place within 2-3 days after death. Usually, not always, there is visitation including extended family and friends, lasting 1-3 hours. Typically, the pastor comforts the family and helps with preparation of the service.

Appropriate Attire: Men – jacket and tie. Women – dress or skirt and blouse. Dark, somber colors are recommended.

Flowers and Donations: It is appropriate to send flowers to the bereaved or to the funeral home before the funeral upon hearing the news of the death, or shortly thereafter. Other contributions are not customary, although the family may suggest contributions to charity in lieu of flowers. Food may be sent to the home of the bereaved before or after the funeral. No dietary restrictions.

The Ceremony: Takes place at a church or a funeral home. Sometimes there is simply a graveside service. It is not customary for the family to be present before the service. Rarely is the casket open during the service. If the service is open-casket, it is open just prior to the service but closed during service. The minister leads the service with prayers, Scripture readings and a biographical sermon or eulogy. Scripture texts that are used convey assurances of eternal life. Hymns may also be sung.

The Interment: Guests may attend the graveside service. At the graveside, the officiating pastor or minister recites prayers and brief Scripture readings. The service is very brief.

Comforting the Bereaved: No set tradition. Frequently, mourners welcome visitors at their home after the funeral. This imparts a sense of community to the grieving process. Other mourners may prefer solitude and privacy. Food may be served, at the discretion of the hosts.

Important Facts: No mourning customs or rituals for observing the anniversary of a death. Funerals are governed by local custom. Cremation is becoming more common.

Quakers (Religious Society of Friends)

Funerals and Mourning: Friends do not believe in life after this life. A funeral, or memorial meeting, is either "unprogrammed" (no pastor) or 'programmed" (having a pastor). Unprogrammed meetings are held in silence. Pastoral meetings can be either programmed or semi-programmed. A memorial service is a celebration of a person's life. Either form of meeting usually lasts an hour.

Spiritual Caregiver: In a meeting without a Pastor, the responsibility of the meeting's Oversight Committee or the meeting's Ministry Committee is the caregiver.

Books used: Bible or a hymnal

Before the Ceremony: The memorial meeting may take place in the same week of death, or may take place up to 6 weeks or 2 months later. Memorial services are individual from meeting to meeting. Frequently, cremation occurs.

Appropriate Attire: No rules,

Flowers and Donations: Flowers and contributions are appropriate. Frequently, obituary notices in the local paper will list specific charities to which contributions can be made in memory of the deceased. Close friends and neighbors may bring food to the home of the bereaved. No food restrictions; alcohol is not allowed in a meetinghouse.

The Ceremony: Usually takes place in a Quaker meetinghouse. If programmed or semi-programmed meeting, hymns, reading(s), and/or a eulogy may happen. Programmed meetings are planned in advance and usually include a moment of silence. Semi-programmed meetings will have a pastor but will not have an order of worship, and there may be up to 45 minutes of silence. Most Quakers simply sit during the service unless they are moved to speak or offer a prayer or message that comes out of the silence. All present – Quaker and non-Quaker - are welcome to speak if moved to do so. The body is rarely in a meetinghouse.

The Interment: Usually only close family members attend the service. At the graveside, the body is committed to the ground. If there has been a cremation, the ashes are either buried or put in a vault. Sometimes, the ashes are scattered.

Comforting the Bereaved: There is no specific "ritual" for calling or expressing sympathy to someone who is mourning. Nor is there a "ritual" that guides the behavior of the mourners. It is appropriate to visit the home of the bereaved.

Important Facts: No rituals for observing the anniversary of a death. The Religious Society of Friends is a religious body without creeds. Quakers are divided into 4 major groups. There is a great deal of theological diversity among Society of Friends and it is best not to make any assumptions about the beliefs of the Quakers you meet.

Reformed Church in America/Canada (RCA)

Funerals and Mourning: The Reformed Church believes that to be absent from the body is to be present with the Lord. The funeral is a service unto itself and lasts 20-30 minutes.

Spiritual Caregiver: pastor. Governed by elders and deacons.

Books Used: none. The hope of Church members is summarized by Jesus' words from John 11:25-26, "I am the resurrection and the life, says the Lord; whoever believes in Me though he die, yet shall he live; and whoever lives and believes in Me shall never die."

Before the Ceremony: Funeral usually takes place 2-3 days after a death. Viewing may be scheduled in the days or hours before the funeral, depending on the families' preference.

Appropriate Attire: Men – jacket and tie. Women – dress or skirt and blouse. Dark, somber colors of clothing are advised. Bright, flashy tones are strongly discouraged.

Flowers and Donations: Flowers may be sent to the home of the bereaved upon hearing of the death, or they may be sent to the church or funeral home where the funeral ceremony will be held. Contributions to a church or organization designated by the family may be made after the funeral. It is also appropriate to send food to the home of the bereaved.

The Ceremony: Takes place either in a church or a funeral home. A pastor officiates and delivers the sermon. Possibly a family member or close friend may also deliver a eulogy. The casket is rarely open. Viewing may be offered during or at the end of the funeral service.

The Interment: At the graveside, Scriptures are read, prayers are recited and the casket is placed in the ground.

Comforting the Bereaved: Often, there is a reception at the church or home of the bereaved after the funeral. If not, visiting a few days after the funeral is appropriate. It is recommended that the visit be brief. Seldom is a religious service at the home of the bereaved. No food will be served.

Important Facts: No mourning customs or rituals for observing the anniversary of a death. Local, ethnic and cultural customs are more relevant than any particular religious tradition of the Church. The RCA are closely related (theologically) to Presbyterian. Beliefs lie in the historic Christian faith, and that the Bible is the Word of God and the final authority for faith and practice. Worship services range from highly formal to very informal.

Seventh-day Adventist

Funerals and Mourning: Seventh-day Adventists believe that to die is to stop living. Death is a complete cessation of life. The deceased sleep until the resurrection of Jesus. A funeral usually lasts 15-30 minutes.

Spiritual Caregiver: pastor, minister or clergyman

Books used: Bible – *The Second Coming of Jesus Christ*, *Revelation*, *John* or *First Corinthian*

Before the Ceremony: Funerals usually take place within one week of death. Usually 30 minutes to an hour before the funeral, there is a wake or visitation.

Appropriate Attire: No dress code.

Flowers and Donations: Contributions to various good works and causes of the church are commonly made as memorials. Flowers may be sent to the funeral, church or to the deceased's home before or after the funeral. It is appropriate to bring food after the funeral to the home of the deceased or to the place of a memorial meal, which could be elsewhere. If food is brought to the church, it has to be vegetarian – meat is not allowed into the church.

The Ceremony: Takes place in a church or funeral home. Usually the casket is open. Typically, a Scripture is read from the Old and New Testament. Prayer is offered and then remarks are made. Acknowledgement of flowers and cards are followed by the eulogy, which is read aloud or silently. Special music or song follows the eulogy, and the benediction completes the ceremony.

The Interment: At the graveside, there will be a brief message of encouragement and prayer from the clergyman.

Comforting the Bereaved: The first few days after the funeral it is appropriate for friends to visit the home of the bereaved. One should visit briefly to express words of encouragement or to offer to help with any difficulties the bereaved may encounter. The bereaved can be helped by offering to transport incoming relatives from airports or bus/train stations, or offering to help with errands. Expressing words of comfort such as: "I sense your grief and share it with you", and "We look forward to the resurrection of your loved one" are common.

Important Facts: The Bible does not mandate rituals for observing the anniversary of a death. Adventists pray only for the living. Even though the dead body is usually buried, Adventists have no objection to cremation or to the donation of the body to medical or scientific institutions.

Sikh

Funerals and Mourning: Sikh believe in the cycle of reincarnation and that certain actions and attachments bind the soul to this cycle. The soul itself is not subject to death. Death is only the progression of the soul on its journey through the universe back to God. The service usually lasts about 30-60 minutes. A second service lasts about an hour.

Spiritual Caregiver: *Granthi* - priest

Books Used: A *Nit Nem* – daily prayer book

Before the Ceremony: The body of a Sikh is always cremated. This usually occurs within 3 days after death. Sikhs prepare the body for the funeral with a yogurt bath while reciting prayers. The body is dressed in new clothes and the five (5) Sikh symbols: *kesh* - uncut hair; *kirpan* – a knife representing compassion and one's task to defend the truth; *kara* – a stainless steel bracelet; *kachera* – special Sikh underwear; and *kanga* – a small comb.

Appropriate Attire: Men – jacket and tie, or more casual, modest clothing. Women – modest dress, skirt and blouse or pants suit. It is best if the legs are covered. For both sexes, shoes may be worn inside the funeral home but not at the *gurdwara* service. Heads also should be covered with a hat, scarf cap or veil.

Flowers and Donations: Flowers, food or contributions to a charity, chosen by the family, may be given but are not expected. Food restrictions are meat, fish, eggs and alcohol.

The Ceremony: The pre-cremation ceremony will take place at a funeral home. The optional post-cremation ceremony will be at the *gurdwara*; everyone sits on the floor facing the *Siri Guru Granth Sahib*, sometimes with the men on the left and women on the right. The casket may be open, depending on the customs of the community. A close family member officiates the ceremony, leading prayers. All ceremonies commemorating a death include much prayer.

The Cremation: Only close family members remain for the cremation since it lasts several hours. An *ardas* (community prayer) is recited to begin the service. A minister may offer prayers and say a few words, but this is optional. Two (2) daily prayers, *Japji* and *Kirtan Sohila*, are recited before the cremation.

Comforting the Bereaved: It is fine to call the family of the deceased to express love and concern and offer help or support. When visiting, it is best to remember the joy of the soul returning to its true Home with God. Memorial services are often held at home with people taking turns reading of the *Siri Guru Granth Sahib*.

Important Facts: While some Sikhs choose to remember a deceased loved one in prayer during a *gurdwara* service, others hold a special *gurdwara* and *langar,* where a communal meal is provided after the service, at the anniversary of a death. Sikhs are prohibited from drinking alcoholic beverages. Most Sikh are vegetarian.

Unitarian Universalist

Funerals and Mourning: There is no specific doctrine about afterlife, some believe in an afterlife while some doubt that there is one. The ritual that marks one's death is called a "memorial service", not a funeral. The service is a ceremony to itself and may last 30-60 minutes, or longer.

Spiritual Caregiver: Minister or Chaplain

Books used: Unitarian Universalist Hymnal, *Singing the Living Tradition*

Before the Ceremony: The memorial service usually takes place within one week, but sometimes up to a month after a death. The length of time between the death and the memorial service is determined solely at the discretion of the family. Generally, deceased would be cremated; therefore there can be as much time between the death and memorial as is needed.

Appropriate Attire: Men – jacket and tie. Women – business attire.

Flowers and Donations: Flowers may be delivered to the place where the memorial will be held. Contributions made to a fund or charity, designated by the family, are preferable. If needed or wanted, food may be sent to the home of the bereaved before the memorial.

The Ceremony: Memorial services are often held in the church, but they can also be held in the home or funeral home. The body is very seldom present at the memorial. The minister delivers a meditation or eulogy. Members of the family and friends are invited to share memories of the deceased. Oftentimes, music is provided by members of the congregation on whatever instruments are available.

The Interment: A brief meditation may be offered at the graveside by the minister who then commits the body (ashes) to the ground.

Comforting the Bereaved: It is appropriate to visit the home of the bereaved after the memorial service. When visiting, express sympathies to the bereaved and offer specific help to them. Sharing fond memories of the bereaved are especially appreciated. Food may be served. Comments such as "I am so very sorry for your loss" are appropriate.

Important Facts: No mourning customs or rituals for observing the anniversary of a death. Cremation is an increasingly favored method of disposal of the body. Unitarian Universalists are agnostic about the existence of God. Unitarians decide for themselves what makes sense to them, and that is what they believe; it varies widely.

United Church of Christ

Funerals and Mourning: The loss and grief that accompany death clouds the awareness of eternal life. Although death brings an end to earthly life, the spirit remains. Life exists beyond life. A funeral service affirms once more the powerful, steadfast love of God from which people cannot be separated, even by death. The funeral service is almost always a service unto itself, lasting from 15-40 minutes.

Spiritual Caregiver: minister or pastor (The Reverend ____)

Books Used: Bible - any contemporary version; *New Century Hymnal*; The *Chalice Hymnal*; Book of Worship – whatever the need of the bereaved. (Often favorite poems or essays).

Before the Ceremony: Usually, the funeral takes place within one week after a death. Viewing time is sometimes scheduled in the days or hours before the funeral. However, for a cremation, there is a memorial service, which may or may not have included a viewing. The viewing usually occurs at the funeral home.

Appropriate Attire: Sunday dress.

Flowers and Donations: Flowers normally are sent to the funeral home or church, depending on where the service is being held, the disposition of the flowers is at the family's discretion. Contributions to a church or organization designated by the family may be made after the funeral. Food may be sent to the home of the bereaved. No restrictions

The Service: Takes place in a church or funeral home. A minister officiates and delivers the homily. A family member or close friend may deliver a eulogy. The casket is rarely open. The service has 3 goals: thanking God for the gift of life, celebrating and giving thanks for one particular life and asking God's blessings on the spirit of the departed and the continuing lives of the gathered congregation of family and friends. The service may or may not include the singing of anthems and hymns.

The Interment: Guests may or may not be invited, at the family's discretion. Scriptures are read, a hymn may be sung and the deceased is remanded to the care of God.

Comforting the Bereaved: Most churches will have a care group who provides a memorial meal for family and friends. (usually in the church's fellowship hall). If the family desires, however, the meal may be served in their home. Visiting a few days after the funeral is appropriate. Presence (silence and/or hugs) may be more comforting than words. Inviting persons to talk about the deceased is a particularly effective ministry of support.

Important Facts: Local, ethnic and cultural customs are more relevant than any particular religious tradition of the Church. The church does not have creeds or doctrine. The church operates with a statement of faith, but local congregations around the country vary widely in their "standard practices".

Unity

Funerals and Mourning: Believe that God is omnipresent and that no one is really ever separated by God. Many believe that there is a transition from this world, through death, into another realm. Funeral services tend to last, on the average, 30 minutes, but may last over an hour.

Spiritual Caregiver: minister

Books used: Bible – passages from *John:* 14:1-3 and 14:27, 23rd *Psalm*

Before the Ceremony: Funerals take place within 2-3 days of death. It is the choice of the family to have a visitation.

Appropriate Attire: Men – coat and tie. Women – a dress or business casual.

Flowers and Donations: A choice of the family. Donations may be sent to charities and occasionally to the church. Church members may provide food to the bereaved.

The Ceremony: There are memorial services as well as funerals. No casket is involved.

The Interment: The graveside service is very brief. The minister reads Scripture and recites phrases reaffirming what was previously said at the funeral service.

Comforting the Bereaved: It is appropriate to visit the home of the bereaved. Phone calls are made, cards sent and communication is kept with the bereaved. Initially, contact is made by the minister, and tapers off over time.

Important Facts: Unity is not a traditional church. It is not heavily ritualistic. Rituals are not crucial to what is taught. It is more a matter of the heart and the mind. Many believe in the afterlife. Unity teachings, such as the universal salvation process – of being healed – is an ongoing/daily practice. It is through a person's relationship with God, through prayer and meditation, that wholeness/salvation is experienced. Judgement, like salvation, occurs daily through our own self-judging; by going through life-challenging experiences and learning from our lessons, therefore gaining in wisdom. Unity views death as a transition or graduation and that the soul/spiritual being is still alive although not physically expressing in a physical body.

Wesleyan

Funerals and Mourning: Teaches that upon the second resurrection of Christ, the just will be resurrected to eternal life. The body of the resurrected body will be whole and identifiable. The funeral ceremony is a ceremony unto itself and may last 30-60 minutes.

Spiritual Caregiver: Minister, Pastor or Reverend

Books used: Versions of the Bible: the New International Version, the New King James Bible, and the King James are common.

Before the Ceremony: Funeral usually takes place 2-3 days after a death. Visitation takes place before the funeral service. The family decides the length of visitation.

Appropriate Attire: Casual attire is appropriate, if modest.

Flowers and Donations: Flowers may be sent to the home of the bereaved before or after the funeral or to the funeral itself. In lieu of flowers, contributions may be made to a fund or charity designated by the family or the deceased. Food may be sent to the home of the bereaved upon hearing of the death. Sometimes, the church ladies provide meals for the family before or after the service. There are no dietary restrictions. Alcoholic beverages are prohibited.

The Ceremony: takes place in a church or a funeral home or at the site of the grave itself. The casket is usually open. Prelude music begins the service. The minister reads Scripture and delivers thoughts about the deceased and recites the eulogy. Music is played or sung. A sermon is recited; prayer and meditation are followed again by the Postlude. Usually musicians provide music at the beginning and end of the funeral ceremony, while guests view the deceased. No funeral service has specific requirements.

The Interment: At the graveside, there is Scripture reading, prayers are recited and the body is committed to the ground. Sometimes, hymns are sung.

Comforting the Bereaved: It is appropriate to visit the home of the bereaved to express sympathies and to offer specific help to them. A brief prayer, reflecting upon the life of the deceased, may be offered. No religious service or food will be available at the home of the bereaved, unless desired. The church cares about the needs of the family and desires to comfort the family in the grieving process.

Important Facts: No mourning or rituals for observing the anniversary of a death. Wesleyans are Fundamentalists.

Zoroastrian/Parsis or Parsee

Funerals and Mourning: Death is inevitable. Zoroastrians believe that when an individual dies, the life force (*ushtanal jan*) leaves the body (*tan*) which then becomes an empty shell of matter – a corpse (*ristag*) that demonic forces attack and cause to decay. The mortal soul (*urvan*) also leaves the body at death. Death is regarded as a focal point in the struggle between good and evil within each human. Funeral services last about an hour.

Spiritual Caregiver: priest

Before the Ceremony: Cleansing of the body occurs. The chest of the deceased is draped in a sacred undershirt (*sudra*) and a sacred cord (*kustil/koshti*) is tied around the waist. The deceased is dressed in white clothes, the hands are crossed over the chest (the legs are also crossed) and the entire body is covered in a white shroud. The face remains exposed. Relatives and friends may then bid farewell to the dead person.

Appropriate Attire: wearing of white

Flowers and Donations: There are no restrictions on giving flowers and donations. Fruit may also be given. Alcohol is prohibited.

The Ceremony: Occurs within 24 hours, during daylight, so that sunlight can keep evils – like pollution – away from persons attending the funeral, as well as purify the corpse. At the commencement, pairs of corpse bearers recite the *Srosh Baj*. Two magi perform the basic dedicatory rite of the faith – washing of the hands, face and feet, and then untying and retying the sacred cord while reciting prayers, additional hymns of praise, they then enter the funeral hall and face the body. The priests invoke god's protection and chant the *Ahunavaiti Gatha*. During the recitation, the priests turn away from the corpse, and
perform another rite. The body is placed by the corpse bearers on an iron –or stone – bier.

The Interment: The corpse is placed in a hearse that is followed to the funerary site by relatives and friends in a motorcade. Zoroastrians bury the dead in walled graves, with cement slabs, or enclosed graveyards so as to prevent the corpse from touching the earth and thus polluting it.

Comforting the Bereaved: On returning home, mourners bathe themselves as an added ritual precaution against pollution. The prayer vigil continues after death, in the belief that the deceased's soul will be comforted during its time of transition. Chanting a hymn specific to the period, a repetition of the confessional liturgy and an invocation of the messenger divinity Sraosha or Srosh Yasht Vadi occurs. Oil lamps burn to dispel evil.

Important Facts: Considerable variation in Zoroastrian funerary practices. Zoroastrians adhere to the concept of the extended family, in which support and care for the elderly is maintained. The number 3 is believed to represent the creed of good thoughts, good words and good deeds conquering evil.

Questions & Answers

1) Is Cremation allowed by your faith?
   African American Methodist Church – yes
   Amish – acceptable, not common
   Apostolic - no
- Assemblies of God – yes, it is optional
- Baha'i – no, the body should be treated with appropriate respect
- Baptist – yes, is up to the individual
- Brethren Church – yes, it is up to the family
- Buddhism – yes, is generally the course of action
- Catholic/Roman Catholic – no
- Christian – yes, varies from person to person
- Christian and Missionary Alliance – yes, no problems
- Christian Science – yes, choice is left up to the individual
- Church of Christ – yes, not widely practiced
- Disciples of Christ (Christian Church) - yes
- Episcopalian & Anglican – yes
- Evangelical – yes, preference of family
- Greek Orthodox – no, disapproves
- Hindu – yes, it is the only method
- International Church of the Foursquare Gospel – up to individual
- International Pentecostal Holiness Church - yes
- Jain - yes
- Jehovah's Witness – yes, it is a personal choice
- Judaism – no, among traditional Jews; yes, among Reform Jews
- Lutheran – yes
- Mennonite – very few do this, not common but it is optional
- Methodist - yes
- Mormon (Jesus Christ of Latter-day Saints) – reluctant, up to family
- Muslim (Islam) – no, Muslim are never cremated
- Native American - yes
- Nazarene – yes, it is permitted
- Orthodox Church - no
- Pentecostal - allowed
- Presbyterian – yes, no official belief
- Quakers/Friends – customs vary, some prefer burial, some cremation
- Reformation (Reformed Church of America – RCA) - optional
- Seventh-day Adventist – yes
- Sikh - yes
- Unitarian Universalist – yes, a favored method of disposal
- United Church of Christ - yes
- Unity – yes, it is acceptable
- Wesleyan – yes, it is allowed
- Zoroastrian/Parsis – yes, but not by Orthodox

2.) What is a Columbarium? What is the difference between internment in a niche, walkway or on the ground?

A Columbarium is a niche or group of niches set aside as a repository for cremated remains. A niche is a small vault that contains one or more urns or cremains (ashes). The vault is sealed with a plaque identifying the individual(s) interred to include date of birth and death. Some families may choose to bury the remains in the walkway of a memorial garden. Burial spaces in the walkway will be identified with a granite plaque. Scattering of ashes on the grounds of the Memorial Garden is also an option for families. Those choosing this option may remember their loved one with a memorial plaque on the Garden of Memory Wall.

3) Who is Your Spiritual Caregiver?

- African American Methodist Church – Pastor
- Amish - bishop
- Apostolic - Minister
- Assemblies of God – Pastor
- Baha'i – there are 9 elected leaders
- Baptist – Pastor
- Brethren Church - Pastor
- Buddhist – minister or priest; monk, in Cambodian, Thai & Ceylonese
- Catholic/Roman Catholic - priest
- Christian – minister or pastor
- Christian & Missionary Alliance (CMA) – Pastor
- Christian Science – no clergy; a Reader, Practitioner, Teacher or Friend
- Church of Christ – minister
- Disciples of Christ (Christian Church) – pastor or minister
- Episcopalian & Anglican – priest
- Evangelical Free Church – Pastor, elder, major official or friend
- Greek Orthodox – priest
- Hindu – Priest or Senior Care Giver
- International Church of the Foursquare Gospel – Pastor
- International Pentecostal Holiness Church – minister, pastor, Reverend
- Jain – Family member or village leader
- Jehovah's Witness – Congregation Elder
- Jewish – rabbi
- Lutheran – Pastor
- Mennonite – pastor
- Methodist – Pastor
- Mormon (Church of Jesus Christ of Latter-day Saints) – church officer
- Muslim (Islam) – *imam* ("eee-mom") – Muslim leader
- Native American – no one in particular
- Nazarene – Pastor or Reverend
- Orthodox Church – Priest. A bishop is called in for important members
- Pentecostal Church – Minister or Pastor
- Presbyterian – Pastor or Minister
- Quakers (Religious Society of Friends) – person appointed in Meeting
- Reformed Church in America/Canada (RCA) – Pastor
- Seventh-day Adventist – minister, pastor or clergyman
- Sikh – *Granthi* (priest) or *Giani Ji* and attendants

  Unitarian Universalist – minister or chaplain
- United Church of Christ – minister or pastor

- Unity - minister
- Wesleyan – Minister, Pastor or Reverend
- Zoroastrian/Parsis - priest

4) Does your faith believe in Resurrection, if so, will the Body or Spirit Rise?

African American Methodist Church – yes, of the spirit
Amish - no
Apostolic - yes
Assemblies of God – yes, both body and spirit
Baha'i – no
Baptist – yes, the spirit first then the body
Brethren Church – yes, the body
Buddhism – consciousness leaves the body at death, rebirth follows
Catholic/Roman Catholic – yes, of the body
Christian – yes
Christian and Missionary Alliance – yes, both body and spirit
Christian Science – the body is fundamentally regarded as thought, as thoughts grow more spiritual the body is increasingly freed of limitation
Church of Christ – yes, a spiritual body
Disciples of Christ (Christian Church)– yes, both body and spirit
Episcopalian & Anglican – yes, both body and spirit
Evangelical – yes, both body and spirit
Greek Orthodox – yes, the body
Hindu – no
International Church of the Foursquare Gospel – yes, the body
International Pentecostal Holiness Church - yes
Jain - no
Jehovah's Witness – yes, of the person
Judaism – yes, Reform Jews believe only in resurrection of the soul, other Jews believe in the resurrection of both body and soul
Lutheran – yes, both the body and spirit
Mennonite – yes, of the spirit
Methodist – yes, of a new spiritual body
Mormon (Jesus Christ of Latter-day Saints) – yes, both body and spirit
Muslim (Islam) – yes, afterlife: physical pains and pleasures
Native American – yes, the ideals of it
Nazarene – yes
Orthodox Church – yes, of the soul
Pentecostal – yes, of the physical body
Presbyterian – yes, body and soul
Quakers/Friends – individual, no creed
Reformation (Reformed Church of America – RCA) - yes
Seventh-day Adventist – yes, the spirit
Sikh - no
Unitarian Universalist – yes, if it makes sense
United Church of Christ – yes, in the spirit
Unity – yes, of the spirit
Wesleyan – yes, of a glorified body
Zoroastrian/Parsis – yes, both body and soul

5) Does your Faith believe in the Concept of Reincarnation?

African American Methodist – no
Amish - no
Apostolic - no
Assemblies of God – no, it is taboo
Baha'i – no
Baptist – no
Brethren Church - no
Buddhism – yes
Catholic/Roman Catholic - no
Christian – no
Christian and Missionary Alliance (CMA) - no
Christian Science – no
Church of Christ – no
Disciples of Christ (Christian Church) – no
Episcopalian & Anglican - no
Evangelical – no
Greek Orthodox - no
Hindu – yes, each person will be physically reborn many times during the course of a soul's evolution.
International Church of the Foursquare Gospel – no
International Pentecostal Holiness Church - no
Jain - yes
Jehovah's Witness - no
Judaism – no; some groups and sects have considered it, but it has never been mainstream
Lutheran – no
Mennonite – no
Methodist – no
Mormon (Church of Jesus Christ of Latter-day Saints) - no
Muslim – no, the Qur'an states we have only one life on earth
Native American - yes
Nazarene – no
Orthodox Church - no
Pentecostal - no
Presbyterian – no Quakers/Friends – individual
Reformation (Reformed Church of America – RCA) -
Seventh-day Adventist – no; given only one life, no second chance
Sikh – yes, the soul is born again
Unitarian Universalist – yes, if it makes sense
United Church of Christ - no
Unity – many believe; not an official doctrine
Wesleyan – no
Zoroastrian/Parsis –

Internet Links For Crisis, Grief and Healing

RESOURCES

Grief:

- Emotional Support Guide – an index of support resources on the internet
- Alt.support.grief – news group that functions as an electronic support group
- Home page of the Compassionate Friends
- Comprehensive listing of grief-related links – Kathi Webster's links
- WidowNet – a resource for widows and widowers
- Bereaved Families of Ontario – support for family members & self-help
- Transformations – helps those in recovery and spiritual growth
- Families Survivors United – advocacy group (formed in wake of Oklahoma City bombing), provides information & support for families and all affected by tragedy
- AltaVista – Death – a website
- Bereav.txt – a website on bereavement

Other:

- Islewest – find books and resources to help meet life's challenges: Self-awareness, Personal Growth, Healing, Relationships, Recovery
- After-Death.com – forum dedicated to researching & sharing After-Death Communications and related spiritual subjects
- The D.R.E.A.M.S. Foundation - non-profit resource about dreams: nightmares, lucid dreams, interpretation, and more…
- Jan Luckingham Fable's web site – articles on grief, anger, consciousness and feeling your feelings in addition to counseling.

REFERENCE

Caring for the Dead, Lisa Carlson – complete guide of arrangements (general)
Coping with Bereavement, Harnish McIwraith - Stages of grief, facing death, going on with life, etc.
Facing Death and Finding Hope, Christine Longaker – A guide to the Emotional and Spiritual Care of Dying (advice for caregivers and survivors; children's view; healing-bereavement; preparing)
On Death and Dying, by Elizabeth Kubler-Ross (1969)
Planning Memorial Celebrations: A Sourcebook, Rob Baker. 1999 Bell Tower
Surviving Grief and Learning to Live Again, Dr. Catherine M Sanders - rituals
The Magic Years, by Selma Fraiberg (Scribner's, 1968)
The Wheel of Life: A Memoir of Living and Dying, by Elizabeth Kubler-Ross
When Bad Things Happen to Good People, by Harold S Kushner (Avon, 1983)

Books for Adolescents & Children

How it Feels When a Parent Dies, by Jill Krementz (1981)
Learning to Say Good-bye: When a Child's Parent Dies, by Eda leShan (1986)
Lifetimes –
Straight From the Siblings: Another Look at the Rainbow, by G.G. Jampolsky & G. Murray
Straight Talk about Death for Teenagers: How to Cope with Losing Someone you Love, by Earl Grollman
When the Ship Sails Away – for kids on grieving

Books Distributed by the Cincinnati Area Chapter Mental Health Volunteers After Death Related Disasters

A Child's View of Grief, by Alan D. Wolfelt, Ph.D
How I Feel: A coloring Book for Grieving Children, by Alan D. Wolfert, Ph.D.
I Can't Stop Crying, by John D. Martin and Frank D. Ferris, MD

Magida, Arthur J. & Stuart M. Matlins, How to be a Perfect Stranger Vol.1: A Guide to Etiquette in Other People's Religious Ceremonies, Woodstock, Vermont. 1999. Pp 31-35, 48-51, 65-69, 85-88, 97-100, 113-116, 133-136, 149-152, 168-171, 189-192, 202-205, 231-235, 259-263, 278-281, 296-299, 315-319, 333-337, 352-355, 366-369, 407-411.
Matlins, Stuart M. & Arthur J. Magida, How to be a Perfect Stranger Vol.2: A Guide to Etiquette in Other People's Religious Ceremonies, Woodstock, Vermont. 1999. Pp 38-41, 54-59, 75-79, 92-95, 116-120, 140-143, 159-163, 180-183, 199-203, 227-231, 247, 269-273, 292-295, 298 & 313-317, 337-343, 366-370, 387-391.

See: **Local Resources** as contact persons for more precise information.

Language Bank Contacts

1) International Family Resource Center (IFRC): The Language Bank
Mary Kaye Gulasey, (contact) or Kathy Archbold. 483-6242
4050 Executive Park Drive. Suite 404 45241. (Sharonville).
*24 hour answering service
*1-5 hour minimum, can be extended
*rates: $69/hour, can be adjusted with extended service hours
*serves: Albanian, African – several dialects, Arabic, Bosnian, Chinese – several dialects, Croatian, French, Japanese, Portuguese, Spanish…

2) **University of Cincinnati** –
*German Language Dept: 556-2752 (German, Japanese, Russian, Swedish)
*Italian – Professor Nattina Eckert – 556-1833
*Romance Language Dept: 556-1950 (French, Spanish and Italian)

3) **Arabic/Ethiopian Interpreter**: Huda Kebede: w - 556-1950, h - 825-8764
Joseph Hanna: h - 825-8764

4) **Dutch Interpreter**:
* Martha Iskyan (DMHS): 769-3100

5) **French Interpreter**:
* Ibraham Amidou (UC Professor): 221-8069 or 556-1829, may charge a fee
* Martha Iskyan (DMHS): 769-3100
* Martine Kincaid: 772-8934
* Joy Rich: 344-0393

6) **German Interpreter**:
* Marion Piening (UC): 556-2752 – may charge a fee
* Cordelia Stroinigg: 556-2757

7) **Japanese Interpreter**:
* Noriko Fujioka (UC Professor): 556-2747

8) **Portuguese Interpreter**:
* Martha Iskyan (DMHS): 769-3100

9) **Spanish Interpreter**:
* Ismael Godoy (from Mexico – UC graduate student): 961-7233
* Ligia Gomez (UC professor): 751-9009 or 591-3100 - @ $20/hour
* Martha Iskyan (DMHS): 769-3100
* Aaron Krynicki (UC, Masters in Spanish): 961-6178, w-556-1829
* Charles Mack: 831-4351
* HarryPrats (DMHS): h-231-8038, w-556-1678

10) **Swedish Interpreter**:
* Germanic Language Department: 556-2754
* Cordelia Stroinigg: 556-2757
* Julie Rape (pronounced “rap-pay”): 221-5803

11) **Russian Interpreter**:
* Julia : 244-2528
- Lilly Narusevich: w-351-3680, h-563-8671, may charge a fee for lengthy services needed, happy to assist with telephone translations (for free).

Appendix A

HANOVER PARK FIRE DEPARTMENT

. . . taking care of our own

Line-of-Duty Death

Contingency Plan

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LINE OF DUTY DEATH INTRODUCTION

A firefighter's death, in the line of duty, will be an extraordinarily traumatic event for both the surviving family and to our organization. When this happens, the tragedy will most likely be a sudden event without any warning. The time period from the death to the laying to rest of our comrade will be extremely short and will require that our Department move quickly, with great compassion and organization, to provide a fitting memorial for our firefighter.

The purpose of this document is to provide a written contingency plan to assist our Department with the planning and coordination that will become necessary when this event occurs.

The plan is devised for maximum structural flexibility and not to overburden any one individual.

The plan assigns responsibility to individuals and teams for the:

1. Notifications
2. Planning
3. Execution of Services
4. Death Investigation
5. After Care

Since this catastrophic event could take place at anytime, the Chief and Command Staff Officers (Battalion Chiefs, and Assistant Chief) should carry the plan in their Department vehicles. A Battalion or Assistant Chief may need to initiate the plan if the Chief is unavailable.

As the plan is read you will see that the organizational system we use is designed along the lines of the Incident Command System (ICS). The plan is administrated by a Planning Group Manager, or Incident Commander, and the work load is divided among specific Divisions and Groups.

Once the Planning Group Manager (Battalion Chief level) is designated by the Chief, that person should obtain the Line-of-Duty Death binders (kept by the Chief's administrative assistant). The binders, which comprise the detailed lists of responsibilities for each ICS position within this structure, are as follows:

1. Planning Group Manager
2. Logistics Group
3. Viewing/Vigil Division
4. Memorial Service Division
5. Interment Division
6. Reception Division
7. Family Liaison Officer
8. Public Information Group

Immediately, the Planning Group Manager needs to appoint Division/Group leaders for each of the eight positions. A meeting of all Division/Group leaders then need to be called without delay. At this initial meeting the distribution of the assignment notebooks should be made.

The notebooks are meant to be a starting point for each leader. Leaders should keep an open mind since no pre-plan can cover all possibilities.

If a Line-Of-Duty Death strikes our Department, it is imperative that we move quickly and efficiently. It is hoped that this pre-designed structure will be an aid.

All of us desire that this plan will never be implemented, but preplanning for the event is prudent.

CHIEFS RESPONSIBILITY

Upon the death of any Hanover Park Firefighter the Chief or Acting Chief should immediately be notified. In the case of a Line of Duty Death, it is imperative that this communication is made without delay.

During notifications, it is imperative that accurate information is passed quickly and discretely. Our radio traffic is monitored regularly by the media and private citizens. Names of dead or injured firefighters shall NEVER be given over the radio. All communications of this sensitive nature shall be conducted by telephone.

Upon the receipt of this tragic news the Chief or Acting Chief (if the Chief is unavailable) should coordinate the following:

1. Order FD notifications
    a. Command Staff
    b. Community Services P.I.A.

2. Contact and advise the Village Manager of all pertinent information and that the Department is implementing the "Line Of Duty Death Contingency Plan".

3. Assemble the Notification Team
    a. Chief (if possible) or representative
    b. Family Liaison Officer (select the individual)
    c. A firefighter friend of the family or close civilian family friend

4. Make surviving family notification (See "Notification of Next of Kin" information in next section.)

5. Set up a Command Staff Meeting to commence upon the completion of the notification process.

6. Command Staff Meeting
    a. Appoint the Planning Group Manager to coordinate all ceremonial services and issue the Line of Duty Death container that holds the notebooks comprising the detailed responsibilities of this function.
    b. Appoint the Death Investigation Leader and issue the notebook comprising the detailed responsibilities of this function.
    c. Verify that the necessary Critical Incident Stress Management (CISM) is in progress.
    d. Discuss all pertinent issues.

For detailed information of making the Next of Kin Notification please refer to the next section.

NEXT OF KIN NOTIFICATION

The importance of the NEXT OF KIN NOTIFICATION cannot be over-emphasized. This process will set the tone for many difficult days, weeks, months, and years for the surviving family. Sensitivity and compassion are imperative.

Family notification should be made as quickly as possible to avoid the family receiving a notification from another outside party. The media will employ many efforts to seek out the name of the fallen firefighter. We must use all necessary measures to protect the next of kin from unwanted media exposure.

For this reason, the Notification Team will need to assemble rapidly. The team should be at least two and preferably three individuals with individual vehicles. The team should be comprised the following members:

1. The Chief, if possible. However, if unavailable, the highest ranking Officer (AC) available.

2. Family Liaison Officer.

3. A firefighter friend of the family – Check Packet.

If the fallen firefighter's family resides far enough out of the area as to make our department's participation in the notification impractical, the local Fire agency in the area should be notified to make a timely notification.

Another distinct possibility is that our Department could experience a loss of more than one member. This would require multiple notification teams to be assembled and deployed.

Before you arrive at the residence, verify latest information, and decide who will speak, and what that person will say.

A word of warning, the family may strike out and blame our Department for their loss. For this reason, the initial notification and how we handle it is extremely important.

Steps to be taken at the residence:

1. It may become necessary to have paramedics standby if the people receiving the news are medically vulnerable. If this is done, have the apparatus standby near the residence, but not in view.

2. At the door identify yourself and ask to come in. (Notification should take place in a private setting.)

3. When inside, ensure you are notifying the right person.

4. Get people in a comfortable or relaxed setting: the most important function of the person making the notification is to put all of the known basic facts into one sentence and tell them.

5. Make sure your message is absolutely clear and direct.

6. Begin with, "I have very bad news" or "I'm very sorry to tell you".

7. Let them know how it happened, "Your husband died responding to a fire," or "Bob was killed in a building collapse."

8. Allow the family to express their emotions. Do not try to talk them out of their grief.

9. This is a very sad time. Do not mask your own grief.

10. Provide only the facts you know, never speculate. If you cannot answer a question, find out the correct answer.

11. Phrases or words to avoid:
    a. "I know how you feel."
    b. "It was God's will."
    c. "Life will go on."
    d. "He would have wanted to go this way."
    e. "Be brave."
    f. "Passed away."

12. Use the victim's first name when referring to our firefighter.

13. Ask if the Department can assist by notifying immediate family members (parents, brothers, and sisters).

14. With the permission of the next of kin, the Department can help setup a support system:
    a. Clergy
    b. Relatives
    c. Friends

15. Never leave immediately after making a notification.

16. Do not leave people without a support system. Wait for others to arrive.

17. Do not take the victim's personal items with you.

18. Ask the survivor(s) if they wish to see the deceased firefighter, even if the body is badly disfigured. People often have a need to see, touch and hold the deceased, otherwise they may be in denial. This is often very helpful in the family's grief process. It gives a sense of finality.

19. If family members wish to see the firefighter, arrangements need to be made rapidly for the viewing. Sensitivity to the family is very important. Provide the best possible environment and avoid delays that heighten the family's anxiety.

20. Offer to transport the family to the location of the firefighter, and help prepare them for what they will see.

21. Do not let them drive.

22. If you transport the family, turn off your radio and/or advise dispatch that you are transporting the relatives and, if possible, switch to an alternate channel, or communicate by cell phone.

23. If the Department's Family Liaison Officer is not present at the notification, the family should be given the name prior to the team departing. Write down his or her Nextel and/or telephone (cell) numbers. If possible, this person should already be known by the family.

24. Have one member of the Department stay with the family, unless the family declines.

25. Advise the family that the Family Liaison Officer will contact them to assist with the necessary arrangements.

26. Ask if the Department can pick up any children who may be away at this time.

27. Advise the family of possible media calls. Unwanted media exposure will only add to the difficulty of this tragedy. Suggest that a friend of the family screens their incoming calls.

28. Assure the family that their wishes are the Department's number one concern.

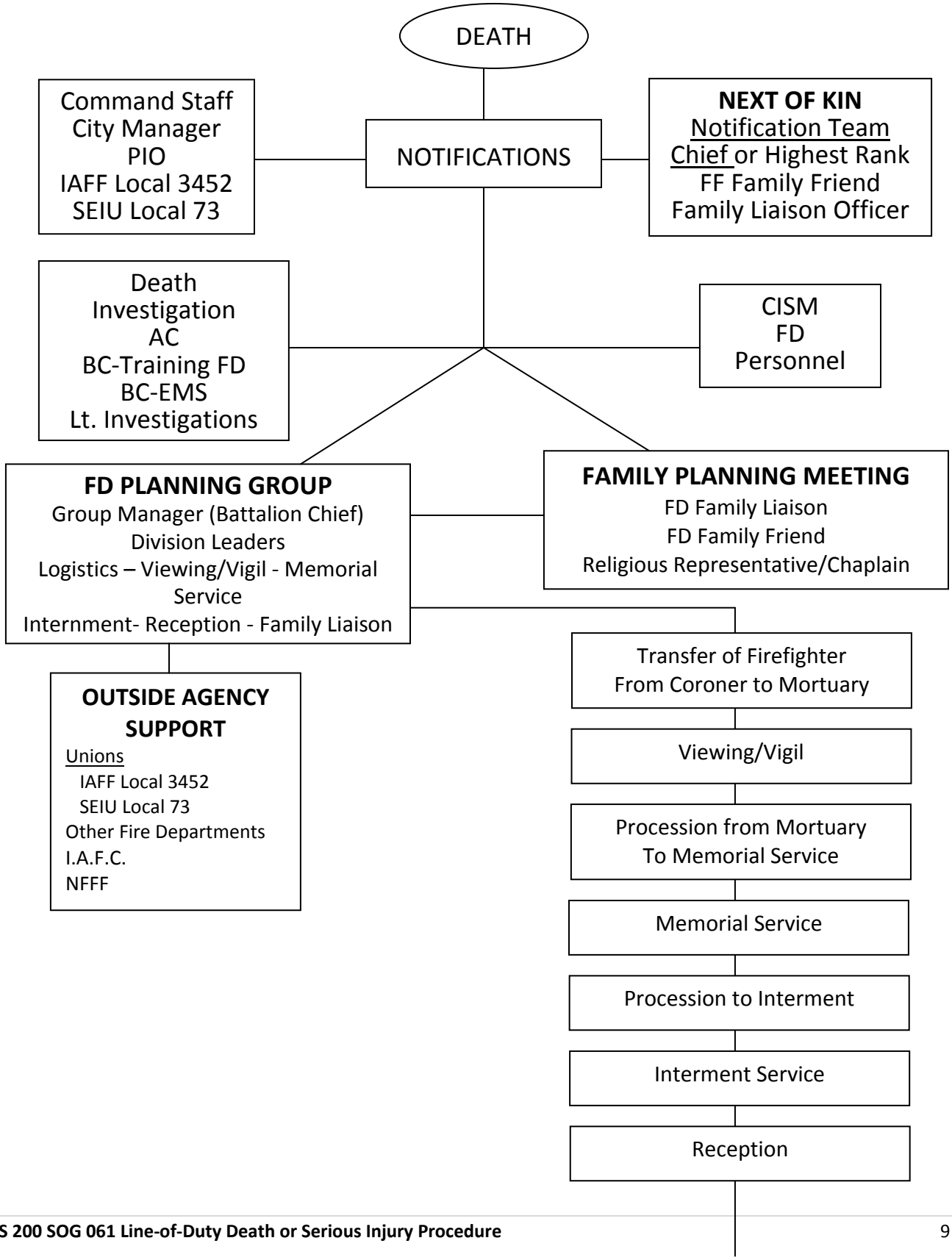
29. Advise the family that an autopsy is required by law.

30. Ensure that the family understands that they do not have to make any immediate decisions regarding services, mortuary, wills, etc.

31. Before leaving the residence, try to set a time for a Family Planning Meeting. There are decisions that will need to be made by the family that will shape the planning process. This meeting should take place within the first 24 hours.

Appendix A

LINE OF DUTY DEATH FLOW CHART



After Care of Family

Death Investigation

In the event of a line of duty death or serious injury to one or our firefighters, our Department must take immediate steps to ensure that the incident is accurately documented and investigated. This action is conducted to protect the interests of the deceased, the surviving family, and our Department. It is also a mandate of State and Federal law.

To accomplish this, there will be an Incident Investigation Team pre-designated for use in these types of emergencies. The team shall be made up of:

1. Assistant Chief (appointed by the Chief), Chairman
2. Battalion Chief of EMS
3. Battalion Chief of Training
4. Lieutenant - Fire Investigation Unit
5. Police Investigator/Detective

The activation of the team should be called by the Battalion Chief in charge. The team should then meet at the site as soon as possible.

The initial collection of facts, preservation of evidence, and the appropriate agency notifications shall be the responsibility of the Incident Commander until the time the team can take over.

The following is a list of items that should be addressed:

1. Immediate Action
   a. Secure the scene. No unnecessary disturbing of the scene should take place. Remove all non-essential personnel.
   b. Impound all safety equipment that was used by our firefighter, they may need to be sent for testing:
      1) SCBA
      2) Turnouts
      3) Helmet
      4) Gloves

c. Have a video and still picture record made of the sight.

2. Secondary Action
   a. Arrange for the required autopsy that meets Public Safety Officers Benefit (PSOB) Program requirements. Included is the Firefighter Autopsy Protocol.
   b. Obtain audio tapes of the incident.
   c. Request written transcripts with times of radio transmissions.
   d. Impound all written forms used in the incident:
      1) Incident Work Sheets
      2) Personnel Accountability Forms

   e. Ensure all necessary agency notifications have been made:
      1) OSHA
      2) Federal Emergency Management Association (FEMA)
      3) U.S. Fire Administration
      4) NIOSH
      5) A TF (if there are suspicious circumstances)
      6) State Fire Marshal – Included is the Line of Duty Death Notification Policy from the Office of the State Fire Marshal.
      7) PSOB (one member of team needs to be designated liaison)

   f. Obtain sworn written statements from all directly involved individuals. It is preferred that these statements be completed prior to the release of members at the end of the shift. If this is impractical, the statements should be provided within twenty-four hours. These statements are confidential and are not to be reviewed by any individual, including Supervisors. These documents are to be sealed and turned over to the Incident Investigation Team.
   g. Review all chronological reports.
   h. Review all written statements.
   i. Setup interview teams for all companies on the scene.
   j. Interview all individuals on scene (tape record).
   k. Reconstruct the scene from statements.
   l. Have diagrams and designs of fire scene for interviews.
   m. Review the autopsy report (one is required).
   n. Write the final report.

If an employee is killed as a result of a fire/explosion, the FIRE INVESTIGATION shall be conducted by the Fire Department Arson Investigation Unit. The cause and origin determination shall rest with this unit and any additional investigation resources that may be requested, such as the ATF, Hanover Park Police, or Sheriff Department. Once this investigation is complete, the Arson Investigation Lieutenant will then turn the scene over to the Death Investigation Group.

PLANNING GROUP MANAGER

It is very important to both the immediate family of the deceased, and to our firefighters, that our Department provides the best possible tribute to our fallen comrade(s). For this reason it is extremely important that an effective group of planners is gathered to manage all activities. The organizational structure that will become necessary to control and coordinate this effort is patterned after the ICS structure that is utilized to manage major emergency incidents.

A Battalion Chief will be designated by the Chief, or Acting Chief, and will lead the Planning Group as the Planning Group Manager. This Manager will be appointed as quickly as possible and have overall responsibility and control of coordinating all activities involving the planning and execution of the plans that provide an appropriate memorial service for our fallen firefighter.

The Planning Group Manager will supervise the following seven Divisions/Groups:

1. Logistics Group
2. Viewing/Vigil Division
3. Memorial Service Division
4. Interment Division
5. Reception Division
6. Family Liaison Group
7. Public Information Group

Once the death occurs or is eminent, the Planning Group Manager should assign the Division/Group Leaders to appropriate individuals and a staff meeting should be convened to distribute work assignment notebooks. It is important that this meeting is called ASAP. The laying to rest of our firefighter will take rapid action. There may be religious reasons that dictate this burial or cremation within three days of death.

The structure provided to the Planning Group Manager is meant to be a guide. It may be altered as the Manager sees fit.

As the overall event manager, the following are considerations that should be followed as planning progresses:

1. The desires of the surviving family are paramount at all times.
2. Planners should be aware that open and frequent communication between and within the Planning Group is key to successfully coordinating this effort.
3. Rehearsals of specific events are advisable, if possible, to reduce confusion.
4. It is advisable for the Planning Group to meet once or twice daily. This allows all Division/Group Leaders to see the overall work in progress.
5. The earlier the team is activated the better. Lost time can never be made up when dealing with this work load in a three to five day window.
6. This is a complex event to manage. Bring the best talent to the Group that is available.
7. Give your Division/Group Leaders authority to select the best people to staff their organizations.
8. Think Big - There is a potential for having thousands of individuals participating in a full FD funeral.
9. Remember there is planning support available from other agencies.
    a. Unions
        1) Local
        2) Associated Fire Fighters of Illinois (AFFI)
        3) IAFF and SEIU

    b. Hanover Park Police Department
    c. Other major agencies

See the Planning Group Organizational Chart on the next page.

Included in this policy are individual Division/Group job descriptions.

Also included are the individual Division/Group notebooks for you to distribute.

LINE OF DUTY DEATH PLANNING GROUP ORGANIZATIONAL CHART

PLANNING GROUP MANAGER

Logistics	View/Vigil	Memorial Service	Interment Service	Reception	Family Liaison	Public Information
Liaison to Mortuary Apparatus Static Participating Staging Areas Mortuary Apparatus Processions To Funeral To Burial PD Liaison Traffic Control Honor Guard PD&FD Memorial Honor Guards Bagpiper(s) Drummer	Liaison with Site and Mortuary Coordinate Event Honor Guard Flowers Portrait Display	Liaison with Site and Clergy Funeral Service Program Order Seating Chart Music Flowers Officer Duties *Pallbearers *Color Guard Paramedic Standby Formations Memorial Program Parking Portrait Display Flowers	Liaison to Cemetery Burial Service Program Seating Music Shape Restrooms Maps to Reception Parking Sun Shade Paramedic Standby Relocation of Flowers	Food & Refreshments Catering Restrooms Site Selection Sun Shade Program Seating Relocation of Flowers	Point of Contact with Family Transportation Lodging After Care	Media Press Releases Video Coverage Pool Camera(s) Tribute Victim's Bio Pictures for Service VIP Arrangements VIP Transportation Program Design Letter to be read from non- attending VIP's Notifications of Service Details B.O.T. Proclamation

LOGISTICS GROUP

The Logistics Group is established to manage specific areas of responsibility as outlined in this document in response to a Line of Duty Death.

The Logistics Group Leader shall report directly to the Planning Group Manager.

The Logistics Group Leader will need to appoint competent staff members to assist with the Group's responsibilities which are far reaching.

This Leader is responsible for the following:

1. Arrange for deceased's transport from Coroner to mortuary (possible FD ambulance).

2. Designate and coordinate the use of all Fire Department apparatus for events:
    a. FD apparatus to be used as caisson.
    b. FD apparatus -to be used as flower car (if necessary).
    c. HPFD units in processions
    d. Outside agency vehicles
    e. VIP transport:
        1) Surviving family
        2) Politicians
        3) Union officials
        4) Village Management
        5) Clergy
    f. Antique Fire Apparatus

3. Designate apparatus order for all processions.

4. Designate route of procession:
    a. If possible, the procession should proceed past deceased's station and as many stations as possible.
    b. Mortuary to service.
    c. Visiting apparatus meeting with caisson and the procession to service site.
    d. Service site to burial.
    e. NO SIRENS will be activated during any procession.
    f. Apparatus should have emergency lights activated during any procession

5. HPFD apparatus static displays:
    a. In-service apparatus standing by on procession routes.
    b. Ladder trucks for arch (large flag for arch).

6. Coordinate with Planning Manager if mutual aid will be needed to fill HPFD stations.

7. Liaison with PD:
    a. Street closures along route
    b. Rifle team for 21-gun salute (if necessary)

8. Organize staging areas:
    a. Locations:
        1) Mortuary staging area (officer needed):
            a) Liaison with mortuary
            b) Organizes HPFD apparatus
            c) Obtains casket roller if FD apparatus will be used as caisson
        2) Outside Agency Apparatus Staging Area (officer needed, possibility of over 100+ vehicles to control)
    b. Need to provide:
        1) Restrooms
        2) Refreshments
        3) Food

9. Obtain services of a bagpiper – Associated Fire Fighters of Illinois (AFFI)

10. Obtain one or two buglers (they may need to be amplified).

11. Obtain the services of a drummer, if desired.

12. Obtain adequate white gloves for Command Staff, pallbearers, and color guard (Fireground Supply).

13. Obtain black bands for badges.

14. Design all necessary maps.

15. Obtain helmet and turnout that will accompany casket.

16. Select eight pallbearers and a leader. Coordinate with Family Liaison Officer for family preferences.

17. Coordinate the HPFD color guards.

18. Issue a directive that specifies uniform to be worn.
    a. Hat
    b. Tie
    c. Black badge band

19. If there are injured firefighters who wish to attend any service, provide for their transportation.

VIEWING/VIGIL DIVISION

The Viewing/Vigil Division will be established if service is desired by the family(s).

The Viewing/Vigil Leader will report to the Planning Group Manager.

Necessary information the Division needs is:

1. Service date (usually one to two days prior to Memorial) _____
2. Location _____
3. Time _____

The duties and responsibilities of this Leader are:

1. Liaison with mortuary.
2. Liaison with clergy.
3. Coordinator with service facility.
4. Coordinate with Logistics if the body is moved to a site away from mortuary.
5. Service content and order.
6. If this form of event is held, it is the responsibility of this Division to provide Honor Guards for posting at or near the casket. Five guards will be needed. One at each end of the casket. Rotate guards every 15 minutes. Coordinate with the Family Liaison Officer if there are preferred individuals by the family.

   Honor Guards' Names _____ _____

   _____ _____

   _____ _____

7. Other considerations:
    a. Immediate family members should be escorted by FD personnel to and from the viewing.
    b. Catholic protocols may include a rosary service in conjunction with the viewing. This may require the participation of an Honor Guard.
    c. It is generally proper protocol for Honor Guards to wear their uniform hat inside the church or mortuary including the time spent posted alongside the casket. Gloves should also be worn.
    d. The event is usually held one or two days prior to the memorial service.
    e. The casket may be open or closed.
    f. CISM members should be on site for counseling, if necessary.
    g. Pictures of our fallen fighter should be present. It is responsibility of the PIO group to provide:
        1) Photographs
        2) Flowers

MEMORIAL SERVICE DIVISION

Memorial Service Division is responsible for planning and coordinating any and all arrangements for this main service for a Line of Duty Death.

The Division Leader (Assistant Chief) will report directly to the Planning Group Leader.

For proper planning to commence, it is very important that the following information be submitted to the Division, from the Planning Group Manager and Family Liaison Officer, as soon as possible. Necessary Information includes the following:

1. Date _____

2. Location _____

3. Time _____

4. Level of FD involvement

5. Open or closed service to public and outside agencies?

6. Open or closed casket?

7. Preferred music _____

8. Preferred speakers _____

9. Will a bagpiper be used? Yes ____ No ____

10. Will the last alarm tradition be used? Yes ____ No ____

Outline of Division's responsibilities:

1. Ensure the facility is large enough to handle anticipated large numbers. You may have to plan for overflow.

2. Coordinate with:
    a. Logistics - arrival and departure from service
    b. Religious Leaders - program content

3. Design order of program. This service should last no more than one hour and forty minutes. Coordinate with Planning Group Leader on starting time of the service.

4. Design seating plan - If indoors determine capacity and obtain a floor plan drawing.
    a. Family area
    b. VIP's
        1) Politicos
        2) Village management
        3) Union (local, state, and national)
        4) HPFD Command Officers
        5) Chief Officers' visitors
    c. HPFD personnel
    d. Civilian friends
    e. Visiting departments (possibly in blocks)
    f. Retired HPFD Chiefs

5. Coordinate music:
    a. Family requests
    b. Other
    c. How music is to be performed
        1) Choir
        2) Soloists (very impressive if possible)
        3) Recording
        4) Orchestra
        5) Small group (instrumental)

6. Adequacy of PA system

7. If outdoors, there are special needs:
   a. PA system
   b. Tent
   c. Chairs
   d. Restrooms
   e. Water
   f. Stage
   g. Power
   h. Shade

8. Coordination with pallbearers. The designation of individual pallbearers will be the responsibility of the Logistics Group.

9. Conduct any rehearsals deemed necessary.

10. There should be ALS and BLS ambulances standing by.

11. Coordinate program- Advise Family Liaison, who will keep the family informed.
    a. Content
    b. Order
    c. Number of speakers

12. Eulogy presenter - Should be strong, and well prepared.

13. Need large photo of deceased(s) for service. Coordinate with Family Liaison and PIO's.

14. Need a shadow box (PIO Group to provide) to present with:
    a. Badge
    b. Patches
    c. Hat hardware
    d. Picture (PIO's to provide)

15. Select the ushers to be used and tasks for them to carry out.

16. FD Chaplain.

17. Room for family.

18. Last Alarm ceremony.

19. Parking requirements.

20. Coordinate with PIO's on the printed program for service.

21. Coordinate with the PIO group on an appropriate video presentation:
    a. interviews with friends and supervisors
    b. any pre-existing video of firefighter
    c. Department video clips

22. Memorial program distribution.

23. Parking

24. Portrait Display

POSSIBLE ORDER OF SERVICE

1. Invocation

2. Prayer

3. Opening remarks/greetings

4. Special music

5. Scripture reading/minister's remarks

6. Speakers
   a. Mayor
   b. Village Board Members
   c. Any State or Federal politicos
   d. Family representative(s)
   e. Union representative
   f. FD representative's friend(s)

7. Eulogy – Chief

8. Special music

9. Presentations

10. Closing remarks/prayer

11. Last Alarm Ceremony

12. Bagpipes

13. Dismissal instructions

SUGGESTED "LAST ALARM" CEREMONY

Chaplain or Department member reads or recites:

Throughout most of history, the life of a firefighter has been closely associated with the ringing of a bell. As he/she began his hours of duty, it was the bell that started it off. Through the day and night, each alarm was sounded by a bell, which called him to fight fire and to place his life in jeopardy for the good of his/her fellow man. And when the fire was out, and the alarm had come to an end, the bell rang three times to signal the end.

And now our Brother/Sister has completed his/her task, his/her duties well done, and the bell rings three times, followed by a pause, three times, followed by a pause, and three time in memory of, and in tribute to his/her life and service.

Officer in charge calls firefighters to attention.

Color Guard called to present arms.

Bell is struck three times.

Color Guard called to order arms.

Firefighters seated.

INTERMENT DIVISION

The Interment Division is established to manage all arrangements for an internment service in response to a Line of Duty Death.

The interment Officer shall report directly to the Planning Group Manager.

The graveside service normally consists of a short religious service and several FD protocols.

Remember, the arrival at the cemetery is a very difficult time for family members. A long wait before the service begins can cause a great deal of anxiety. If an extremely long motorcade or delays are anticipated, it may be advisable to arrange for a family waiting room. It is imperative to have a parking plan at the cemetery. Cemeteries usually have traffic plans and know exactly how many vehicles can be accommodated.

Critical information for this Division:

1. Open or closed service to the public

2. Location

3. Time of anticipated arrival

4. Number of anticipated guests

This Division is responsible for:

1. Organizing program
    a. Content
    b. Order

2. Providing seating for at least family and VIPs

3. Providing restrooms if deemed necessary

4. Distributing maps to reception location

5. Shade if necessary

6. Liaison with cemetery
7. Liaison with clergy
8. Coordinate flag presentation to family. This will be conducted by the pallbearer team.
9. Present badge, name tag, and patch in a case to the family.
10. Create a parking plan
11. Provide a sound system
12. Provide electrical power
13. Provide a public address system
14. Provide and coordinate a bugler - Playing taps
15. Coordinate bagpiper
16. Coordinate 21-gun salute (if necessary)
17. Relocation of flowers

POSSIBLE PROGRAM FOR INTERMENT

1. Assembly
2. Officers attention, salute (command given, ready two, when casket is placed over grave)
3. Opening prayer
4. Scripture reading
5. Bagpiper
6. Committal reading, closing prayer
7. Taps
8. Flag folding
9. Flag presentations by Chief
10. 21-gun salute (Military)
11. Attention, dismissal

RECEPTION DIVISION

The Reception Leader shall be responsible directly to the Planning Group Manager.

It is the responsibility of this Division to organize and provide food and refreshments at a reception at the conclusion of the burial service. This will probably take place at a location away from the cemetery. The responsibilities of this Division include:

1. Location selection (Ensure the site has parking and a venue large enough to accommodate the anticipated group)

2. Number of anticipated attendees

3. Anticipated starting time

4. Anticipated closing time

5. Menu and refreshments

6. Is the event to be catered

7. Provide maps to be handed out at the internment

8. If outside:
   a. Tents
   b. Bathrooms
   c. Tables and chairs

9. Any introductions and/or program:
   a. PA
   b. Stage

10. Relocation of flowers

FAMILY LIAISON OFFICER (FLO)

The Family Liaison Officer is a critical position in our Line of Duty Death organization.

This Officer will be designated by the Chief or Acting Chief immediately after the death.

The Family Liaison Officer (FLO) shall:

1. Accompany the Chief or designee during the initial family notification.
2. Conduct the Family Planning Meeting within 24 hours.
3. Act as Department's single point of contact to the family.
4. Manage the After Care Program

This individual should be drawn from the ranks of our Critical Incident Stress Management (CISM) Team. The team should provide a list of specially trained individuals to the Alarm Office. Designated individuals should be available by Nextel or cell phone at all times.

Once assigned, the FLO will be available 24 hours a day until after the burial. The Family Liaison should be assigned a FD vehicle. He/she should also be issued communication equipment, cell phone, and portable radio for the entire funeral process.

The FLO should also designate an assistant to help with this very important function.

In the event of a multiple death, it will be necessary to have one liaison for each victim.

Initial Notification - It is critical that the FLO is designated as quickly as possible after the death. If possible, this person should attend the initial notification of death visit, which will allow the FLO to start building a relationship with the family. If this is not possible, the name, Nextel and/or telephone (cell) numbers should be given to the family prior to leaving the initial notification visit.

Family Planning Meeting - As soon as it is practical after the notifications (12 to 24 hours), it is important that the FLO schedule a Family Planning Meeting. The decisions made at this meeting will provide important information to the planning and logistics effort as we prepare for an honorable service(s) for our fallen comrade(s).

The meeting will be difficult for both the family and the FD team, but it will be an important step in the eventual recovery of the family.

For this meeting, our Department should be represented by the following:

1. FD Family Liaison Officer
2. Assistant Family Liaison Officer (friend of the family)
3. The family's religious representative, or our FD Chaplain

At this meeting, the family should decide how many people will represent them. A word of caution, this will most likely be an emotional meeting, the fewer members present the more constructive the meeting. A large group could make the painful process more difficult to manage.

<u>Always keep in mind that we are there to facilitate the wishes of the family.</u>

It is important that we .first explain all options to the family regarding service types and FD involvement before any decisions are made. The FLO must be prepared to discuss all aspects of the funeral process and counsel the family in its decisions.

One of the most important decisions that will need to be reached is the sight of the memorial/funeral service. Explain to the family that a traditional fire department service could bring 4,000 to 5,000 mourners, thus requiring a large venue.

Explain that our Department is ready to organize such a large service. Let the family know that if a decision is made to proceed with a traditional line of duty service that the family will be consulted on every detail, if desired.

The FLO should explain what a traditional Fire Department funeral includes:

1. Flag draped casket
2. Casket carried on FD apparatus
3. FD - pallbearers (8) and color guard
4. Apparatus procession (HPFD and outside agencies)
5. Honor Guard at viewing
6. Bagpipers
7. Last alarm ceremony
8. 21 gun salute
9. Ladder arch
10. Bugler playing taps
11. Eulogy and speeches by Chief, Union, Politicos

Be prepared for the potential of being blamed for the loss of the loved one. It is very natural for people to find escape goats in a time of extreme grief. There is always a possibility that the family will refuse all FD assistance. If this happens calmly state, "we respect your wish." Also advise them that it is our Department's intent to memorialize our firefighter with a service that will be held in Hanover Park and that they are welcome to attend. Explain that this service is not meant to bypass the family's wishes, but that it is extremely important to our grieving firefighters and the fire service to properly pay tribute to one of our own.

Remember, some religions require that the deceased is buried or cremated within a three-day period of time. If these restraints are present, it becomes even more important that the process moves rapidly.

It is important to advise the family that thousands of firefighters will come to pay their respects.

The following pages will give you a work sheet to follow as you precede though this process.

FAMILY PLANNING CHECKLIST

1. Mortuary to be used after coroner's autopsy: (Have suggestions if no preference)

   Name _____

   Address _____

   Telephone # _____

2. Would the family like a formal FD service? Explain what all this would entail.

   Yes ____ No ____

3. Is there a preference? Burial ____ Cremation ____ Other ____

4. Has a cemetery plot been already purchased? Yes ____ No ____

   Location _____

   If no, preferred location _____

5. Will there be a Vigil/Viewing (usually one to two days prior to Memorial Service)

   Location _____

   Date _____

   Time _____

6. Nature of Memorial Service

   a. Religious preference, if any _____

   b. Open or closed to public? Open _____ Closed ____

c. Location (large area if open service, Church, Synagogue, Arena, Terrace Theatre, outside.)

Name _____

Location _____

Date _____

Time _____

d. Open or closed casket? Open _____ Closed ____

7. Is there a religious requirement for burial time frame? Yes ____ No ____

If yes, when will burial or cremation have to be completed by _____

8. Burial (graveside) service? Yes ____ No ____

a. Location _____

b. FD involved? Yes ____ No ____

9. Ask if the FD can assist with out-of-town family arrangements.
   a. Transportation
   b. Lodging

10. Ask if there are preferred pallbearers, and that eight will be needed in total. If no preference is made, assure the family that the FD will select the necessary and appropriate individuals.

Preferred Names

_____ _____

_____ _____

_____ _____

11. FD needs family contact numbers.

Name	Relationship	Telephone #

12. Are there preferred scriptures?

13. Is there preferred music?

14. Are there preferred speakers?

15. Obtain all articles of clothing that the deceased will wear and deliver them to the funeral director.

16. Obtain recent photographs of the deceased for the Memorial Officer and PIO.

AFTER CARE

It is the responsibility of the Hanover Park Fire Department to assist the surviving family(s) during their recovery from the devastating event of a line of duty death. There will be many details, paper work, and steps that our organization can assist the family with. This assistance may extend over a length of time.

The Family Liaison Officer is charged with providing the necessary assistance. This officer may need to select individuals with special expertise to assist in this function.

After care may require a generous time commitment, but as details are handled the work load will diminish.

The surviving family should always be considered one of our own. This is what we would like the Department to do for our families if we were the fallen firefighter.

After care responsibilities include, but are not limited to:

1. Assisting the family(s) with the completion of all forms for benefits:
   a. FD
   b. State
   c. Federal
   d. Insurance
   e. Deferred Compensation
   f. Assisting with taxes

2. Review of all bills before payment by survivors for legality, honesty, and accuracy. This should include last illness, previous debts, and funeral expenses. Some bills may be covered by insurance, or otherwise not legally due.

3. Change of titles and bank accounts

4. Grief counseling

5. Referral to the Fallen Firefighters Foundation:
   a. Support groups
   b. Fallen Firefighters Memorial Celebration - Maryland

6. Invitations to FD functions: This is important - The family should never feel that they are not still included in our FD family.

7. At some point the deceased's locker will need to be cleaned out and the contents returned to the family. It is the FLO's responsibility to do this. It is advisable that the contents are screened for inappropriate material prior to sending to the family.

8. Any other needs

PUBLIC INFORMATION GROUP

The Public Information Group is established primarily to coordinate and disseminate all information regarding a Line of Duty Death.

The Group Leader will report directly the Planning Manager during the service preparation phase.

RULE NUMBER ONE - WE RELEASE NO NAMES OF INJURED OR DECEASED FIREFIGHTERS PRIOR TO THE NOTIFICATION OF NEXT OF KIN.

Think of how tragic it would be if the media informed the family of the loss.

The responsibilities of the Group include:

1. The coordination and/or presentation concerning all media contacts
   a. Interviews
   b. News conferences
   c. Written news releases

2. Notification of the death and pertinent information to:
   a. Village Safety Officer - who will contact OSHA
   b. Local Union
   c. Associated Fire Fighters of Illinois (AFFI)
   d. IAFF
   e. IAFC
   f. National Fallen Firefighters Foundation
      Telephone (301) 447-1365, FAX (301) 447-1645
   g. Public Safety Officers Benefit Program
      Telephone (888) 744-6513, FAX (202) 307-3373
   h. President
   i. Governor
   j. Senators - State and Federal
   k. Representatives - State and Federal

3. Rapid notification to important State and Federal politicians is very important if you desire their participation. They need as much lead time as possible to adjust their schedules.

4. Establish information telephone numbers for:
   a. Recorded information
   b. Live contact person

5. Develop a complete biography of individual(s) and recent pictures to be used:
   a. For press
   b. Ceremonies (collogue, portraits)

6. Preparation of a press kit that will include:
   a. Bio(s)
   b. Pictures
   c. Service information
   d. Maps

7. Organization of all media coverage at any/all service(s)
   a. Consider the use of pool coverage
      1) Notify the Radio Television and News Association (1-818-986-8168)
      2) Notification needs to be done ASAP
   b. Manage media viewing area at service and burial. They should not be in a position that would detract from any service in any way.
   c. Work with the media, not against them. Good coverage will help in the tribute to our fallen comrade.

8. Preparation of printed service programs for:
   a. Viewing
   b. Memorial

9. Coordinate with FD video section for taping of events.

10. Manage VIP arrangements:
    a. Airport pickup
    b. Transport
    c. Lodging

11. Coordinate with Family Liaison if the family would like any of the following:
    a. Set up trust fund(s)
    b. Charity donation in-lieu of flowers

12. Maintain complete phone logs to avoid duplication.

13. Collect appropriate photos.

14. Have a shadow box constructed for displaying at any/or all services. It should contain:
    a. Badge
    b. Hat hardware
    c. Patches
    d. Photo

15. Have a video segment prepared, if appropriate, for memorial.
    a. Friends
    b. Supervisors
    c. Pre-existing video

16. If additional PIO assistance is necessary, contact the Police Department for their assistance.

17. Request letters from top political people who are unable to attend. These can be read at the service.

18. Supply printed PIO badges to those personnel who will be working at any event.

U.S. Fire Administration

Firefighter Autopsy Protocol

March 2008

FEMA

U.S. Fire Administration

Mission Statement

As an entity of the Federal Emergency Management Agency (FEMA), the mission of the U.S. Fire Administration (USFA) is to reduce life and economic losses due to fire and related emergencies, through leadership, advocacy, coordination, and support. We serve the Nation independently, in coordination with other Federal agencies, and in partnership with fire protection and emergency service communities. With a commitment to excellence, we provide public education, training, technology, and data initiatives.

Firefighter Autopsy Protocol

Jeffrey O. Stull
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Austin, Texas

March 2008

Any opinions, findings, conclusions, or recommendations expressed in this publication do not necessarily reflect the views of the Department of Homeland Security or the U.S. Fire Administration.

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Overview

The Firefighter Autopsy Protocol has been extensively revised since its original 1994 edition. In this new protocol, a number of additional areas of information have been provided to take into account emerging issues and new technologies as applied to the conduct of autopsies. As stated in the report, it is recommended that autopsies be performed for all firefighter fatalities where a line-of-duty death has occurred. It is further recommended that an autopsy be performed when a non-line-of-duty death may be linked to a line-of-duty exposure.

Specific sections have been provided in this report as background and areas of information as related to the conducting of autopsies. General autopsy procedures must be supplemented with additional analyses and reviews in order to ascertain specific causes and mechanisms of death and to add to the body of knowledge for understanding firefighter fatalities which, in turn, helps to prevent future firefighter fatalities. The protocol gives specific attention to several areas, where current autopsy practice may be supplemented with additional evaluations and considerations. Examples of these supplemental factors include

- evaluation of victim work history with specific attention to prior exposures;
- examination of personal protective equipment (PPE) for relating effects of clothing and equipment on individual parts of the body, particularly in cases of trauma and burn injury;
- details in the physical examination for identifying signs of smoke asphyxiation and burn injury as contributing causes of firefighter fatality;
- implementation of appropriate carbon monoxide and cyanide evaluation protocols as part of the toxicological evaluation; and
- detailed toxicological evaluations where hazardous atmospheres have been encountered.

The utility of this specific firefighter autopsy protocol is intended to advance the analysis of the causes of firefighter deaths to aid in the development of improved firefighter health and safety equipment, procedures, and standards. It also is critical in helping to determine eligibility for death benefits under the Federal government's Public Safety Officer Benefits (PSOB) Program, as well as State and local programs. Lastly, implementation of this protocol will increase interest in the study of deaths as related to occupational illnesses among firefighters, both active and retired.

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I. BACKGROUND

The U.S. Fire Administration (USFA) is committed to improving the health and safety of firefighters. This mission has created an accompanying interest in learning about the causes of firefighter deaths and injuries. In the process of researching firefighter deaths, it was determined that forensic medicine had no standard protocol that would assist a coroner or medical examiner specifically in determining the cause of a firefighter death. Many purposes for firefighter autopsy are related to ensuring benefits in addition to providing an improved understanding of fireground hazards and the effectiveness of firefighting equipment.

In 1993, the USFA initiated a project to develop a standard firefighter autopsy protocol. Experts in forensic pathology, toxicology, epidemiology, and medicolegal aspects of autopsy, as well as representatives of several national fire service organizations, were selected to serve as a Technical Advisory Committee, to provide expertise and guidance for development of the new autopsy protocol. The first firefighter autopsy protocol was finalized in 1994 and disseminated in 1995. This protocol effectively served the forensic professional and provided a basis for examining firefighter deaths more consistently.

In 2004, a revision of the firefighter autopsy protocol was undertaken to further refine and update autopsy procedures to account for new types of analyses and concerns that have arisen with respect to the conducting of firefighter autopsies. A second Technical Advisory Committee, with membership similar to the first, was formed to help guide and review the modifications. The new changes and improvements in the autopsy protocol are represented in this publication.

The consensus of the Technical Advisory Committee is reflected in the new protocol. This protocol is intended to provide guidance to medical examiners, coroners, and pathologists on uniform recommended procedures for investigating the causes and contributing factors related to firefighter deaths. The protocol recognizes and addresses those attributes of firefighter casualties which distinguish them from casualties in the general population, as well as from civilian fire casualties. These differences include the use of protective clothing and equipment, prolonged exposures to the hazardous environment, and specialized training and duties.

The accompanying documentation is intended to describe the need for a revised autopsy protocol, the situations that led to its development, and the major issues that are related to it.

I.1 Scope of the Problem

Firefighting has been described as one of the Nation's most hazardous occupations. The USFA estimated that the number of firefighters in 2005 was 1,136,650, comprising 313,300 career and 823,350

volunteer firefighters.[1] This figure included only those career firefighters working for public municipalities rather than for private fire brigades or for State or Federal government.

The NFPA defines on-duty fatalities as follows (Fahy, 2007):

On-duty fatalities include any injury sustained in the line of duty that proves fatal, any illness that was incurred as a result of actions while on duty that proves fatal, and fatal mishaps involving non-emergency occupational hazards that occur while on duty. The types of injuries included in the first category are mainly those that occur at a fire or other emergency incident scene, in training, or in crashes while responding to or returning from alarms. Illnesses (including heart attacks) are included when the exposure or onset of symptoms occurred during a specific incident or on-duty activity.

According to reports by the NFPA[2], 3,723 firefighters have lost their lives while on duty in the United States over the past 30 years (1977 through 2006); this includes the 343* firefighters who died at the World Trade Center in 2001. Excluding the World Trade Center firefighter deaths, the average number of firefighter fatalities approaches 113 per year. However, from a yearly average of 151 firefighter line-of-duty deaths in the 1970s, the average death rate has declined to 99 deaths per year since 2000. While the primary cause of line-of-duty fatalities remains sudden cardiac death, the number of such deaths per year has declined by about one-third; however, since the early 1990s the number of cardiac-related deaths has remained between 40 and 50 per year. Vehicular crashes remain the second-highest cause of line-of-duty fatalities.

Improvements in firefighter health and safety standards and practices, particularly in the areas of PPE, physical fitness, and training, are widely believed to be responsible for a significant downward trend in line-of-duty deaths during the past 30 years. Between 1977 and 2006, the Nation experienced a 43-percent drop in the annual number of firefighter line-of-duty deaths (see Figure 1). Notwithstanding the significant drop in firefighter deaths, too many firefighters die needlessly each year.

The statistical analysis of firefighter fatalities accounts for *how many* firefighters have died and, to some extent, explains *how* they died, but the available data do not explain *why* firefighters die. Interpreting data is made more complex by factors such as the declining number of structural fires and the year-to-year variation in number and severity of wildland fires. Moreover, a dramatic downward shift in the total number of firefighter deaths in certain years, such as 1992, 1993, and 2005, begs still more questions about what is being done correctly to prevent line-of-duty deaths.

Epidemiological studies of firefighter mortality conducted in various years provide interesting insights for comparing firefighter health and mortality rates to those of other population groups, but they, too, fall short of explaining conclusively why firefighters die, and especially why any particular firefighter dies. The interest in occupational health factors relates to the frequency of sudden deaths due to heart attacks, as well as chronic conditions which include respiratory disorders, heart disease, and cancer.

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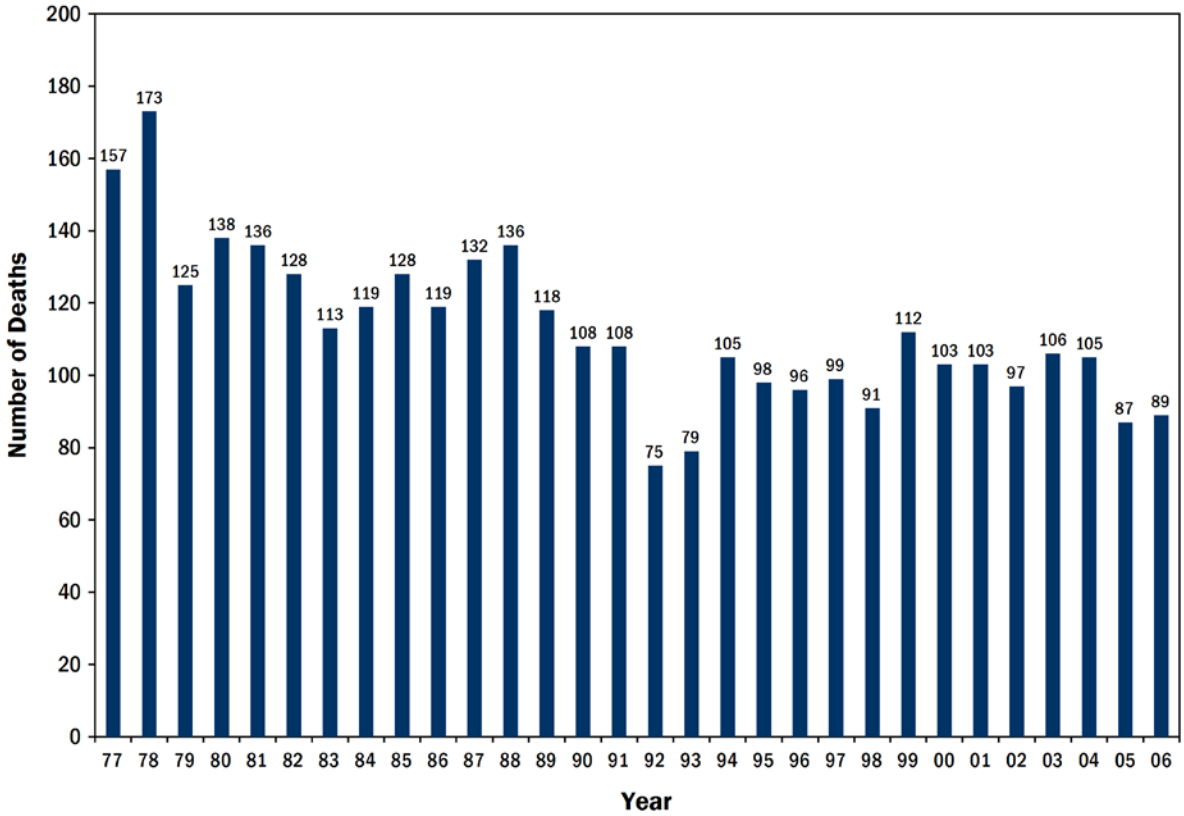
[1] USFA Web site—based on figures from the National Fire Protection Association's (NFPA) U.S. Fire Department Profile through 2005.

[2] NFPA *Journal*, July/Aug 2007

*The USFA shows 344 firefighters died on duty and the National Fallen Firefighters Foundation have honored 347 firefighters from the World Trade Center.

Figure 1. On-Duty Firefighter Deaths (1977-2006)[3]



I.2 Rationale for the Protocol

The autopsy protocol was developed to give guidance to qualified professionals on the specific procedures that will be most appropriate in performing an autopsy on a deceased firefighter. The recommended procedures are intended to address the complex relationship between the firefighter and the inherently dangerous work environment where the duties of a firefighter must be performed. **It has been assumed that the user will be qualified, skilled, and experienced in performing autopsies, as the protocol is intended only to provide guidance on the special considerations that should apply to a firefighter autopsy that go beyond standard autopsy practice.**

It is anticipated that the application of this firefighter autopsy protocol will lead to a more thorough documentation of the causes of firefighter deaths and achieve three goals:

1. It will advance the analysis of the causes of firefighter deaths to aid in the development of improved firefighter health and safety equipment, procedures, and standards.
2. It will help determine eligibility for death benefits under the Federal government's PSOB, as well as State and local programs.
3. It will address an increasing interest in the study of deaths that could be related to occupational illnesses among firefighters, both active and retired.

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[3] Fahy, Rita F., Paul R. LeBlanc, and Joseph L. Molis. *Firefighter Fatalities in the U.S.—2006*. Quincy: National Fire Protection Association, June 2007.

The work environment of the firefighter is undoubtedly one of the most inherently dangerous workplaces. To survive in that environment, the firefighter routinely uses protective clothing, respiratory protection, safety equipment, and standard operating procedures (SOPs) intended to reduce the level of risk, but which cannot eliminate all risks. It is extremely important, in the event of a failure of those protective systems, to fully and carefully determine what, if anything, may have gone wrong and how, if possible, similar occurrences may be prevented from happening again. An autopsy may provide some of the essential evidence to make those determinations.

Several areas of interest in the study of chronic health issues are addressed in Part III of this document. The specific issues relating to the determination of eligibility for death benefits are discussed in Part IV of this document.

NFPA 1500, *Standard on Fire Department Occupational Safety and Health Program*,[4] section 10.4.4 recommends, "If a member dies as a result of occupational injury or illness, autopsy results, if available, shall be recorded in the health data base." Appendix A-10.4.4 states, "The fire department should try to obtain autopsy or other medical information for all deceased employees or former employees. This information could be useful in establishing relationships between occupational factors and resulting fatalities at some time in the future. Autopsies for fire fatalities should be conducted and recorded according to a standard protocol." Annex B, Monitoring Compliance with a Fire Safety Occupational Safety and Health Program, Section B-2, Figure B-2 includes space for recording compliance with recording autopsy results in the health database.

I.3 Description of the Protocol

The Firefighter Autopsy Protocol is provided at the end of this section. The protocol is divided into the following sections:

- preliminary;
- initial examination;
- external examination;
- internal examination;
- toxicological examination;
- microscopic examination;
- summary of pathological findings; and
- conclusions.

The specific areas of procedures are described, but detailed step-by-step instructions are not provided as autopsy practice varies and changes with the specific circumstances of death.

[4] NFPA 1500, *Standard on Fire Department Occupational Safety and Health Program*. 2007 Ed. Quincy: National Fire Protection Association (617-770-3000; *www.nfpa.org*).

September 2007 Firefighter Autopsy Protocol

PROTOCOL	DISCUSSION
I. Preliminary A. Circumstances of Death 1. Line-of-duty a. Fire suppression b. Special operations (e.g., hazmat, technical rescue) c. In transit to emergency d. Other official activity 2. Non-line-of-duty a. Active firefighter, unrelated activity b. Former firefighter activity or exposure B. Medical Records Review 1. Fire department injury/exposure records a. Prior incidents b. Prior injuries and treatments 2. Current medical conditions/medications a. Prescribed b. Over-the-counter c. Administered by paramedics C. Complete Work History 1. Length of fire suppression duty 2. Other jobs held during fire service 3. Jobs held after fire service D. Scene Investigation E. Scene Photography 1. The body as discovered 2. The site after the body is removed 3. The body clothed at autopsy 4. The body after removal of clothing 5. Specific shots of body depending on type of injury F. Jurisdiction/Authority to Conduct Autopsy	Firefighters are subject to many uncommon occupational hazards, including toxic and superheated atmospheres; explosions; falls; crushing/penetrating forces; contact with fire, electricity, or hazardous materials; and extremely strenuous and stressful physical activities. The autopsy results may be essential to determine why or how a firefighter was incapacitated, how the activity related to the cause of death, and whether protective equipment performed properly. Having a clear picture of the nature of firefighting operations that were taking place (and to which the deceased was assigned) will assist in identifying possible mechanisms of injury. If the firefighter was reported missing, try to determine the time of last contact or the length of time between the initial report and the finding of the body. The fire department should have an officer or internal Line-of-Duty Death Investigation Team assigned to conduct a death investigation. Other investigators may include the police, the State Fire Marshal (or other State officials), and/or Federal/State agencies responsible for occupational safety and health, including the National Institute for Occupational Safety and Health (NIOSH). Consult with these officials as necessary. In conducting the medical records review, obtain any documents that pertain to the incident. Document the occupational history of the deceased, including the number of years assigned as a "line" firefighter, any history of unusual exposures (or changes in frequency of exposure) to hazardous substances or diseases, and any relevant occupational medical history. Finally, all recent medical history should be reviewed, including documentation of any attempts at onscene resuscitation.
II. Initial Examination A. Identification of Victim B. Document Condition of PPE 1. Refer to PPE diagram in Figure 8 and information in Appendix C for standardized nomenclature. Ppe description should include: a. Turnout coat b. Turnout pants c. Helmet d. Gloves e. Boots f. Self-contained breathing apparatus (SCBA) g. Personal Alert Safety System (PASS) h. Protective hood i. Clothing worn under turnouts j. Other PPE not listed above 2. Use photographs to enhance documentation (see Appendix C)	**Exercise caution when handling contaminated PPE, especially from hazardous materials incidents, as residue may be harmful to those involved in the autopsy. Gloves and other PPE should be used.** Ppe should be sealed in a plastic bag if fire accelerants or other volatile/toxic chemicals are suspected to be present; otherwise PPE should be air-dried and preserved for examination. (Do not store clothing wet.) Preservation of the original state of PPE, including clothing, is essential. Ppe should be considered as evidence, and handled according to the Special Incident Procedures in NFPA 1851, *Standard on Selection, Care, and Maintenance of Structural and Proximity Firefighting Protective Ensembles* (2008 edition). The Death Investigation Team should perform or assist in the evaluation/documentation of PPE condition and performance. Documentation of the chain of custody of the PPE is required, especially as it may be examined by a number of individuals; however, examinations should be limited if the condition of the clothing is fragile and will be further destroyed upon successive evaluations. Upon completion of any examination, PPE should be secured in an evidence storage area. (International Association of Fire Fighters. *Guide for Investigation of a Line-of-Duty Death*. Washington, DC, 2000).

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PROTOCOL	DISCUSSION
C. Maintenance of Custody of Equipment 1. Appropriate storage conditions 2. Chain of custody 3. Limitation of handling if clothing and equipment is fragile	Observations and photos recorded at the scene should indicate whether the deceased was found wearing SCBA and/or other PPE. If SCBA and PASS are user-controlled, were they properly activated or working at the time of discovery of the deceased? A swab from the inside of the SCBA facepiece may help in determining operability. A qualified specialist should inspect the PPE and note any damage. NIOSH can assist in the determination of any contribution of the deceased's SCBA to the death. Ppe manufacturers may be able to assist in evaluating damage, but PPE should not be returned to the manufacturer for examination (because of concerns about product liability). Breathing apparatus filter cartridges, if any, should be retained.
III. External Examination A. Document Condition of Body 1. Photograph 2. Radiograph 3. Record color of fingernails 4. Record appearance of blood B. Document Evidence of Injury C. Document Evidence of Medical Treatment D. Collect Evidence from External Surfaces 1. Swabs of nasal/oral soot or other substances* 2. Hair* 3. Injection sites E. Collect Vitreous Fluid F. Document Burns* 1. Location 2. Degree 3. Etiology 4. Percentage of body surface area (BSA) G. Biopsy Skin Lesions	A complete initial examination of the body is important prior to the full autopsy, including X-rays, to help with identification, locate equipment, and look for nonobvious causes of death. Firefighters are trained to provide emergency medical care for fire casualties. Of particular importance is that resuscitative efforts for fellow firefighters are likely to be heroic and prolonged. This fact should be taken into account when examining the body for evidence of medical intervention and when interpreting the results of blood gas assay. Note the presence of soot or other unidentified substances on the skin and place samples (swabs) in a sealed container. Certain internal samples (such as soot swabs and vitreous fluid) which can be done before the body is opened are taken at this point because collection can be accomplished in a more controlled manner, thus reducing the potential for cross-contamination of the surfaces. Hair samples should be about the thickness of a finger, pulled out so as to include the roots, tied around the middle, with the proximal and distal ends marked, and stored in a plastic evidence bag. Match burn injury locations to areas of heat/thermal damage on clothing and equipment. Vitreous fluid should be taken from both eyes. Vitreous fluid can be used to corroborate blood alcohol levels.
IV. Internal Examination A. Document Evidence of Injury B. Document Evidence of Medical Treatment C. Describe Internal Organ System D. Collect Samples for Toxicologic Analysis 1. Blood (2 x 20 cc red- and grey-top tubes) 2. Urine (20 to 30 cc) and/or trimmed bladder 3. Bile (all available) or gallbladder (if bile unavailable)	Soot swabs should be obtained from the upper and lower airways as well as from the inside of the SCBA facepiece. These will assist in the determination of SCBA usage and operability. Note any unusual odors/colors of anything found during the internal examination. Fresh-frozen samples of vital organs should be taken and retained a minimum of 90 days, preferably longer, as storage space permits. An area of growing interest is the cancer rate of firefighters. Potentially cancerous tissue should be biopsied and saved. Additionally, histological type and the exact location of the tumor (if site-specific) within an organ should be documented in detail.

*May not be required for clear traumatic death

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PROTOCOL	DISCUSSION
4. Cerebrospinal fluid (up to approx. 30 ml) 5. Soot swabs from airway* a. Tracheal b. Bronchial 6. Representative sampling of gastric and duodenal contents (50 g; note total amount) 7. Take and retain fresh-frozen samples a. Lung 100 g b. Kidney 100 g c. Liver 100 g d. Spleen 100 g e. Skeletal muscle (psoas or thigh) 20 g f. Subcutaneous fat 20 g g. Section of bone with marrow (3-4 cm) h. Brain 100 g 8. Additional specific samples to be taken: a. Tied-off lower lobe of right lung (store in arson debris paint can) b. Peripheral blood from leg vein (fluoridated and red-top tubes) c. Any specimens taken in field or during hospital resuscitation d. Sample hematomas e. Any other sites should be labeled	In the case of incinerated remains, bone marrow or spleen may be the only source of tissue for toxicological studies, especially for those establishing carbon monoxide levels. Request determination of carbon monoxide content and of carbon monoxide-binding capacity of mixture from water extract of spleen, kidneys, or other organs. Gastric and duodenal contents should be representative. Solid dosage forms should be removed, counted, and analyzed. When taking lung samples, use the right lung because aspirated foreign materials have a greater propensity to lodge in the right lung. Soot particles and other heat injuries indicate that the victim was breathing in fire. Absence of soot particles does not prove that the victim was already dead when exposed to the fire.
V. Toxicological Examination A. Urine Screen/Analysis 1. Volatile compounds (e.g., benzene, hydrocarbons including accelerants, ethanol) 2. Psychoactive substances (e.g. opiate derivatives, marijuana metabolites, cocaine metabolites, stimulants, phencyclidine) B. Blood Analysis. 1. Carboxyhemoglobin, methemoglobin, sulfhemoglobin 2. Volatile compounds (see A.I. above) 3. Other (e.g., hydrocyanic acid, flouride) 4. Confirm results of positive urine screen C. Subcutaneous Fat Analysis 1. Organic compounds, including: a. Herbicides b. Pesticides 2. Polychlorinated biphenyls (PCBs) D. Soot Screen (from swabs)* 1. Metals, including: a. Arsenic b. Antimony c. Lead	The toxicologic analysis performed for firefighters should be of a higher order than that performed for civilian fire casualties. In addition to ascertaining blood levels of various toxic products that are commonly found in a fire environment, it is beneficial to know about the presence of any judgment-impairing substances. This may be important in the determination of eligibility for death benefits as well as for determining causality. Determinations of asphyxiation from carbon monoxide levels should take into account victim medical history (i.e., smoking) in addition to other types of exposure. If victim survived carbon monoxide poisoning for several hours, portmortem samples usually will fail to show presence of carboxyhemoglobin. Blood taken at time of admission to hospital still may be available and of particular value. Determination of specific levels of metals, organic compounds, and gross particulate matter should be conducted because firefighter exposure to these substances is believed to be greater than that for civilians. Additionally, this information may yield important clues about the cause, manner, and mechanism of firefighter death. Use vitreous fluids or bile to confirm presence of ethanol in either blood or urine.

*May not be required for clear traumatic death

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PROTOCOL	DISCUSSION
2. Organics, including: a. Pesticides b. Herbicides c. Vinyl chloride d. Acrylonitrile e. Acrolein 3. Particulate analysis (e.g., asbestos)	Use caution when noting the presence of hydrocyanic acid, as it can be produced by bacterial decomposition within the tissues of the deceased. Check for the presence of PCBs and polynuclear aromatic compounds in the subcutaneous fat, as this will help in the determination of a history of exposure.
VI. Microscopic Examination A. Findings of Microscopic Examination	Representative samples of all organs and body systems should be collected. The sections should be microscopically examined for malignant neoplasms and other abnormalities, including suggestive premalignant changes
VII. Summary of Pathological Findings A. Medical Facts 1. Correlation	State objective findings related to gross and microscopic examinations. Correlate physical circumstances, toxicological analyses, and other investigative studies to pathological findings.
VIII. Conclusions A. Discrepancies 1. Inconsistent observations 2. Differences between death certificate and subsequent findings B. Conclusions 1. List diagnoses on a separate page 2. Cause and manner of death	Include determination of **cause, manner, and mechanism** of death. Describe discrepancies between evidence collected or observations of eyewitnesses and the autopsy findings.

II. Medicolegal Autopsy Procedures in the United States

The need to investigate and understand the cause of death, particularly when it occurs under unusual, confusing, or ambiguous circumstances, is almost universal. Nearly every country has established requirements for the medicolegal investigation of unforeseen, unnatural, or violent deaths, usually including workplace accidents and job-related deaths. However, unlike some other industrialized nations, no national system of death investigation exists in the United States. Death investigation in the United States falls under the authority of State and local officials

Legal structures governing death investigation vary considerably among the 50 States, the District of Columbia, and the territories. Depending on the jurisdiction, the official responsible for determining the cause, manner, and mechanism of death may be a coroner or medical examiner. Eleven States operate coroner systems (either district or county coroners). Eighteen States use a State, district, or county medical examiner system. Eighteen States operate under a mixed system of State or county medical examiners and county coroners/medical examiners.[5] Appendix A lists the specific practices used in each State.

Most firefighter deaths are investigated as unusual or unforeseen deaths according to State laws and regulations, and a high level of discretion is afforded to coroners and medical examiners in the manner of fulfilling their duties and responsibilities. Only one State, Maryland, specifically requires a medicolegal investigation of all firefighter deaths and, in fact, has a staff epidemiologist to study firefighter deaths. Other States such as New Jersey have designated the Division of Fire Safety as the lead agency for investigating fire service accidents, but have established no autopsy requirements.

Three publications attempt to organize and describe medicolegal autopsy requirements in the United States:

1. Wecht, C.H. United *States Medicolegal Autopsy Laws*. 3rd ed. Arlington: Information Resources Press, 1989.
2. Combs, D.L., R.G. Parrish, R. Ing, et al. *Death Investigation in the United States and Canada, 1995*. Atlanta: Centers for Disease Control, U.S. Health Services, 1995.
3. Ludwig, Jurgen. *Autopsy Practice*. 3rd ed. Totowa: Humana Press, 2002.

Notwithstanding the differences among the various systems, all death investigation systems are intended to respond to questions of who died, how and why a death occurred, and (as applicable) who is responsible for the occurrence. This information, in turn, may be used in legal proceedings; to compile vital statistics; to evaluate medical care and treatment; and to compile factual information on clinical, anatomical, pathological, physiological, and epidemiological subjects for research purposes.

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[5] *www.cdc.gov/epo/dphsi/mecisp/death_investigation_in_the_united_states_and_canada.htm*

II.1 When Is an Autopsy Required?

An autopsy is not performed as a part of every death investigation. In most cases, the determination of the need to perform an autopsy is a discretionary responsibility of the coroner or medical examiner. The issuance of a death certificate does not require an autopsy, and only a death certificate is needed to qualify for most insurance and death benefit programs. The coroner or medical examiner may determine that no autopsy is required in any situation where there is sufficient other evidence to make conclusive determinations on the cause and manner of death. In past years, an autopsy typically was omitted when the firefighter death was believed to have been caused by natural causes, such as cardiac ischemia, even when it occurred on the scene of, or en route to or from, a fire or emergency incident (see Goode, 1990). However, autopsies are now recommended for all firefighter deaths, and the International Association of Fire Fighters (IAFF) and other organizations encourage this practice. NIOSH's Fire Fighter Fatality Investigation and Prevention Program (FFFIPP) uses autopsy results in the analysis of firefighter fatalities and specifically recommends that an autopsy be performed even if the cause of death is presumed to be natural. Section III.3, Investigation of Line-of-Duty Deaths, provides additional details on this NIOSH program.

Many coroners and medical examiners have had to limit the number of autopsies performed because of cost and time constraints. Fiscal pressures have increased as the number of death investigation cases has increased, particularly those involving violent deaths. The cases in which an autopsy is most likely to be omitted include those where there is a known and undisputed cause of death without suspicion of criminal activity; line-of-duty deaths often fall within these parameters. Autopsies are sometimes omitted because of the religious or personal preferences of the deceased and his or her family.

The failure to conduct autopsies appears to be of significant concern throughout the medicolegal community. Performing autopsies, even in cases of prolonged illness or involving individuals with prior medical histories, would be valuable in conclusively determining the cause of death, gaining a more detailed understanding of injury and disease processes, and evaluating the quality of medical care. According to some in the death investigation profession, a decline in the level of interest in pathology and forensic pathology among medical students has led to a shortage of trained professionals to conduct these procedures.

Autopsies usually are performed to establish or verify the cause of death, or to gather information or evidence that would be helpful in an investigation. Without an autopsy, specific causes, contributing factors, and underlying conditions may go undiscovered and unreported. In the case of firefighter fatalities, this lack of information may hamper industry and fire service understanding of the hazards of firefighting significantly, and limit the ability to develop more effective ways to prevent firefighter deaths and injuries.

II.2 Definition of Manner, Cause, and Mechanism of Death

Because the firefighter death certificate and autopsy results have legal ramifications, it is important to clarify the differences among manner, cause, and mechanism of death, and especially to recognize that various entities may use the terms "cause of death" or "nature of death" in ways quite different from their appropriate use in the medicolegal autopsy.

- ***Manner of death*** refers to classification of the death as natural, accidental, homicidal, or suicidal.[6]

The phrases "cause of death" and "mechanism of death" often are used interchangeably by clinicians and laymen, but they are not synonymous:

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[6] Ludwig, Jurgen. *Autopsy Practice.* 3rd ed. Totowa: Humana Press, 2002.

- ***Cause of death*** is the "disease or injury that sets in motion the physiologic train of events culminating in cerebral and cardiac electrical silence."[7]
- ***Mechanism of death*** is the "physiological derangement set in motion by the causes of death that leads to cessation of life."

Thus, for example, a firefighter who dies from a cardiac event at the scene of a fire may have "atherosclerotic heart disease" as the "cause of death" and "ventricular arrhythmia" as the "mechanism of death."

II.3 Chain of Custody and Documentation

Careful documentation is essential both because of the legal ramifications, and the medical and epidemiological issues surrounding firefighter deaths. Documentation to maintain the chain of custody is of particular importance in medicolegal cases. The following recommendations are made for the information that is included with specimens that are submitted for toxicological studies:

- information that identifies each specimen, including the site where taken;
- specific details about the requested analytical test methods;
- relevant information about circumstances surrounding the specimen (e.g., emergency room measures that could affect certain drug levels); and
- signatures that document the chain of custody.

Shipping of autopsy specimens requires special consideration. Specimens must be packaged appropriately to guard against breakage and to ensure the integrity of the samples. Tissues or body fluids submitted for analysis for volatile substances should be packaged in glass rather than plastic, although plastic may be acceptable for other samples. Any caps, lids, stoppers, or other loose parts of a container should be taped into place. The materials used in shipping the specimens must not compromise the samples (e.g., paraffin blocks should be not be wrapped in cotton because cotton fibers could adhere to the paraffin). Containers with wet or frozen samples must be packaged inside a second container that includes material sufficient to absorb all liquid in case of leakage. Frozen samples require ice or dry ice around the sample and in the secondary container; an insulated mailing container is necessary.

The *Autopsy Handbook*[8] specifies that "medicolegal material is sent by messenger, registered mail, or air express" and that specimen labels (inside the shipping container) include the following information:

- name and address of sender;
- name and address of recipient;
- description of container and source and nature of contents;
- tag stating that the shipment is evidence; and
- detailed requests for specific examinations.

Containers should be sealed with a tamper-proof method, such as with sealing wax imprinted with the sender's thumbprint. The outer mailing container should have address labeling and also appropriate labels such as:

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[7] Ibid.

[8] Ludwig, op.cit.

- Biohazard;
- Perishable Material;
- Fragile, Rush, Specimen; and/or
- Glass, Handle with Care.

Postal regulations must be followed. The publication "Domestic Mail Manual" is updated by the Postal Service periodically. It is recommended that the receiving party be notified by telephone or electronic mail when a shipment is initiated.

II.4 Retention of Autopsy Specimens and Paperwork

Autopsy specimens should certainly be retained until the investigations into the firefighter's death have been completed and any litigation surrounding the firefighter's death has been resolved. After that point, specimens and paperwork should be retained for a significant period of time. Recommended minimum storage times, **following the completion of the investigation**, are listed in Table 1.

Table 1. Recommended Minimal Storage Times for Autopsy Specimens and Paperwork[9]

Sample Type	Minimum Retention Time
Wet tissues	6 months
Accession records	1 year
Quality assurance documents	2 years
Paraffin blocks and photographs	5 years
Autopsy authorization forms	7 years
Autopsy reports and slides	20 years

It is important to recognize that each State or local medical examiner or coroner's office may have retention times that are very different from the recommendations provided above. In fact, these offices may have procedures in place that require automatic disposal of certain records or samples that will require extraordinary efforts on the part of fire departments or other individuals for continued storage and maintenance. Of principal concern is the retention of samples until after any investigation is completed. Further, certain statutes of limitation for potential litigation are likely to extend beyond the investigation period. In these instances, it is important to file a request for extending the retention times for specific samples with the State or local medical examiner or coroner. In certain circumstances, it may be necessary to identify alternative storage locations that meet all the storage requirements for autopsy samples complete with detailed chain of custody.

[9] Ibid.

III. Occupational Aspects of Firefighting of Specific Concern to Autopsy

Firefighter fatalities often result from complicated scenarios. Due to the nature of the occupation, a firefighter's death could be caused by a wide variety of single factors or a combination of several factors. For example, a firefighter could die from a stress-induced heart attack caused by simple over-exertion; or a firefighter could die from asphyxiation which is actually caused by the failure of his or her breathing apparatus; or a firefighter could die from hypothermia, resulting from being trapped in a structural collapse while fighting a fire on an extremely cold day. A firefighter's death could be caused by the inhalation of toxic products of combustion, burns, traumatic injury, exposure to hazardous materials, radiation, a variety of other singular causes, or a combination of factors.

A better understanding of the actual causes of firefighter deaths, including all of the causal factors, will require a thorough examination of the protective clothing and equipment that are involved in the incident, a detailed analysis of the situation, and the details, such as carboxy-hemoglobin levels and the presence of toxic products in the respiratory and circulatory systems, that can be obtained only through an autopsy.

III.1 Firefighter Death Classification

The USFA and the NFPA separately publish annual analyses of firefighter line-of-duty deaths. Although the two entities share information, they collect data independently. The NFPA identifies cases of firefighter fatalities through sources including newspaper reports and Internet sites such as firehouse.com. The NFPA then makes contact with the department (after the funeral) and collects information about the fatality.

To describe the mechanism of injury, the NFPA uses categories based on coding used in the 1981 edition of NFPA 901, *Uniform Coding for Fire Protection*. The NFPA studies incident reports and witness accounts as available, and then determines which classification best describes that individual fatality. The nine causal categories on which the system is based include

1. Fell/Slipped.
2. Struck by.
3. Overexertion/Strain.
4. Fire Department Apparatus Accident.
5. Caught/Trapped.
6. Contact with/Exposure to.
7. Exiting or Escaping/Jumped.
8. Assaulted.
9. Other.

In any particular year, the categories used in summary reports do not include all of the above categories. The NFPA analyst makes classifications based on the actual events for that year, and the reported causal categories may vary from year to year. In certain years, some categories which had extremely few events may be grouped into the "other" category.

While cardiac arrest and other stress-related fatalities are the leading cause of fireground deaths, this classification system does not differentiate the causes of cardiac and stress-related cases; all are classified

as "Overexertion/Strain." Although firefighting is widely recognized as a highly stressful occupation, the physiological and psychological effects of job-related stress have not been clearly established or differentiated, particularly as they affect mortality and morbidity.

The annual reports also describe firefighter fatalities according to the nature of the death (i.e., the medical cause of death), using the following categories:

- Sudden cardiac event
- Internal trauma
- Asphyxiation
- Crushing
- Burns
- Drowning
- Stroke
- Electrocution
- Hemorrhage
- Gunshot
- Aneurysm
- Fracture
- Heat stroke
- Pneumonia
- Other

Depending on the fatalities sustained for that year, the categories included in the report may not include all of those listed above. In addition, new categories may be created to reflect different circumstances.

Because the reported categories may vary from year to year, one must be careful when comparing results from year to year. For example, if there are several drowning deaths in one year, those would likely be reported as a separate category in the annual report;however, if there were only a single drowning in the next year, then likely that death would be included as part of the "other" category in that year's report. Therefore, upon request, NFPA is willing to analyze data for particular situations.

It should be noted that these categories do not correspond with International Classification of Disease (ICD-10, released July 2007) or SNOMED (Standardized Nomenclature of Medicine) cause categories. There are also new classifications of death and injury as the result of terrorism incidents that have been established by the National Center for Health Statistics of the Department of Health and Human Services.

III.2 Trends in Line-of-Duty Deaths

The overall downward trend in line-of-duty deaths has been driven primarily by the downward trends in deaths attributed to cardiac arrest and in deaths during fireground operations or while at the fire scene. Fireground deaths account for more than half of all firefighter duty deaths over the last 30 years; in 42.9 percent of the cardiac-related deaths, the firefighters' cardiac symptoms appeared during fireground operations. The downward trend in the number of fireground deaths has corresponded with a downward trend in the number of structural fires, although in recent years the death rate has continued to decline while the number of structural fires has held steady (see Figure 2). Death rates due to traumatic injuries (smoke inhalation, burns, and crushing or internal trauma) injuries remain a significant concern.

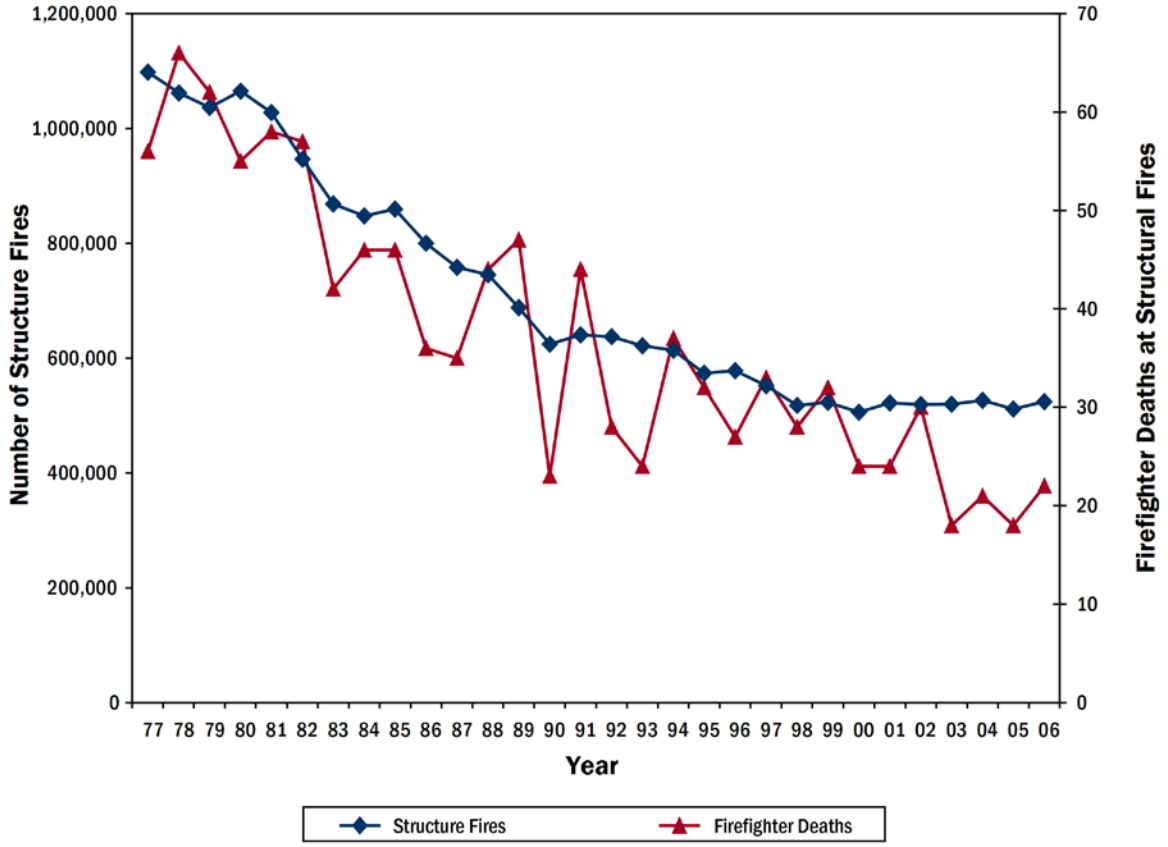
Other areas of concern for the period 1977 through 2006 include the following[10]:

- Wildland firefighting accounted for 338 fatalities, and aircraft crashes contribute significantly to this number.
- Road vehicle crashes accounted for 406 fatalities, mostly volunteer firefighters, and are the second greatest cause of firefighter fatalities.

[10] Fahy, Rita, Paul LaBlanc, and Joseph Molis. "Firefighter Fatality Studies 1977-2006." NFPA *Journal*, July/Aug. 2007.

- Falls from apparatus while en route to or from alarms accounted for 41 deaths in the first 10 years, but only 4 in the years 1999-2006 (and none in most of the 1990s).
- Training deaths accounted for 247 fatalities, and the number of deaths in the most recent decade is nearly twice that of the first decade in this time period.

Figure 2. Trend for Firefighter Deaths at Structure Fires (courtesy of NFPA)



Figures 3 to 5 show these trends for the period 1977 to 2006.

Sudden cardiac death leads all categories of line-of-duty deaths. Between 1977 and 1991, 45 percent of all firefighter deaths resulted from cardiac disorders, most from myocardial infarction. The proportion of deaths resulting from heart attacks has varied from 33.6 percent to 53.9 percent over the 15-year period. Fahy (2007) reports that the number of deaths has remained between 40 and 50 per year for the period since the early 1990s, although the year 2006 saw a record low of only 34 sudden cardiac deaths.

continued on next page

Figure 3. Firefighter Deaths in Aircraft Crashes Related to Wildland Fires (1977-2006) (courtesy of NFPA)

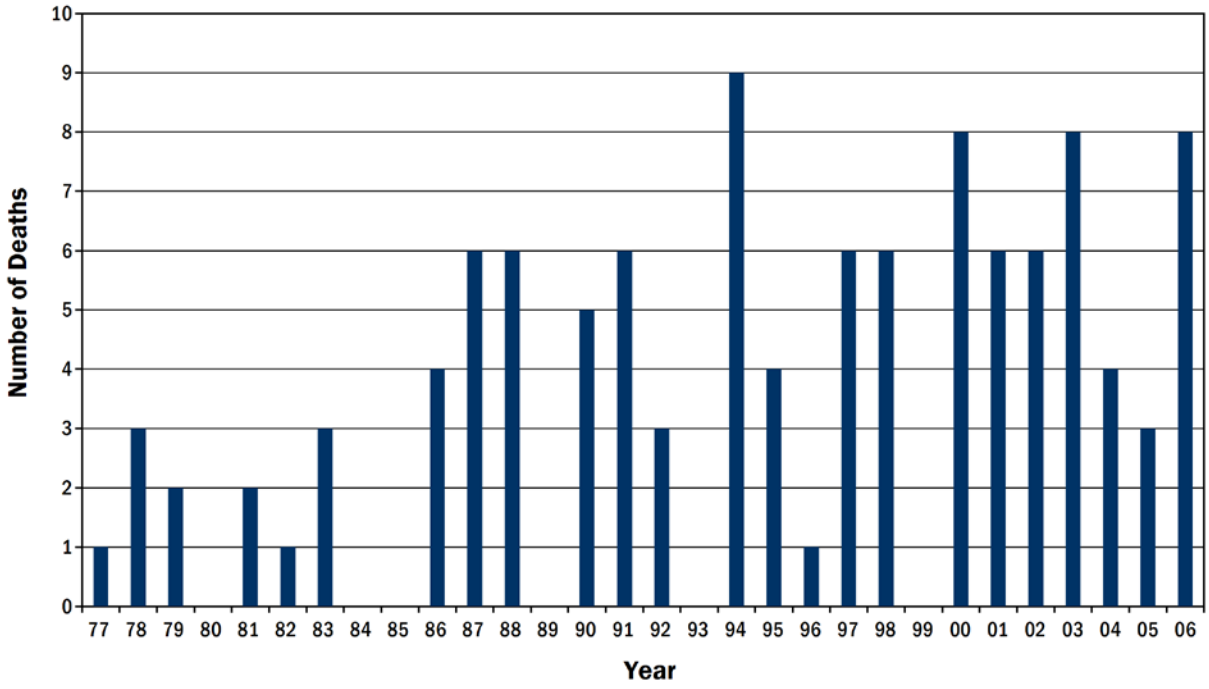


Figure 4. On-Duty Firefighter Deaths in Road Vehicle Crashes (1977-2006) (courtesy of NFPA)

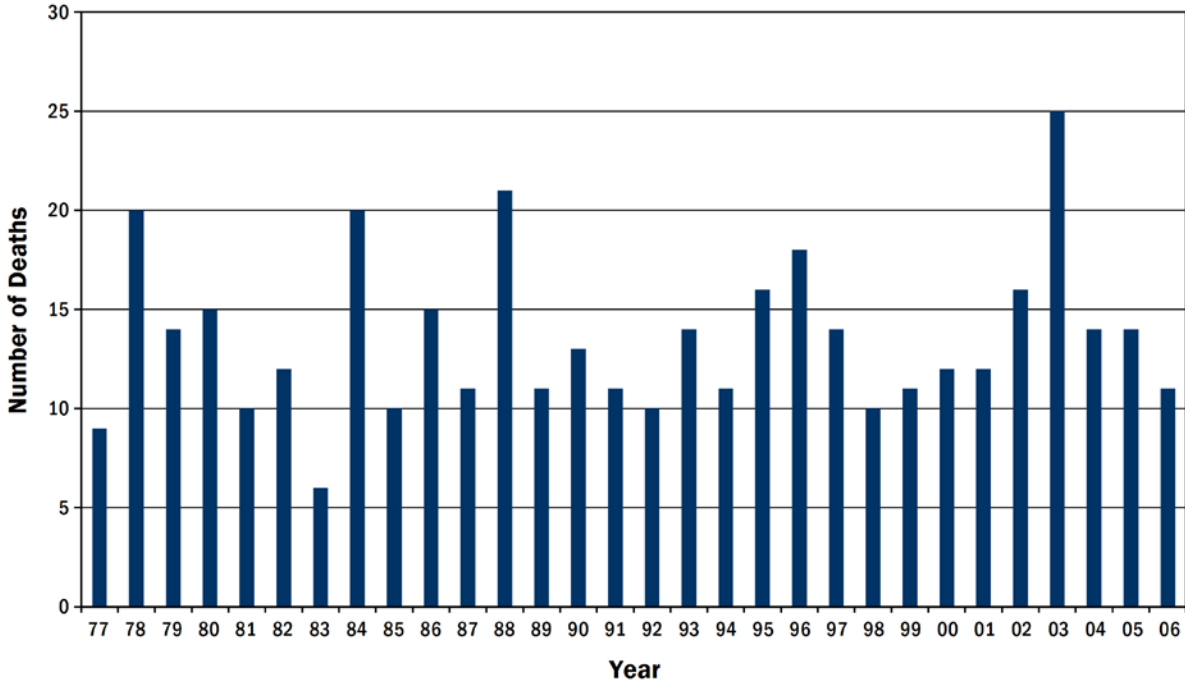
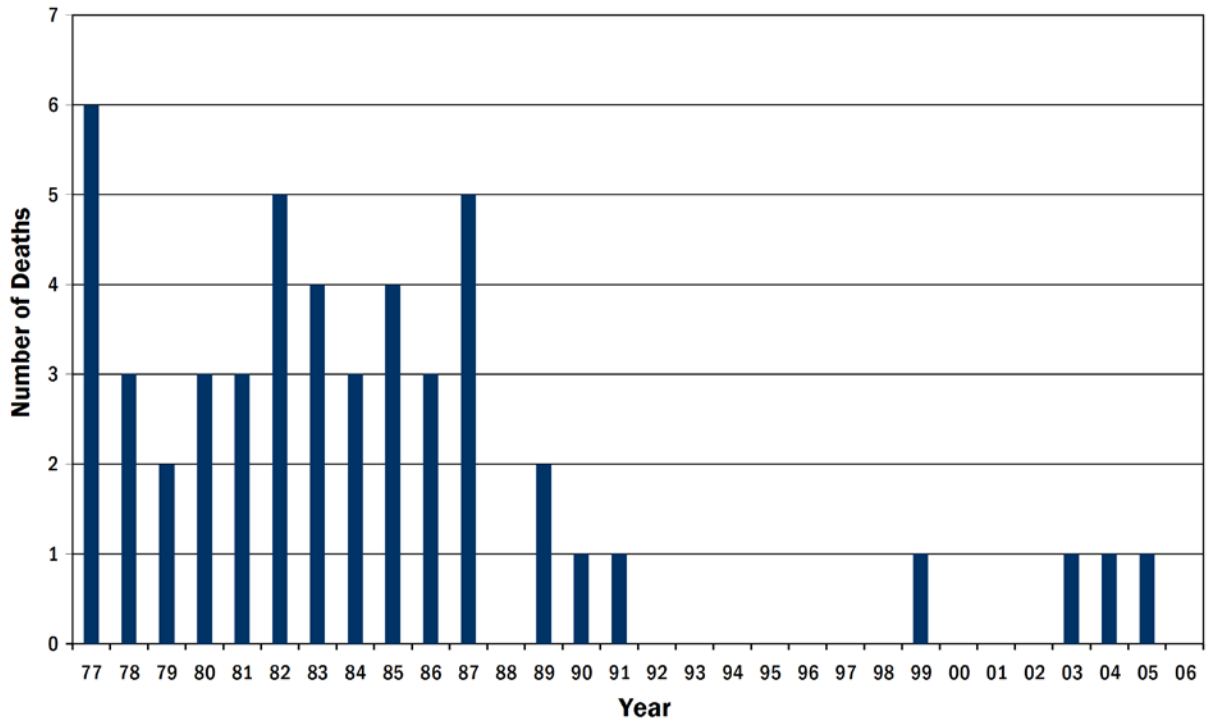


Figure 5. Deaths of U.S. Firefighters During Training (1977-2006) (courtesy of NFPA)



That same report points out that, according to NIOSH, "Firefighting activities are strenuous and often require firefighters to work at near maximal heart rates for long periods. The increase in heart rate has been shown to begin with responding to the initial alarm and to persist throughout the course of fire suppression activities." Fahy's report also refers to a study published this year by Kales, et al.[11]; in which the risk of dying during specific fire department duties was evaluated. The risk of death due to coronary heart disease was 10 to 100 times higher during firefighting activities than during nonemergency duties.

Fahy (1993) reported that an NFPA study of fatal firefighter heart attacks conducted for the USFA determined that about 40 percent of the firefighters who died on duty from heart attacks between 1981 and 1990 (and for whom medical documentation was available) had prior histories of cardiac ischemia, myocardial infarction, or coronary artery bypass surgery. An additional 39 percent had prior histories of acute atherosclerosis (defined as more than 50 percent occlusion); most of these cases involved occlusions greater than 70 percent. Any of these conditions could have represented sufficient cause for disqualification from continued firefighting duty under the provisions of NFPA 1582, *Standard on Comprehensive Occupational Medical Program for Fire Departments*, which was adopted in 1992.

The adoption of health maintenance and physical fitness requirements for firefighters is a controversial subject and the requirements of NFPA 1582 have not been widely adopted. This subject is further

[11] Kales, Stephanos, Elpidoforos Soteriades, Costas Christophi, and David Christiani. "Emergency Duties and Deaths from Heart Disease among Firefighters in the United States." *New England Journal of Medicine*, Vol. 356 (12), 2007, pp. 1207-1215.

complicated by the provisions of the Americans with Disabilities Act (ADA), which may restrict the ability of fire departments to limit the duties of high risk individuals.

III.3 Investigation of Line-of-Duty Deaths

Fire suppression and emergency operations are inherently dangerous; however, the data on firefighter line-of-duty deaths presented by the statistics in this document suggest that a significant proportion of firefighter deaths, particularly those on the fireground, are preventable. The IAFF has developed the *Fire Fighter Line-of-Duty Death and Injury Investigations Manual*,[12] which provides a systematic approach to the overall investigation of fireground fatalities. The IAFF Manual notes that an autopsy should be requested for every line-of-duty death and the results of the autopsy should be included in the report of the investigation. The IAFF Manual further states

The medical histories of firefighters are best analyzed and interpreted by a physician. The autopsy of a firefighter who died in the line of duty is always conducted by the local medical examiner, in accordance with accepted procedures. However, the investigation team may need a physician to help interpret the medical examiner's findings and/or review other medical records. Physicians are also useful in investigations in which firefighters are severely injured. The fire department's physician is a suitable candidate for the investigation and already familiar with the demands of the job and the physiological burden of protective clothing and equipment.

There has been a significant decline in the number of firefighter deaths during fireground operations, particularly from exposure to combustion products, which appears to be related to the increased use of better protective equipment. Firefighter deaths due to cardiac ailments remain a significant concern, as do traumatic injuries from vehicle accidents and training accidents.

Evaluating the thermal performance of various types of firefighter protective clothing is an example of an area where considerable insight can be gained through accurate anatomical descriptions obtained from an autopsy. Toxicological studies can help investigators better understand the effectiveness of SCBA use and operating procedures on preventing fireground exposures to hazardous atmospheres. Evaluations of body fat, muscle development, and special coronary studies can help develop a database on the relative fitness of firefighters. These types of studies will help reinforce lessons that should help the fire service improve fireground operating procedures, protective equipment, training, and physical fitness. They also can help support the development and use of criteria for regular medical evaluations for firefighters.

If the number of line-of-duty deaths continues to decline, it will become more difficult to evaluate improvements in firefighter safety through the mortality statistics. This will place increased emphasis on the need for a detailed investigation and documentation of each and every line-of-duty death. It is a matter of compelling public interest that information about the cause and manner of all firefighter line-of-duty deaths should be thoroughly and systematically collected. The autopsy results should be an important part of the record in each case.

In 1998, the National Institute for Occupational Safety and Health (NIOSH) instituted the Fire Fighter Fatality and Prevention Program (FFFIPP). The FFFIPP investigates firefighter line-of-duty deaths (and selected non-fatal injuries) with the goal of formulating recommendations for the prevention of future casualties. The investigators use the Fatality Assessment and Control Evaluation (FACE) model.

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[12] *Fire Fighter Line-of-Duty Death and Injury Investigations Manual* (updated in 2000). International Association of Fire Fighters (IAFF), 1750 New York Avenue, NW, Washington DC 2006. (202-737-8484; *www.iaff.org*).

Medical records, death certificates, and autopsy reports as well as interviews and evaluations of personal protective equipment (PPE), particularly SCBA, are integral to the process of investigating fatalities. Each report includes a summary of the incident and specific recommendations for preventing similar events. Reports omit department and individual identifiers, as the focus in not on determining fault or blame, but rather on understanding the causes of firefighter fatalities and then developing and disseminating recommendations for prevention of fatalities. An examination of each NIOSH firefighter fatality report was conducted with the specific focus of discerning specific comments related to the conduct of autopsies. These results are provided in Appendix C.

III.4 Alcohol and Drugs

A relatively routine examination as part of any autopsy is an alcohol and drug screen. These analyses are provided as part of toxicology reports. Toxicology reports in most autopsies document the positive and negative findings of a series of tests conducted to detect specific substances that may have caused death. Such tests commonly include tests for the presence of pharmacological agents and illegal drugs. Blood tests for the presence of ethyl alcohol are conducted to determine whether the deceased was under the influence of an intoxicating beverage at the time of death. In the case of fire victims, the toxicology report should include analyses of blood, urine, other body fluids, and tissues for the presence of combustion products and other toxicants and their biomarkers (see section below), as well as alcohol and drugs.

It is extremely important that, in the determination of alcohol levels, the effects of postmortem changes and specimen storage be accounted for. Blood alcohol concentrations obtained at autopsy are valid until putrefaction begins. This may vary from several hours to a few days, depending on the environment. Most autopsy procedures recommend the addition of sodium fluoride at a concentration of 10 mg/mL of blood to the sample and the storage of the sample in a refrigerator. Considerations for evaluation of blood alcohol levels include

- If the blood is analyzed soon after withdrawal or if the blood is kept in the refrigerator, results usually are reliable, even if no sodium fluoride has been added.
- If the air space about the blood sample is large, alcohol can evaporate and a falsely low blood alcohol level can result.
- Putrefaction changes before autopsy or during storage may cause a falsely high blood alcohol concentration. Ethanol can be produced in the specimen container, usually in the absence of a preservative, as the fluoride inhibits bacteria far more effectively than fungi. Higher fluoride concentrations are required for inhibiting fungal growth.[13]
- Although there is no major difference in alcohol concentrations of blood samples from the intact heart chambers and the femoral vessels, autopsy samples from pooled blood in the pericardial sac or pleural cavity are unsatisfactory; blood should be withdrawn from peripheral vessels.
- Blood alcohol concentrations vary from vitreous, urine, or tissue samples as compared to alcohol determined through stomach contents. These variations depend on whether blood alcohol concentrations were increasing or decreasing at the time of death.[14]

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[13] Harper D.R. and J.E.L. Correy. "Collection and storage of specimens for alcohol analysis." *In Medicolegal Aspects of Alcohol*, J.C. Garriott, ed. Phoenix: Lawyers and Judges Publishing Co., 1997, pp. 145-169.

[14] Caplan Y.H., "Blood, urine and other tissue specimens for alcohol analysis." *In Medicolegal Aspects of Alcohol*, J.C. Garriott, ed. Phoenix: Lawyers and Judges Publishing Co., 1997, pp. 74-86.

The principal drugs for analysis include those for common narcotics, barbiturates, amphetamines, hallucinogens, or cannabinoids. Tests for other prescription and nonprescription drugs are performed occasionally to detect such compounds as common steroids, analgesics, and other indicators of coexisting illnesses/conditions, as well as of drugs used in emergency resuscitation attempts. Methods typically used in these analyses are described in Table 2.

Table 2. Common Methodologies for Toxicological Analysis

Technique	How Used
Volatiles by Gas Chromatography (GC)	Usually used for testing ethanol content; testing is applied as part of a general panel to detect and quantify numerous volatile compounds that include methyl, ethyl, and isopropyl alcohols and ketones. t-Butyl alcohol is used as an internal standard because it does not occur naturally.
Specific drug screening by Enzyme-Multiplied Immunoassay (EMIT)	EMIT can detect but not quantify dependence drugs of abuse. Specific test panels are available for cocaine metabolites, tricyclic antidepressants, barbiturates, cannabinoids, amphetamines, opiates, and propoxyphene. The technique does not detect drugs at parts per billion (ppb) levels.
Specific drug screening by Enzyme-Linked Immunosorbent Assay (ELISA)	ELISA uses antibodies as a more effective technique compared to EMIT (which it is supplanting). ELISA can detect drugs at ppb levels.
Drug screening by Thin-Layer Chromatography (TLC)	TLC is used a general drug screen in lieu of EMIT and ELISA, which use panels for specific drugs.
General drug screening, identification, and quantification by High-Performance Liquid Chromatography (HPLC)	HPLC is used most commonly in place of TLC, given its greater sophistication and use of computerized compound matching. HPLC can be used as a general screening technique, but also has been configured for specific drug or substance analyses. HPLC is preferred for drugs that decompose in GC/MS injection procedures.
Specific drug identification and quantification by Gas Chromatography linked to Mass Spectrometry (GC/MS)	GC/MS is now the preferred overall technique for analysis of specific drugs. Gas chromatography provides the separation of compounds in wet sample fluids while the mass spectrometry provides the identification and quantification of each analyte using computerized matching compound libraries. Specific separation techniques must be applied to identify specific drugs.

Advances are being made each year in progressively more capable and sensitive analytical equipment and procedures that can be applied to the analysis of substances in autopsy tissues and fluid samples. It is important to apply the most up-to-date techniques when conducting specific analyses for alcohol and drug levels. A number of references are provided at the back of the protocol on the subject of alcohol and drug testing.

III.5 Fire Toxicology

A complete understanding of the cause of a firefighter's death must include some consideration of emergency scene-specific toxicological agents that may have been involved and how they may have interacted with the deceased's biological processes and systems to cause death.

- For instance, did the inhalation of carbon monoxide result in cardiac ischemia and subsequent cardiac arrest?
- Did a toxin enter the body through some route other than the respiratory system, such as through dermal exposure, injection, or ingestion?
- Did protective clothing or SCBA fail to protect the user, or was the user's air supply depleted or otherwise compromised?

These conditions are often accompanied by other injuries which may or may not themselves have caused death, such as crushing forces (trauma) or prolonged exposure to high radiant heat levels (burns).

Firefighters respond to a variety of incidents, each presenting its own unique hazards. Traditionally, most firefighting activity has centered around structural fires. The combustion of wood releases several combustion products into the atmosphere, principally carbon monoxide and other simple hydrocarbons. Structural fires have changed over the past several years because building materials have changed. Roofing, insulation, carpets, paints, and other construction materials all contribute to an ever-growing diversity of chemical products found at fires. The increased use of plastics and other synthetic materials release different kinds of combustion products, many of them highly toxic or carcinogenic. Some examples of fire combustion products:

- carbon monoxide and carbon dioxide;
- inorganic gases (hydrogen sulfide, hydrogen cyanide, nitrogen oxides);
- acid gases (hydrochloric acid, sulfuric acid, nitric acid);
- organic acids (formic acid, acetic acid);
- aldehydes (acrolein, formaldehyde);
- chlorinated compounds (carbon tetrachloride and vinyl chloride);
- hydrocarbons (benzene);
- polynuclear aromatic compounds (PNA); and
- metals (cadmium, chromium).

In addition, chemicals at the site of a fire further contribute to hazardous contaminants in fire smoke. A classic example are PCBs, found in electrical transformers and other equipment, which, when burned, may form dioxin, an acutely deadly substance. Even the normal household will contain cleaning supplies, pesticides, pool chlorine, and other substances that contribute to release of toxic substances at fires. Table 3 lists some common fire smoke contaminants, the sources of these substances, and toxic effects from repeated or high concentration exposure to these chemicals. Table 4 shows chemicals identified in an analysis of fire smoke for several different fires.

Most protective clothing and equipment used by firefighters permits the ready penetration and permeation of toxic chemicals through protective fabrics and components. Since most firefighter protective clothing uses porous fabrics, the chemical vapors or liquids simply penetrate or pass through the pores of the material. Molecules of chemicals can also permeate into the fibers or coatings of clothing materials and can remain in the material for long periods of time, depending on the types of exposure chemical(s) and care given to the clothing. Chemicals that get into the clothing from either means often directly contact the firefighter's skin.

Different areas of the firefighter protective ensemble are likely to demonstrate varying propensities for the absorption or adsorption of chemicals. Any porous fabric material found in the clothing or other items may be contaminated, such as:

- turnout clothing outer shells, moisture barriers, thermal liners, collars, and wristlets;
- station/work uniforms;
- glove shells and liners;
- protective hoods;

- boot linings;
- helmet straps; and
- SCBA straps.

Coated materials such as moisture liners, reflective trim, boot outer materials, a respirator masks are more likely to be affected by permeation. The same is true for hard plastics or resins such as those used in the helmet, SCBA components, and certain turnout clothing hardware.

In addition to liquid or vapor chemical contaminants, a tremendous amount of ash, soot, and other solid matter is released during fires and firefighting activities. This solid matter provides the visible portion of smoke and is the primary cause of residue left on structures and clothing following fires. Soot and ash represent incomplete products of combustion; that is, unburned fuel or agglomerated solids which fail to burn completely during the fire. During combustion, synthetic materials create an increase in the amount of particulate matter, hence the "black" smoke from burning plastics. Since soot particles are very porous, they tend to adsorb other hazardous chemicals. Ash, resins, and other particles from fire smoke can become entrapped within the fibers of clothing or adhere to skin. Accumulation of soot on protective clothing becomes visible as soiled or "dirty" areas. In some cases, these "soils" are made of melted resins or plastics which, in the heat of the fire, become liquid and spread even further throughout the protective clothing. In other cases, many of the particles are too small to see (less than 10 microns) and can penetrate easily into the inner layers of clothing, such as liner and barrier materials, contacting the firefighter's skin.

Table 3. Examples of Fireground Contaminants

Contaminant	Sources	Toxicology
Polychlorinated Biphenyl (PCBs)	Power transformers/capacitors Televisions Air conditioners Carbonless copy paper Hydraulic systems Elevators	• PCBs can produce dioxins that are toxic by inhalation and ingestion. • PCBs also absorb through the skin. • PCBs cause cancer of the liver and pancreas.
Asbestos	Roofing and shingles Acoustic ceiling tiles Sprayed ceilings Old pipe insulation Old octopus-type furnaces Pre-1975 drywall	• Principal hazard is inhalation of fibers (<5 microns length) causes cancer. • Asbestos fibers can be aerosolized from clothing and inspired or and ingested.
Creosote	Power poles Railroad ties Treated wood or buildings Lumber yards Piers and docks	• Creosote is toxic through inhalation and skin absorption. • Causes cancer of skin, prostate, and testicles.
Plastic Decomposition Products • Polycarbonates • Polystyrene • Polyurethane • (PVC)	Electrical insulation Plumbing Furniture Construction materials Insulation and packaging Tools/Toys Automobiles	• Variety of decomposition products including acrylonitrile, hydrogen cyanide, nitrogen oxides, hydrogen chloride, benzene. • Various routes of toxicity through skin absorption, inhalation or ingestion.

Table 4. Specific Chemical Contaminants Identified in Various Fires[15]

Compound	1(K)	1(K)	2(K)	3(O)	4(O)	5(K)	6(K)	6(O)
Furan	X			X				
C_4H_8 isomers	X		X					
Benzene	X	X	X	X	X	X	X	X
Dimethylfuran	X		X					
Methyl methacrylane	X						X	
Toluene	X	X	X				X	
Furfural	X		X					
Xylene	X		X			X		
Styrene	X		X				X	
Pinenes	X		X				X	
Limonene	X						X	
Indane	X		X			X	X	
Methylcyclopentane	X					X		
2,4-Dimethyl-1-pentene						X		
Ethyl benzene						X	X	
C_3-Alkyl benzene						X		
C_4-Alkyl benzene						X	X	
n-Butane							X	
Freon 11							X	
t-Butyl anisole						X	X	
Methyl naphthalene						X	X	

K-knockdown; O-overhaul

Firefighters may be exposed to other particulate hazards. Chemical dusts, lead particles, and asbestos also may be encountered at fires and other responses. For example, though asbestos is principally an inhalation hazard, it can cling to protective clothing and be released when the responder is not wearing his or her SCBA. Similarly, lead and other toxic dusts can fill clothing pores and contaminate the firefighter's skin after the incident.

Firefighters also are subject to exposure to blood or other body fluids containing pathogens, particularly the Human Immunodeficiency Virus (HIV) or Acquired Immunodeficiency Syndrome (AIDS) virus, and Hepatitis B and C viruses. These viruses are extremely small in size and are transmitted by blood or other biological fluids. The risk is high since emergency patient care is a major function of many responses. The extrication of victims from automobile accidents and rescue of injured persons from fires and other incidents all involve the potential for this exposure. Even minute droplets of blood are capable of carrying thousands of virus that potentially can cause infection through mucous membrane contact or nonintact skin. Firefighters also face serious health threats from exposure to existing and nontraditional airborne pathogens that can be encountered in providing medical care or general interface with the public, including tuberculosis, sudden acquired respiratory syndrome (SARS), and more recently avian flu. Though these exposures may not be fatal, they can contribute to firefighter fatalities.

[15] Noonan, Gary P., Judith A. Stobbe, Paul Keane, Richard M. Ronk, Scott A. Hendricks, Laurence D. Reed, and Robert L. McCarthy. *Firesmoke: A Field Evaluation of Self-Contained Breathing Apparatus*. NIOSH and U. S. Fire Administration, 1989.

An emerging concern for firefighters and other first responders is the potential lethality from exposure to chemical, biological, radiological, nuclear, and explosive (CBRNE) hazards. These hazards may take the form of chemical warfare agents, toxic industrial chemicals, biological agents that are both liquid and airborne, ionizing radiation, nuclear material, and explosives. Terrorism has become a real threat to firefighters and is likely to cause multiple casualties, including firefighters. Under the circumstances of a terrorism event, special provisions will be needed for the handling of first responder and civilian deaths.

III.6 Burns

Firefighters encounter flames, high heat, physical obstacles, and a number of other hazards in carrying out their response duties. Each hazard serves as an individual stressor on the firefighter that given its relative intensity, length of exposure, and the degree to which protection is provided, creates specific risks of injury, disease, or death.

Particularly relevant to this report is structural firefighting, which the NFPA defines as "the activities of rescue, fire suppression, and property conservation in buildings, enclosed structures, vehicles, marine vessels, or like properties that are involved in a fire or emergency situation." Structural firefighting is likely to expose firefighters to a range of thermal conditions when responding to a fire. While several researchers have attempted to classify these conditions, one system is shown in Figure 1, where the fireground is characterized in terms of level of thermal radiation (expressed in cal/cm^{2}s) and the air temperature (expressed in degrees Celsius and degrees Fahrenheit).[16,17] Three possible structural firefighting situations are illustrated in this figure and are described below:

- The ***Routine*** region describes conditions where one or two objects, such as a bed or waste basket, are burning in a room. The thermal radiation and the air temperatures are virtually the same as those encountered on a hot summer day. As shown in Figure 1, ***Routine*** conditions are accompanied by a thermal radiation range of 0.025 to 0.05 cal/cm2s and by air temperatures ranging from 68 to 140 °F (20 to 60 °C). Protective clothing for firefighters typically provides protection under these conditions, but excessive exposure times may create a burn injury situation.
- The ***Ordinary*** region describes temperatures encountered in fighting a more serious fire or being next to a "flashover" room. ***Ordinary*** conditions are defined by a thermal range of 0.05 to 0.6 cal/cm2s, representing an air temperature range of 140 to 571 °F (300 °C). Under these conditions, protective clothing may allow sufficient time to extinguish the fire or to fight the fire until the nominal air supply is exhausted (usually less than 30 minutes).
- The ***Emergency*** region describes conditions in a severe and unusual exposure, such as those caused inside a "flashover" room or the firefighter being next to a flame front. In ***Emergency*** conditions, the thermal load exceeds 0.3 cal/cm2s and temperatures exceed 571 °F. In such conditions, the function of firefighters' clothing and equipment is simply to provide protection during the short time needed for an escape without serious injury.

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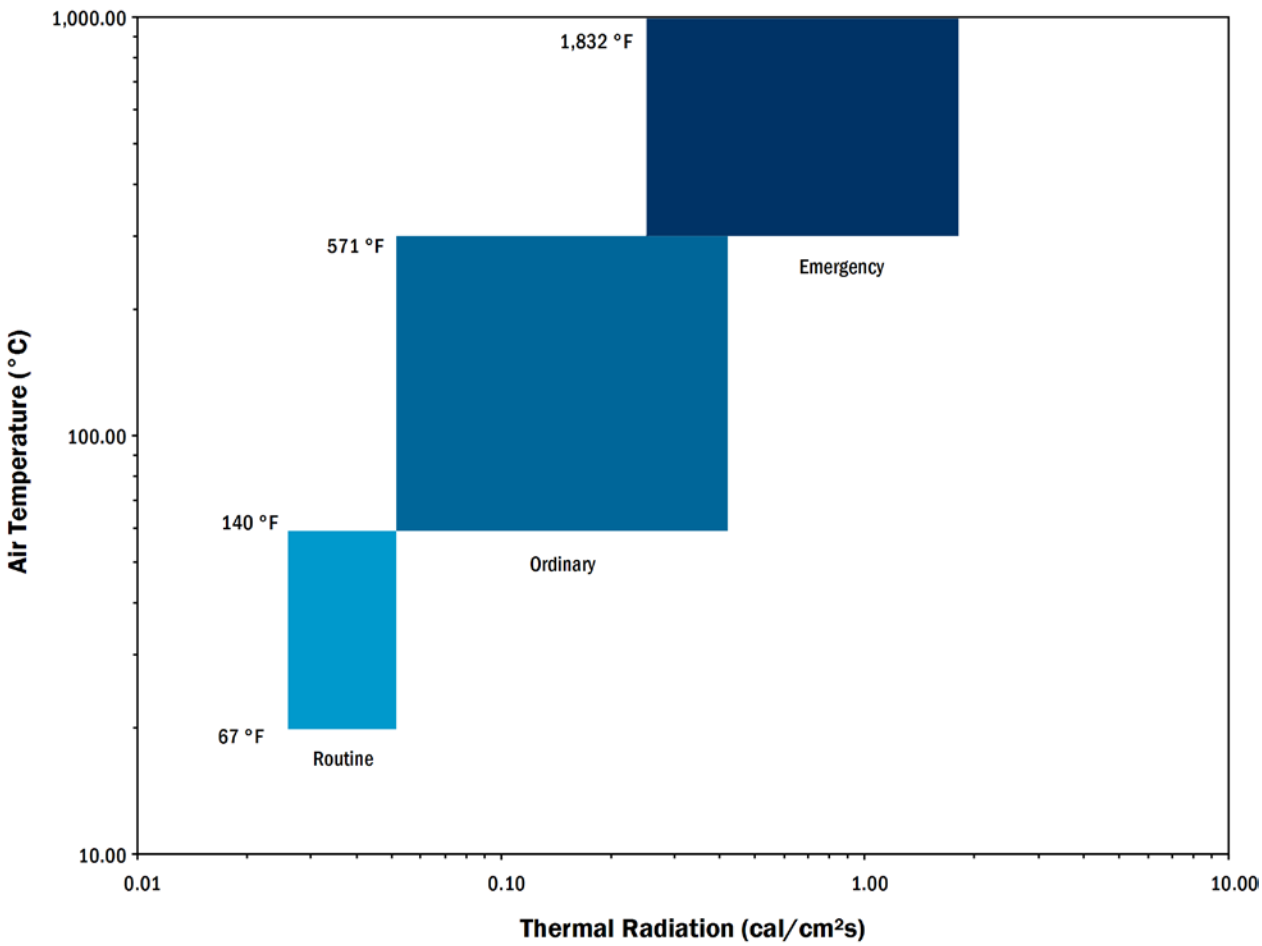
[16] Abbott, N. J. and S. Schulman. "Protection from Fire: Nonflammable Fabrics and Coatings." *Journal of Coated Fabrics*, Vol. 6, July 1976, pp. 48-64.

[17] Utech, H.P. "High Temperatures vs. Fire Equipment." *International Fire Chief*, Vol. 39, 1973, pp. 26-27.

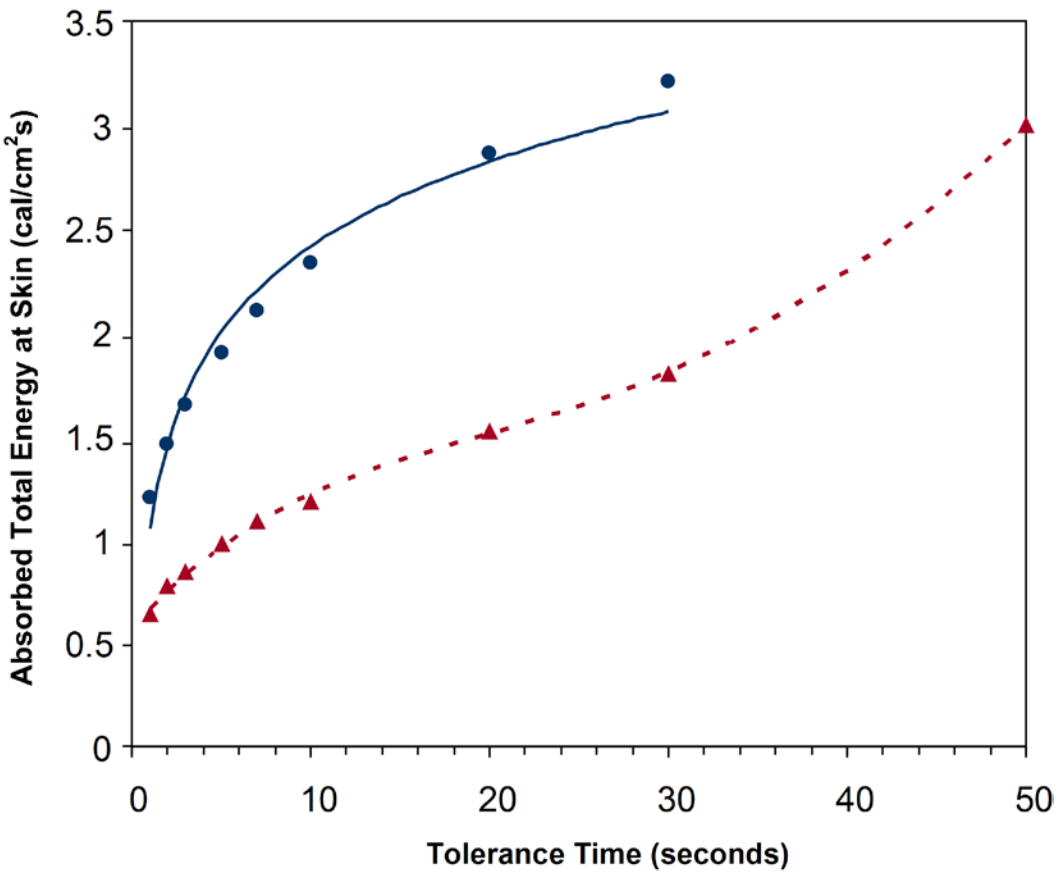
Figure 6. Classification of Fireground Conditions



Burns occur as the consequence of heat transfer to the skin at a rate greater than the body's ability to dissipate that heat. The occurrence of a burn injury can be predicted by plotting the heat energy versus time, as shown in Figure 7. This relationship shows that burns occur very quickly for high levels of heat energy exposure, while exposures to lower heat energies require a greater amount of time to cause a burn injury. Thus, burn injury is a function of both the intensity of heat exposure and the length of the exposure.

Increasing amounts of stored heat energy in the skin cause progressively greater damage. The defined degrees of burn injury distinguish the levels (depth) of skin damage and how permanent the damage becomes. For example, third-degree burns, also referred to as full-thickness burns, involve damage to the entire skin thickness and are considered irreversible (complete healing is not possible). It is also important to point out that burn injuries may occur under portions of protective clothing and equipment that show no damage.

Figure 7. Relationship of Heat Energy and Time to Burn Injury



III.7 Personal Protective Equipment

Detailed knowledge of the manner of death requires, among other things, an evaluation of the performance of the firefighter's personal protective equipment (PPE), which includes protective clothing and breathing apparatus. There is voluminous anecdotal evidence that failure to use proper protective equipment has been responsible for many firefighter injuries, illnesses, and deaths.

Typically, firefighter protective ensembles consist of several elements of clothing and equipment that are worn together to provide protection against fireground hazards:

- SCBA;
- protective coat and pants;
- protective helmet;
- protective hood;
- protective gloves;
- protective footwear; and
- PASS (may be integrated with SCBA)

An example protective ensemble for structural firefighting is shown in Figure 8. Additional PPE information is provided in Appendix C. Other types of specialized ensembles are worn by firefighters for different applications. These include specialized ensembles for emergency medical operations, hazardous materials incidents, and technical rescue events.

Figure 8. Typical Structural Firefighting Ensemble (Courtesy of Morning Pride Manufacturing)

In order to provide intended protection, the ensemble elements must be chosen to work together without interference and must be properly sized and worn consistent with manufacturer instructions. Even when these instructions are followed, it still is possible to overwhelm the protective qualities of the firefighter PPE when fireground conditions exceed the designed capabilities of the clothing and equipment. In addition, the burden of insulative clothing under hot working conditions also creates stressors on the firefighter's body that can contribute to illness and death.

The use of SCBA has reduced significantly the number of firefighter injuries and deaths that are attributable to smoke inhalation. While thermal and respiratory injuries remain a concern in cases of firefighter autopsies, the widespread use of SCBA has introduced new considerations into the evaluation of these injuries. For example, knowing that a firefighter's death was the result of inhalation of combustion products, when the firefighter was using an SCBA, would indicate the need to fully evaluate the performance of the SCBA. This investigation can be conducted by the NIOSH, which is responsible for the certification of this equipment. Reviews are particularly important to ascertain the correct functioning of the equipment and the amount of service air remaining in the cylinder. Obtaining this information may

not always be possible when the SCBA is destroyed in the fire. Regardless, it is important to check the service life of the SCBA as part of any investigation, particularly where there is a question of asphyxiation. The actual service life provided by an SCBA is always significantly less than the rated service life, since firefighters can exhaust the air supply through more rapid breathing due to physical activity and stress. Some instances also may be able to compromise the positive pressure of the facepiece, permitting the infiltration of outside contaminants.

Experts may need to be consulted to determine how a firefighter's protective clothing and equipment performed or failed to perform. NIOSH has several independent consultants who are available to assist in the evaluation of PPE. Checks of PPE include the following reviews:

- the identification on each item of PPE that was worn;
- the identification of each personal item of clothing that is worn underneath the protective clothing;
- the manufacturer and date of manufacturing of each PPE item;
- the standard to which the specific item of PPE complies;
- any specific options or attributes of the clothing item; and
- the condition of the item as found on the injured or deceased firefighter.

Specific guidelines for the examination of PPE items are provided in Appendix C.

III.8 Non-Line-of-Duty Deaths

Because of their repetitive exposure to toxic environments and carcinogens, many firefighters are concerned that they are at a higher risk to die prematurely, particularly as their longevity on the job increases. The causes of firefighter deaths that occur off-duty (or non-line-of-duty) sometimes can be attributed to one exposure or to a series of exposures to toxins. There have been some major, well-documented exposures of firefighters to certain known carcinogens. It has been suggested, for instance, that fires in occupancies manufacturing or storing chemicals in Elizabeth, New Jersey, and Fort Lauderdale, Florida, are responsible for increased incidence of cancer among the firefighters who fought these blazes.

In one of those examples, as many as 29 cases of cancer, including 19 cancer deaths, have occurred among the approximately 100 firefighters who fought a fire in 1968 at the Everglades Fertilizer Plant in Fort Lauderdale, Florida. All but one of these cases was diagnosed after the firefighter had retired or resigned from the fire department. This case has prompted the NIOSH to initiate an epidemiological study of firefighters involved in the Everglades fire.

More recently, additional medical and industry reviews have found the incidence of firefighter cancers to be elevated as compared to other occupations.

- A study of Seattle firefighters shows excess mortality from diseases of a priori concern, such as lung cancer, nonmalignant respiratory disease, and cardiovascular disease.[18]
- An analysis of firefighter deaths in the Boston area indicated a 3-to-1 increase in firefighter cancers when compared to the general population.[19]

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[18] Heyer, Nicholas, Noel S. Weiss, Paul Demers, and Linda Rosentock. "Cohort Mortality Study of Seattle Fire Fighters: 1945-1983." *American Journal of Industrial Medicine*, Vol. 17, 1990, pp. 493-504.

[19] Musk, A. William, John M. Peters, and David H. Wegman. "Lung Function in Fire Fighters, I: A Three Year Follow-Up of Active Subjects." *American Journal of Public Health*, Vol. 67(7), 1977, pp. 86-89.

- In Los Angeles, cancer mortality among surviving firefighters is elevated for all lung and circulatory system cancers.[20]
- A study of firefighter mortality as compared to police officers in three northwestern U.S. cities showed excesses of brain tumors, and lymphatic and hematopoietic cancers.[21]
- A detailed mortality study in Toronto showed firefighters to have statistically significant excesses of brain, central nervous system, and other cancers.[22]

A more recent study has documented the risk of increased rates of multiple myeloma, non-Hodgkin lymphoma, and testicular cancer for firefighters based on a review of 32 different studies related to firefighter cancer risks.[23]

It can be very difficult to directly attribute a non-line-of-duty death to a line-of-duty exposure, especially if the exposure occurred years before the death. Comprehensive autopsies of firefighters whose death may have been caused by a line-of-duty exposure could help establish a better understanding of the relationship between exposures and premature deaths; however, this will require much better data be obtained and maintained than is currently the norm.

Many fire departments have mandated physical requirements and medical examinations for firefighters. Regular medical exams and physical testing can track a firefighter's physical and medical status from hire to retirement, and can serve as a baseline against which to compare, especially after an incident or series of incidents where a firefighter may be concerned that an exposure has jeopardized his or her health.

Records of exposures to particular toxins should be kept by the fire department along with the medical records. Such documentation would be valuable in determining whether an exposure led to medical problems, or whether a non-line-of-duty death is related to firefighting or other emergency or occupational activities.

The firefighter autopsy protocol is primarily intended to be applicable to line-of-duty deaths; however, it would also be appropriate for non-line-of-duty deaths where an occupational factor is suspected to be involved in the cause of death. For most firefighter deaths that are not duty-related or that involve former firefighters, existing clinical autopsy procedures consistent with the individual's medical history should be appropriate. The USFA Firefighter Autopsy Protocol has been designed to uncover pertinent forensic information consistent with the distinct occupational aspects of firefighting.

III.9 Firefighter Health

Several studies have looked at the frequency of premature death rates among active and retired firefighters. Rubin has described the relationships between the hazards of fire suppression and the risk of premature

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[20] Lewis, S.S., H.R. Bierman, and M.R. Faith. "Cancer Mortality Among Los Angeles City Fire Fighters." Published Report Submitted to the Los Angeles Fire Department, Dec., 1982.

[21] Demers, Paul A., Nicholas J. Heyer, and Linda Rosenstock. "Mortality Among Firefighters from Three Northwestern United States Cities." *British Journal of Medicine*, 1992, 49: 664-670.

[22] L'Abbe, Kristan A. and George A. Tomlinson. "Fire Fighters in Metropolitan Toronto: Summary of the Mortality Study." *Industrial Standards Panel*, Toronto, Ontario, Canada, 1994.

[23] LeMasters, Grace K. et al. "Cancer Risk Among Firefighters: A Review and Meta-Analysis of 32 Studies." *Journal of Environmental Medicine*, Vol. 48, No. 11, November 2006, pp. 1189-1202.

death from heart disease or cancer as "Firefighter's Disease."[24] He notes that relatively little research has been conducted on firefighter mortality and morbidity or the medical treatment of firefighters.

Rubin proposes that a concern for firefighter health should begin with prevention. He suggests that diet, lack of exercise, and lifestyle may be as responsible for premature firefighter deaths as any job-related exposure. The relationships of lifestyle, exercise, and diet with firefighter mortality appear to be more than just conjecture. Epidemiological studies have demonstrated that firefighters are much less likely than the general population to die from natural causes at a given age, early in their careers, because they must be healthier than the average person to pass the rigorous health and fitness standards in order to be hired or approved for volunteer duty. The death rate for firefighters catches up with the rest of the population by their retirement age, which suggests that the so-called "healthy worker effect" diminishes with time, especially if the individuals do not take care of themselves. This takes into account the factor that firefighters tend to retire at a younger age than the general population.

The USFA[25] describes a number of resources that address the implementation of firefighter health programs. These include the IAFF/International Association of Fire Chiefs (IAFC) "Fire Service Joint Labor Management Wellness-Fitness Initiative;" the USFA/National Volunteer Fire Council (NVFC) "Health and Wellness Guide for the Volunteer Fire Service"; the NVFC "Heart-Healthy Firefighter Program"; the IAFF/IAFC "Candidate Physical Ability Test" for recruits; and the 16 Life Safety Initiatives from the National Fallen Firefighter Foundatin's (NFFF's) "Everyone Goes Home" program.

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[24] Rubin, D.L. "Firefighters' Disease.," *Firehouse Magazine*, Jan. 1992, pp. 40-43. U.S. Bureau of the Census. 1991. *Statistical Abstract of the United States*, 111th ed. Washington, D.C.: U.S. Government Printing Office.

[25] Fire in the United States: 1992-2001, Chapter 5, p. 153.

IV. PUBLIC SAFETY OFFICER BENEFITS (PSOB) PROGRAM

IV.1 Summary of the PSOB Law[26]

The Public Safety Officers Benefits Act, (42 USC 3796, Public Law 94-430) became law on September 29, 1976. The legislation provided for a $50,000 death benefit for firefighters (paid and volunteer) and law enforcement officers who died in the line of duty (emergency or non-emergency) from a traumatic injury. On December 15, 2003, the Act was amended (Hometown Heroes Act) to cover deaths from heart attack and stroke occurring in the line of duty. The Act does not cover deaths resulting from occupational illness or pulmonary disease unless a traumatic injury is a substantial factor to the death. On August 10, 2006, new regulations for the PSOB were issued that incorporated all prior amendments to the original regulations and adds the regulations for the Hometown Heroes Act.

On November 11, 1988, the benefit was increased from $50,000 to $100,000 and made retroactive to June 1, 1988. The dependency test for parent(s) was eliminated. Additionally, it provided that, on October 1, 1988, and every year thereafter, the benefit would be increased to reflect any increase in the consumer price index. On October 26, 2001, as part of the Patriot Act of 2001, the benefit was increased to $250,000 and made retroactive to January 1, 2001.

The Act did exclude Federal firefighters; however on October 12, 1984, the Act was amended to correct this exclusion. Likewise, on October 15, 1986; public-sector EMS personnel also were amended into the coverage of the Act. On June 25, 2002, the Act was amended by the enactment of the Mychal Judge Police and Fire Chaplains Safety Officers Benefit Act, which now allows coverage of fire chaplains under the Act and authorizes all beneficiaries of fallen firefighters, not just parents, spouses; or children to receive the Federal compensation. The legislation, named after the FDNY Chaplain Father Judge, was proposed after it was discovered that 10 public safety officers who gave their lives on Sept. 11 would not be eligible for death benefits because they did not have any surviving immediate family.

On August 10, 2006, new regulations for administration of all PSOB benefits were issued that incorporated all prior amendments to the original regulations and added the provisions of the Hometown Heroes Act (see below). These new regulations address the PSOB Act and regulations in five parts:

1. The first part of this document describes the structure and background of the PSOB Program and aspects of the history of its administration.

[26] From Summary of the Federal (U.S.) Benefits for Public Safety Officers PSOB and PSOEA Programs, IAFF Division of Occupational Health Safety and Medicine, *www.iaff.org*

2. The second part covers the recent changes to the PSOB Act contained in Public Law 109–162, which provided a number of clarifying and conforming changes to the PSOB Act. New definitions included the term "member of a rescue squad or ambulance crew," which is now defined as "an officially recognized or designated public employee member of a rescue squad or ambulance crew." It also amended the PSOB Act to ensure that the pre-existing statutory limitation on payments to noncivilians referred to the individual who was injured or killed, and not to any potential beneficiaries. Finally, this legislation amended certain provisions of the PSOB Act regarding designation of beneficiaries when the officer dies without a spouse or eligible children and removed the need for a 1-year waiting period to ensure payment to the beneficiary of the officer's "most recently executed life insurance policy."
3. The third part addresses the comments received by the Bureau of Justice Assistance (BJA) that relate to the proposed provisions implementing the Hometown Heroes Act, and explains the changes being made in the final rule.
4. The fourth part is a specific discussion of the terms "line of duty" and "authorized commuting."
5. The last part addresses the remainder of the comments in a section-by-section analysis, indicating where changes to provisions were made, or where the BJA determined no changes were necessary.

IV.2 Summary of the Heart/Stroke Amendment[27]

The Hometown Heroes Survivors Benefits Act of 2003 (HHA) amends the PSOB Act and was signed into Law on December 15, 2003. If a public safety officer dies as a direct and proximate result of a heart attack or stroke, that officer shall be presumed to have died as the direct and proximate result of a personal injury sustained in the line of duty unless such presumption is not overcome by competent medical evidence to the contrary.

The law requires that the officer, while on duty engaged in a situation, and such engagement involved nonroutine stressful or strenuous physical law enforcement, fire suppression, rescue, hazardous material response, emergency medical services (EMS), prison security, disaster relief, or other emergency response activity; or participated in a training exercise, and such participation involved nonroutine stressful or strenuous physical activity. Any claim for nonroutine stressful or strenuous physical activities will be excluded if such actions are of a clerical, administrative, or nonmanual nature.

Further, the law requires that the officer must have died as a result of a heart attack or stroke suffered

- while engaging or participating in such activity as described above;
- while still on that duty after so engaging or participating in such an activity; or
- not later than 24 hours after so engaging or participating in such an activity.

The HHA provision only covers deaths occurring on or after December 15, 2003. The HHA is not retroactive, and therefore it does not apply to deaths that occurred before the aforementioned date.

[27] From Summary of the Federal (U.S.) Benefits for Public Safety Officers PSOB and PSOEA Programs,IAFF Division of Occupational Health Safety and Medicine, *www.iaff.org*

IV.3 Useful Web sites

The following Web sites provide useful information either directly or indirectly related to the Public Service Officer Benefits Program:

Department of Justice Public Service Officer Benefits	*https://www.psob.gov/*
National Fallen Firefighters Foundation	*http://www.firehero.org/*
U.S. Fire Administration (firefighter fatality page)	*http://www.usfa.dhs.gov/fireservice/fatalities/index.shtm*
National Institute for Occupational Safety and Health (Fire Fighter Fatality Investigation and Prevention Program)	*http://www.cdc.gov/niosh/fire/*
International Association of Fire Fighters (line-of-duty deaths)	*http://www.iaff.org/HS/LODD/index.html*
International Association of Fire Chiefs (Near Miss reporting system)	*http://www.iafc.org/displaycommon.cfm?an=1&subarticlenbr=328#nearmiss*
National Volunteer Fire Council (in the line of duty)	*http://nvfc.org/index.php?id=657*

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Determination of Alcohol Levels During Autopsy *(abstract provided where available)*

Barillo DJ, Rush BF Jr, Goode R, Lin RL, Freda A, Anderson EJ Jr
Am Surg.1986 Dec;52(12):641-5.
Is ethanol the unknown toxin in smoke inhalation injury?

Of the 12,000 fire-related deaths occurring annually in the United States, it is estimated that 60 to 80 per cent are due to smoke inhalation. Plastic and synthetic materials which have been introduced in home construction and furnishings produce a more toxic smoke when burned. Efforts to identify a "supertoxin" in this smoke have been unsuccessful to date. An alternative approach is to examine why victims are unable to escape, and become exposed to smoke for lethal periods of time. The authors examined the circumstances of death in 39 fire victims (27 adults, 12 children) over a 25-month period. Detailed examination of the fire scene, autopsy studies, and toxicologic analysis were carried out. Position of the victim, and escape efforts were noted. Carbon monoxide was elevated in all victims, with "lethal" levels (= greater than 50%) in 21/39 victims. Cyanide was detected in 24/29 victims, but none had lethal (3 mg/L) levels present. Ethanol was detected in 21/26 adults (80%) and 0/12 children (0%). 18/26 adult victims had ethanol levels above the statutory level of intoxication (10 mg%). Victims found in bed (no escape attempt) had a mean blood ethanol level of 268 mg%, compared with a mean level of 88 mg% in those victims found near an exit (P = .006). Ethanol intoxication significantly impairs the ability to escape from fire and smoke and is a contributory factor in smoke-related mortality.

Bonnichsen R, Moller M, Maehly AC.
Zacchia.1970 Apr-Jun;6(2):219-25.
How reliable are post-mortem alcohol determinations?

Brown GA, Neylan D, Reynolds WJ, Smalldon KW.
Anal Chim Acta.1973 Sep;66(2):271-83.
The stability of ethanol in stored blood. I. Important variables and interpretation of results.

Buchsbaum RM, Adelson L, Sunshine I.
Cuyahoga County Coroner's Office, Cleveland, OH 44106.
Forensic Sci Int.1989 Jun;41(3):237-43.
A comparison of post-mortem ethanol levels obtained from blood and subdural specimens.

Post-mortem subdural ethanol levels have been proposed as a useful test in certain forensic cases involving head trauma, particularly when the time interval from injury to death may have caused a

lowering of the blood ethanol concentration to insignificant or undetectable levels. This study of 75 autopsied persons from whom both blood and subdural ethanol levels were obtained, shows the usefulness of the subdural ethanol level, especially where there is a prolonged or unknown post-traumatic time interval. Use of such a test is recommended in these situations.

Budd RD.
J Chromatogr. 1982 Dec 3;252:315-8.
Ethanol levels in postmortem body fluids.

Chao TC, Lo DS.
Institute of Science and Forensic Medicine, Singapore.
Am J Forensic Med Pathol. 1993 Dec;14(4):303-8.
Relationship between postmortem blood and vitreous humor ethanol levels.

The relationship between the blood to vitreous humor ethanol ratios (B/V) and the corresponding urine to blood ethanol ratios (U/B) of 200 postmortem cases were found to be bimodal in nature. Using the U/B ratio of 1.20 as a demarcation below which early absorption prevails, the results in the early absorption phase gave an average B/V ratio of 1.29, a range from 0.71 to 3.71, and a relatively large standard deviation of 0.57, whereas the results in the other phases (late absorption and elimination) gave an average B/V ratio of 0.89, a spread from 0.32 to 1.28, and a standard deviation of 0.19. It would appear that the blood ethanol levels can be estimated using B = 1.29 V for early absorption phase cases and B = 0.89 V for cases in subsequent phases. The former relationship would underestimate the blood ethanol levels in cases of very early absorption phase and the later overestimate the levels of late elimination cases. The ethanol distribution results in cases of fatal road traffic accidents and suicides by falling, in which 69% of the deceased sustained some form of head injury, were found to be similar to those of other postmortem cases. The observations reflect that vitreous humor, being reasonably protected, is likely to survive certain traumatic deaths and be available for postmortem ethanol investigation. The U/B ethanol ratios recorded in this work had an average of 1.29, a range from 0.19 to 5.19, and a standard deviation of 0.48.

Coe JI, Sherman RE.
J Forensic Sci. 1970 Apr;15(2):185-90.
Comparative study of postmortem vitreous humor and blood alcohol.

de Lima IV, Midio AF.
University of Sao Paulo, Medicolegal Institute, College of Pharmaceutical Sciences, Brazil.
Forensic Sci Int. 1999 Dec 20;106(3):157-62.
Origin of blood ethanol in decomposed bodies.

Problems related to blood contamination by other postmortem fluids in decomposed bodies (DB) make the interpretation of medicolegal blood alcohol levels (B EtOH) a very difficult task. So the aim of this paper is to show the utilization of vitreous humor (VH) as the biological fluid for an unequivocal determination of ethanol origin in DB for forensic purposes. Alcohol was determined in VH, blood (chest fluid-CF) and urine (Ur) collected from 27 DB in different states of putrefaction. A simple head-space gas-chromatographic method was used. In fifteen cases alcohol was found to be of endogenous production due to its absence in VH. In the twelve remainders, alcohol was detected in

VH and CF in an atypical distribution. Examining the reliable scene and historical information together with the analytical data, ethanol origin in these cases was classified: endogenous production (3 cases), ingested (2 cases), both (2 cases), contaminated plus endogenous production (3 cases) and unable to determine (2 cases). According to the results obtained it was possible to conclude that alcohol analysis in VH is fundamental for determining the origin of ethanol detected in CF of DB.

Hardin GG.
Forensic Science Laboratory, Minnesota Department of Public Safety Bureau of Criminal Apprehension, St. Paul 55104, USA.
J Forensic Sci.2002 Mar;47(2):402-3.
Comment in:
J Forensic Sci. 2002 Nov;47(6):1405; author reply 1405**.**
Postmortem blood and vitreous humor ethanol concentrations in a victim of a fatal motor vehicle crash.

A 20-year-old male was found on the passenger side of a small car after a collision with a semi-trailer truck. Postmortem blood, collected from the chest cavity, and vitreous humor samples were collected following harvesting of the heart and bones. Gas chromatographic analysis revealed a blood ethanol concentration of 0.32 g/dL and a vitreous humor ethanol concentration of 0.09 g/dL. The stomach was intact and full of fluid and food, but its contents were not collected. Possible explanations for the large difference between the two results include diffusion of ethanol from the stomach into the chest cavity, contamination of the blood sample prior to collection, and ingestion of a large quantity of ethanol shortly before death. This case demonstrates the importance of proper quality assurance procedures in collecting postmortem specimens and of collecting a vitreous humor sample for ethanol analysis in postmortem toxicology cases.

Heise HA.
Rocky Mt Med J.1968 Jun;65(6):39-44.
Alcohol and sudden death--importance of testing several body fluids.

Ito A, Moriya F, Ishizu H.
Department of Legal Medicine, Okayama University Medical School, Japan.
Acta Med Okayama.1998 Feb;52(1):1-8.
Estimating the time between drinking and death from tissue distribution patterns of ethanol.

To establish a method for estimating the time between the last consumption of alcohol and death, we examined the ethanol levels in body fluids and tissues of rats that had been orally administered 1 g/kg ethanol. We observed the following relationships between ethanol levels in the cardiac blood (blood in the heart itself), vitreous humor, and urine: cardiac blood > vitreous humor > urine at 10 min (early absorption stage); vitreous humor > cardiac blood > urine from 20 to 50 min (late absorption stage); vitreous humor > urine > cardiac blood from 60 to 120 min (distribution stage); and urine > vitreous humor > cardiac blood at 180 min (excretion stage). It was also observed that, in cases of death immediately following drinking, ethanol levels in the stomach contents are very high, and the following ratios of ethanol levels were observed: skeletal muscle to cardiac blood--less than 1; liver to cardiac blood--around 1. buccal mucosa to cardiac blood-greater than 1. These ratios at equilibrium after drinking were around 1, lower than 1 and around 1, respectively. We also measured alcohol

levels in the cardiac blood, urine, vitreous humor and stomach contents of nine cadavers who had consumed alcohol prior to death. The relationships between the time since last consumption of alcohol and relative ethanol levels in these specimens were in good accordance with the results of the animal experiments.

A W Jones and P Holmgren
J. Clin. Pathol., Sep 2001; 54: 699 - 702.
Uncertainty in estimating blood ethanol concentrations by analysis of vitreous humour

Aims—To determine the concentrations of ethanol in femoral venous blood (FVB) and vitreous humour (VH) obtained during forensic necropsies. The ratios of ethanol concentrations in VH and FVB, the reference interval, and the associated confidence limits were calculated to provide information about the uncertainty in estimating FVB ethanol concentrations indirectly from that measured in VH. *Methods*—Ethanol concentrations were determined in specimens of FVB and VH obtained from 706 forensic necropsies. The specimens were analysed in duplicate by headspace gas chromatography (HS-GC), with a precision (coefficient of variation) of 1.5% at a mean ethanol concentration of 500 mg/litre. The limit of detection of ethanol in body fluids by HS-GC in routine casework was 100 mg/litre. *Results*—In 34 instances, ethanol was present in VH at a mean concentration of 154 mg/litre, whereas the FVB ethanol concentration was reported as negative (< 100 mg/litre). These cases were excluded from the statistical analysis. The concentration of ethanol in FVB was higher than in VH in 93 instances, with a mean difference of 160 mg/litre (range 0 to 900). The mean concentration of ethanol in FVB (n = 672) was 1340 mg/litre (SD, 990) compared with 1580 mg/litre (SD, 1190) in VH. The arithmetic mean VH/FVB ratio of ethanol was 1.19 (SD, 0.285) and the 95% range was 0.63 to 1.75. The mean and SD of the differences (log VH - log FVB) was 0.063 (SD, 0.109), which gives 95% limits of agreement (LOA) from -0.149 to 0.276. Transforming back to the original scale of measurement gives a geometric mean VH/FVB ratio of 1.16 and 95% LOA from 0.71 to 1.89. These parametric estimates are in good agreement, with a median VH/FVB ratio of 1.18 and 2.5th and 97.5th centiles of 0.63 and 1.92. *Conclusions*—The ethanol distribution ratios (VH/FVB) show wide variation and this calls for caution when results of analysing VH at necropsy are used to estimate the concentration in FVB. Dividing the ethanol concentration in VH by 2.0 would provide a very conservative estimate of the ethanol content in FVB, being less than the true value, with a high degree of confidence.

Leahy MS, Farber ER, Meadows TR.
J Forensic Sci. 1968 Oct;13(4):498-502.
Quantitation of ethyl alcohol in the postmortem vitreous humor.

Kaye S.
Am J Clin Pathol. 1980 Nov;74(5):743-6.
The collection and handling of the blood alcohol specimen.
Text Available @ *http://rcm-medicine.upr.clu.edu/publications/sidney_kaye/the-collection-and-handling-of-blood.htm*

Proper collection, handling, and storage of the blood alcohol specimen are essential in medicolegal cases involving the question of sobriety. A standard operating procedure is necessary to ensure maximum reliability. Comments are offered on the advantages of using blood specimens in preference to urine or tissue specimens. The use of a conversion factor to obtain a calculated "presumed blood level" can be dangerous. Cautions and suggestions are offered regarding how and from where

the blood should be obtained from a living person and during an autopsy. There are certain time limitations for storage of these blood-alcohol specimens. Each laboratory must establish its own limits for reliable storage, given the conditions in that laboratory. Unexpected and confusing results can lead to an erroneous interpretation if history, circumstances, type of injury, and survival time are not all carefully considered. Several possibilities for error in judgment are discussed.

Kaye S, Cardona E.
Am J Clin Pathol. 1969 Nov;52(5):577-84.
Errors of converting a urine alcohol value into a blood alcohol level.
Text Available @ *http://rcm-medicine.upr.clu.edu/publications/sidney_kaye/Error-of-Converting.htm*

A blood alcohol determination is one of the more frequently requested analyses in a toxicology or forensic chemical laboratory. There are many reliable methods for determining the concentration of alcohol in the blood. It is the purpose of this communication to show that it is, however, *not* reliable to determine the concentration of alcohol in the urine and report as a blood alcohol level. This is *not* reliable even using the best of average factors of equivalence. These factors used are an average of many determinations, some of which show very wide ranges from the mean. Random specimens of urine and blood were collected from 148 cases examined for alcohol content. An average urine-blood alcohol ratio of 1.28: 1, with a range of 0.21 to 2.66, was obtained. The blood alcohol level was calculated in each case from the corresponding urine alcohol determination by means of the average ratio obtained from our data. In 32 (21.5%) of the cases, the blood figures calculated from the urine value exceeded the actual level determined in blood. In 51 cases (34.5%) the calculated blood alcohol concentration was below the determined value. In 65 cases (44%) the values corresponded. This procedure was repeated using the conversion factor (1.25: 1) employed in some communities. In this instance, the calculated blood alcohol concentration exceeded the actual value in 39 cases (26.5%). In 49 cases (33%) the calculated value was below the observed level, and in 60 cases (40.5%) the values corresponded. In view of the wide ranges in the individual urine-blood alcohol ratios found in most published reports, we find it hard to understand how so many investigators can conclude that it is satisfactory procedure to calculate the alcoholic content of blood, to the second decimal place, from a selected specimen of urine. Our data clearly confirm what other investigators[2, 7 – 10] have claimed: that the relationship (ratio-range) between the concentrations of alcohol in urine and in blood may vary widely. This renders it unreliable to use an average conversion factor in medicolegal cases.

Kuroda N, Williams K, Pounder DJ.
Department of Legal Medicine, Keio University, Tokyo, Japan.
Am J Forensic Med Pathol. 1995 Sep;16(3):219-22.
Estimating blood alcohol from urinary alcohol at autopsy.

Urine alcohol concentration (UAC) and blood alcohol concentration (BAC) measured by gas chromatography were available from 435 medicolegal autopsies. Simple linear regression with BAC as outcome variable and UAC as predictor variable (range, 3-587 mg%) gave the regression equation BAC = -5.6 + 0.811UAC with 95% prediction interval +/- 0.026 square root of [9465804 + (UAC-213.3)2] and 99% prediction interval +/- 0.034 square root of [9465804 + (UAC-213.3)2]. The standard error of the slope was 0.013 and the 95% confidence interval for the slope 0.785-0.837. In practice, a BAC of 80 mg% is predicted with 95% certainty by a UAC of 204 mg% and similarly

a BAC of 150% by a UAC of 291 mg%. The prediction interval is too wide to be helpful in the assessment of an individual case fatality. The UAC is useful in corroborating but not in predicting BAC.

Mackey-Bojack S, Kloss J, Apple F.
Hennepin County Medical Center, Clinical Laboratories, Minneapolis, Minnesota 55415, USA.
J Anal Toxicol. 2000 Jan-Feb;24(1):59-65
Cocaine, cocaine metabolite, and ethanol concentrations in postmortem blood and vitreous humor.

The use of postmortem cocaine and metabolite concentrations is a complex subject. This study was undertaken to determine (1) the usefulness of vitreous humor as a specimen, compared with blood, to quantitate cocaine and cocaine metabolites; (2) whether there is a preferential site of disposition for cocaethylene between vitreous humor and blood; and (3) if the presence of cocaethylene influences the concentration of benzoylecgonine in postmortem specimens. Cocaine, benzoylecgonine, and cocaethylene were quantitated in blood and vitreous humor by gas chromatography-mass spectrometry, and ethanol was quantitated by gas chromatography in 62 medical examiner cases. No differences were found between mean concentrations of vitreous cocaine 0.613 mg/L (standard deviation [SD] 0.994 mg/L), cocaethylene 0.027 mg/L (SD 0.59 mg/L), and ethanol 0.092 g/dL (SD 0.13 g/dL) compared to blood cocaine 0.489 mg/L (SD 1.204 mg/L), cocaethylene 0.022 mg/L (SD 0.055 mg/L), and ethanol 0.058 g/dL (SD 0.91 g/dL), respectively. However, a statistical difference was found between mean benzoylecgonine concentrations in vitreous 0.989 mg/L (SD 1.597 mg/L) and blood 1.941 mg/L (SD 2.912 mg/L) ($p = 0.0004$). Regression analysis demonstrated that linear relationships were present between concentrations of vitreous and blood cocaine ($r = 0.854$) and benzoylecgonine ($r = 0.763$). However, the correlation coefficients were lower for cocaethylene ($r = 0.433$) and ethanol ($r = 0.343$). There were variations between the concentrations of cocaine and metabolites both in terms of magnitude and also direction of change. Mean concentrations of benzoylecgonine in blood and vitreous were higher in cases where ethanol was absent, 2.593 mg/L (SD 3.195 mg/L) and 1.431 mg/L (SD 2.021 mg/L), compared to when ethanol was present, 1.199 mg/L (SD 2.396 mg/L) and 0.469 mg/L (SD 0.553 mg/L). This study demonstrates that vitreous humor may be used to quantitate cocaine and cocaine metabolites; however, because the concentrations of cocaethylene in vitreous humor and blood were not well correlated, vitreous humor may not be a reliable specimen for measuring cocaine and cocaine metabolite concentrations.

Marks P.
Med Leg J.1996;64 (Pt 4):186-93.
Comment in:
Med Leg J. 1997;65 (Pt 3):151-2.
Blood alcohol level: the law and the medicine.
Marraccini JV, Carroll T, Grant S, Halleran S, Benz JA.
Office of the Medical Examiner, Palm Beach County, FL.
J Forensic Sci.1990 Nov;35(6):1360-6.
Differences between multisite postmortem ethanol concentrations as related to agonal events.

In a study of postmortem ethanol concentrations, blood was withdrawn from the right atrium, ascending aorta, and inferior vena cava. These samples, vitreous humor, and gastric fluid were analyzed in 307 autopsies, where a minimum blood ethanol concentration of 0.05% weight/volume (w/v) was present. Premortem, agonal, and postmortem events were reviewed in an attempt to account for

differences in blood ethanol concentrations between sites. The agonal aspiration of vomitus having at least 0.80% w/v ethanol appears to be associated with an increase in aortic ethanol concentrations. We conclude that valid interpretation of postmortem ethanol concentrations must take into consideration the possible entry of ethanol into the pulmonary venous circulation via the respiratory system.

McNeil AR, Gardner A, Stables S.
Department of Molecular Medicine, University of Aukland, New Zealand.
Alanmcn@ahsl.co.nz
Clin Chem.1999 Jan;45(1):135-6.
Simple method for improving the precision of electrolyte measurements in vitreous humor.
Text Available @ *http://www.clinchem.org/cgi/content/full/45/1/135*

Penttila A, Karhunen PJ, Pikkarainen J.
Department of Forensic Medicine, University of Helsinki, Finland.
Forensic Sci Int.1990 Jan;44(1):43-8.
Alcohol screening with the Alcoscan test strip in forensic praxis.

The Alcoscan test strip was applied as an assay for the screening of alcohol in vitreous humor and urine samples in autopsy cases and in saliva from drunken drivers. The method gives instant and reliable semi-quantitative information on the presence of alcohol and is valuable when considering the necessity of chemical sampling especially during autopsy.

Pleuckhahn VD, Ballard B.
Forensic Sci.1967 Oct;12(4):463-70.
Diffusion of stomach alcohol and heart blood alcohol concentration at autopsy.

Pounder DJ, Kuroda N.
Department of Forensic Medicine, University of Dundee, Scotland.
Forensic Sci Int.1994 Mar 25;65(2):73-80.
Comment in:
Forensic Sci Int. 1995 May 22;73(2):155**;** author reply 159-60.
Forensic Sci Int. 1995 May 22;73(2):157-8; author reply 159-60**.**
Vitreous alcohol is of limited value in predicting blood alcohol.

Vitreous humour alcohol concentration (VHAC) and blood alcohol concentration (BAC) measured by gas chromatography were available from 345 medico-legal autopsies. Simple linear regression with BAC as outcome variable and VHAC as predictor variable (range 1-705 mg%) gave the regression equation BAC = 3.03 + 0.852 VHAC with 95% prediction interval +/- 0.019 square root of [7157272 + (VHAC - 189.7)2] and 99% prediction interval +/- 0.025 square root of [7157272 + (VHAC - 189.7)2]. The residual standard deviation of VHAC was 26 mg%, the standard error of the slope 0.0098 and the 95% confidence interval for the slope 0.833-0.871. In practice a BAC of 80 mg% is predicted with 95% certainty by a VHAC of 150 mg% and similarly a BAC of 150 mg% by a VHAC of 232 mg%. The prediction interval is too wide to be of real practical use. Previous authors have provided various formulae, including a simple conversion factor, to predict BAC from VHAC without taking into account the uncertainty of the prediction for an individual subject. A re-analysis of the raw data from previous publications gave in most instances regression equations significantly different from the authors' own.

Riggs JE, Schochet SS Jr, Frost JL.
Department of Neurology, West Virginia University School of Medicine,
Morgantown, USA.
Mil Med.1998 Oct;163(10):722-4.
Ethanol level differential between postmortem blood and subdural hematoma.

Alcohol use is a major risk factor for accidental injury and death. However,when death occurs several hours after injury, ethanol in the blood may be absent or low. Ethanol in sequestered hematomas has been used to retrospectively implicate alcohol as a contributing factor at the time of injury. A 69-year-old man died from a large acute subdural hematoma. He had been seen in a hospital emergency department 8 to 12 hours before his death for treatment of two lacerations (one on the head) that occurred during a fall. Postmortem blood ethanol was 0.07%, and subdural hematoma ethanol was 0.04%. This ethanol level differential between the postmortem blood and the subdural hematoma indicates that this man had consumed alcohol after being released from the hospital.

Semenov VA, Shaev AI.
Sud Med Ekspert.1967 Jan-Mar;10(1):8-10.
[On the possibility of photometric determination of alcohol in the blood and urine of cadavers with the use of photoelectrocolorimetry]
[Article in Russian]

Shepherd RT.
Med Leg J.1997;65 (Pt 3):105-6.
Postmortem toxicology.

Sylvester PA, Wong NA, Warren BF, Ranson DL.
University Department of Surgery, University of Bristol, Bristol Royal
Infirmary, UK.
J Clin Pathol.1998 Mar;51(3):250-2.
Unacceptably high site variability in postmortem blood alcohol analysis.

Blood alcohol concentration is a frequently requested test in forensic pathology. The variability of this value was studied by measuring the blood alcohol concentration from six sites in nine subjects at necropsy in whom alcohol was the implicated cause of death. There were small consistent differences in the blood alcohol concentrations between the sites in the nine subjects ($p < 0.04$). Calculation of the mean blood:vitreous humour alcohol concentration ratio (B:V ratio) showed that vitreous humour alcohol concentration most closely reflected the concentration at the femoral vein (B:V ratio = 0.94, r = 0.98), which is considered the optimal site for blood alcohol measurement. The correlation of left heart blood with femoral blood was lower compared with the other sites. There is a potential for an unacceptably large variation in the postmortem measurement of blood alcohol within each subject.

Trojanowska M.
Acta Pol Pharm.1967;24(3):331-4.
[**The formation of endogenous ethanol in the blood and urine of cadavers**]
[Article in Polish]

Van den Oever R.
Arch Belg Med Soc.1977 Mar;35(3):181-91.
[Postmortem alcohol concentration in blood and vitreous humor]
[Article in Dutch]

Winek CL, Esposito FM.
Leg Med.1985;:34-61.
Blood alcohol concentrations: factors affecting predictions.

As a result of extensive alcohol research conducted on both humans and animals, it is possible to predict a BAC, given pertinent data. In addition, it is possible to estimate from a given BAC the quantity of alcohol consumed. Caution must be used in these predictions, for certain factors will affect the final estimation. Absorption of alcohol is influenced by gastrointestinal contents and motility, and also the composition and quantity of the alcoholic beverage. The vascularity of tissues influences the distribution of alcohol, and their water content will determine the amount of alcohol present after equilibrium. Elimination of alcohol begins immediately after absorption. The elimination rate varies for individuals but falls between .015 percent to .020 percent per hour, with an average of .018 percent per hour. In addition to these factors, a BAC will depend on the subject's weight, percentage of alcohol in the beverage, and the rate of drinking. The principal effect of alcohol in the body is on the central nervous system. Its depressant effect consists of impairment to sensory, motor and learned functions. When combined with some other drugs, a more intoxicated state occurs. Although tolerance to alcohol at low blood concentrations is possible, the tolerance most noted is a learned tolerance among chronic drinkers. Contamination of antemortem blood samples collected for alcohol analysis is minimal when swabbing with an ethanolic antiseptic is performed with routine clinical technique; sloppy swabbing has been shown to increase the BAC determination significantly. The alcoholic content of blood used for transfusion does not contribute significantly to the BAC of the recipient, since extensive dilution occurs; nor does the alcohol present in injectable medication contribute significantly. Although many factors may alter the concentration of alcohol present in autopsy specimens, postmortem synthesis of alcohol receives the most attention. The microorganisms that cause postmortem ethanol production can be inhibited by adding a preservative to the samples and storing them under refrigeration. Should putrefaction be present, it is recommended that, in addition to blood, several different specimens be collected and analyzed for the presence of alcohol. Antemortem blood samples containing ethanol, collected using sterile tubes and techniques, may be analyzed up to 14 days later with reasonable certainty that the ethanol level reflects that which was present at the time of collection.

Winek CL, Murphy KL, Winek TA.
Forensic Sci Int.1984 Aug;25(4):277-81**.**
The unreliability of using a urine ethanol concentration to predict a blood ethanol concentration.

Of approximately 5,000 forensic cases with a positive ethanol result, over 1,000 were available in which both blood and urine were present for comparison of ethanol content. Data were examined for calculation of the urine to blood ethanol concentration ratio, with the intent of evaluating the validity of predicting a blood ethanol level given a urine ethanol level. The overall urine to blood ethanol concentration ratio was 1.57:1 with a range of 0.7 to 21.0:1. The extremely wide range of values implies that a large degree of error would be introduced if a mean ratio was used when predicting a blood ethanol level from a urine ethanol level.

Additional References

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2. Garriott JC. Analysis of alcohol in postmortem specimens. In: Garriott JC, ed. *Medicolegal aspects of alcohol determination in biological specimens*. Littleton, Mass: PSG Publishing, 1988.
3. Corry JE. Possible sources of ethanol ante- and post-mortem: its relationship to the biochemistry and microbiology of decomposition. *J Appl Bacteriol* 1978;44:1-56.
4. Nanikawa R, Moriya F, Hashimoto Y. Experimental studies on the mechanism of ethanol formation in corpses. *Z Rechtsmed* 1988;101:21-6.

   Various in vitro experiments were performed for the purpose of clarifying the mechanism of ethanol production in corpses. Whereas a negligible quantity of ethanol was produced in the blood alone, which was left at room temperature, the quantity of ethanol was slightly increased by addition of glucose to the blood. When saprogens were further added, the quantity was markedly increased. Various materials were added to blood-liver homogenates as specimens, and the mixtures were stored in an incubator at 37 degrees C. As a result of the addition of an antibiotic to the mixture every day, there was hardly any production of ethanol. When alcohol dehydrogenase (ADH) and reduced nicotinamide adenine dinucleotide (NADH) were added, ethanol production was slightly increased. When acetaldehyde was added first, ethanol production was inhibited the next day, but on and after day 2, the quantity of ethanol was more than that in the control material. When pyruvic acid was added first, the results were similar to the above. Pyrazole, cyanamide, and disulfiram completely inhibited the production of ethanol. Ethanol production in corpses is believed to take place through a pathway opposite to that of ethanol metabolism in the living body, under the influence of ADH, ALDH, etc., in saprogens using carbohydrates as substrates.
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AIMS: To gather data on blood alcohol concentrations in a forensic necropsy population and to analyse the information on trends that may predict where alcohol testing is going to prove cost-effective. METHODS: Alcohol assays were performed on blood, urine, and vitreous samples in 1620 consecutive medicolegal necropsy examinations. RESULTS: Alcohol was detected in only 7% of natural deaths from all causes and in four of 40 deaths categorised as unknown/obscure. Alcohol concentrations > or = 350 mg/100 ml were found in nine drug/alcohol abuse deaths (range 362-506 mg/100 ml), five accidental deaths (356-504 mg/100 ml), and one homicide victim (400 mg/100 ml). Those categorised as alcohol abusers were represented in all but one category of death (unknown/obscure deaths in males), showing that many true alcoholics die with their alcoholism rather than of it; 39% of males and 34% of females with histories of alcohol abuse had alcohol present in their blood at necropsy at concentrations > or = 50 mg/100 ml, v only 9% (male) and 6% (female) without such history. CONCLUSIONS: The study highlights the problems of elderly and "hidden" alcoholics and illustrates cases where routine assays would provide additional significant information. Routine alcohol testing is useful in all cases of suspected unnatural death but universal testing of forensic necropsies is not cost-effective.

Website Information

http://www.coheadquarters.com/coFire/cofire4.htm
Death from CO in Fire and Non-Fire Situations: Role of Alcohol (Ethanol, Ethyl Alcohol, ETOH) in Death from CO

http://www.vv.se/traf_sak/t2000/POSTER7.pdf
"Blood alcohol concentrations in an autopsy material in practice of the Institute of Forensic Research in 1990-1999"
Gubala, W.; Piekoszewski, W. (Poland)

http://bmj.bmjjournals.com/cgi/content/full/316/7125/87
BMJ 1998;316:87 (10 January)
"Dead sober or dead drunk?May be hard to determine"

Carbon Monoxide Determination During Autopsy *(abstracts provided where available)*

Barillo DJ, Rush BF Jr, Goode R, Lin RL, Freda A, Anderson EJ Jr.
Am Surg.1986 Dec;52(12):641-5.
Is ethanol the unknown toxin in smoke inhalation injury?

Of the 12,000 fire-related deaths occurring annually in the United States, it is estimated that 60 to 80 per cent are due to smoke inhalation. Plastic and synthetic materials which have been introduced in home construction and furnishings produce a more toxic smoke when burned. Efforts to identify a "supertoxin" in this smoke have been unsuccessful to date. An alternative approach is to examine why victims are unable to escape, and become exposed to smoke for lethal periods of time. The authors

examined the circumstances of death in 39 fire victims (27 adults, 12 children) over a 25-month period. Detailed examination of the fire scene, autopsy studies, and toxicologic analysis were carried out. Position of the victim, and escape efforts were noted. Carbon monoxide was elevated in all victims, with "lethal" levels (=greater than 50%) in 21/39 victims. Cyanide was detected in 24/29 victims, but none had lethal (3 mg/L) levels present. Ethanol was detected in 21/26 adults (80%) and 0/12 children (0%). 18/26 adult victims had ethanol levels above the statutory level of intoxication (10 mg%). Victims found in bed (no escape attempt) had a mean blood ethanol level of 268 mg%, compared with a mean level of 88 mg% in those victims found near an exit (P = .006). Ethanol intoxication significantly impairs the ability to escape from fire and smoke and is a contributory factor in smoke-related mortality.

Blackmore DJ.
Analyst.1970 May;95(130):439-58.
The determination of carbon monoxide in blood and tissue.
Chen KC, Lee EW, McGrath JJ.
J Appl Toxicol.1984 Jun;4(3):145-9.
Effect of intermittent carbon monoxide inhalation on erythropoiesis and organ weights in rats.

Sprague-Dawley rats were exposed to 450 ppm carbon monoxide (CO) for 6 h per day, 5 days per week for 33 days. The effect of CO on reticulocyte count, hematocrit, hemoglobin concentration, body weight and selected organ weights was measured. Exposure to CO caused a three-fold increase in the youngest reticulocyte population, concomitant with an increase in the total reticulocyte count. Despite continued CO exposure, reticulocyte number and distribution returned to normal by day 9, suggesting that reticulocyte response of the organism to CO had changed. Both hematocrit and hemoglobin concentrations began to increase 16 days after CO exposure and remained at the increased level for the duration of the exposure period. There were no changes in kidney, liver and adrenal weights throughout the course of study. However, spleen weight was increased after 5 days of CO exposure. Left and right ventricular organ weight ratios increased equally at the same time during the study. These results indicate that the increase in the young reticulocyte population and the subsequent increase in total reticulocyte count are the earliest erythropoietic responses to intermittent CO exposure and that CO-induced polycythemia is associated with cardiac hypertrophy in rats.

Christensen AM, Icove DJ.
U.S. Tennessee Valley Authority Police, 400 W. Summit Hill Dr., WT-3D,
Knoxville, TN, USA
J Forensic Sci.2004 Jan;49(1):104-7.
The application of NIST's Fire Dynamics Simulator to the investigation of carbon monoxide exposure in the deaths of three Pittsburgh fire fighters.

A case is reported in which computer fire modeling was used to reevaluate a fire that killed three fire fighters. NIST's Fire Dynamics Simulator (FDS) was employed to model the fire in order to estimate the concentration of carbon monoxide present in the dwelling, which was the immediate cause of death of two of the fire fighters, who appear to have removed their face pieces in order to share available air. This estimate, along with an assumed respiration volume and known blood carboxyhemoglobin, was plugged into a standard equation to estimate the time of exposure. The model indicated that 27 min into the fire, the carbon monoxide concentration had already reached approximately 3600 ppm. At this

concentration, and a respiration of 70 L/min, an estimated 3 to 8 min of exposure would have been required to accumulate the concentrations of carboxyhemoglobin (49, 44, and 10%) measured on the fire fighters at autopsy.

Freireich AW, Landau D.
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Carbon monoxide determination in postmortem clotted blood.

Grabowska T, Sybirska H, Malinski M.
Katedry Medycyny Sadowej Slaskiej AM w Katowicach
Arch Med Sadowej Kryminol.2003 Jan-Mar;53(1):9-17.
[Attempt to estimate risks of fatal poisoning on the basis of HCN and HbCO concentrations in blood of fire victims]
[Article in Polish]

Using the results of HCN and HbCO concentrations in the blood of 174 deceased found in different burning spaces and 35 people with symptoms of poisoning evacuated from the scene of a fire and then admitted to hospital. The correlation between blood concentration of both these xenobiotics and death or chance of survival in a fire was estimated by statistical analysis. An attempt was made to define a value of so-called "cut-off" points for HbCO and HCN by independence test chi 2 with Yates's correction. Point and interval estimations (95% Comfield's confidence interval) were used for the odds ratio (OR). The research showed that there was a strict statistical correlation between the chance of survival and death risks dependent on blood concentrations of HCN and HbCO in all the groups examined.

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Absence of carboxyhemoglobin in flash fire victims.

Iffland R, Sticht G.
Arch Toxikol.1972;29(4):325-30.
[Gas chromatographic method for determination of carbon monoxide in blood]
[Article in German]

Jones JS, Lagasse J, Zimmerman G.
Emergency Medicine Residency Program, Butterworth Hospital, Grand Rapids, MI.
Am J Emerg Med.1994 Jul;12(4):448-51.
Computed tomographic findings after acute carbon monoxide poisoning.

Selective necrosis and degeneration of the globus pallidus are characteristic autopsy findings in patients with severe carbon monoxide (CO) poisoning. The objective of this study was to show that computed tomography (CT) may demonstrate these morphological changes in the brain during life, and provide a clue to prognosis. The authors reviewed the medical records of 19 consecutive patients with acute CO poisoning who underwent CT examination during hospitalization. Abnormal CT findings were found in 10 of the 19 patients (53%). The most common abnormal findings were low-density areas in the basal ganglia. These lesions were found in 7 of the 10 cases, and varied from small (limited to

the globus pallidus) to large (extending to the internal capsule). Of the 10 patients with abnormal CT scans, 9 survived to hospital discharge but all had some degree of functional neurological impairment. Eighty-nine percent (8 of 9) of the patients with normal CT scans were discharged neurologically intact. Awareness of the potential for basal ganglia lesions in CO poisoning should lead to more accurate CT interpretation and may have significant prognostic implications

Kojima T, Nishiyama Y, Yashiki M, Une I.
Forensic Sci Int.1982 May-Jun;19(3):243-8.
Postmortem formation of carbon monoxide.

Since carbon monoxide (CO) production after death was suggested in a drowned body, CO and carboxyhemoglobin (HbCO) levels in blood and body cavity fluids of cadavers which were not exposed to fire and CO hve been analyzed. CO released from the tissues was determined by gas chromatography and gas chromatography-mass spectrometry, and the total concentration of hemoglobin (Hb) was measured as cyanmethemoglobin (CNmHb). The HbCO level was calculated by the ratio of CO content and CO-binding capacity. CO levels (ml/100 g at STP) of the seven cases in which blood and body cavity fluids could be collected ranged from 0.13 to 0.87 in blood and 0.02 to 0.80 in body cavity fluids. HbCO levels in blood and body cavity fluids were from 0.3 to 6.0% and from 2.3 to 44.1%, respectively. In a typical case showing postmortem formation of CO, the CO levels in body cavity fluids were higher than that in blood. It is suggested that CO in a putrefied body is due to CO in blood prior to death and the CO formed by the decomposition of Hb, myoglobin and other substances during putrefaction. The significance of HbCO levels in body cavity fluids of cases with marked postmortem decomposition seems difficult to interpret without the value of HbCO in blood.

Kuller LH, Radford EP, Swift D, Perper JA, Fisher R.
Arch Environ Health.1975 Oct;30(10):477-82.
Carbon monoxide and heart attacks.

A study of the relationship between carbon monoxide exposure and heart attacks was conducted in Baltimore. There was no evidence of clustering of either myocardial infarction or sudden ASHD on a specific day, nor was there correlation between the number of cases per day and ambient CO levels. Postmortem HbCO levels were slightly higher in ASHD sudden deaths than in sudden deaths due to other causes. Any differences were probably primarily due to cigarette smoking. Cigarette smokers who died suddenly due to ASHD had substantially higher postmortem HbCO levels than nonsmokers. Practically all of the elevated HbCO levels could be related to cigarette smoking or specific environmental exposure. There were no differences between HbCO levels in ASHD sudden death patients and in living controls. There was also no relationship between cardiac pathologic findings and postmortem HbCO levels among patients dying suddenly of ASH.

Kunsman GW, Presses CL, Rodriguez P.
Forensic Toxicology Laboratory, Bexar County Medical Examiner's Office, San Antonio, Texas 78229, USA.
J Anal Toxicol.2000 Oct;24(7):572-8.
Carbon monoxide stability in stored postmortem blood samples.

Carbon monoxide (CO) poisoning remains a common cause of both suicidal and accidental deaths in the United States. As a consequence, determination of the percent carboxyhemoglobin (%COHb) level in postmortem blood is a common analysis performed in toxicology laboratories. The blood specimens analyzed are generally preserved with either EDTA or sodium fluoride. Potentially problematic scenarios that may arise in conjunction with CO analysis are a first analysis or a reanalysis requested months or years after the initial toxicology testing is completed; both raise the issue of the stability of carboxyhemoglobin in stored postmortem blood specimens. A study was conducted at the Bexar County Medical Examiner's Office to evaluate the stability of CO in blood samples collected in red-, gray-, and purple-top tubes by comparing results obtained at the time of the autopsy and after two years of storage at 3 degrees C using either an IL 282 or 682 CO-Oximeter. The results from this study suggest that carboxyhemoglobin is stable in blood specimens collected in vacutainer tubes, with or without preservative, and stored refrigerated for up to two years.

Malik MO.
J Forensic Sci Soc.1971 Jan;11(1):21-8.
Problems in the diagnosis of the causes of death in burned bodies.

Mallach HJ, Mittmeyer HJ.
Beitr Gerichtl Med.1979;37:393-9.
[Effect of exposure, alcohol and body disposition on the carbon monoxideconcentration of fatal poisonings]
[Article in German]

Mayes RW.
RAF Institute of Pathology and Tropical Medicine, Halton Aylesbury.
J Clin Pathol.1993 Nov;46(11):982-8.
ACP Broadsheet No 142: November 1993. Measurement of carbon monoxide and cyanide in blood.

Miyazaki T, Kojima T, Yashiki M, Chikasue F, Iwasaki Y.
Department of Legal Medicine, Hiroshima University School of Medicine, Japan.
Int J Legal Med.1992;105(2):65-8.
Interpretation of COHb concentrations in the left and right heart blood of cadavers.

Carbon monoxide hemoglobin (COHb) concentrations in left and right heart blood samples from cadavers both exposed and not exposed to fire or CO gas were analyzed by the gas chromatographic method. The COHb concentration ratio between samples of left and right heart blood (L/R ratio) does not appear to be useful for establishing whether death has occurred before or after exposure to fire with the exception of cases where no soot can be detected in the airways by the naked eye and the COHb concentration in the blood sample is within the level considered normal for tobacco smokers.

Morinaga M, Kashimura S, Hara K, Hieda Y, Kageura M.
Department of Forensic Medicine, Fukuoka University School of Medicine, Japan.
Int J Legal Med.1996;109(2):75-9.
The utility of volatile hydrocarbon analysis in cases of carbon monoxide poisoning.

A new approach to investigate the circumstances relating to carbon monoxide intoxication by analysing volatile hydrocarbons in the blood of cadavers is reported. Headspace gas chromatography/mass spectrometry was used to demonstrate the hydrocarbons. The results can be characterized into four categories depending on the compounds detected. In construction fire cases where no accelerants were found at the scene benzene, toluene and styrene were detected in the blood. In cases where gasoline was found in the fire debris surrounding the victim, high levels of benzene, toluene, ethylbenzene, xylene isomers, n-hexane and n-heptane were detected in the blood. In cases where kerosene was found in the fire debris around the victim, benzene, toluene, ethylbenzene, xylene isomers, C9-aromatics(n-propylbenzene, trimethyl-benzene isomers), n-octane, n-nonane and n-decane were detected in the blood. In cases where the victim was found inside a gasoline-fuelled automobile filled with exhaust gas, benzene, toluene, ethylbenzene, xylene isomers, C9-aromatics were found, but no aliphatic hydrocarbons such as components of petroleum. The analyses of the combustion gases of inflammable materials, exhaust gas, gasoline vapours and kerosene vapours were also performed to evaluate the results of the blood analyses. Consequently, some compounds are proposed as indicators to discriminate between inhaled gases i.e. styrene in common combustion gas, n-hexane and n-heptane as well as benzene, toluene and C9-aromatics in gasoline cases, n-nonane and n-octane as well as benzene, toluene and C9-aromatics in kerosene cases, and benzene, toluene, C9-aromatics but no aliphatic hydrocarbons in exhaust gas cases.

Nakatome M, Matoba R, Ogura Y, Tun Z, Iwasa M, Maeno Y, Koyama H, Nakamura Y, Inoue H.
Department of Legal Medicine, Course of Social Medicine, Osaka University Graduate School of Medicine, Suita City, Japan. nakatome@legal.med.osaka-u.ac.jp
Int J Legal Med.2002 Feb;116(1):17-21.
Detection of cardiomyocyte apoptosis in forensic autopsy cases.

The purpose of the present study was to determine reliable parameters for the detection of apoptotic cells for use as a diagnostic marker during the early stage of acute myocardial infarction (AMI) in forensic autopsy cases. Myocardial tissues taken from forensic autopsy cases were examined by immunohistochemical and molecular-biological methods using the terminal deoxynucleotidyl transferase-mediated dUTP biotin nick end-labelling (TUNEL) and the DNA laddering methods. In cases of AMI with a time period between 2 h from onset to death and 20 h post-mortem time, the nuclei of cardiomyocytes were stained positive with the TUNEL method and DNA fragmentation of myocardial cells was detected by agarose gel electrophoresis. Similar findings were obtained in cases of carbon monoxide (CO) intoxication. However, no apoptotic cells were found in other cases such as methamphetamine (MAP) intoxication, tetrodotoxin intoxication, alcohol intoxication, asphyxia, head injury, heart injury or myocarditis. These findings suggested that it would be possible to apply TUNEL-positive cells as a diagnostic marker during the early stages of AMI.

Perrigo BJ, Joynt BP.
Central Forensic Laboratory, Royal Canadian Mounted Police, Ottawa.
J Anal Toxicol.1989 Jan-Feb;13(1):37-46.
Evaluation of current derivative spectrophotometric methodology for the determination of percent carboxyhemoglobin saturation in postmortem blood samples.

Carbon monoxide intoxication continues to be a commonly encountered cause of death in most areas of Canada. The forensic nature of the samples in these cases presents special problems that are not

normally encountered in clinical determinations. A study was undertaken to assess various methods of determining the percent carboxyhemoglobin saturation in blood, more specifically, those using derivative spectrophotometric measurements in the Soret region of the UV spectrum. At the same time, other studies were carried out: the effects of storage time on the carboxyhemoglobin levels; evaluation of sample containers; comparison of percent carboxyhemoglobin saturation in blood samples taken ante-mortem and post-mortem. Blood for the study was obtained from laboratory animals that were exposed to carbon monoxide before death.

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1-4-3, Abeno, 545-8585, Osaka, Japan
Forensic Sci Int.2000 Sep 11;113(1-3):375-9.
Automated determination of carboxyhemoglobin contents in autopsy materials usinghead-space gas chromatography/mass spectrometry.

To establish a method for the routine analysis of carboxyhemoglobin (COHb) in autopsy materials including those which have undergone postmortem changes, e.g. thermo coagulation, putrifaction and contamination, an automated head-space gas chromatography/mass spectrometry (GC/MS) analysis was utilized. The procedure consisted of preparation of the sample in a vial and a carbon monoxide (CO) saturated sample, for estimation of hemoglobin content, in another vial, the addition of n-octanol, potassium ferricyanide and an internal standard (t-butanol), GC separation and determination of CO using a GC/MS system equipped with an automated head-space gas sampler. The method was practical not only with the blood and bone marrow aspirates to confirm the findings on the CO-oximeter system, but also with the thermo-coagulated and putrified blood.

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Department of Legal Medicine, Osaka City University Medical School, Asahi-machi
1-4-3, Abeno, 545-8585 Osaka, Japan. legalmed@med.osaka-cu.ac.jp
Leg Med (Tokyo).2003 Mar;5 Suppl 1:S335-7.
Ultrasonographic densitometry of the lungs at autopsy: a preliminary investigation for possible application in forensic pathology.

The aim of the present study was to examine the possible application of ultrasonographic (US) densitometry of the lungs to quantitative evaluation of pulmonary edema at autopsy (n=85). A diagnostic ultrasound device LOGIQ alpha200 (GE Yokogawa Medical Systems) equipped with an LH probe (linear, 7.5 MHz) was used and each lobe of the lungs was scanned on the anterior and posterior surfaces after resection. The US density showed a correlation between the left and right lobes, and also between the anterior and posterior surface scans of each lobe. Although there was a correlation between the US density and combined lung weight in total cases, the density ranged very widely when lung weight was below about 1300 g, depending on the cause of death. The density was high in drowning, asphyxia, poisoning and delayed traumatic death, whereas it was usually low in fire death mainly due to burns, hemorrhagic shock and head injury. In the other causes of death, a considerable case-to-case difference was observed independent of the lung weight. These findings suggested a possible contribution of pulmonary edema to high US density, possibly depending on the survival time and irrespective of the blood contents (congestion or postmortem hypostasis).

Quan L, Zhu BL, Oritani S, Ishida K, Fujita MQ, Maeda H.
Department of Legal Medicine, Osaka City University Medical School, Japan.
Int J Legal Med.2001;114(6):310-5.
Intranuclear ubiquitin immunoreactivity in the pigmented neurons of the substantia nigra in fire fatalities.

To evaluate the significance of immunohistochemical staining of ubiquitin (heat shock protein) in the midbrain for medico-legal investigation of death in fires, we examined forensic autopsy cases of fire fatalities (n = 35) in comparison with controls (n = 27; brain stem injury, acute myocardial infarction and carbon monoxide poisoning other than fire fatality). There were two intranuclear staining patterns in the nuclei of pigmented substantia nigra neurons: a type of inclusion (possible Marinesco bodies) and a diffuse staining. Percentage of nuclear ubiquitin positivity (Ub-positive %) in fire fatalities (2.7-44.7%; mean, 18.5%) was significantly higher than in brain stem injury (n = 9; 0-10.4%; mean, 4.5%) and myocardial infarction (n = 14; 1.5-14.6%; mean, 6.9%), independently of blood carboxyhemoglobin (COHb) levels. Age-dependent increase in Ub-positive % was observed in lower COHb (< 60%) cases. The intranuclear diffuse ubiquitin staining was not observed in cases of high blood cyanide level (> 1.0 microg/ml). These observations showed that intranuclear ubiquitin immunoreactivity of the pigmented substantia nigra neurons in the midbrain was induced by severe stress in fires.

Reys LL, Santos JC.
Institute of Legal Medicine, University School of Medicine, Lisbon, Portugal.
Am J Forensic Med Pathol.1992 Mar;13(1):33-6.
Importance of information in forensic toxicology.

Information in forensic toxicology plays a very important role. The forensic pathologist usually seeks toxicologic analyses on basis of the information available at the time of the medicolegal autopsy. Such information may be obtained from different sources: hospitals, authorities, relatives, friends, or neighbors of the deceased and, obviously, macroscopic findings at the time of the autopsy. In order to evaluate the relative importance of these different sources of information, the authors have studied, retrospectively, results of 580 postmortem examinations performed at the Institute of Legal Medicine of Lisbon, wherein toxicologic analyses had been requested. These cases pertain to the years 1987 and 1988, but do not include alcohol determination in the blood in cases of traffic accidents. In 274 (47.4%) of the 580 cases, there were positive findings while in the remaining 306 (52.6%) findings were negative. In cases with positive findings, circumstances and factors, which may have influenced the pathologist's decision to request toxicologic analysis, are discussed. In more than half the cases, hospital information was the decisive factor, while in approximately 25% of the cases, autopsy findings were the justification. In contrast, it is worth mentioning that in approximately 45% of the cases with analytical negative results, requests were made, in cases of blank autopsies, for toxicologic analyses in order to exclude the possibility of poisoning. It is interesting to note that in the same proportion requests were justified on grounds of hospital information. Some of the factors that may explain this apparent discrepancy are discussed. Finally, the relevance of background information is emphasized at the level of the interpretation of analytical results, whether positive or negative.

Schmidt P, Musshoff F, Dettmeyer R, Madea B.
Institut fur Bechtsmedizin, Universitat Bonn.
Arch Kriminol.2001 Jul-Aug;208(1-2):10-23.
[Unusual carbon monoxide poisoning]
[Article in German]

Despite of indicative death scenes or characteristic findings of the external examination, about 40% of the accidental fatal intoxications due to carbon monoxide are not recognized before the performance of the autopsy. Six cases are reported which illustrate possible reasons for the delayed establishment of the diagnosis: unusual circumstances of the intoxication or sources of carbon monoxide, only subtle degree or lack of external signs of the intoxication or a competing cause of death at autopsy.--Cases 1 and 2: 53, respectively 54-year-old couple, found dead in a caravan, extreme putrefaction of the bodies, spectrophotometric detection of the fatal carboxyhaemoglobin level in oedema fluid of the scalp.--Case 3: 23-year-old lorry driver, found dead in the tightly closed cab of his lorry, operation of a source of electricity with "environmentally friendly" fuel, carboxyhaemoglobin level 83%.--Case 4: 19-year-old man, found dead in the flat of friends, removal of the CO-source before alerting the police forces, lack of the bright pink coloration of livor mortis, haemopericardium due to atrial rupture at postmortem examination, carboxyhaemoglobin level 65%.--Case 5: 27-year-old man, found dead in his flat, advanced decomposition of the body, residues of a charcoal fire in a metal bucket in the sink, carboxyhaemoglobin level 80%.--Case 6: 42-year-old woman, lying dead in the garage beside her car, engine switched-off, ignition key next to the body on the floor under the car, carboxyhaemoglobin level 46%.

Shinomiya T, Shinomiya K.
Acta Med Leg Soc (Liege).1989;39(1):131-43.
[The variation in carbon monoxide release in the blood stain and in visceral tissues]
[Article in French]

Teige B, Lundevall J, Fleischer E.
Z Rechtsmed.1977 Jul 5;80(1):17-21.
Carboxyhemoglobin concentrations in fire victims and in cases of fatal carbon monoxide poisoning.

The study comprises an eleven-year autopsy material of 141 cases from the Institute of Forensic Medicine, Oslo. The fatal level of carboxyhemoglobin concentration is calculate from cases of pure carbon monoxide poisoning. Carboxyhemoglobin concentrations below this level are found in approximately thirty percent of the fire victims. Alcohol intoxication, present in many fire victims, is not related to low corboxyhemoglobin concentrations.

von Meyer L, Drasch G, Kauert G.
Z Rechtsmed.1979;84(1):69-73.
[Significance of hydrocyanic acid formation during fires]
[Article in German]

Cyanide concentrations of blood samples from fire victims autopsied in the Institute of Legal Medicine, Munich, have been determined. In 25% of 48 analyzed cases cyanide concentrations from 0.52 microgram to 6.24 microgram Cyanide/ml blood have been detected. These results are compared to former studies and the higher mean level in our collective is emphasized. The importance of

hydrocyanid acid in the toxicity of fire gases is evidently greater, than assumed. Hydrocyanic acid may be produced from nitrogen continaing polymers during combustion. The quote of these polymers in clothing, furniture, and also in equipment of cars is increasing. Therefore, it is necessary to take more notice of the formation of hydrocyanic acid during combustion, even though carbon monoxide is in general the main toxic agent in fire gases.

Winek CL, Prex DM.
Forensic Sci Int.1981 Sep-Oct;18(2):181-7.
A comparative study of analytical methods to determine postmortem changes in carbon monoxide concentration.

Twenty-one autopsy blood samples were analyzed using spectrophotometric and gas chromatographic procedures after storage for 30 and 150 days. When carboxyhemoglobin was measured spectrophotometrically at the absorbance ratio of 540 nm/555 nm, the observed average percent losses were 8 +/- 9% and 35 +/- 27% after 30 and 150 days of storage, respectively. When measured at the absorbance ratio of 540 nm/579 nm, the average percent losses of carboxyhemoglobin were 7 +/- 8% and 34 +/- 25% after 30 and 150 days, respectively. Wavelength shifts and distorted spectral scans were observed at 150 days. When carbon monoxide was determined by gas chromatographic methods based on combining capacity, the average percent loss was 15 +/- 24% and 37 +/- 36% after 30 days and 150 days, respectively. The average percent loss of calculated CO based on hemoglobin concentration after 30 days was 31 +/- 14% and at 150 days, 40 +/- 24%. The average percent loss of calculated CO based on iron content was 23 +/- 13% and 37 +/- 23% after 30 and 150 days, respectively.

Wirthwein DP, Pless JE.
Division of Forensic Pathology, Indiana University, Indianapolis 46202-5120, USA.
Am J Forensic Med Pathol.1996 Jun;17(2):117-23.
Carboxyhemoglobin levels in a series of automobile fires. Death due to crash or fire?

The determination of death by trauma versus fire can be of major consideration, especially in civil product liability litigation. Blood carboxyhemoglobin levels can be instrumental in that differentiation. Twenty-eight fatalities involving fire in automobiles were reviewed. All subjects displayed some degree of body burn, and in 25 severe charring and/or incineration was present at autopsy. In only one case was there a history of explosion or flash fire. Carboxyhemoglobin levels varied from 92% to values of < 10%. In seven cases no collision occurred. In six of these subjects COHb values were > or = 47%. In all 16 cases with carboxyhemoglobin levels of < or = 10% a collision occurred. In 12 of 16 of these subjects, blunt force injury sufficient to cause death was discovered. Data presented in this article indicate that a carboxyhemoglobin level of > 30% strongly suggests inhalation of combustion products as the cause of death. In contrast, a level of < 20% should prompt a search for other causes.

Wu SC, Levine B, Goodin JC, Caplan YH, Smith ML.
Office of the Chief Medical Examiner, State of Maryland.
J Anal Toxicol.1992 Jan-Feb;16(1):42-4.
Analysis of spleen specimens for carbon monoxide.

Crucial to the investigation of aircraft fatalities is the analysis of biological specimens for carbon monoxide (CO). In many cases, blood specimens are unavailable or unsuitable for analysis, and the

testing of an alternate specimen for CO becomes necessary. Spleen specimens provide a rich source of red blood cells and hence can be a primary substitute for blood. To verify this, 40 paired blood and spleen specimens were analyzed for CO by using a gas chromatographic method. Ten specimens with a spleen CO saturation level (sat.) of less than 10% were associated with corresponding blood specimens with CO sat. less than 10%. Fifteen of the 18 spleen specimens with CO sat. greater than 29% were associated with blood specimens with greater than 48% sat. Results were inconclusive when the spleen CO sat. was between 10 and 29%. We concluded that spleen CO sat. can reflect blood CO sat. in certain situations, particularly when spleen CO sat. is high.

Appendix A: Death Investigation Systems In The United States And Territories

State/ Territory	Type of System	Title	Deaths Investigated	Contact	Comment
Alabama	Mixed: State Medical Examiner and County Coroners/Medical Examiners	County Coroner, State Medical Examiner	Coroner—All deaths where the deceased died without being attended by a legally qualified physician. State Medical Examiner— • If the person dies by violence or homicide, suicide, accidental, or industrial. • Criminal abortion. • Sudden death, if in apparent good health. • In suspicious circumstances. • When a public health hazard. • If the body is to be cremated.	Emily Ward, MD Alabama Department of Forensic Sciences P.O. Box 240591 Montgomery, AL 36124-0591 (334) 242-3093 Fax: (334) 260-8734	Slight differences in death investigation in Jefferson County (Birmingham) from those in other counties.
Alaska	State Medical Examiner	State Medical Examiner	• Homicide. • Suspicion of criminal means. • Suicide. • With no physician in attendance. • When physician is unable to execute death certificate. • When cause of death cannot be determined.	Franc G. Fallico, MD Acting State Medical Examiner 4500 South Boniface Pkwy. Anchorage, AK 99507 (907) 269-5090 Fax: (907) 334-2216 Email: Franc_Fallico@HEALTH.STATE.AK.US	

State/ Territory	Type of System	Title	Deaths Investigated	Contact	Comment
American Samoa	Territorial Coroner	No death investigation official.	• Where any dead body is found. • By accidental means. • Allegedly caused by unlawful means.	Malaetasi M. Cogafau Attorney General of American Samoa P.O. Box 7 Pago Pago, AS 96799 (684) 633-4163	Pulenuu (village chief) reports deaths to the Attorney General, or, if necessary, to the Department of Medical Services' local representative, who is authorized to act as Coroner and report findings to the Attorney General.
Arizona	County Medical Examiner	County Medical Examiner	• When not under current care of a physician for a potentially fatal illness. • When the attending physician is unavailable to sign the death certificate. • By violence. • Of a prisoner or occurring in prison. • Occurring suddenly to a person in apparent good health. • By occupational disease or accident. • Where a public health hazard is presented. • Occurring during anesthetic or surgical procedures. • Occurring in a suspicious, unusual, or unnatural manner.	Philip E. Keen, M.D. Medical Examiner Maricopa County 120 South Sixth Avenue Phoenix, AZ 85003 (602) 506-3322 Fax: (602) 506-1546	
Arkansas	Mixed: State Medical Examiner and County Coroners/Medical Examiners	County Coroner, State Medical Examiner	• Death appears to be caused by violence, homicide, suicide, or accident. • Death appears to be the result of the presence of drugs or poisons. • Death appears to be the result of a motor vehicle accident or the body was found in or near a roadway or railroad.	William Q. Sturner, M.D. State Medical Examiner P.O. Box 8500 Little Rock, AR 72215 (501) 227-5936 Fax: (501) 221-1653 Email: William.Sturner@ASCL.State.AR.US	

State/ Territory	Type of System	Title	Deaths Investigated	Contact	Comment
Arkansas (cont'd)			• Death appears to be the result of a motor vehicle accident and there is no obvious trauma to the body. • Death occurs while the person is in a State mental institution or hospital and there is no previous medical history to explain the death, or while the person is in police custody, a jail, or penal institution. • Death appears to be the result of a fire or explosion. • Death appears to be the result of drowning. • Death of a minor child appears to indicate child abuse. • Death of an infant or minor child without previous medical history. • Human skeletal remains are recovered. • Decomposition of the body prohibits external examination to rule out injury or circumstances of death cannot rule out the commission of a crime. • Manner of death appears to be other than natural. • Death is sudden and unexplained. • Death occurs at a worksite. • Death is due to criminal abortion. • A physician was not in attendance within 36 hours preceding death or, in pre-diagnosed terminal or bedfast cases, within 30 days. This includes persons admitted to an emergency room, unconscious and unresponsive, following cardiopulmonary resuscitation, who die within 24 hours of admission without regaining consciousness or responsiveness.		

State/ Territory	Type of System	Title	Deaths Investigated	Contact	Comment
California	Mixed: County Medical Examiners/ Coroners	County Coroner, County Sheriff-Coroner, County Medical Examiner, Coroner	• Violent, sudden, or unusual. • Unattended. • Deaths wherein the deceased has not been attended by a physician in the 20 days before death. • Self-induced or criminal abortion. • Known or suspected homicide, suicide, or accidental poisoning. • By recent or old injury or accident. • Drowning, fire, hanging, gunshot, stabbing, cutting, exposure, starvation, acute alcoholism, drug addiction, strangulation, aspiration. • Suspected sudden infant death syndrome. • By criminal means. • Associated with known or alleged rape or crime against nature. • By known or suspected contagious disease constituting a public hazard. • By occupational disease or hazard. • Of State mental hospital patient. • Of developmentally disabled patient in State developmental services hospital. • In prison or while under sentence. • Under other suspicious circumstances.	Scotty D. Hill Executive Secretary California State Coroners Association 5925 Maybrook Circle Riverside, CA 92506-4549 (909) 788-2656 Fax: (909) 788-2934 Email: CSCA2000@aol.com	41 counties with Sheriff-Coroners. In addition, many County Coroners also serve as Public Administrator, Public Guardian, and Public Conservator.

State/ Territory	Type of System	Title	Deaths Investigated	Contact	Comment
Colorado	County Coroner	County Coroner	• From external violence. • Unexplained cause. • Under suspicious circumstances. • Suddenly, when in good health. • Where no physician is in attendance, or where the attending physician is unable to certify the cause of death. • From thermal, chemical, or radiation injury. • From criminal abortion. • From disease that may be hazardous or contagious or may constitute a hazard to the public health. • While in custody of law enforcement officials or while incarcerated in a public institution. • From industrial accident.	James L. Kramer, P.A.C. President Colorado Coroner Association 517 Colorado Avenue Pueblo, CO 81004 (719) 543-4016 Fax: (719) 583-6077 Email:kramerpa@co.pueblo.co.us Thomas E. Henry, M.D. Chief Medical Examiner/ Coroner Denver City and County 660 Bannock Street Denver, CO 80204-4507 (303) 436-7711 (303) 436-7411 Fax: (303) 436-7709	
Connecticut	State Medical Examiner	State Chief Medical Examiner	• Due to criminal abortion, whether apparently self-induced or not. • Violent, whether apparently homicidal, suicidal, or accidental, including but not limited to deaths due to thermal, chemical, electrical, or radiation injury. • Sudden or unexpected deaths not caused by readily recognizable disease. • Under suspicious circumstances. • Where the body is to be cremated, buried at sea, or otherwise disposed of so as to be thereafter unavailable for examination. • Related to occupational disease or accident. • Related to disease which might constitute a threat to public health.	H. Wayne Carver, II, M.D. Chief Medical Examiner Office of the State Medical Examiner 11 Shuttle Road Farmington, CT 06032-1939 (860) 679-3980 Fax: (860) 679-1257 Email: H.Wayne.Carver@po.state.ct.us	

State/ Territory	Type of System	Title	Deaths Investigated	Contact	Comment
Delaware	State Medical Examiner	State Chief Medical Examiner	• By violence, suicide, or casualty. • While under anesthesia. • By abortion or suspected abortion. • By poison or suspicion of poison. • Suddenly when in apparent health. • When unattended by a physician. • In prison or penal institution or police custody. • Resulting from employment. • From undiagnosed cause which may be related to a disease constituting a threat to public health. • In any suspicious or unusual manner. • If the body is unclaimed or to be cremated.	Richard Callery, M.D. State Chief Medical Examiner Office of the Chief Medical Examiner Department of Health and Social Services 200 South Adam Street Wilmington, DE 19801 (302) 577-3420 Fax: (302) 577-3416 Email: rcallery@state.de.us	
District of Columbia	Medical Examiner	Chief Medical Examiner	• By violence, whether apparently homicidal, suicidal, or accidental, including deaths due to thermal, chemical, electrical, or radiation injury. • Due to criminal abortion, whether apparently self-induced or not. • Under suspicious circumstances. • Of persons whose bodies are to be cremated, dissected, buried at sea, or otherwise disposed of so as to be thereafter unavailable for examination. • Sudden deaths not caused by readily recognizable disease. • Related to disease resulting from employment or to accident while employed. • Related to disease which might constitute a threat to public health.	Johnathan L. Arden, M.D. Chief Medical Examiner Office of the Chief Medical Examiner Building 27 1910 Massachusetts Avenue, Southeast Washington, DC 20003 (202) 698-9000 Fax: (202) 698-9100	

State/ Territory	Type of System	Title	Deaths Investigated	Contact	Comment
Florida	District Medical Examiner	District Medical Examiner	• By criminal violence. • By accident. • By suicide. • Suddenly, when in apparent good health. • Unattended by a physician or other recognized practitioner. • In a prison or penal institution. • In police custody. • In any suspicious or unusual circumstances. • By criminal abortion. • By poison. • By disease constituting a threat to public health. • By disease, injury, or toxic agent exposure resulting from employment. • When a body is brought into the State without proper medical certification. • When the body is to be cremated, dissected, or buried at sea.	Stephen J. Nelson, M.D., M.A., F.C.A.P. Chairman Medical Examiners Commission Florida Department of Law Enforcement P.O. Box 1489 Tallahassee, FL 32302-1489 (850) 410-8600 Fax: (850) 410-8621 Email:JNelsonMD@aol.com Vickie Marsey Program Admin. Medical Examiners Commission Same address as above (850) 410-8660 Fax: (850) 410-8621 Email: VickieMarsey@fdle.state.fl.us	
Georgia	Mixed: State Medical Examiner and County Coroners/Medical Examiners	County Coroner, State Medical Examiner, Regional Medical Examiner, County Medical Examiner, Local Medical Examiner	• By violence, suicide, or casualty. • Suddenly, when in apparent good health. • When unattended by a physician. • When an inmate of a State hospital or State, county, or city penal institution. • When ordered by a court having criminal jurisdiction. • After birth but before 7 years of age if the death is unexpected or unexplained.	Kris Sperry, M.D. State Medical Examiner Division of Forensic Sciences Georgia Bureau of Investigation P.O. Box 370808 Decatur, GA 30037-0808 (404) 244-2709 Fax: (404) 212-3047 Email: kris.sperry@gbi.state.ga.us	

State/ Territory	Type of System	Title	Deaths Investigated	Contact	Comment
Georgia (cont'd)			• In any suspicious or unusual manner, with particular attention to those persons 16 years of age and under. • As a result of an execution carried out pursuant to imposition of the death penalty.	Randy Hanzlick, M.D. Chief Medical Examiner, Fulton County Fulton County Medical Examiner Center 430 Pryor Street SW Atlanta, GA 30312 (404) 730-4400 Fax: (404) 730-4407 Email: RandyHanzlick@mail.co.fulton.ga.us	
Guam	Territorial Medical Examiner	Chief Medical Examiner	• Violent, unusual, or unnatural deaths. This covers any death attributed to accident, suicide, homicide, criminal abortion, physical, mechanical, electrical, chemical, radiational, thermal, or related means. • All deaths under suspicious circumstances. • Sudden deaths in apparent health without obvious cause. • Deaths without medical attendance: 1. found dead without obvious or probable cause. 2. unattended at anytime by a licensed physician. 3. unattended by a physician during a terminal illness, particularly if such death appears unrelated to a disease previously diagnosed and treated. 4. fetal death attended by midwife. 5. deaths in prison, lock up, penitentiary, or juvenile justice facility. 6. deaths during or following an acute or unexplained syncope or coma. 7. during an acute or unexplained rapidly fatal illness which may be contagious to the public.	Aurelio A. Espinola, M.D. Chief Medical Examiner P.O. Box 7147 Tamuning, GU 96931 (671) 646-9363h	

State/ Territory	Type of System	Title	Deaths Investigated	Contact	Comment
Guam (cont'd)			8. all hospital DOAs (dead on arrival) and those dying within 24 hours after admission. • Bodies to be cremated, buried at sea, or shipped off island.		
Hawaii	Mixed: County Medical Examiners/ Coroners	County Coroner, Coroner Physician (titled Medical Examiner in Honolulu)	• As the result of violence. • As the result of any accident. • By suicide. • Suddenly when in apparent health. • When unattended by a physician. • In prison. • In a suspicious or unusual manner. • Within 24 hours after admission to a hospital or institution.	Kanthi Von Guenthner, M.D. Department of the Medical Examiner 835 Iwilei Road Honolulu, HI 96817 (808) 527-6777 Fax: (808) 524-8797	
Idaho	County Coroner	County Coroner	• As a result of violence whether apparently homicidal, suicidal, or accidental. • Under suspicious or unknown circumstances. • When not attended by a physician during his/her last illness and the cause of death cannot be certified by a physician.	Erwin Sonnenberg Idaho Coroners Association 5550 Morrishill Road Boise, ID 83706 (208) 364-2676 Fax: (208) 364-2685 Email: CRSONNEL@ ADAWEB.NET ˜	
Illinois	Mixed: County Medical Examiners/ Coroners	County Coroner, County Medical Examiner	• Sudden or violent death, whether apparently suicidal, homicidal, or accidental, including but not limited to deaths apparently caused or contributed to by thermal, traumatic, chemical, electrical or radiation injury, or a complication of any of them, or by drowning, suffocation, or motor vehicle accident. • Maternal or fetal death due to abortion. • Due to sex crime or crime against nature.	Jeff Lair Secretary Illinois Coroners and Medical Examiners Association P.O. Box 1261 Jacksonville, IL 62651 (217) 245-7423 Fax: (217) 479-4637 Email: coroner@ direcway.com	

State/ Territory	Type of System	Title	Deaths Investigated	Contact	Comment
Illinois (cont'd)			• Where the circumstances are suspicious, obscure, mysterious, or otherwise unexplained; and where, in the written opinion of the attending physician, the cause is not determined. • Where addiction to alcohol or to any drug may have been a contributory cause. • Where the decedent was not attended by a licensed physician. • Occurring in State institutions or of wards of the State. • If a child under 2 years dies suddenly or unexpectedly and circumstances concerning the death are unexplained. • While being pursued, apprehended, or taken into custody by law enforcement officers or while in custody of any law enforcement agency.		
Indiana	County Coroner	County Coroner	• Has died from violence. • Has died by casualty. • Has died when apparently in good health. • Has died in an apparently suspicious, unusual, or unnatural manner. • Has been found dead.	Lisa Barker Executive Director Indiana Coroners Association 1643 West 800 South Romney, IN 47981 (877) 692-7284 Fax: (765) 538-2880 Email: ISCABarker@aol.com James St. Myer President Indiana Coroners Association 4109 Janney Ave. Muncie, IN 47305 (765) 289-0865 Fax: (765) 284-4606 Email: JSTM1079@aol.com	

State/ Territory	Type of System	Title	Deaths Investigated	Contact	Comment
Iowa	State Medical Examiner	State Medical Examiner, County Medical Examiner	• Violent, including homicidal, suicidal, or accidental. • Caused by thermal, chemical, electrical, or radiation injury. • Caused by criminal abortion including those self-induced, or by rape, carnal knowledge, or crimes against nature. • Related to disease thought to be virulent or contagious, which might constitute a public hazard. • Occurring unexpectedly or from unexplained causes. • Of a person confined in jail, prison, or correctional institution. • Where a physician was not in attendance at any time at least 36 hours preceding death, with the exception of pre-diagnosed terminal or bedfast cases for which the time period shall be extended to 20 days. • Where the body is not claimed by relatives or friends. • Where the identity of the deceased is unknown. • Of a child under the age of 2 years when sudden infant death syndrome is suspected or cause of death is unknown.	Julia C. Goodin, M.D., State Medical Examiner Office of the Iowa State Medical Examiner, Iowa Department of Public Health Lucas State Office Building, 5th Floor, 321 East 12th Street Des Moines, IA 50309 (515) 281-6726 Email: *jgoodin@raccoon.com*	
Kansas	District Coroner	District Coroner	• Death is suspected to have been the result of violence caused by unlawful means, or by suicide. • By casualty. • Suddenly when the decedent was in apparent health. • When the decedent was not regularly attended by a licensed physician.	Alan Hancock, M.D. President Kansas Coroners Association 9201 Parallel Parkway Kansas City, KS 66112-1598 (913) 299-1474 Fax: (913) 299-4931	
Kansas (cont'd)			• In any suspicious or unusual manner, or when in police custody, or when in a jail or correctional institution. • When the determination of the cause of death is held to be in the public interest.		

State/ Territory	Type of System	Title	Deaths Investigated	Contact	Comment
Kentucky	Mixed: State Medical Examiner and County Coroners/Medical Examiners	County Coroner, State Medical Examiner, District Medical Examiner	• Caused by homicide, violence, suicide, an accident, drugs, poison, motor vehicle, train, fire, explosion, drowning, illegal abortion, or unusual circumstances. • By criminal means. • Sudden infant death syndrome. • Child abuse. • Death in a person less than 40 years of age with no past medical history to explain the death. • Death occurring at a worksite. • Death in any mental institution. • Death in any prison, jail, or penal institution, or while decedent was in police custody. • When the death was sudden and unexplained or the decedent was unattended by a physician by more than 36 hours prior to death. • When skeletonized or extensively decomposed human remains are found. • When the body is to be cremated. • When circumstances of death result in a request by any responsible citizen for an investigation.	Tracey S. Corey, MD State Chief Medical Examiner Office of the State Medical Examiner Urban Government Center 810 Barrett Ave. Louisville, KY 40204 (502) 588-5587 Fax: (502) 852-1767 Email: TraceySCorey@aol.com Dan Able Executive Director Office of the State Medical Examiner 100 Sower Blvd, Suite 202. Frankfort, KY 40601 (502) 564-4545 Fax: (502) 564-1699 Email: dan.able@ky.gov	

State/ Territory	Type of System	Title	Deaths Investigated	Contact	Comment
Louisiana	County Coroner	Parish Coroner	• When suspicious, unexpected, unusual or sudden. • By violence. • Due to unknown or obscure causes. • Where the body is found dead. • Without attending physician within 36 hours prior to the hour of death. • When abortion, whether self-induced or otherwise, is suspected. • Due to suspected suicide or homicide. • When poison is suspected. • From natural causes occurring in a hospital under 24 hours admission unless seen by a physician in the past 36 hours. • Following an injury or accident, either old or recent. • Due to drowning, hanging, burns, electrocution, gunshot wounds, stabs or cutting, lightning, starvation, radiation, exposure, alcoholism, addiction, tetanus, strangulation, suffocation, or smothering. • Due to trauma from whatever cause. • Stillborn deaths. • Due to criminal means. • If victim of alleged rape, carnal knowledge, or crime against nature. • By casualty. • In prison or while serving a sentence. • Due to virulent contagious disease that might be caused by or cause a public hazard (AIDS cases included).	Allen Herbert, M.D. President Louisiana Coroners' Association P.O. Box 747 Alexandria, LA 71309 (318) 473-6831 Fax: (318) 473-6832 Email: LSCA@speed-gate.net	

State/ Territory	Type of System	Title	Deaths Investigated	Contact	Comment
Maine	State Medical Examiner	State Chief Medical Examiner, Medical Examiner	• Violence of any kind. • Any cause where the death occurs suddenly while the person is in apparent good health. • Any cause where there is no attending physician capable of certifying the death as due to natural causes. • Poisoning, either chronic or acute. • Diagnostic or therapeutic procedures under circumstances indicating gross negligence or unforeseen clearly traumatic causes. • Any cause while the person is in custody or confinement, unless clearly certifiable by an attending physician as due to natural causes. • Disease or pathological process constituting a threat to public health, if the authority of the medical examiner is required to study the death adequately to protect the public health. • Deaths which may have been improperly certified or inadequately examined, including, but not limited to, bodies brought into the State under these circumstances. • In the case of a child under the age of 3 years, from any cause, including sudden infant death syndrome, unless the death is clearly due to a specific natural cause.	Margaret S. Greenwald, MD State Chief Medical Examiner State House, Station #37 Augusta, ME 04333 (207) 624-7180 Fax: (207) 624-7178 Email: margaret.greenwald@state.me.us	

State/ Territory	Type of System	Title	Deaths Investigated	Contact	Comment
Maryland	State Medical Examiner	State Chief Medical Examiner	• By violence, suicide, or casualty. • Suddenly when in apparent good health, or when unattended by a physician. • In any suspicious or unusual manner. • Fetuses, regardless of duration of pregnancy, if the mother is not attended by a physician at or after the delivery.	David Fowler, M.D. Acting State Chief Medical Examiner State of Maryland 111 Penn Street Baltimore, MD 21201 (410) 333-3226 Fax: (410) 333-3063 Email: OCMEMD@aol.com	
Massachusetts	State Medical Examiner	State Chief Medical Examiner, District Medical Examiner	• Where criminal violence appears to have taken place, regardless of the time interval between the incident and death, and regardless of whether such violence appears to have been the immediate cause of death, or a contributory factor. • By accident or unintentional injury, regardless of the time interval between the incident and death, and regardless of whether such violence appears to have been the immediate cause of death, or a contributory factor. • Suicide, regardless of the time interval between the incident and death. • Death under suspicious or unusual circumstances. • Death following an illegal abortion. • Death related to occupational illness or injury. • Death in custody, in any jail or correctional facility, or in any mental health or mental retardation facility. • Death where suspicion of abuse of a child, family or household member, elder person, or disabled person exists. • Death due to poison or acute or chronic use of drugs or alcohol.	Richard Evans, M.D. State Chief Medical Examiner Commonwealth of Massachusetts 720 Albany Street Boston, MA 02118 (617) 267-6767 Toll free in Massachusetts (800) 962-7877 Fax: (617) 266-6763 Email: richard.evans@cme.state.ma.us	

State/ Territory	Type of System	Title	Deaths Investigated	Contact	Comment
Massachusetts (continued)			• Skeletal remains. • Death associated with diagnostic or therapeutic procedures. • Sudden death when the decedent was in apparent good health. • Death within 24 hours of admission to a hospital or nursing home. • Death in any public or private conveyance. • Fetal death as defined by Section 202 of Chapter 111, where the period of gestation has been 20 weeks or more or where fetal weight is 350 grams or more. • Pediatric deaths under and including the age of 18 years from any cause. • Any person found dead. • Death in an emergency treatment facility, medical walk-in center, day care center, or under foster care. • Death occurring under such circumstances as the chief medical examiner shall prescribe in regulations promulgated pursuant to the provisions of Chapter 30 A.		
Michigan	County Medical Examiner	County Medical Examiner	• By violence. • When unexpected. • Without medical attendance during the 48 hours prior to the hour of death unless the attending physician, if any, is able to determine accurately the cause of death. • As the result of an abortion, whether self-induced or otherwise. • Of any prisoner in any county or city jail.	Dan Remick, M.D. President Michigan Association for Medical Examiners M2210 Medical Science I, 1301 Catherine Road Ann Arbor, MI 48109-0602 (734) 763-6454 Fax: (734) 763-6476 Email: remickd@umich.edu	

State/ Territory	Type of System	Title	Deaths Investigated	Contact	Comment
Minnesota	Mixed: County Medical Examiners/ Coroners	County Coroner, Medical Examiner (Hennepin, Ramsey Counties)	• Violent, whether apparently homicidal, suicidal, or accidental, including but not limited to deaths due to thermal, chemical, electrical, or radiation injuries. • Due to criminal abortion, whether apparently self-induced or not. • Under unusual or mysterious circumstances. • Of persons whose bodies are to be cremated, dissected, buried at sea, or otherwise disposed of so as to be thereafter unavailable for examination. • Of inmates of public institutions who are not hospitalized therein for organic diseases.	Andrew M. Baker, M.D. Medical Examiner Hennepin County 530 Chicago Avenue Minneapolis, MN 55415 (612) 215-6300 Fax: (612) 215-6330 Email: andrew.baker@co.hennepin.mn.us Michael Rossman Executive Secretary Minnesota Coroners' and Medical Examiners' Association 530 Chicago Avenue Minneapolis, MN 55415 (612) 215-6300 FAX (612) 215-6330 Email: michael.rossman@co.hennepin.mn.us	
Mississippi	Mixed: State Medical Examiner and County Coroners/Medical Examiners	State Medical Examiner, County Medical Examiner (Coroner), County Medical Examiner Investigator (Coroner)	• Violent, including homicidal, suicidal, or accidental. • Caused by thermal, chemical, electrical, or radiation injury. • Caused by criminal abortion, including self-induced, or abortion related to or by sexual abuse. • Related to disease thought to be virulent or contagious which may constitute a public health hazard. • Unexpected or from an unexplained cause. • Of a person confined in a prison, jail, or correction institution (autopsy mandatory if prisoner was in custody of State Correctional System). • Of a person where physician was not in attendance within 36 hours preceding death, or in prediagnosed terminal or bedfast cases within 30 days. • Of a person where the body is not claimed by a relative or friend. • Of a person where the identity of the deceased is unknown.	Sam Howell Administrator Mississippi Crime Laboratory 1700 East Woodrow Wilson Avenue Jackson, MS 39216 (601) 987-1440 Fax: (601) 987-1445 Email: showell@mcl.state.ms.usl	

State/ Territory	Type of System	Title	Deaths Investigated	Contact	Comment
Mississippi (continued)			• Of a child under the age of 2 years where death results from an unknown cause or where the circumstances surrounding the death indicate that sudden infant death syndrome may be the cause of death (autopsy mandatory). • Where a body is brought into this State for disposal and there is reason to believe either that the death was not investigated properly or that there is not an adequate certification of death. • Where a person is admitted to a hospital emergency room unconscious and/or unresponsive, with cardiopulmonary resuscitative measures being performed, and dies within 24 hours of admission without regaining consciousness or responsiveness, unless a physician was in attendance within 36 hours preceding presentation to the hospital, or in cases in which the decedent had a prediagnosed terminal or bedfast condition, unless a physician was in attendance within 30 days preceding presentation to the hospital.		

State/ Territory	Type of System	Title	Deaths Investigated	Contact	Comment
Missouri	Mixed: County Medical Examiners/ Coroners	County Coroner, County Medical Examiner	Coroner—In any city of 700,000 or more inhabitants or in any county of the first or second class in which a Coroner is required, the Coroner must investigate all deaths where there is reason to believe that death was caused by criminal violence or following abortion. • By violence by homicide, suicide, or accident. • By criminal abortion, including those self- induced. • By some unforeseen occurrence and the deceased had not been attended by a physician during the 36-hour period preceding the death. • Occurring in any unusual or suspicious manner. Medical Examiner— • By violence by homicide, suicide, or accident. • By criminal abortion, including those self-induced. • By disease thought to be of a hazardous and contagious nature or which might constitute a threat to public health. • Suddenly when in apparent good health. • When unattended by a physician, chiropractor, or accredited Christian Science practitioner during the 36-hour period preceding the death. • While in the custody of the law. • While an inmate of a public institution. • Occurring in any unusual or suspicious manner.	Michael A. Graham, M.D. Medical Examiner City of St. Louis 1300 Clark Avenue St. Louis, MO 63103-2718 (314) 622-4971 Fax: (314) 622-4933 Email: GRAHAMMA@ slu.edu	

State/ Territory	Type of System	Title	Deaths Investigated	Contact	Comment
Montana	Mixed: State Medical Examiner and County Coroners/Medical Examiners	County Coroner, Chief State Medical Examiner, Associate Medical Examiner	Coroner— • Death caused or suspected to have been caused by an injury, either recent or remote in origin. • Death caused or suspected to have been caused by the deceased or any other person that was the result of an act or omission, including, but not limited to, a criminal or suspected criminal act; a medically suspicious death, unusual death, or death of unknown circumstances, including any fetal death; or an accidental death. • Death caused or suspected to have been caused by an agent, disease, or medical condition that poses a threat to public health. • Death occurring while the deceased was incarcerated in a prison or jail or confined to a correctional or detention facility owned and operated by the State or a political subdivision of the State. • Death occurring while the deceased was in the custody of, or was being taken into the custody of, a law enforcement agency or a peace officer. • Death occurring during or as a result of the deceased's employment. • Death occurring less than 24 hours after the deceased was admitted to a medical facility or if the deceased was dead upon arrival at a medical facility. • Death occurring in a manner that was unattended or unwitnessed and the deceased was not attended by a physician at any time in the 30-day period prior to death.	Gary Dale, M.D. State Medical Examiner State Crime Lab Division of Forensic Sciences 2679 Palmer Street Missoula, MT 59808 (406) 728-4970 Fax: (406) 549-1067 Email: gdale@state.mt.us Terry Bullis Secretary-Treasurer Montana Coroners' Association P.O. Box 318 Hardin, MT 59034-0318 (406) 665-1207 M.E. "Mickey" Nelson Lewis and Clark County Coroner 228 Broadway St. Helena, MT 59601-4263 (406) 442-7398 Fax: (406) 447-8298 Email: MNELSON@co.lewis-clark.mt.us	

State/ Territory	Type of System	Title	Deaths Investigated	Contact	Comment
Montana (cont'd)			• If the dead body is to be cremated or shipped into the State and lacks proper medical certification or burial or transmit permits. • Death that occurred under suspicious circumstances. • Death that is the result of a judicial order. • Death that has occurred and no physician or surgeon licensed in Montana will sign a death certificate. ChiefState Medical Examiner—provides assistance and consultation to Coroners.		
Nebraska	County Coroner	County Coroner, County Coroner's Physician	• By criminal means or violence. • Homicide or suicide. • By drowning. • If sudden or unusual. • If drug-related. • If sudden infant death syndrome is suspected. • When involving the sudden and unexplained death of a child between the ages of 1 week and 3 years, and when neglect, violence, or any unlawful means are possible. • When death is not certified by attending physician. • When an individual has died while being apprehended by or while in the custody of a law enforcement officer or detention personnel. • Any suspicious, unexplained, or unattended death.	DeMaris Johnson Executive Director Nebraska County Attorneys Association Suite 203 1233 Lincoln Mall Lincoln, NE 68508 (402) 476-6047 Fax: (402) 476-2469	In Lancaster and Douglas Counties, physicians have been appointed to assist in the investigations and the signing of the medical portion of death certificates. In Douglas County, the County Attorney has appointed a medical examiner to investigate deaths by unnatural causes.

State/ Territory	Type of System	Title	Deaths Investigated	Contact	Comment
Nebraska (cont'd)					Coroner's physicians sign the death certificates. In Lancaster County, the County Attorney has retained a pathologist who assists in the investigation by performing autopsies and signing the medical portion of death certificates.
Nevada	District Coroner	District Coroner	• Unattended deaths. • Deaths wherein the deceased has not been attended by a physician in the 10 days before death. The coroner shall issue the certificate of death following consultation with a physician licensed to practice in the State. • Deaths related to or following known or suspected self-induced or criminal abortion. • Known or suspected homicide, suicide, or accidental death. • Deaths known or suspected as resulting in whole or in part from or related to accident or injury. • Deaths from drowning, fire, hanging, gunshot, stabbing, cutting, exposure, starvation, alcoholism, drug addiction, strangulation, or aspiration. • Deaths in whole or in part occasioned by criminal means. • Deaths in prison.	Lary Simms, M.D. Chief Medical Examiner Clark County 1704 Pinto Lane Las Vegas, NV 89106 (702) 455-3210 Fax: (702) 455-0416 Email: LSI@co.clark.nv.us Vernon O. McCarty Washoe County Coroner P.O. Box 11130 Reno, NV 89520 (702) 785-6114 Fax:(775) 785-1468 Email: VMCCARTY@mail.co.washoe.nv.us	Although they have coroner systems by ordinance, Washoe County (Reno) and Clark County (Las Vegas) employ board-certified forensic pathologists who provide medical examiner services for their respective counties, as well as for other counties on a fee-for-service basis.

State/ Territory	Type of System	Title	Deaths Investigated	Contact	Comment
Nevada (cont'd)			• Deaths under such circumstances as to afford reasonable ground to suspect that the death was caused by the criminal act of another, or any deaths reported by physicians or other persons having knowledge of death for inquiry by the coroner.		
New Hampshire	State Medical Examiner	State Chief Medical Examiner, County Medical Examiner	• By violence or unlawful act. • In any suspicious, unusual, or unnatural manner. • In prison. • When unattended by a physician. • Suddenly when in apparent health, including those sudden and unexpected deaths of children under 3 years of age or when sudden infant death syndrome is suspected.	Thomas Andrew MD Chief Medical Examiner Office of State Chief Medical Examiner Suite 218 246 Pleasant Street Concord, NH 03301 (603) 271-1235 Fax: (603) 271-6308	
New Jersey	State Medical Examiner	State Medical Examiner, County Medical Examiner	• By violence whether apparently homicidal, suicidal, or accidental, including, but not limited to, deaths due to thermal, chemical, electrical, or radiation injury. • Deaths due to criminal abortion, whether apparently self-induced or not. • Not caused by readily recognizable disease, disability, or infirmity. • Under suspicious or unusual circumstances. • Within 24 hours after admission to a hospital or institution. • Of inmates in prison. • Of inmates of institutions maintained in whole or in part at the expense of the State or county where the inmate was not hospitalized therein for organic disease.	Faruk B. Presswalla, M.D. State Medical Examiner Office of the State Medical Examiner P.O. BOX 094 Trenton, NJ 08625-0094 (609) 896-8900 Fax: (609) 896-8697 Email: presswallaf@dcj.lps.state.nj.us	

State/ Territory	Type of System	Title	Deaths Investigated	Contact	Comment
New Jersey (cont'd)			• From causes which might constitute a threat to public health. • Related to disease resulting from employment or to accident while employed. • Sudden or unexpected deaths of infants and children under 3 years of age. • Fetal deaths occurring without medical attendance.		
New Mexico	State Medical Examiner	State Medical Investigator, District Medical Investigator	• Sudden, violent, or untimely. • Found dead and the cause of death is unknown or obscure. • If caused by criminal act or omission.	Ross E. Zumwalt, M.D. State Chief Medical Investigator Office of the Medical Investigator State of New Mexico MSC11 6030 1 University of New Mexico Albuquerque, NM 87131-0001 (505) 272-3053 Fax: (505) 272-0727 Email:RZumwalt@salud.unm.edu	
New York	Mixed: County Medical Examiners/ Coroners	County Coroner, County Coroner's Physician, County Medical Examiner (in counties abolishing coroner system)	• By violence, whether criminal violence, suicide, or casualty. • Caused by unlawful act or criminal neglect. • Occurring in a suspicious, unusual, or unexplained manner. • Caused by suspected criminal abortion. • While unattended by a physician, so far as can be discovered, or where no physician is able to certify the cause of death as provided in public health law and in form as prescribed by the Commissioner of Health can be found. • Of a person confined in a public institution other than a hospital, infirmary, or nursing home. • Death occurring to an inmate of a correctional facility.	Charles S. Hirsch, M.D. Chief Medical Examiner City of New York (New York, Bronx, Kings, Queens, and Richmond Counties) 520 First Avenue, Room 134 New York, NY 10016 (212) 447-2034 Fax: (212) 447-2744	In some counties, there are multiple coroners, each having equal authority. In Lewis, Madison, and Oswego Counties, State law requires that the District Attorney serve as Coroner.

State/ Territory	Type of System	Title	Deaths Investigated	Contact	Comment
North Carolina	Mixed: State Medical Examiner and County Coroners/Medical Examiners	Chief Medical Examiner, County Medical Examiner, (Acting) Medical Examiner	• Homicide. • Suicide. • Trauma-related. • Accidental. • Disaster related. • Violence related. • Unknown, unnatural, unusual, or suspicious circumstances. • In police custody, jail, prison, or correctional institution. • Poisoning or suspicion of poisoning. • Possible public health hazard (such as acute contagious disease or epidemic). • Deaths during surgical or anesthetic procedure. • Sudden unexpected deaths which are not reasonably related to known previous disease. • Deaths without medical attendance, as defined by statute.	John D. Butts, M.D. Chief Medical Examiner State Department of Health and Human Services Office of the Chief Medical Examiner Chapel Hill, NC 27599-7580 (919) 966-2253 Fax: (919) 962-6263 Email: jbutts@ocme.unc.edu	North Carolina has coroners in some counties who work closely with the State Medical Examiner.
North Dakota	County Coroner	County Coroner	• Generally, deaths occurring by unlawful means or without medical attendance. • In counties with more than 8,000 population. • As a result of criminal or violent means. • By casualty or accident. • By suicide. • Suddenly when in apparent good health. • In a suspicious or unusual manner. • Occurring without medical attendance. • When the Workers' Compensation Board deems it necessary under the Crime Victims Reparation Act.	Beverly R. Wittman Deputy State Registrar and Director Division of Vital Records North Dakota State Department of Health 600 East Boulevard Bismarck, ND 58505 (701) 328-4508 Fax:(701) 328-1850 Email: BWITTMAN@state.nd.usNorth Dakota	The office of Coroner is abolished in counties adopting the County Manager form of government, with the County Manager or Sheriff assuming the duties of the Coroner. However, if these duties conflict with those performed by the Sheriff, the county State's Attorney assumes the duties of the coroner.

State/ Territory	Type of System	Title	Deaths Investigated	Contact	Comment
Northern Marina Islands	Not available	Not Available	• Not available.	Orana Castro Director Office of Vital Statistics Commonwealth Trial Courts P.O. Box 307 Saipan, MP 96950 (670) 234-6401	
Ohio	Mixed: County Medical Examiners/ Coroners	County Coroner	• As a result of criminal or other violent means. • By casualty. • By suicide. • Suddenly when in apparent health. • In any suspicious or unusual manner. • Threat to public health.	David P. Corey Executive Director Ohio State Coroners Association 6161 Busch Blvd Suite #87 Columbus, OH 43229-2508 614-262-OSCA Fax: 614-888-9767 Email: info@osca.net	Coroners are not allowed to actively practice law while in office. Summit County has a County Medical Examiner system.
Oklahoma	State Medical Examiner	State Chief Medical Examiner, County Medical Examiner	• By violence, whether apparently homicidal, suicidal, or accidental, including, but not limited to, death due to thermal, chemical, electrical, or radiation injury. • Due to criminal abortion, whether apparently self-induced or not. • Under suspicious, unusual, or unnatural circumstances. • Related to disease that might constitute a threat to public health. • Unattended by a licensed medical or osteopathic physician for a fatal or potentially fatal illness. • Of persons after unexplained coma. • That are medically unexpected and occur in the course of a therapeutic procedure. • Of any inmates occurring in any place of penal incarceration. • Of persons whose bodies are to be cremated, buried at sea, transported out of State, or otherwise made ultimately unavailable for pathological study.	Fred B. Jordan, M.D. Chief Medical Examiner 901 North Stonewall Oklahoma City, OK 73117 (405) 239-7141 Fax: (405) 239-2430 Email: Medical_Examiner@ocmeokc.state.ok.us	

State/ Territory	Type of System	Title	Deaths Investigated	Contact	Comment
Oregon	State Medical Examiner	State Medical Examiner, County Medical Examiner	• Apparently homicidal, suicidal, or occurring under suspicious or unknown circumstances. • Resulting from the unlawful use of dangerous or narcotic drugs or the use or abuse of chemicals or toxic agents. • Occurring while incarcerated in any jail, correction facility, or in police custody. • Apparently accidental or following an injury. • By disease, injury, or toxic agent exposure during or arising from employment. • While not under the care of a physician during the period immediately previous to death. • Related to disease which might constitute a threat to the public health.	Karen Gunson, M.D. State Medical Examiner Medical Examiner Division Oregon Department of State Police 301 Northeast Knott Street Portland, OR 97212-3092 (503) 988-3746 Fax: (503) 280-6041 Email: karen.gunson@state.or.us Eugene Gray Forensic Administrator Medical Examiner Division Oregon Department of State Police 301 Northeast Knott Street Portland, OR 97212-3092 (503) 280-6061 Fax: (503) 280-6041 Email: eugene.gray@state.or.us	
Pennsylvania	Mixed: County Medical Examiners/ Coroners	County Coroner, County Medical Examiner	• Sudden deaths not caused by readily recognizable disease, or wherein the cause of death cannot be properly certified by a physician on the basis of prior (recent) medical attendance. • Deaths occurring under suspicious circumstances, including those where alcohol, drugs, or other toxic substances may have had a direct bearing on the outcome. • Deaths occurring as a result of violence or trauma, whether apparently homicidal, suicidal, or accidental (including, but not limited to, those due to mechanical, thermal, chemical, electrical or radiational injury, drowning, cave-ins, and subsidences).	Dennis Kwiatkowski Secretary Treasurer Pennsylvania State Coroners Association 110 Franklin Street Suite 500 Johnstown, PA 15901 (814) 535-622 Fax: (814) 539-9057 Email: coroner@co.cambria.pa.us	

State/ Territory	Type of System	Title	Deaths Investigated	Contact	Comment
Pennsylvania (cont'd)			• Any death in which trauma, chemical injury, drug overdose, or reaction to drugs or medication or medical treatment was a primary or secondary, direct or indirect, contributory, aggravating, or precipitating cause of death. • Operative and perioperative deaths in which the death is not readily explainable on the basis of prior disease • Any death wherein the body is unidentified or unclaimed. • Deaths known or suspected as due to contagious disease and constituting a public hazard. • Deaths occurring in prison or a penal institution or while in the custody of the police. • Deaths of persons whose bodies are to be cremated, buried at sea, or otherwise disposed of so as to be thereafter unavailable for examination. • Sudden infant death syndrome. • Stillbirths.		
Puerto Rico	Territorial Medical Examiner	Director	• As a result of criminal acts or acts that are suspected as such. • As a result of any accident or act of violence or any subsequent act, regardless of its nature or time interval between said acts and death, if there is a reasonable doubt that there might have been a relation between said accident or act of violence and death. • As a result of poisoning or suspicion of poisoning. • Occurring in custody of the police or officers of the law, while in prison, or as a result of sickness or injury occurring while in prison, or suspicion thereof.	Lyvia A. Alvarez, M.D. Director Institute of Forensic Sciences Call Box 11878 Caparra Height Station San Juan, PR 00922 (809) 765-0615 (809) 765-4880	

State/ Territory	Type of System	Title	Deaths Investigated	Contact	Comment
Puerto Rico (cont'd)			• As a result of or in relation to the occupation of the deceased. • Due to acute intoxication with alcohol, narcotics, or any type of drug or controlled substance or suspicion of such. • Due to suicide or suspected suicide. • When in process of an autopsy that was not originally considered medicolegal, the pathologist discovers any clue, or any suspicion arises to indicate that such death could have occurred due to the commission of any crime. • Occurring suddenly or unexpectedly, while the person was enjoying relative or apparent good health. • Occurring during or after an abortion or childbearing. • When the physician who attended said person while living cannot reasonably establish that the death was due to natural causes. • Occurring during or after surgical, diagnostic, or therapeutic procedures or where the deceased was under anesthesia or recovering from it. • Occurring during the course of an illness, if there is a suspicion that factors extraneous to said illness could have contributed to the death. • Occurring in a convalescent home, asylum, or similar institution, whether it be commonwealth, municipal, or private. • Occurring to a person who has had a contagious disease that could constitute a threat to public health.		

State/ Territory	Type of System	Title	Deaths Investigated	Contact	Comment
Puerto Rico (cont'd)			• Occurring within 24 hours after the admission of the patient to a hospital, clinic, or asylum, whether it be commonwealth, municipal, or private, whenever the death cannot be attributed to natural causes. • Occurring during hospitalization in a psychiatric institution, whether it be commonwealth, municipal, or private, except in cases of death due to childbirth, duly certified by a physician. • Death caused by physical force such as electricity, heat, cold, radiation, or the effect of chemical products. • Any death due to malnutrition, abandonment, or exposure to the elements, or as a result of negligence. • When the corpse is to be cremated, dissected, or it is to be disposed of in such a way that it will not be available subsequently for examination, regardless of how the death occurred. • When the prosecutor or trial judge investigating the death requests an autopsy.		
Rhode Island	State Medical Examiner	State Medical Examiner	• By homicide, suicide or casualty. • Due to a criminal abortion. • Due to an accident involving lack of due care on the part of a person other than the deceased. • Which is the immediate or remote consequences of any physical or toxic injury incurred while the deceased person was employed.	Elizabeth A. Laposata, M.D. State Medical Examiner Office of State Medical Examiner Rhode Island Department of Health 48 Orms Street Providence, RI 02904 (401) 222-5500 Fax: (401) 222-5517	

State/ Territory	Type of System	Title	Deaths Investigated	Contact	Comment
Rhode Island (cont'd)			• Due to the use of addictive or unidentifiable chemical agents. • Due to an infectious agent capable of spreading an epidemic within the State. • When unattended by a physician.		
South Carolina	Mixed: County Coroner and Medical Examiner	County Coroner, County Medical Examiner	• By violence. • By suicide. • When in apparent good health. • When unattended by a physician. • In any unusual or suspicious manner. • While an inmate in a penal or correctional institution. • As a stillbirth, medically unattended.	Debbie Johnson Executive Director South Carolina Coroners Association 301 University Ridge, Suite 2300 Greenville, SC 29601 (864) 467-7446 Fax: (864) 467-7469	In counties with populations of 100,000 or more, the governing body of that county can chose to have a Medical Examiner system.
South Dakota	County Coroner	County Coroner	• By unnatural means, including all deaths of accidental, homicidal, suicidal, and undetermined manner, regardless of suspected criminal involvement in the death. • Identity of victim is unknown or the body is unclaimed. • Inmates of any state, county or municipally operated correctional facility, mental institution or special school. • Those believed to represent a public health hazard. • Children under 2 years of age resulting from unknown cause or if circumstances suggest sudden infant death syndrome as the cause. • Natural deaths if the decedent is not under the care of a physician or the decedent's physician does not feel qualified to sign the death certificate.	Kathlene A. Mueller Manager, Office of Data, Statistics and Vital Records State Department of Health 600 East Capitol Avenue Pierre, SD 57501-3182 (605) 773-3361 Fax: (605) 773-5683 Email: KATHIMU@doh.state.sd.us	

State/ Territory	Type of System	Title	Deaths Investigated	Contact	Comment
Tennessee	State Medical Examiner	State Chief Medical Examiner, Deputy Chief Medical Examiner, Assistant Chief Medical Examiner, County Medical Examiner	• From sudden violence. • By casualty. • By suicide. • Suddenly when in apparent health. • When found dead. • In prison. • In any suspicious, unusual, or unnatural manner. • Where the body is to be cremated. • For workers compensation claims if cause of death is obscure or disputed.	Bruce Levy, M.D. State Chief Medical Examiner State of Tennessee Center for Forensic Medicine 850 R.S. Gass Blvd. Nashville, TN 37216-2640 (615) 743-1800 Fax: (615) 743-1890 Email: blevy@forensic-med.com	
Texas	Mixed: County Medical Examiners/ Coroners	County Justice of the Peace, County/ District Medical Examiner	Justice of the Peace— • In prison or jail. • When a person is killed, or from any cause dies an unnatural death, except under sentence of the law. • In the absence of one or more good witnesses. • When found dead, the circumstances of death unknown. • When the circumstances are such as to lead to suspicion of unlawful means. • By suicide or suspected suicide. • When unattended by a duly licensed and practicing physician and the local health officer or registrar required to report the cause of death does not know the cause of death. • When the attending physician(s) cannot certify the cause of death. Medical Examiner— • Same as above, and in addition, any death within 24 hours after admission to a hospital or institution.	Vincent J.M. DiMaio, M.D. State Chief Medical Examiner Bexar County Forensic Science Center 7337 Louis Pasteur San Antonio, TX 78229-4565 (210) 615-2100	

State/ Territory	Type of System	Title	Deaths Investigated	Contact	Comment
U.S. Virgin Islands	Territorial Medical Examiner	Medical Examiner	• Unnatural deaths as prescribed by law. • From violence, whether criminal, suicide or casualty. • Unlawful act or criminal neglect. • Suspicious, unusual, or unexplained manner. • Suspect criminal abortion. • Death unattended by physician or where cause of death unable to be certified as provided by law. • When confined to a public institution other than hospital, infirmary, or nursing home. • As prescribed by the Governor or Attorney General.	James Glenn, M.D. Medical Examiner Office of the Medical Examiner U.S. Virgin Islands Department of Justice Toro Building 3008 Golden Grove Christiansted St. Croix, VI 00820 (809) 778-6311 Francisco Landron, M.D. Medical Examiner Office of the Medical Examiner U.S. Virgin Islands Department of Justice 8050 Kronprindsens Gade St. Thomas, VI 00802 (809) 744-5666 ext. 663 (809) 776-8311	
Utah	State Medical Examiner		• By violence, gunshot, suicide, or accident (except highway accidents). • Suddenly when in apparent health. • When unattended (not seen by a physician within 30 days). • Under suspicious or unusual circumstances. • Resulting from poisoning or overdose of drugs. • Resulting from diseases that may constitute a threat to public health. • Resulting from disease, injury, toxic effect, or unusual exertion incurred within the scope of the deceased's employment. • Due to sudden infant death syndrome.	Todd C. Grey, M.D. State Medical Examiner Utah Department of Health 48 North Medical Drive Salt Lake City, UT 84113 (801) 584-8410 Fax: (801) 584-8435 Email:hldels.tgrey@state.ut.usa	

State/ Territory	Type of System	Title	Deaths Investigated	Contact	Comment
			• Resulting when the deceased was in prison, jail, police custody, the State hospital, or a detention or medical facility operated for the treatment of mentally ill or emotionally disturbed or delinquent persons. • Associated with diagnostic and therapeutic procedures. • Involving questions of civil liability, in accordance with provisions of the Worker's Compensation Act.		
Vermont	State Medical Examiner	Chief Medical Examiner, Regional Medical Examiner	• From violence. • Suddenly when in apparent good health. • When unattended by a physician. • By casualty. • By suicide. • As a result of injury. • When in jail, prison, or any mental institution. • In any unusual, unnatural, or suspicious manner. • In circumstances involving a hazard to public health, welfare, or safety.	Paul L. Morrow, M.D. State Chief Medical Examiner Department of Health Baird 1 111 Colchester Ave. Burlington, VT 05401 (802) 863-7320 Fax: (802) 863-7265 Email: pmorrow@vdh.state.vt.us	

State/ Territory	Type of System	Title	Deaths Investigated	Contact	Comment
Virginia	State Medical Examiner	State Chief Medical Examiner, County/ City Medical Examiner	• By trauma, injury, violence, poisoning, accident, suicide, or homicide. • Suddenly when in apparent good health. • When unattended by a physician. • In jail, prison, other correctional institution or in police custody. • Suddenly as an apparent result of fire. • In any suspicious, unusual, or unnatural manner. • The sudden death of any infant less than 18 months of age whose death is suspected as due to SIDS. • When the body shall be cremated or buried at sea. • Fetal death not attended by a physician.	Marcella Farinelli Fierro, M.D. State Chief Medical Examiner Department of Health Office of the State Chief Medical Examiner 400 East Jackson Street Richmond, VA 23219-3694 (804) 786-3174 Fax: (804) 371-8595 Email: mfierro@vdh.state.va.us	
Washington	Mixed: County Medical Examiners/ Coroners	County Coroner, County Medical Examiner	• Those in which the Coroner suspects that the death was unnatural, or violent, or resulted from unlawful means, or from suspicious circumstances, or was of such a nature as to indicate the possibility of death by the hand of the deceased or through the instrumentality of some other person. • Those occurring suddenly when in apparent good health and without medical attendance within 36 hours preceding death. • Those resulting from unknown or obscure causes. • Those occurring within 1 year following an accident. • Those as a result of any violence whatsoever. • Those resulting from a known or suspected abortion, whether self-induced or otherwise.	Richard Harruff, M.D., Ph.D. Chief Medical Examiner, King County 325 Ninth Avenue HMC Box 35792 Seattle, WA 98104 (206) 731-3232 Fax: (206) 731-8555 Email: richard.harruff@metrokc.gov Dan Blasdel, President Washington Association of Coroners and Medical Examiners 1016 North 4th Avenue Pasco, WA99301 (509) 546-5885 Fax: (509)546-5812, page (509) 530-6906 Email: dblasdel@3-cities.com	

State/ Territory	Type of System	Title	Deaths Investigated	Contact	Comment
Washington (cont'd)			• Those apparently resulting from drowning, hanging, burns, electrocution, gunshot wounds, stabs or cuts, lightning, starvation, radiation, exposure, alcoholism, narcotics or other addictions, tetanus, strangulation, suffocation, or smothering. • Those due to premature birth or stillbirth. • Those due to virulent or suspected. contagious disease which may be a public health hazard. • Those resulting from alleged rape, carnal knowledge, or sodomy. • Those occurring in a jail or prison. • Those in which a body is found dead or is not claimed by relatives or friends. • Industrial deaths when cause of death is unknown and investigation is requested by the Department of Labor and Industries.		
West Virginia	State Medical Examiner	State Chief Medical Examiner, Deputy Chief Medical Examiner, County Medical Examiner	• From violence or suspected violence, or where natural disease cannot be assumed. • When unattended by a physician. • When during incarceration, protective custody, as a ward of the State, or associated with police intervention. • From disease or environmental condition which might constitute a threat to the public health. • When in any suspicious, unusual, or unnatural manner. • In deaths thought to be due to, or associated with, suspected abuse or neglect.	James Kaplan, M.D. State Chief Medical Examiner State of West Virginia Office of the Chief Medical Examiner 701 Jefferson Road South Charleston, WV 25309 (304) 558-3920 Fax: (304) 558-7886 Email: jkaplan@wvdhhr.org	

State/ Territory	Type of System	Title	Deaths Investigated	Contact	Comment
Wisconsin	Mixed: County Medical Examiners/ Coroners	County Coroner, County Medical Examiner	• If circumstances are unexplained, unusual, or suspicious. • By homicide or manslaughter, including death resulting from reckless conduct, negligent control of a vicious animal, or negligent use of a firearm. • By suicide. • Following an abortion. • By poisoning, whether homicidal, suicidal, or accidental. • Following accidents, whether the injury is or is not the primary cause. • When a physician or accredited practitioner of a bona fide religious denomination relying upon prayer or spiritual means for healing was not in attendance within 30 days preceding death, or if the deceased was not being treated for the condition causing death. • When a physician refuses to sign the death certificate. • When a physician cannot be obtained to sign the medical certification of death. • At the request of the Worker's Compensation Department.	Tom Terry, M.D. President Wisconsin Coroner and Medical Examiner Association 730 Wisconsin St Racine, WI 53403 (262) 636-3303 Fax: (262) 636-3728 Email: TOMT@racineco.com	Counties with a Medical Examiner include those having a population of 500,000 or more, and those that have chosen to have a Medical Examiner system.

State/ Territory	Type of System	Title	Deaths Investigated	Contact	Comment
Wyoming	County Coroner	County Coroner	• Violent or criminal action. • Apparent suicide. • Accident. • Apparent drug or chemical overdose or toxicity. • The deceased was unattended or had not seen a physician within 6 months prior to death. • Apparent child abuse causes. • The deceased was a prisoner, trustee, inmate, or patient of any county or state corrections facility or state hospital. • If the cause is unknown.	Donald B. Pierson Executive Director Wyoming Peace Officers Standards and Training Commission 1710 Pacific Avenue Cheyenne, WY 82002 (307) 777-7718 Fax: (307) 638-9706 Email: wypost@sisna.com James W. Thorpen, M.D. Chairman Wyoming Board of Coroner Standards County Building 200 North Center St, Suite 10 Casper, WY 82601-1949 (307) 235-9458 Fax: (307) 235-9608 Email: coroner@natrona.net	

SOURCE: all information was obtained from http://www.cdc.gov/epo/dphsi/mecisp/death_investigation.htm

Appendix B: Niosh Firefighter Fatality Reports—Autopsy Information

The NIOSH Fire Fighter Fatality Investigation and Prevention Program (FFFIPP) investigates firefighter line-of-duty fatalities. The purpose of this investigative program is, according to the FFFIPP Web site (*http://www.cdc.gov/niosh/fire/implweb.html*), threefold:

> *"Better define the magnitude and characteristics of line-of-duty deaths among fire fighters"*
>
> *"Develop recommendations for the prevention of deaths and injuries"*
>
> *"Disseminate prevention strategies to the fire service"*

The FFFIPP reports include specific details about the circumstances surrounding the fatalities as well as medical information including cause of death and pertinent autopsy results, when available.

This summary concentrates on investigations completed in the years 2000 through 2006; a few of the year 2000 investigations related to incidents in 1998 and 1999. The following table includes for each investigation the NIOSH Report Number, Date of Incident, Title, and Cause of Death, and includes notations about whether an autopsy was performed and autopsy findings. A link to each report's PDF file, available online, is provided. When the death certificate and autopsy listed differing causes of death, both are included in the table.

Most reports specifically mention the autopsy (or lack thereof). However, about one-third of the reports did not mention the autopsy outright. For some of those cases, postmortem toxicological specimen analysis, typically for carboxyhemoglobin level, was noted; however, the specimen was not necessarily obtained as part of an autopsy.

Approximately 280 FFFIPP reports were reviewed for recommendations or comments related to autopsy procedures and protocols. The most common comment specific to autopsy protocols was the recommendation to "perform autopsies on all on-duty fire fighter fatalities." This was noted on about two dozen cases involving cardiovascular deaths. No other recommendations were made for specific protocols or procedures for the autopsy itself, or for the postautopsy storage of tissue samples, etc. However, carboxy-hemoglobin levels were mentioned numerous times with a comment that postmortem levels were artificially low in a case in which the victim had received oxygen therapy prior to death.

TABLE: SUMMARY OF FFFIPP REPORTS

NIOSH REP. #	DATE OF INCIDENT	Title	CAUSE OF DEATH	AUTOPSY	AUTOPSY COMMENTS	PDF LINK
F2007-01	Dec 30, 2006	Career firefighter dies and chief is injured when struck by 130-foot awning that collapses during a commercial building fire—Texas	Blunt-force trauma	Not mentioned	None	*F2007-01PDF*
F2006-26	Aug 13, 2006	Career engineer dies and firefighter injured after falling through floor while conducting a primary search at a residential structure fire—Wisconsin	Smoke inhalation and thermal burns	Not mentioned	None	*F2006-26PDF*
F2006-22	Apr 8, 2006	Volunteer firefighter dies after being struck by a shackle on a recoiling tow rope—South Dakota	Blunt-force head trauma	Not mentioned	None	*F2006-22PDF*
F2006-19	May 14, 2006	Career lieutenant dies in residential structure fire—Colorado	Complications from hypoxic encephalopathy (lack of oxygen to the brain) due to apparent smoke inhalation	Not mentioned	None	*F2006-19PDF*
F2006-10	Mar 1, 2006	Volunteer firefighter is killed and another volunteer firefighter is injured at a wildland/urban interface fire—Oklahoma	Complications from the burns he received to over 45% of his body	Yes	None	*F2006-10PDF*
F2006-06	Nov 22, 2005	Volunteer firefighter dies in tanker rollover crash—Texas	Open skull fracture resulting from an automobile accident	Not mentioned	None	*F2006-06PDF*
F2005-28	Aug 6, 2005	One career firefighter dies and two are injured in apparatus crash—California	Multiple blunt-force trauma to the torso	Yes	None	*F2005-28PDF*

NIOSH REP. #	DATE OF INCIDENT	Title	CAUSE OF DEATH	AUTOPSY	AUTOPSY COMMENTS	PDF LINK
F2006-25	Jul 26, 2006	Junior volunteer firefighter dies and three volunteer firefighters are injured in a tanker crash—Alabama	Blunt force trauma with head and chest injuries	Not mentioned	None	PDF
F2006-21	Mar 09, 2006	Career lieutenant suffers sudden cardiac death at his home after finishing his shift—Tennessee	Hypertensive heart disease	Yes	• Cardiomegaly (enlarged heart): heart weight of 441 grams (g) (normal weight is <400 g) • LVH – left ventricle thickness was 1.5-2.0 centimeters (cm) (normal thickness is 0.6-1.1 cm)*1* • Myocardial perivascular and patchy interstitial fibrosis • Mild bilateral dilatation of left and right ventricles (no measurements were listed) • Moderate to severe coronary artery disease (CAD) with 75% narrowing of the left anterior descending (LAD) artery • Mild aortic sclerosis • No evidence of thrombosis (blood clots) in his coronary arteries • No evidence of a pulmonary embolus	PDF
F2006-20	Apr 16, 2006	Career airport fire apparatus operator suffers sudden cardiac death at his station after exercising—Georgia	Acute Respiratory Distress Syndrome due to an acute myocardial infarction (MI)	Yes	• Acute MIo Massive infarct of the left ventricle, extending from the apex to the base of the heart – Focal acute extension of the infarct – Stent in place, proximal left anterior descending coronary artery, with a luminal thrombus• Atherosclerotic CADo Moderate to severe atherosclerosis of distal left anterior descending artery – Moderate atherosclerosis of right coronary artery – Moderate atherosclerosis of circumflex artery • Cardiomegaly (enlarged heart): heart weight of 600 grams (g) (the normal weight given in the autopsy records is 250-350 g) • No pulmonary embolus	PDF

NIOSH REP. #	DATE OF INCIDENT	Title	CAUSE OF DEATH	AUTOPSY	AUTOPSY COMMENTS	PDF LINK
F2006-18	Mar 31, 2006	Firefighter/emergency medical technician (ff/emt) suffers sudden death while on-duty—South Carolina	Per death certificate: "probable cardiac arrhythmia," due to "seizures," due to "epilepsy." Per autopsy findings: "sudden unexplained ventricular arrhythmia or possible seizure."	Yes	• Normal sized heart, 350 grams (normal < 400 grams) • No plaque, atherosclerosis, or blockages in any of the coronary arteries • Two coronary arteries (the left anterior descending and the right coronary artery) had "small diameters within their distal distribution" • No microscopic evidence of cardiomyopathy (a medical condition that is associated with an increased risk of sudden cardiac death) • No evidence of a pulmonary embolus (blood clot in the lung arteries) • No evidence of an intra-cranial hemorrhage (stroke) • Negative blood drug test for illegal • Positive blood drugs test for methobarbitol and phenobarbital. The phenobarbital level of 8.9 micrograms per milliliter (µg/mL) was sub-therapeutic for a seizure disorder (10-30 µg/mL). A blood level for dilantin was not conducted. These autopsy findings did not point to a definitive cause of death, therefore the county coroner concluded the FF/EMT most likely died of a "sudden unexplained ventricular arrhythmia or possible seizure."	PDF
F2006-17	May 03, 2006	Firefighter suffers heart attack during firefighting operation and dies 40 days later—Georgia	"Hemodynamic failure" due to "healing and remote myocardial infarctions (mis)" due to "atherosclerotic coronary artery disease (CAD)"	Yes	• Atherosclerotic CAD – Normal-sized heart at 400 grams – Old (healed) MI in the lateral portion of the left ventricle – Recent MI in the anteroseptal portion of the left ventricle – Atherosclerotic lesions (50%—60% blockage) in most of the coronary arteries – Recent plaque hemorrhage and rupture of the proximal portion of the LAD • No valve abnormalities • No chamber dilation or hypertrophy	PDF

NIOSH REP. #	DATE OF INCIDENT	Title	CAUSE OF DEATH	AUTOPSY	AUTOPSY COMMENTS	PDF LINK
F2006-16	Jul 07, 2005	Fire apparatus operator suffers sudden cardiac death after responding to 12 calls—Georgia	"Cardiac dysrhythmia due to atherosclerotic coronary artery disease (CAD)"	Yes	• Atherosclerotic CAD – Variable calcific atherosclerosis of the left anterior descending coronary artery with a 90% blockage – Variable calcific atherosclerosis of the right coronary artery with a 40% blockage – Cardiomegaly (enlarged heart: heart weighed 660 grams – Left ventricular hypertrophy • Microscopic examination of the left ventricle revealed "patchy transmural myocardial fibrosis." "Similar but lesser changes were noted in the right ventricular myocardium, where fibrosis was primarily perivascular." • No evidence of thromboemboli in the pulmonary arteries • Negative drug and alcohol tests	PDF
F2006-15	Apr 03, 2006	Assistant chief suffers a stroke during training and dies—Texas	Brain death due to brain aneurysm	No	Perform an autopsy on all duty-related firefighter fatalites	PDF
F2006-13	Jan 14, 2006	Volunteer firefighter suffers sudden cardiac death about 50 minutes after fighting a grass fire—Kansas	Probable heritable cardiac arrhythmia (Brugada Syndrome)	Yes	• Probable heritable cardiac arrhythmia (Brugada Syndrome) • Cardiomegaly (heart weighed 478 grams [g]; normal range is 261-455 g) • Coronary arteries free of significant atherosclerosis or thrombus • No pulmonary embolus	PDF

NIOSH REP. #	DATE OF INCIDENT	Title	CAUSE OF DEATH	AUTOPSY	AUTOPSY COMMENTS	PDF LINK
F2006-12	Nov 15, 2004	Career battalion chief suffers sudden cardiac death at his desk—Kansas	Atherosclerotic cardiovascular disease (CVD)	Yes	• Cardiomegaly (enlarged heart): heart weighed 534 grams • Left ventricular hypertrophy (LVH) • Essentially normal endocardium, myocardium, and epicardium tissue. • Two vessel coronary artery disease (CAD) with 50%-75% narrowing of the left anterior descending and right coronary arteries by atherosclerotic plaque • No evidence of thrombosis • Mild fibrous thickening of the cusps of the aortic valve • No evidence of a pulmonary embolus.	PDF
F2006-09	Jan 28, 2006	Firefighter dies after performing overhaul at a fire in a three-story dwelling—Pennsylvania	"Arteriosclerotic cardiovascular disease (CVD)" as the immediate cause of death and "hypertensive cardiomyopathy" as a significant condition	Yes	• Cardiomegaly (heart weighing 450 grams [g]; normal weight is <400 g) • Arteriosclerotic CAD • Mild concentric left ventricular hypertrophy with wall thickness being 1.9 centimeters [cm]; normal thickness is 0.6-1.1 cm • A discrete 2 cm x 1 cm scar in the subendocardial and deep myocardium of the left ventricular wall (proximal medial posterior) suggesting a remote (old) heart attack (myocardial infarction [MI]) • No valvular disease • No sign of a pulmonary embolus (blood clot in the lung) • No evidence of smoke inhalation • Carboxyhemoglobin (COHb) level (measure of carbon monoxide in the blood) of 3.7% (normal for smokers)	PDF

NIOSH REP. #	DATE OF INCIDENT	Title	CAUSE OF DEATH	AUTOPSY	AUTOPSY COMMENTS	PDF LINK
F2006-08	Nov 21, 2005	Firefighter/Emergency medical technician suffers an acute myocardial infarction and dies 3 days later—Pennsylvania	Per death certificate: "atherosclerotic heart disease" due to "acute myocardial infarction" as the cause of death. Perautopsy: "arteriosclerotic cardiovascular disease (CVD) with acute myocardial infarction; pulmonary emboli" as the cause of death.	Yes	• Arteriosclerotic CVD • Extensive left ventricular MI • Cardiomegaly (enlarged heart: heart weighed 550 grams [g] • Biventricular hypertrophy • Microscopic examination revealed an "early thrombus at the site of the ventricular infarction" • Microscopic evidence of thromboemboli in the pulmonary arteries with pulmonary infarction	PDF
F2006-07	Feb 21, 2006	Two volunteer firefighters die when struck by exterior wall collapse at a commercial building fire overhaul—Alabama	Multiple blunt-force trauma	Yes	None	PDF
F2006-05	Nov 28, 2005	Career firefighter dies after engine he was driving collides with a tractor trailer—Alabama	Blunt-force injuries.	Not mentioned	None	PDF
F2006-04	Oct 24, 2005	Career lieutenant suffers sudden cardiac death at his station after making multiple runs during the day—Tennessee	Cardiac arrhythmia as the immediate cause of death due to hypertensive cardiovascular disease	Yes	• Cardiomegaly (enlarged heart) based on a weight of 700 grams • Left ventricular hypertrophy • Microscopic examination of the left ventricular myocardium (three sections) showed myocyte hypertrophy and small foci of subendocardial interstitial fibrosis (findings consistent with hypertensive heart disease) • Patent coronary arteries with mild atherosclerosis and no intracoronary thrombosis • Normal heart valves • No pulmonary embolus	PDF

NIOSH REP. #	DATE OF INCIDENT	Title	CAUSE OF DEATH	AUTOPSY	AUTOPSY COMMENTS	PDF LINK
F2006-03	Nov 05, 2005	Firefighter suffers sudden cardiac death during fire fighting operations—California	Atherosclerotic cardiovascular disease (CVD)	Yes	• Atherosclerotic CVD with complete narrowing (100%) of the right coronary artery and severe narrowing (75%) of the left main coronary artery and the left anterior descending coronary artery; no evidence of an intra-coronary blood clot (thrombus), but thrombolytic medications were given in the ED • Enlarged heart (cardiomegaly): heart weighed 450 grams (g) • No evidence of a premortem pulmonary thromboemboli (i.e., blood clots in the lungs) • Negative carboxyhemoglobin test • Negative drug and alcohol tests	PDF
F2006-02	May 27, 2005	Lieutenant suffers sudden cardiac death after scba training—Florida	Atherosclerotic cardiovascular disease (CVD)	Yes	• Atherosclerotic CVD • Moderate cardiomegaly (enlarged heart: heart weighed 430 grams • Microscopic examination of the coronary arteries revealed an "apparent thrombus material identified in the lumen" with "evidence of re-canalization" (suggestive of a remote [old] myocardial infarction)) • Acute pulmonary edema • No evidence of thromboemboli in the pulmonary arteries • Negative carboxyhemoglobin test • Negative drug and alcohol tests	PDF
F2006-01	May 13, 2004	Fire chief suffers sudden death during training—Alabama	Accidental multiple drug intoxication	Yes	• Enlarged heart (cardiomegaly): heart weighed 520 grams (g) • Mild atherosclerosis • Moderate to marked pulmonary edema • No evidence of thrombus in the coronary arteries • No evidence of thrombo-emboli in the pulmonary arteries • Positive blood tests for diazepam (Valium®), morphine (MS Contin®), venlafaxine (Effexor®) and methocarbamol (Robaxin®) • Positive urine test for gabapentin (Neurontin®) • No microscopic examinations were performed.	PDF

NIOSH REP. #	DATE OF INCIDENT	Title	CAUSE OF DEATH	AUTOPSY	AUTOPSY COMMENTS	PDF LINK
F2005-35	Dec 02, 2005	Career captain dies and the driver/operator and a fire-fighter are severely injured in apparatus crash—Louisiana	Multiple blunt-force trauma and com-pressed asphyxiation	Yes	None	PDF
F2005-34	Nov 07, 2005	Career firefighter killed while riding manlift to assess a silo fire—Missouri	Positional asphyxia due to entrapment between the manlift and floor access opening	Not mentioned	None	PDF
F2005-33	Nov 04, 2005	Captain suffers pulmonary embolism during response to a medical call and later dies—New York	Pulmonary emboli (PE) due to probable deep vein thrombosis (DVT)	Yes	• Evidence of diffuse PE in both lungs Swollen right lower leg Mild hypertensive CVD: – No significant coronary artery atherosclerosis – Left ventricle walls slightly thickened/ hypertrophied (1.6 centimeters [cm]) (normal is 0.6 cm–1.1 cm)*1* – Right ventricle walls slightly thickened/hypertrophied (0.6 cm) • Cardiomegaly (enlarged heart): heart weighed 540 grams (g) (normal is <400 g)*3* • No microscopic examination of the heart muscle was performed • Negative drug screen	PDF

NIOSH REP. #	DATE OF INCIDENT	Title	CAUSE OF DEATH	AUTOPSY	AUTOPSY COMMENTS	PDF LINK
F2005-32	Mar 16, 2005	Sergeant suffers sudden cardiac death during training—Kentucky	Per death certificate: "acute myocardial infarction (MI)" Per autopsy: "hypertensive/ischemic cardiovascular disease (CVD)" as the cause of death	Yes	• Hypertensive/ischemic CVD • Enlarged heart (cardiomegaly): heart weighed 500 grams (g) (normal is <400 g)*1* • Biventricular hypertrophy – Right ventricle measured 1 centimeter (cm) (normal is 0.3-0.5 cm)*2* – Left ventricle measured 3 cm (normal is 0.76–0.88 cm)*3* (normal echocardiographic measurement is 0.6–1.1 cm)*4* • Mitral valve showed thickening of chordae tendineae • No evidence of thrombus • No evidence of thrombo-emboli • Negative drug and alcohol tests Microscopic examinations revealed the following: • Diffuse myocardial fibrosis • Old MI of lateral wall of left ventricular free wall, posterior aspect of left intraventricular septum • Extensive old MI of left ventricular free wall • Acute pulmonary congestion	PDF
F2005-30	May 31, 2005	Firefighter suffers sudden cardiac death during physical fitness training—New Jersey	"Calcific sclerosis of the aortic valve with aortic stenosis" as the cause of death, with "atherosclerotic coronary artery disease (CAD)" as a significant condition	Yes	• Calcific sclerosis of the aortic valve with aortic stenosis • Enlarged heart (cardiomegaly): heart weighed 580 grams (g) (normal is <400 g)*1* • Atherosclerotic CAD • Severe narrowing (75%) of the left anterior descending coronary artery • No evidence of a premortem pulmonary thromboemboli Negative drug and alcohol tests	PDF
F2005-29	Aug 27, 2005	Volunteer firefighter/rescue diver dies in training incident at a quarry—Pennsylvania	Drowning	Not mentioned	None	PDF

NIOSH REP. #	DATE OF INCIDENT	Title	CAUSE OF DEATH	AUTOPSY	AUTOPSY COMMENTS	PDF LINK
F2005-27	Jun 21, 2005	Volunteer fire chief dies from injuries sustained during a tanker rollover—Utah	Blunt force injuries to the head and torso	Not mentioned	None	PDF
F2005-26	May 19, 2005	Recruit firefighter suffers heat stroke during physical fitness training and dies nine days later—Florida	Severe heat stroke with multisystem organ failure	No	None	PDF
F2005-25	Feb 23, 2005	Fire chief suffers sudden cardiac death at home after performing apparatus maintenance and conducting training—Texas	Severe three vessel atherosclerotic coronary artery disease (CAD)	Yes	• Atherosclerotic CAD: • Three vessel focal severe atherosclerotic CAD • Right ventricle chamber mildly dilated • Cardiomegaly (enlarged heart): heart weighed 460 grams (normal < 400 grams)*1* • No pulmonary embolism • No evidence of a dissecting aortic aneurysm	PDF

NIOSH REP. #	DATE OF INCIDENT	Title	CAUSE OF DEATH	AUTOPSY	AUTOPSY COMMENTS	PDF LINK
F2005-24	Feb 06, 2005	Firefighter dies after responding to a call—New York	"Acute intoxication by the combined effects of propoxyphene (Darvon®) and cyclobenzaprine (Flexeril®)" as the cause of death and "hypertension" as another condition. The NIOSH investigator, like the medical examiner, concluded the FF died due to a drug intoxication, but cannot rule out the possibility of a cardiac arrhythmia associated with his hypertensive heart disease and subsequent left ventricular hypertrophy (LVH).	Yes	• Acute intoxication by the combined effects of propoxyphene and cyclobenzaprine CAD: – Propoxyphene (Darvon®) blood level of 3.3 micrograms per milliliter (mcg/mL) and Norpropoxyphene blood level of 9.0 mcg/mL – Cyclobenzaprine (Flexeril®) blood level of 90 nanograms per milliliter (ng/mL) and Norcyclobenzaprine with a positive blood level • Hypertensive cardiovascular disease: – Left ventricular hypertrophy (LVH)(left ventricle wall thickness 1.5 centimeters [cm]) [normal 0.6cm–1.1cm])*2* – Cardiomegaly (heart weight 500 grams [normal < 400 grams])*3* • No evidence of atherosclerotic coronary artery disease (CAD) • No evidence of pulmonary embolus Microscopic examination of the heart revealed myocyte hypertrophy (consistent with mild hypertensive cardiomyopathy) but no infarcts or myocarditis. The autopsy did not mention "myocytes in disarray," which is diagnostic of hypertrophic cardiomyopathy	PDF
F2005-23	Mar 29, 2005	Firefighter/paramedic suffers a dissection of his aorta while participating in physical fitness training—Texas	"Aortic dissection and its sequelae" with "Hypertensive cardiovascular disease" being another significant condition	Yes	• Extent of the dissection: from proximal left and right coronary artery at the aortic root to the right common iliac artery • Cardiomegaly (a large heart) • Concentric left ventricular hypertrophy • No atherosclerotic coronary artery disease • Negative blood tests for illicit drugs or alcohol	PDF

NIOSH REP. #	DATE OF INCIDENT	Title	CAUSE OF DEATH	AUTOPSY	AUTOPSY COMMENTS	PDF LINK
F2005-22	Jan 09, 2005	Volunteer firefighter suffers cardiac death the morning after emergency medical technician training—North Carolina	Mitral valve failure	Yes	• Mitral valve prolapse—undulating leaflets with obvious hooding and thin, elongated chordae tendineae consistent with prolapse • Cardiomegaly—(530 grams, normal < 400 grams) with mild left ventricular hypertrophy – left ventricle thickness 1.4 cm (normal 0.6 to 1.1 cm), interventricular septum 1.6 cm (normal 0.6 to 1.1 cm) • Microscopic examination of the heart muscle showed widening of the individual myocytes and large, irregular, "boxcar" nuclei; focal increased interstitial fibrosis was present within the posterior left ventricle • Widely patent coronary arteries without evidence of significant atherosclerosis or thrombosis	PDF
F2005-21	Feb 21, 2005	Wildland firefighter suffers sudden cardiac death after performing mop-up/overhaul operations at two wildland fires—Florida	Left anterior descending coronary artery thrombosis	Yes	• Attached thrombus (blood clot) with complete occlusion and focally a pinpoint lumen for about 1.5 cm in the proximal left anterior descending coronary artery • Chronic myocardial ischemia – Fibrosis in the mid septum, just below the right aortic cusp, and near the apex of the heart (strongly suggestive of a remote heart attack) – Heart weight 450 grams (normal < 400 grams) – Left ventricular walls measure 1.4 centimeters (cm) in thickness (normal is 0.6 to 1.1 cm)	PDF
F2005-20	Jun 23, 2005	Firefighter/Emergency medical technician dies during the night at fire station—Arizona	"Oxycodone intoxication" as the cause of death with "mild thickening of the mitral valve" and "mild diffuse nephrosclerosis" as other conditions.	Yes	• Oxycodone intoxication (blood level of 0.85 milligrams per liter [mg/L])(therapeutic blood levels are less than 0.1 mg/L)2 • Mild thickening of the mitral valve	PDF

NIOSH REP. #	DATE OF INCIDENT	Title	CAUSE OF DEATH	AUTOPSY	AUTOPSY COMMENTS	PDF LINK
F2005-19	Jun 19, 2004	Reserve firefighter suffers sudden cardiac death while working on a fuel reduction crew—Arizona	Atherosclerotic heart disease	Yes	• Atherosclerotic heart disease: – 99% occlusion of left anterior descending coronary artery – 99% occlusion of right coronary artery – Left ventricular hypertrophy (wall thickness 1.4 centimeters [cm] [normal 0.6cm–1.1cm])*1* • Chronic pyelonephritis, left kidney • Negative drug and alcohol tests	PDF
F2005-18	Aug 16, 2004	Airport firefighter suffers sudden cardiac death while on duty—South Carolina	Acute myocardial ischemia secondary to a cardiac arrhythmia of unknown etiology	Yes	• Enlarged heart (cardiomegaly) weighing 460 grams (normal < 400 grams) – Left ventricular hypertrophy (wall thickness 1.3 centimeters [cm] [normal 0.6 cm–1.1 cm]) – Interventricular septum hypertrophy (wall thickness 1.5 cm [normal 0.6 cm–1.1 cm]) • Right coronary artery bridging • Right ventricle mildly dilated • Microscopic findings – Histological signs of ischemia – Scattered myocytes indicative of hypertrophy	PDF
F2005-17	Apr 20, 2005	Driver/operator dies due to a stroke while driving a fire engine to an alarm—Tennessee	"Acute subarachnoid hemorrhage" due to "rupture of sacular cerebral aneurysm" as the cause of death with "focal coronary artery atherosclerosis" as a significant condition	Yes	• Sacular aneurysm with rupture, basilar artery – Acute subarachnoid hemorrhage, large amount, base of brain • Coronary artery atherosclerosis, focal and severe – Severe narrowing (90%) of the left anterior descending coronary artery • Negative drug and alcohol tests	PDF

NIOSH REP. #	DATE OF INCIDENT	Title	CAUSE OF DEATH	AUTOPSY	AUTOPSY COMMENTS	PDF LINK
F2005-16	Jan 21, 2004	Captain suffers an acute aortic dissection after responding to two alarms and subsequently dies due to hemopericardium—Pennsylvania	"Hemopericardium" due to an "aortic rupture" and "aortic dissection."	Yes	• Hemopericardium with 575 milliliters (mL) of primarily unclotted blood in pericardium • Rupture of the intrapericardial portion of the ascending thoracic aorta • Thoracoabdominal aortic dissection extending from the ascending aorta to the distal abdominal aorta (4 cm above the iliac bifurcation • History of hypertension – Cardiomegaly, heart weighing 560 grams (normal < 400 grams) ▪ Moderate cardiac left ventricular hypertrophy • Minimal coronary artery disease (25% stenosis of the left anterior descending and right coronary arteries) • No evidence of infection in his left or right lung fields (pneumonia), although there were bilateral serosanguinous pleural effusions (200 mL on the left, 150 mL on the right) • Morbid obesity, with a body mass index of 51.9 kilograms/meters2	PDF
F2005-15	Apr 23, 2005	Career firefighter fatally injured in fall from apparatus—Texas	Blunt-force head injuries	Yes	None	PDF
F2005-14	Apr 22, 2004	Lieutenant suffers sudden cardiac death at the scene of a structure fire—South Carolina	"Acute myocardial infarction" due to "viral endocarditis"	No	Perform an autopsy on all onduty firefighter fatalities	PDF
F2005-13	Apr 18, 2005	A volunteer firefighter and volunteer assistant lieutenant die after a smoke explosion at a townhouse complex—Wyoming	Smoke inhalation and thermal burns to over 50% of their bodies	Not mentioned	None	PDF
F2005-12	Aug 23, 2004	Career firefighter/EMT dies in ambulance crash—Florida	Blunt-force head trauma	Not mentioned	None	PDF

NIOSH REP. #	DATE OF INCIDENT	Title	CAUSE OF DEATH	AUTOPSY	AUTOPSY COMMENTS	PDF LINK
F2005-11	Dec 13, 2004	Fire chief suffers sudden cardiac death while returning to the fire station after a structure fire—Georgia	"cardiorespiratory arrest" due to "ASCVD" (atherosclerotic cardiovascular disease)	No	Perform an autopsy on all onduty firefighter fatalities	PDF
F2005-10	Feb 15, 2005	Lieutenant suffers a heart attack while driving a squad truck and dies four days later—Georgia	"Anoxic encephalopathy" due to "sudden cardiac arrest" due to "atherosclerotic cardiovascular disease" as the cause of death	Yes	• Enlarged heart (cardiomegaly): heart weighed 450 grams • Ischemic heart disease: – Moderate narrowing (40%-50%) of the right coronary artery – Mild narrowing (30%–40%) of the left anterior descending coronary artery • No evidence of pulmonary thromboemboli • Negative drug and alcohol tests	PDF
F2005-09	Feb 19, 2005	Career fire captain dies when trapped by partial roof collapse in a vacant house fire – Texas	Smoke inhalation and thermal injuries	Not mentioned, but postmortem carboxyhemoglobin was reported at 26%	None	PDF
F2005-08	Oct 20, 2004	Fire chief suffers sudden cardiac death after responding to a motor vehicle crash—Texas	"arrhythmia" as the cause of death due to "coronary artery disease" (CAD) with "atrial fibrillation and sleep apnea" as other significant conditions	No	Perform an autopsy on all onduty firefighter fatalities	PDF
F2005-07	Feb 13, 2005	Career captain electrocuted at the scene of a residential structure fire—California	Electrocution	Not mentioned	None	PDF
F2005-06	Jan 07, 2005	Fire equipment operator suffers a heart attack at the scene of a medical call and dies in the hospital thirteen days later—South Carolina	"Myocardial infarction" due to "renal failure" due to "stroke"	No	Perform an autopsy on all onduty firefighter fatalities	PDF
F2005-05	Jan 20, 2005	Career captain dies after running out of air at a residential structure fire—Michigan	Smoke and soot inhalation with a carboxyhemoglobin level of 22.7%	Not mentioned	None	PDF

NIOSH REP. #	DATE OF INCIDENT	Title	CAUSE OF DEATH	AUTOPSY	AUTOPSY COMMENTS	PDF LINK
F2005-04	Jan 23, 2005	Career firefighter dies while exiting residential basement fire—New York	Smoke inhalation and burns of the head, torso and upper extremities	Yes	Note: Carboxyhemoglobin level was 24% saturation; third degree burns on approximately 63% of body surface area	PDF
F2005-03	Jan 23, 2005	Career lieutenant and career firefighter die and four career firefighters are seriously injured during a three alarm apartment fire—New York	Mass trauma of the head, torso and extremities with multiple contusions of the extremities.	Not mentioned	None	PDF
F2005-02	Dec 20, 2004	One probationary career firefighter dies and four career firefighters are injured at a two-alarm residential structure fire—Texas	Thermal injuries and smoke inhalation	Not mentioned	None	PDF
F2005-01	Aug 14, 2004	Career firefighter dies after falling from tailboard and being backed over by engine—California	Multiple blunt-force injuries	Not mentioned	None	PDF

NIOSH REP. #	DATE OF INCIDENT	Title	CAUSE OF DEATH	AUTOPSY	AUTOPSY COMMENTS	PDF LINK
F2004-46	Feb 23, 2004	Firefighter collapses and dies while assisting with fire suppression efforts at a residential fire—Ohio	"Arteriosclerotic and hypertensive heart disease" as the immediate cause of death with "morbid obesity" as a contributory condition	Yes	• Coronary artery disease (CAD) – Atherosclerotic occlusions of the native coronary arteries (remote) – Two vessel coronary artery bypass graft procedure (remote) – Occlusion of the lower coronary artery bypass graft (remote) – Open upper coronary artery bypass graft but with moderate calcific atherosclerosis – Myocardial infarct (heart attack) involving the anterior left ventricle and interventricular septum (remote) • Cardiomegaly (enlarged heart) weighing 780 grams (normal < 400 grams) • Mild narrowing of the arteries leading to the kidneys (arteriolonephrosclerosis), which is consistent with the diagnosis of hypertension • Morbid obesity; at 72 inches tall, the FF weighed 300 pounds for a body mass index (BMI) of 40.7. • A carboxyhemoglobin (COHb) measurement of <5% saturation. (Since the FF did not regain a heartbeat during resuscitation efforts, the 100% oxygen delivered via the endotracheal tube was unlikely to have significantly reduced the half-time of his COHb level. Thus, a level of <5% is unlikely to have contributed to his sudden death.) •. Negative urine drug screen • Skull fractures	PDF
F2004-45	Feb 04, 2004	Firefighter suffers sudden cardiac death after repacking a hose load on a fire engine—New Jersey	Arteriosclerotic cardiovascular disease(CAD)	No	Perform an autopsy on all onduty firefighter fatalities	PDF

NIOSH REP. #	DATE OF INCIDENT	Title	CAUSE OF DEATH	AUTOPSY	AUTOPSY COMMENTS	PDF LINK
F2004-43	Apr 27, 2004	One part-time firefighter dies and another is seriously injured when two fire engines collide at an intersection while responding to a fire—Illinois	Craniocerebral injuries with aspiration of blood within the lungs	Yes	None	PDF
F2004-42	Sep 26, 2004	Assistant chief suffers sudden cardiac death during response to boat fire—Wisconsin	Per death certificate, "severe arterioscle-rotic cardiovascular disease" as the cause of death and "previous myocardial infarction" as other significant condition. Perautopsy: "severe coronary artery disease due to arterio-sclerotic cardiovascular disease" as the cause of death	Yes	• Ischemic heart disease • Heavily calcified coronary arteries with severe atheroscle-rotic plaquing • Total occlusion of the mid right coronary artery • Significant narrowing (60%-95%) of the left anterior descending coronary artery • Mild plaquing in the left circumflex coronary artery • Cardiomegaly (enlarged heart) – heart weighing 450 grams (normal less than 400 grams) • A large area of white fibrosis with thinning of the posterior wall of the left ventricle • Severe dilatation of the heart chambers • No evidence of pulmonary thromboemboli • Negative drug and alcohol tests • Carboxyhemoglobin (carbon monoxide) test was not performed	PDF
F2004-41	Jun 08, 2004	Assistant chief suffers heart attack and dies after complet-ing a walk test—Montana	"Sudden arrhythmia" as the immediate cause of death and "acute coronary artery thrombosis" as a contributing factor	Yes	• Enlarged heart (cardiomegaly): heart weighed 470 grams (normal < 400 grams) Ischemic heart disease: – Thrombus causing total occlusion in the right coronary artery – Significant narrowing (80% to 90%) of the left anterior descending coronary artery – Minor atherosclerosis in the circumflex artery • No evidence of pulmonary thromboemboli • Negative drug and alcohol tests	PDF

NIOSH REP. #	DATE OF INCIDENT	Title	CAUSE OF DEATH	AUTOPSY	AUTOPSY COMMENTS	PDF LINK
F2004-40	Sep 12, 2004	Career helitack firefighter dies in burnover during an initial attack at a wildland fire operation—California	Inhalation of products of combustion	Yes	None	PDF
F2004-38	Mar 13, 2004	Probationary firefighter suffers sudden cardiac death during maze drill—Connecticut	Sudden death associated with rheumatic heart disease	Yes	Valvular heart disease: • Mitral valves thickened and fusion of the chordae tendineae" (strong cords of fibrous tissue fused together resulting in thickening and shortening of the mitral valve cusps) • Aortic valve fusion of the right and left cusps Normal heart size (380 grams), yet mild left atrial enlargement and dilatation • No significant coronary artery disease and no recent or remote evidence of a heart attack • Drug, alcohol, and carbon monoxide tests were negative	PDF
F2004-37	Apr 08, 2004	Volunteer chief dies and two firefighters are injured by a collapsing church facade—Tennessee	Multiple blunt-force trauma and thermal injuries	Not mentioned	None	PDF
F2004-36	Mar 11, 2004	Career firefighter drowns while conducting training dive—New Hampshire	Drowning	Not mentioned	None	PDF

NIOSH REP. #	DATE OF INCIDENT	Title	CAUSE OF DEATH	AUTOPSY	AUTOPSY COMMENTS	PDF LINK
F2004-35	Jun 17, 2004	Firefighter suffers sudden cardiac death at his fire station—Georgia	"Cardiac dysrhythmia" as the immediate cause of death due to "massive cardiomegaly" due to "hypertensive heart disease."	Yes	• Hypertensive heart disease – Severely enlarged heart (cardiomegaly) weighing 840 grams (normal < 400 grams), which is in the 95th percentile for body – Markedly severely thickened left wall of the heart (concentric hypertrophy of the left ventricle) – Moderate hardening of the kidney due to high blood pressure in the small arteries of the kidneys (arterionephrosclerosis) • Mild to moderate heart disease (atherosclerotic plaque blockage of three coronary arteries) – Approximately 40%–50% blockages (stenosis) in each of the left anterior descending, circumflex, and right coronary arteries. • Mild thickening (myocytic hypertrophy) and mild to moderate scarring of the heart muscle (interstitial fibrosis), but no evidence of heart attack (acute or remote infarct) • Microscopic examination of the kidney showed kidney cancer (papillary renal cell carcinoma) His blood carboxyhemoglobin level (a test of carbon monoxide exposure) was not checked due to no exposure to fire smoke during his shift. No drug screen was performed	PDF
F2004-32	May 13, 2004	Volunteer firefighter suffers cardiac arrest while battling a structure fire—New York	Acute myocardial infarction (heart attack) with physical exertion in a hot, humid environment listed as a contributing cause	No	Perform an autopsy on all on-duty firefighter fatalities	PDF
F2004-31	Aug 27, 2003	Volunteer firefighter suffers heart attack while battling structure fire and dies 6 days later—New York	Acute myocardial infarction	No	Perform an autopsy on all onduty firefighter fatalities	PDF

NIOSH REP. #	DATE OF INCIDENT	Title	CAUSE OF DEATH	AUTOPSY	AUTOPSY COMMENTS	PDF LINK
F2004-30	Mar 25, 2004	Firefighter collapses and suffers sudden cardiac death after responding to a vehicle fire—Kentucky	A cardiac event (arrhythmia) due to hypertensive and atherosclerotic cardio-vascular disease	Yes	• Cardiomegaly (an enlarged heart) weighing 560 grams (normal is less than 400 grams)*1* • Dilated right ventricle • Scar of white fibrous tissue interlacing with brown myocardium (evidence of a remote [old] myocardial infarction [heart attack]) • Moderate to severe coronary artery atherosclerosis (left and right) • Possible thrombus in the right coronary artery	PDF
F2004-28	May 31, 2002	Firefighter suffers sudden cardiac death while performing work capacity test—California	Coronary atherosclerosis	Yes	• Atherosclerotic coronary artery disease (CAD) • Ischemic heart disease: – Near complete occlusion of the most proximal branch of the left anterior descending coronary artery – 90% stenosis in the left circumflex coronary artery – 70% stenosis in the right coronary artery – No superimposed acute thromboses or recent hemorrhages – Enlarged heart (cardiomegaly) weighing 510 grams (normal < 400 grams) – Left ventricular hypertrophy (wall thickness 1.7 centimeters [cm] [normal 0.6cm-1.1cm]) – Interventricular septum hypertrophy (wall thickness 1.9cm [normal 0.6cm-1.1cm]) • Mild to moderate perivascular fibrosis of the heart muscle on microscopic examination • No evidence of a pulmonary embolus • Vitreous (eye) chemistries showed elevations in sodium and chlorine consistent with dehydration • Negative drug and alcohol tests	PDF

NIOSH REP. #	DATE OF INCIDENT	Title	CAUSE OF DEATH	AUTOPSY	AUTOPSY COMMENTS	PDF LINK
F2004-26	Feb 01, 2003	Firefighter-engineer suffers sudden cardiac death while performing strenuous fire station maintenance—California	"Atherosclerotic coronary artery disease" as the immediate cause of death with "hypertension"	Yes	• Cardiomegaly (an enlarged heart) weighing 510 grams (upper limit of normal is 400 grams) • Moderate biventricular dilatation (LV—4 centimeters (cm) internal diameter; RV- 4.0 X 4.5 cm internal diameter) • Atherosclerotic coronary artery disease – 75% stenosis of the right coronary artery with a right dominant coronary artery system – 75% stenosis in the left main artery – 90% stenosis in the left anterior descending artery – 90% stenosis in the left circumflex artery – No coronary artery thrombus (blood clot) • No pulmonary emboli (blood clot in the lung vasculature) • Negative drug screen	PDF
F2004-25	Mar 22, 2003	Volunteer firefighter suffers sudden cardiac death during fire suppression at a structural fire—Indiana	Acute, occlusive thrombosis of the left circumflex coronary artery secondary to coronary artery atherosclerosis	Yes	• Moderate to severe coronary atherosclerosis as detailed below: – Acute occlusive thrombus present within the mid to distal portion of the left circumflex coronary artery – 80%-95% stenosis of the distal left anterior descending coronary artery and the right posterior descending coronary artery – Intraplaque hemorrhage at the mid portion of the left anterior descending coronary artery – 40%-60% stenosis of the mid portions of left anterior, left circumflex, and right coronary arteries – Cardiomegaly (enlarged heart weighing 550 grams, normal is less than 400 grams) – Extensive biventricular dilatation – Concentric left ventricular hypertrophy (LVH) • Negative drug and alcohol test results • Carboxyhemoglobin level (a measure of carbon monoxide exposure) of 2.2% (10 hours after the initiation of oxygen). The normal lab value for moderate to heavy smokers is 4-15%. The FF did have a history of smoking.	PDF

NIOSH REP. #	DATE OF INCIDENT	Title	CAUSE OF DEATH	AUTOPSY	AUTOPSY COMMENTS	PDF LINK
F2004-24	Apr 15, 2004	Acting fire chief suffers heart attack after shift and dies—Alaska	Cardiac event	No	Perform an autopsy on all onduty firefighter fatalities	PDF
F2004-23	May 06, 2002	Firefighter suffers unwitnessed sudden cardiac death after responding to mobile home fire—South Carolina	"Cardiac arrhythmia" as the immediate cause of death due to "stress of fighting fire" and "cardiomegaly with dilatation" as contributing factors	Yes	• Cardiomegaly (enlarged heart)—weighing 576 grams (normal less than 400 grams) • Mild atherosclerotic cardiovascular disease – 50% occlusion in the right coronary artery – 50% occlusion in the left anterior descending artery • Biventricular hypertrophy with dilatation (left ventricle thickness of 1.5 cm at the anterior papillary muscle) • Biventricular hypertrophy with dilatation (left ventricle thickness of 1.5 cm at the anterior papillary muscle) • No evidence of thrombi, emboli, or fibrosis on gross pathology • Drug and alcohol tests were negative • Carboxyhemoglobin (carbon monoxide) test was negative (less than 10%) • Hepatosplenomegaly	PDF

NIOSH REP. #	DATE OF INCIDENT	Title	CAUSE OF DEATH	AUTOPSY	AUTOPSY COMMENTS	PDF LINK
F2004-22	Apr 10, 2004	Career firefighter/Emergency medical technician suffers sudden death 5 hours after participating in emergency response—South Carolina	Per death certificate: "atherosclerotic coronary artery disease" Per autopsy: "acute cocaine intoxication" as the immediate cause of death with hypertension and atherosclerotic coronary heart disease as contributing factors.	Yes	• Extensive atherosclerotic coronary artery disease with near total occlusion of three coronary arteries (left anterior descending, first diagonal, and right coronary artery • Acute thrombus ("acute organizing occlusive fibrin thrombi") • Old myocardial infarction of the posterior left ventricle • Cardiomyopathy – Cardiomegaly (an enlarged heart) weighing 680 grams (upper limit of normal is 400 grams – Hypertensive cardiovascular disease – Biventricular dilatation • Acute Cocaine Intoxication – Cocaine, Blood: 0.48 mg/L – Ecgonine methyl ester, blood: 0.67 mg/L – Benzoylecgonine, blood: 0/76 mg/L – Benzoylecgonine, urine: 4.9 mg/L	PDF

NIOSH REP. #	DATE OF INCIDENT	Title	CAUSE OF DEATH	AUTOPSY	AUTOPSY COMMENTS	PDF LINK
F2004-21	Apr 18, 2004	District chief suffers sudden cardiac death at home after experiencing symptoms consistent with heart disease at his station—Illinois	"Cardiac arrhythmia" as the cause of death due to "ischemic heart disease."	Yes	• Marked atherosclerosis with – 60% narrowing of the right coronary artery – 60% narrowing of the left main coronary artery – 90% narrowing of the left anterior descending coronary artery – 90% narrowing of the circumflex coronary artery • Recent thrombus in the circumflex coronary artery, resulting in total occlusion • No evidence of remote myocardial infarction or myocardial fibrosis • Mild left ventricle hypertrophy with: – Left ventricle thickness 1.6 cm (normal is 0.76-0.88 cm) – Interventricular septum thickness 1.5 cm (normal echographic measurement is 0.6-1.1 cm) • Cardiomegaly (enlarged heart) weighing 420 grams (normal is less than 400 grams)	PDF
F2004-20	Dec 25, 2003	Assistant chief dies after suffering aortic dissection during a fire alarm response—Connecticut	"Multi-organ system dysfunction" due to "cardiac arrest" as the immediate cause of death with "aortic dissection" as a significant condition	No	Perform an autopsy on all onduty firefighter fatalities	PDF
F2004-19	Apr 30, 2004	Career firefighter dies from injuries sustained in fall from apparatus—Massachusetts	Blunt-force head trauma	Not mentioned	None	PDF

NIOSH REP. #	DATE OF INCIDENT	Title	CAUSE OF DEATH	AUTOPSY	AUTOPSY COMMENTS	PDF LINK
F2004-18	Jan 14, 2004	Volunteer firefighter suffers sudden cardiac death after participating in emergency responses—Maryland	Acute myocardial infarction	Yes	• Cardiomegaly (an enlarged heart) weighing 670 grams (upper limit of normal is 400 grams) • Four chamber dilatation • Biventricular hypertrophy • Atherosclerotic CAD • Acute plaque rupture and thrombosis, left obtuse marginal artery (recent heart attack) • Total occlusion of mid left circumflex artery by healed plaque rupture with organized and recanalized thrombus (old, healed heart attack) • Healed transmural infarction, posterolateral left ventricle at base • Diffuse 50%-90% narrowing of coronary arteries • Penetrating organized thrombus, right atrium; undetermined etiology	PDF
F2004-17	Mar 13, 2004	Career battalion chief and career master firefighter die and 29 career firefighters are injured during a five alarm church fire—Pennsylvania	Victim #1: asphyxiation due to compression of the body by building debris; blunt-force trauma of the head, neck, pelvis, and extremities were contributory causes of death. Victim #2: asphyxiation due to compression of the body by building debris with blunt force trauma of the head and extremities.	Not mentioned	None	PDF

NIOSH REP. #	DATE OF INCIDENT	Title	CAUSE OF DEATH	AUTOPSY	AUTOPSY COMMENTS	PDF LINK
F2004-16	Dec 18, 2003	Firefighter dies at home after shift—Maryland	Arteriosclerotic cardio-vascular disease	Yes	The carboxyhemoglobin level (a measure of exposure to carbon monoxide) was not measured • Severe arteriosclerotic cardiovascular disease • Old subendocardial infarct of left ventricle • Biventricular dilatation • Cardiomegaly (heart weighing 550 grams with normal less than 400 grams*4*) • Aortic atherosclerosis • Cardiac valves were unremarkable • No thrombi were found • Drug and alcohol tests were negative	PDF
F2004-15	Mar 03, 2004	Forest ranger/Firefighter drowned after catastrophic blow-out of right front tire—Florida	Drowning with no evidence of trauma-related injuries	Not mentioned	Postcrash blood alcohol content (BAC) and drug screening tests were negative	PDF
F2004-14	Apr 04, 2004	Career firefighter dies and two career captains are injured while fighting night club arson fire—Texas	High thermal exposure	Yes	None	PDF
F2004-13	Apr 18, 2003	Firefighters suffers fatal pul-monary embolism after knee surgery for a work-related injury—North Carolina	Massive pulmonary embolism (PE) due to a deep vein thrombus (DVT) due to knee injury that was treated surgically	Yes	• Acute pulmonary embolus • Remote pulmonary emboli (at least two weeks old) • Deep vein thrombosis in the right leg • Evidence of hypertensive cardiovascular disease • Severe focal atherosclerotic coronary artery disease • No ethanol (alcohol) or salicylates (aspirin) detected	PDF
F2004-12	Jan 27, 2004	Firefighter/Paramedic dies after performing physical fitness training—Florida	Aortic valve stenosis	Yes	• Aortic valve stenosis • Cardiomegaly (heart weighing 440 grams with normal less than 400 grams) • Mild, patchy, interstitial fibrosis [as determined by micro-scopic examination] • No evidence of thromboemboli • No evidence of atherosclerosis	PDF

NIOSH REP. #	DATE OF INCIDENT	Title	CAUSE OF DEATH	AUTOPSY	AUTOPSY COMMENTS	PDF LINK
F2004-11	Feb 13, 2004	Career lieutenant killed and firefighter injured by gunfire while responding to medical assistance call—Kentucky	Multiple gunshot wounds	Not mentioned	None	PDF
F2004-10	Feb 18, 2004	Career firefighter dies searching for fire in a restaurant/lounge—Missouri	Smoke inhalation	Not mentioned	An independent toxicology report listed the victim's carbon monoxide level at 51% saturation. There was no notable trauma	PDF
F2004-09	Apr 02, 2001	Firefighter/Driver/Engineer suffers heart attack and dies at the end of his 24-hour shift—Hawaii	Acute myocardial infarction and coronary artery thrombosis due to atherosclerotic cardiovascular disease	Yes	• Blood clot (thrombus) in one of the coronary arteries (mid-left anterior descending artery) • Moderate to severe coronary atherosclerosis • A large heart weighing 470 grams (normal < 400 grams) • Thickened left wall of the heart (left ventricular hypertrophy) • A negative drug screen	PDF
F2004-08	Jan 21, 2004	Firefighter suffers sudden cardiac death after emergency recall—Massachusetts	"Acute sudden cardiac death syndrome" due to "acute myocardial infarction" as the immediate cause of death and "obesity" as another significant condition	No	Perform an autopsy on all onduty firefighter fatalities	PDF
F2004-07	Nov 18, 2002	Fire chief dies after performing service call—Connecticut	"ASCVD" (atherosclerotic coronary vascular disease) as the immediate cause of death, with hyperlipidemia and smoking as contributing factors	Yes	• Arteriosclerosis, with 95% occlusion of the left main coronary artery and 90% occlusion of the right coronary artery • No CO level taken	PDF

NIOSH REP. #	DATE OF INCIDENT	Title	CAUSE OF DEATH	AUTOPSY	AUTOPSY COMMENTS	PDF LINK
F2004-06	Nov 17, 2003	Firefighter/Paramedic suffers sudden cardiac death while performing physical fitness training—Washington	Occlusive atherosclerotic cardiovascular disease	Yes	• Heart weighing 400 grams • Atherosclerotic cardiovascular disease • 0.7 centimeter area of increased consistency which is slightly grayer than adjacent areas in the posterior lateral aspect of the left ventricular wall in the apical third • No thrombi or emboli • No fibrosis • Drug and alcohol tests were negative	PDF
F2004-05	Jan 09, 2004	Residential basement fire claims the life of career lieutenant—Pennsylvania	Smoke and soot inhalation and thermal burns	Not mentioned	None	PDF
F2004-04	Dec 16, 2003	Career firefighter dies of carbon monoxide poisoning after becoming lost while searching for the seat of a fire in warehouse—New York	Smoke inhalation with a carboxyhemoglobin (cohb) level of 74.8% in the emergency department	Yes	None	PDF
F2004-03	Nov 17, 2003	Career captain/safety officer dies in a single motor vehicle crash while responding to a call—Kansas	Probable positional asphyxia	Not mentioned	None	PDF
F2004-02	Nov 29, 2003	Basement fire claims the life of volunteer firefighter – Massachusetts	Smoke and soot inhalation	Not mentioned	None	PDF
F2004-01	Oct 24, 2003	District chief dies after suffering a heart attack—Texas	Myocardial infarction	No	Perform an autopsy on all onduty firefighter fatalities	PDF
F2003-41	Oct 17, 2003	Live-fire exercise in mobile flashover training simulator injures five career firefighters—Maine	No deaths		None	PDF
F2003-40	Feb 26, 2003	Airport firefighter suffers sudden cardiac death at fire station—ArKansas	Myocardial infarction	No	Perform an autopsy on all onduty firefighter fatalities	PDF
F2003-39	Jul 21, 2003	Firefighter suffers sudden cardiac death in parking lot of fire station—Tennessee	Myocardial infarction	No	Perform an autopsy on all onduty firefighter fatalities	PDF

NIOSH REP. #	DATE OF INCIDENT	Title	CAUSE OF DEATH	AUTOPSY	AUTOPSY COMMENTS	PDF LINK
F2003-38	Oct 07, 2003	Firefighter dies after performing ventilation at a fire in a two-story dwelling—Pennsylvania	"Ischemic heart disease" as the immediate cause of death and "smoke inhalation" as a significant condition	Yes	• Cardiomegaly (heart weighing 552 grams, with normal less than 400 grams) • Mild atherosclerotic coronary artery disease involving the left main coronary artery • Remote (old) myocardial infarction involving the apex and left posterior ventricular wall • Fibrosis within the apex and left posterior ventricular wall (as determined by microscopic examination) • Evidence of smoke inhalation (moderate amount of soot in the trachea and large airways of both lungs) • Carboxyhemoglobin (measure of carbon monoxide in the blood) level negative	PDF
F2003-37	Oct 27, 2003	Volunteer assistant chief is struck and killed at road construction site—Minnesota	Craniocerebral injuries and closed head trauma	Yes	None	PDF
F2003-36	Oct 29, 2003	A career firefighter was killed and a career captain was severely injured during a wildland/urban interface operation—California	Thermal injuries	Yes	Extensive burns over the entire body, no evidence of underlying cardiovascular or pulmonary disease, and a carboxyhemoglobin level of 27% (confirming significant exposure to carbon monoxide prior to his death)	PDF
F2003-35	Sep 27, 2003	Firefighter suffers a heart attack after responding to a rubbish fire at a two-story apartment building—New York	"Acute myocardial infarction" as the immediate cause of death and "diabetes mellitus" and "hypertension" as other significant conditions	No	None	PDF
F2003-34	Jul 10, 2003	Volunteer firefighter/fire service products salesman dies after being struck by dislodged rescue airbag—South Dakota	Closed head wound	Not mentioned	None	PDF

NIOSH REP. #	DATE OF INCIDENT	Title	CAUSE OF DEATH	AUTOPSY	AUTOPSY COMMENTS	PDF LINK
F2003-33	Aug 06, 2003	Career firefighter/emergency medical technician dies and paramedic is injured in a three-vehicle collision—Nebraska	Blunt-force trauma due to a motor vehicle accident	Not mentioned	None	PDF
F2003-32	Oct 01, 2003	Two firefighters die and eight firefighters are injured from a silo explosion at a lumber company—Ohio	Multiple blunt-force injuries	Not mentioned	None	PDF
F2003-31	Apr 14, 2003	Lieutenant suffers sudden cardiac death after performing forcible entry requiring heavy physical exertion—Georgia	"Cardiac dysrhythmia" due to "atherosclerotic coronary artery disease" as the immediate cause of death and "superimposed physical exertion" as a contributing factor	Yes	• Cardiomegaly (heart weighing 530 grams, with normal less than 400 grams*1*) • Atherosclerotic coronary artery disease • Left ventricular hypertrophy (15 millimeters (mm) thick; normal between 7.6-8.8 mm • Interventricular septal hypertrophy (16mm thick; normal is 6 to 11 mm) • No thromboemboli are recovered from the main, right, or left pulmonary arteries or their segmental branches • No obvious soot in the nares or oral cavity • Microscopic sections of the right ventricle, left ventricle, and interventricular septum do not reveal significant myocardial inflammation, infarct, hemorrhage, fibrosis, or neoplasia • Drug and alcohol tests were negative	PDF
F2003-30	Jul 28, 2003	One volunteer lieutenant dies and a volunteer firefighter is seriously injured in a motor vehicle rollover incident while enroute to a trailer fire—North Carolina	Acute intracranial injuries	Not mentioned	None	PDF

NIOSH REP. #	DATE OF INCIDENT	Title	CAUSE OF DEATH	AUTOPSY	AUTOPSY COMMENTS	PDF LINK
F2003-29	Dec 15, 2002	Firefighter suffers heart attack at the scene of a structure fire and dies 2 months later—Indiana	"Acute myocardial infarction" due to "atherosclerotic cardio-vascular disease" as the immediate cause of death and "chronic obstructive pulmonary disease (COPD)" as a contributing factor	No	Perform an autopsy on all onduty firefighter fatalities	PDF
F2003-28	Aug 08, 2003	Live-fire training exercise claims the life of one recruit firefighter and injures four others—Florida	Atherosclerotic cardio-vascular disease" due to "COPD"	No	Perform an autopsy on all onduty firefighter fatalities	PDF
F2003-27	Jan 25, 2003	Fire captain suffers sudden cardiac death during a live-fire training exercise—North Carolina	"Acute myocardial infarction" (heart attack) as the cause of death due to "coronary atherosclerosis" with a "prior myocardial infarction" being a significant contributing factor	Yes	Severe atherosclerotic coronary artery disease • 100% blockage of the right coronary artery, the circumflex coronary artery, and the first diagonal coronary artery in the area of the stent • A seven centimeter scar (due to his heart attack in 1999) in the posterior and lateral left ventricular wall • A two centimeter hyperemic area near the first diagonal coronary artery which probably represented the early signs of a recent (acute) heart attack (myocardioal infarction) Carboxyhemoglobin level was less than 5% suggesting carbon monoxide exposure was not a significant factor in the Captain's sudden death	PDF

NIOSH REP. #	DATE OF INCIDENT	Title	CAUSE OF DEATH	AUTOPSY	AUTOPSY COMMENTS	PDF LINK
F2003-26	Feb 20, 2003	Firefighter suffers sudden cardiac death at his fire station—Oregon	Per death certificate: "ischemic heart disease" as the immediate cause of death due to "atherosclerotic coronary heart disease." Per autopsy: "arteriosclerotic cardiovascular disease" as the cause of death	Yes	• Moderate calcification and atherosclerotic narrowing of the coronary arteries • Softening and dark discoloration of the left ventricle, more toward the apex" [a finding suggestive of a recent myocardial infarct (MI) (otherwise known as a heart attack)] • No scars suggestive of old/remote heart attacks • No evidence of a blood clot (embolus) in the pulmonary arteries • Microscopic examination of the heart muscle showed no inflammation, necrosis, or scarring • Blood carboxyhemoglobin level (a test of carbon monoxide exposure) was not checked due to no exposure to fire smoke during his shift, and no drug screen was performed	PDF
F2003-25	May 14, 2003	Career Federal firefighter dies from injuries sustained at prescribed burn—Arizona	Adult Respiratory Distress Syndrome secondary to severe inhalation injury with cardiovascular compromise.	None mentioned	Note: Thirty-six % of the victim's body surface area had second- and third-degree burn injuries and he had a significant inhalation injury	PDF
F2003-24	Jan 21, 2003	Firefighter suffers fatal heart attack while performing physical fitness training—Missouri	Per death certificate: "acute myocardial infarction" due to "atherosclerotic coronary artery disease" Per autopsy: "coronary atherosclerosis" followed by "stenosis, thrombosis, chronic myocardial infarct, subacute myocardial infarcts, acute myocardial infarct, and acute ischemic change" as the cause(s) of death.	Yes	• A large heart (435 grams with normal less than 400 grams) • Significant coronary atherosclerosis • Stent placement in three coronary arteries [left anterior descending (LAD), left circumflex, right coronary artery] • Evidence of old heart attacks (myocardial infarcts or MIs) • Subacute MIs • Acute (recent) MI in the interventricular septum and left ventricular free wall Since the captain was not involved in any fire suppression duties that day, a carboxyhemoglobin level (a measure of exposure to carbon monoxide) was not checked	PDF

NIOSH REP. #	DATE OF INCIDENT	Title	CAUSE OF DEATH	AUTOPSY	AUTOPSY COMMENTS	PDF LINK
F2003-23	Jun 26, 2003	Volunteer assistant chief dies in tanker rollover—New Mexico	Multiple injuries consistent with a rollover motor vehicle crash	Not mentioned	None	PDF
F2003-22	Dec 13, 2002	Volunteer firefighter suffers sudden cardiac death after completing emergency medical technician (emt) written examination—Texas	Acute myocardial infarction	No	Perform autopsies on all on-duty firefighter fatalities	PDF
F2003-21	Feb 12, 2003	Firefighter recruit suffers sudden cardiac death during physical ability training—Texas	Cardiac hypertrophy, "biventricular dilatation and cardiomegaly	Yes	• Cardiac hypertrophy • Biventricular and right atrial dilatation • Cardiomegaly (an enlarged heart) weighing 440 grams • The coronary arteries are free of atherosclerosis • The cardiac valves are unremarkable • No blood clots in the pulmonary vessels, therefore no evidence of a pulmonary embolus	PDF
F2003-20	May 22, 2003	Junior volunteer firefighter is killed while responding to a brush fire with an intoxicated driver—Wyoming	Massive trauma	Not mentioned	None	PDF
F2003-19	Jun 16, 2003	Volunteer firefighter killed after his privately owned vehicle hydroplaned and struck a billboard signpost—kentucky	Massive head and chest trauma	Not mentioned	None	PDF
F2003-18	Jun 15, 2003	Partial roof collapse in commercial structure fire claims the lives of two career firefighters—Tennessee	Victim #1: thermal burns. Victim #2: thermal inhalation injury	Not mentioned	None	PDF
F2003-17	May 18, 2003	Volunteer training/Safety officer dies from injuries received in fall from pick-up truck following training exercise—Tennessee	Blunt-force injury to the head	Not mentioned	None	PDF

NIOSH REP. #	DATE OF INCIDENT	Title	CAUSE OF DEATH	AUTOPSY	AUTOPSY COMMENTS	PDF LINK
F2003-16	Feb 23, 2003	Volunteer fire police captain dies from injury-related complications after being struck by motor vehicle while directing traffic—New Jersey	Severe pneumonia as a consequence of complications due to a pedestrian motor vehicle accident	Not mentioned	None	PDF
F2003-15	Apr 03, 2003	Volunteer firefighter dies in tanker rollover—Ohio	Compressive asphyxia	Not mentioned	None	PDF
F2003-14	Mar 19, 2003	Volunteer captain killed in fire apparatus crash while responding to a training exercise—Oregon	Positional asphyxiation	Not mentioned	None	PDF
F2003-13	Mar 18, 2003	Volunteer firefighter killed while walking across an interstate highway respond-ing to a motor vehicle incident—Texas	Severe craniocerebal injuries	Yes	None	PDF
F2003-12	Mar 31, 2003	Career firefighter dies and two career firefighters injured in a flashover during a house fire—Ohio	Severe third degree burns	Not mentioned	None	PDF
F2003-11	Feb 07, 2001	Firefighter collapses and dies at the scene of residential fire—Florida	Hypertensive and arteriosclerotic heart disease	Yes	• Enlarged heart (concentric left ventricular hypertrophy) • Coronary atherosclerosis • Four-vessel bypass • Pulmonary edema • Cerebral edema His blood carboxyhemoglobin level was not checked	PDF

NIOSH REP. #	DATE OF INCIDENT	Title	CAUSE OF DEATH	AUTOPSY	AUTOPSY COMMENTS	PDF LINK
F2003-10	May 22, 2002	Firefighter suffers sudden cardiac death during a medical emergency response—California	Complication of hypertrophic cardiomyopathy	Yes	• An enlarged heart weighing 565 grams (normal less than 400 grams) • Thickened left ventricle of 2.0 centimeters (cm) in diameter (normal <1.3) • Thickened right ventricle of 1.0 centimeters (cm) in diameter (normal <0.8) • Minimal atherosclerosis in the coronary arteries • surgical patch and scar at the apex of the heart's left ventricle consistent with a well healed surgical repair of an old knife wound to the chest • Bilateral fibrous pleural adhesions and pericardial sac adhesions also consistent with his old knife wound to the chest • No evidence of a blood clot (embolus) in the pulmonary arteries • A negative drug screen of illicit drugs (e.g. cocaine) • Histology (microscopic) examination of the heart tissue was not performed	PDF

NIOSH REP. #	DATE OF INCIDENT	Title	CAUSE OF DEATH	AUTOPSY	AUTOPSY COMMENTS	PDF LINK
F2003-09	Jan 14, 2003	Firefighter suffers fatal heart arrhythmia at structure fire—Illinois	"Cardiac arrhythmia" due to "heart disease" as the immediate cause of death and "exertion while fighting a house fire" as a contributing factor	Yes	• Atherosclerotic cardiovascular disease • Coronary artery atherosclerosis • Remote myocardial infarct (heart attack), posterior/inferior wall of left ventricle with moderate thinning of the wall • Diffuse mild and focal moderate aortic atherosclerosis • Clinical history of hypercholesterolemia • Hypertensive cardiovascular disease • Cardiac hypertrophy (490 grams) • Clinical history of hypertension • Tobacco pneumonitis with early pulmonary emphysema and chronic bronchitis • History of cigarette smoking • No ethanol or illicit drugs were detected Carboxyhemoglobin level was 2.2%, indicating the captain had inhaled some but not an excessive amount of carbon monoxide; possibly due to his cigarette smoking	PDF
F2003-08	Nov 12, 2002	Sudden cardiac death due to myocardial sarcoidosis claims the life of an onduty firefighter—Connecticut	Myocardial sarcoidosis	Yes	• Myocardial sarcoidosis (noncaseating granulomas) of the heart, lung, lymph nodes, and liver • The right heart ventricle revealed lymphocytic infiltrates and noncaseating granulomas that are confluent, with dense fibrosis between the granulomas. There is also some nodule involvement of the papillary muscles and interventricular septum (all findings consistent with sarcoidosis involving the heart) • Cardiomegaly (an enlarged heart) weighing 640 grams • No atherosclerotic disease of the coronary arteries	PDF
F2003-07	Jan 13, 2003	Career firefighter/emergency medical technician dies from injuries sustained in fall from apparatus—California	Multiple traumatic injuries	Not mentioned	None	PDF

NIOSH REP. #	DATE OF INCIDENT	Title	CAUSE OF DEATH	AUTOPSY	AUTOPSY COMMENTS	PDF LINK
F2003-06	Sep 19, 2002	Firefighter dies from progressive respiratory failure—Massachusetts	Progressive respiratory failure and clinical history of adult respiratory distress syndrome due to inhalational injuries		• Pulmonary congestion • Tracheobronchial tree is diffusely obstructed by mucoid-type material • Areas of squamous metaplasia in the midtrachea • Chronic inflammatory infiltrate within the mucosa and submucosa of the lungs • Diffuse alveolar damage in the reparative phase • Interstitial fibrosis of the lungs • No significant narrowing of the coronary arteries • Cardiomegaly (enlarged heart) (466 grams)	PDF
F2003-05	Jan 19, 2003	Career firefighter/emergency medical technician dies in ambulance crash—Texas	Blunt-force injuries	Not mentioned	None	PDF
F2003-04	Jan 20, 2003	Career firefighter dies from injuries received during a chimney and structural collapse after a house fire—Pennsylvania	Compressional asphyxia as a result of being trapped from falling debris	Not mentioned	None	PDF
F2003-03	Jan 19, 2003	Volunteer firefighter dies following nitrous oxide cylinder explosion while fighting a commercial structure fire—Texas	Thermal injuries, with smoke inhalation and blast effect	Yes	Preliminary autopsy findings indicated that he had received significant blast injuries, i.e., both eardrums were ruptured and there was concussive damage to his lungs	PDF
F2003-02	Dec 05, 2002	Firefighter suffers fatal heart attack at two-alarm structure fire—Texas	Atherosclerotic and hypertensive cardiovascular disease	Yes	• Severe occlusive coronary artery disease • Remote infarct of the posterior wall of the left ventricle and the posterior aspect of the interventricular septum • Cardiomegaly (an enlarged heart) weighing 560 grams (normal is less than 400 grams) • Concentric left ventricular hypertrophy (free wall width 1.5 centimeters thick) Carboxyhemoglobin level was less than one percent, indicating inhaled carbon monoxide was not a factor in his death	PDF

NIOSH REP. #	DATE OF INCIDENT	Title	CAUSE OF DEATH	AUTOPSY	AUTOPSY COMMENTS	PDF LINK
F2003-01	May 29, 2002	Firefighter dies during night at fire station—Mississippi	"Sudden cardiac death" secondary to hypertensive heart disease and coronary artery disease	Yes	• Coronary artery disease (CAD) • An enlarged heart (460 grams). • Histologic and visual inspection of the heart failed to reveal evidence of acute or remotein farction • Microscopic analysis reveals ischemic change manifested by nuclear hyperchromatism, nuclear outline irregularity, and nuclear enlargement of the nuclei of the individual rhabdomycytes	PDF
F2002-50	Nov 25, 2002	Structural collapse at an auto parts store fire claims the lives of one career lieutenant and two volunteer firefighters—Oregon	Asphyxiation	Not mentioned	None	PDF
F2002-49	Nov 01, 2002	Volunteer lieutenant dies following structure collapse at residential house fire—Pennsylvania	Traumatic compressional asphyxia	Not mentioned	None	PDF

NIOSH REP. #	DATE OF INCIDENT	Title	CAUSE OF DEATH	AUTOPSY	AUTOPSY COMMENTS	PDF LINK
F2002-48	Aug 28, 2001	Firefighter suffers sudden cardiac death at a structural fire—New York	"Hypertrophic cardiomyopathy with myocardial arteriolarsclerosis" as the immediate cause of death with a "myxomatous mitral value"	Yes	• Widely patent (open) coronary arteries • An enlarged heart weighing 440 grams • Slightly thickened left ventricle of 1.4 centimeters (cm) in diameter • Microscopic changes of the heart muscle • Myocyte bundles arranged in a sinusoidal and other irregular patterns • Focal myocyte hypertrophy with occasional multipolarity • Widened interstitium with fibrosis in irregular patterns • Arterioles with thickened intima • No inflammatory infiltrates, contraction banding, or hypereosinophilia • Marked billowing of both leaflets of the mitral valve • No evidence of a blood clot (embolus) in the pulmonary arteries • Blood carboxyhemoglobin level was less than 3%, suggesting the victim was not exposed to excessive carbon monoxide levels	PDF

NIOSH REP. #	DATE OF INCIDENT	Title	CAUSE OF DEATH	AUTOPSY	AUTOPSY COMMENTS	PDF LINK
F2002-47	Jan 13, 2001	Firefighter suffers a heart attack and dies after performing "ventilation-entry-search" activities in a five-story apartment building fire—New York	"Hypertensive and arteriosclerotic heart disease" as the immediate cause of death and "smoke inhalation" as an other significant condition	Yes	• Hypertensive and arteriosclerotic cardiovascular disease • 60% calcific atherosclerotic stenosis in left main stem coronary artery • 30% stenosis in proximal right coronary artery • Valves have focal atherosclerosis • Cardiomegaly (heart weighed 560 grams) with concentric left ventricular hypertrophy • Coronary arteriosclerosis, multifocal, moderate, with superimposed coronary thrombosis in the left main stem and right coronary artery • Generalized visceral congestion with pulmonary edema • Smoke inhalation • Scant soot in nares • Soot in upper airway • Blood carboxyhemoglobin level was less than 3%, suggesting the victim was not exposed to excessive carbon monoxide levels	PDF
F2002-46	Jan 04, 2001	Firefighter suffers a heart attack and dies while exercising in firehouse—New York	Atherosclerotic cardiovascular disease	Yes	• Atherosclerotic cardiovascular disease • Coronary artery with marked atherosclerotic stenosis (80%) of the proximal left anterior descending artery • Myocardial infarct, remote (at least 3 months old), septum (microscopic), focal fibrosis of septum adjacent to conduction fibers • Myxoid mitral valve • No evidence of a blood clot (embolus)	PDF
F2002-44	Sep 30, 2002	Parapet wall collapse at auto body shop claims life of career captain and injures career lieutenant and emergency medical technician—Indiana	Extensive blunt-force trauma	Yes	None	PDF

NIOSH REP. #	DATE OF INCIDENT	Title	CAUSE OF DEATH	AUTOPSY	AUTOPSY COMMENTS	PDF LINK
F2002-43	Oct 09, 2002	Firefighter dies after collapse at apartment building fire—kentucky	Ventricular tachyarrhythmia	No	Perform an autopsy on all onduty firefighter fatalities	PDF
F2002-42	Jun 13, 2002	Emergency medical technician killed in single-vehicle crash while responding to structure fire—North Carolina	Blunt-force trauma to the head and neck	Not mentioned	None	PDF
F2002-41	Sep 23, 2002	Career firefighter dies in tanker rollover—North Carolina	Fractured neck due to motor-vehicle incident	Not mentioned	None	PDF
F2002-40	Sep 14, 2002	Career firefighter dies after roof collapse following roof ventilation—Iowa	Smoke inhalation, intra-alveolar hemorrhage, and carbon monoxide intoxication	Yes	Carboxyhemoglobin level, 30.3%	PDF
F2002-39	Sep 05, 2002	Junior volunteer firefighter dies in tanker rollover—Tennessee	Massive head and chest trauma	Not mentioned	None	PDF
F2002-38	Jul 01, 2002	Volunteer captain killed, two firefighters and police officer injured when struck by motor vehicle at highway incident—Minnesota	Multiple blunt-force trauma	Not mentioned	None	PDF
F2002-37	Aug 01, 2002	Volunteer firefighter dies during wildland fire suppression—South Dakota	Second- and third-degree burns over 70 percent of the body	Not mentioned	None	PDF
F2002-36	Aug 08, 2002	Volunteer firefighter dies after being run over by brush truck during grass fire attack—Texas	Craniofacial crush injuries due to a fall from moving vehicle with a secondary run-over	Not mentioned	None	PDF
F2002-35	Jun 08, 2002	Offduty career firefighter dies and another offduty career firefighter is injured after being struck by a truck while assisting at a highway traffic incident—Florida	Multiple blunt-force injuries with compound fractures of the skull	Not mentioned	None	PDF

NIOSH REP. #	DATE OF INCIDENT	Title	CAUSE OF DEATH	AUTOPSY	AUTOPSY COMMENTS	PDF LINK
F2002-34	Jul 30, 2002	Career lieutenant and firefighter die in a flashover during a live-fire training evolution—Florida	Smoke inhalation and thermal injuries	Not mentioned	None	PDF
F2002-33	Jan 31, 2002	Firefighter dies during night at fire station—North Carolina	Ischemic heart disease	Yes	• Severe three-vessel atherosclerotic disease • Microscopic examination of one section of the heart reveals multiple small areas of fibrosis. But there is otherwise no evidence of acute or old infarction • A normal sized heart	PDF
F2002-32	Jul 04, 2002	Structural collapse at residential fire claims lives of two volunteer fire chiefs and one career firefighter—New Jersey	Fixed compression	Yes	None	PDF
F2002-31	Jul 05, 2002	Volunteer firefighter dies due to inadvertent fireworks discharge—North Dakota	Blunt-force injuries of the chest and left upper extremity due to fireworks discharge	Not mentioned	None	PDF
F2002-30	Jan 21, 2002	Firefighter suffers probable heart attack at condominium fire—South Carolina	Arteriosclerotic cardio-vascular disease	Yes	• Ischemic fibrosis with scarring, consistent with an remote, healed heart attack (infarct) • Coronary atherosclerosis • Aortic atherosclerosis with ulcerating plaques • A large heart (500 grams)	PDF
F2002-28	Apr 27, 2002	Firefighter dies after leaving fire station—Pennsylvania	Sudden cardiac death	No	Perform autopsies on all on-duty firefighter fatalities	PDF
F2002-27	May 16, 2001	Firefighter dies during the night at fire station—Missouri	Asphyxiation due to probable seizure	No	Perform an autopsy on all deceased firefighters	PDF

NIOSH REP. #	DATE OF INCIDENT	Title	CAUSE OF DEATH	AUTOPSY	AUTOPSY COMMENTS	PDF LINK
F2002-24	Nov 02, 2001	Firefighter suffers fatal heart attack at fire scene—Wisconsin	Per autopsy: acute coronary thrombosis with ischemic arrhythmia Per death certificate: "cardiac arrhythmia" as the immediate cause of death and "CAD" (coronary artery disease) as the underlying cause	Yes	• Severe three-vessel coronary atherosclerosis • Multiple 90-98% stenosis of LAD [left anterior descending] and left circumflex [coronary arteries] • Acute thrombosis, left circumflex artery • Interstitial and perivascular fibrosis, myocardium • Cardiomegaly due to left ventricular hypertrophy • A blood specimen obtained at autopsy contained "<1%" COHb	PDF
F2002-23	Mar 11, 2001	Firefighter suffers fatal heart attack during training—New Mexico	Per autopsy: "myocardial infarction" with "severe hypoxic brain injury" resulting from the cardiac arrest. Per death certificate: "cardiac arrest" as the immediate cause of death, due to "myocardial infarction," with "coronary artery disease" as the underlying cause	Yes	• Acute myocardial infarction, extensive, left ventricle and intraventricular [sic] septum with cardiac arrest and resuscitation • Coronary artery stenosis, bilateral, 95% left coronary and 90% right coronary • Brain death secondary to cardiac arrest (The last finding was based on the hospital record; the autopsy did not include an examination of the brain.)	PDF
F2002-22	Sep 26, 2001	Firefighter suffers fatal heart attack at fire at his residence—Florida	"Acute thrombosis of coronary artery" due to "arteriosclerotic cardiovascular disease"	Yes	Atherosclerotic cardiovascular disease to include • Cardiomegaly (445 grams) with left and right ventricular hypertrophy • Mild to severe calcific atherosclerosis of the coronary arteries • Acute thrombosis of the left anterior descending coronary artery Carboxyhemoglobin (COHb) concentration (a measure of carbon monoxide exposure) in blood obtained at autopsy was 1.4% (a medically insignificant level). There was no soot in the lungs	PDF

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F2002-21	May 04, 2002	Junior firefighter killed while responding to fire alarm on his bicycle—Pennsylvania	Multiple injuries	Not mentioned	None	PDF
F2002-20	May 03, 2002	Two career firefighters die in four-alarm fire at two-story brick structure—Missouri	Smoke inhalation	Not mentioned	Note: The carbon monoxide level in the blood was noted to be less that 10% in Victim #1, and 47.9% in Victim #2. Victim #1 had third-degree thermal injury over 40% of his body, and Victim #2 had third-degree thermal injury over 18% of his body surface area.	PDF
F2002-19	Apr 10, 2002	Firefighter dies during live fire training—North Carolina	Per death certificate: "ischemic heart disease due to coronary artery disease" Per autopsy: "probable cardiac arrhythmia secondary to ischemic heart disease caused by severe coronary artery atherosclerosis"	Yes	• Carboxyhemoglobin level was measured at less than 5%. • Severe coronary atherosclerosis of the left anterior descending and right coronary arteries • Proximal to mid left anterior descending diffuse lesions causing a pinpoint lumen • 80% stenosis of right coronary alternating to minimal throughout length of lumen • Obesity (height of 67 inches and weight of 195 pounds) (Body Mass Index of 30.5 kilograms per square meter (kg/m2)	PDF
F2002-18	Apr 11, 2002	Career fire chief dies after being struck by a fire truck at a motor-vehicle incident—Kansas	Chest, abdomen, and skull trauma	Not mentioned	None	PDF
F2002-17	Apr 05, 2002	Firefighter dies during the night at fire station—Kansas	Cardiac arrhythmia due to mitral valve prolapse	Yes	• Carboxyhemoglobin level was less than 10%, suggesting that carbon monoxide poisoning was not responsible for his demise • Urine and blood drug screen was negative for illicit drugs and alcohol • Normal sized heart of 360 grams • Moderate myxomatous degeneration, mitral valve with endocardial friction lesions • Foci of myofiber bundle disorder and myocyte disarray of the left ventricle on microscopic examination • Normal coronary arteries • Possible acutely dilated right ventricle	PDF

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F2002-16	Apr 07, 2002	Volunteer firefighter dies and two are injured in engine rollover—Alabama	Mechanical asphyxia due to blunt head trauma	Not mentioned	None	PDF
F2002-15	Jun 14, 2002	Career firefighter drowns during final dive of training course—Indiana	Drowning	Yes	None	PDF
F2002-14	Jan 10, 2002	Civilian jumps from fourth-story window of burning apartment building and strikes career firefighter—Michigan	County medical examiner listed the cause of death as natural due to a ruptured berry aneurysm; independent review concluded that the firefighter's death was work-related	Yes	The independent review concluded that the firefighter's death was work-related. The report described the cause of death as "...job related, caused by stress and exertion in the performance of his duties. The timeliness of the events on January 10, 2002, and subsequent developments are unquestionably the direct result of the victim's blood pressure which brought on leakage from a pre-existing aneurysm, (sentinel bleed) and ultimately the rupture of the aneurysm, profuse subarachnoid hemorrhage, brain swelling, coma, and death."	PDF
F2002-13	Mar 20, 2002	Volunteer firefighter dies after being struck by motor vehicle on interstate highway—Mississippi	Craniocerebral trauma	Not mentioned	None	PDF
F2002-12	Mar 01, 2002	Volunteer firefighter killed and career chief injured during residential house fire—Tennessee	Asphyxiation	Not mentioned	Carboxyhemoglobin level was listed at 31.8%	PDF
F2002-11	Mar 04, 2002	One career firefighter dies and a captain is hospitalized after floor collapses in residential fire—North Carolina	Multiorgan failure; 80% total body surface burns	Not mentioned	None	PDF
F2002-10	Mar 02, 2002	Volunteer firefighter dies after tanker truck is struck by freight train—kentucky	Multiple blunt-force injuries	Not mentioned	None	PDF

NIOSH REP. #	DATE OF INCIDENT	Title	CAUSE OF DEATH	AUTOPSY	AUTOPSY COMMENTS	PDF LINK
F2002-09	Aug 29, 2001	Firefighter dies while exercising—Florida	Arteriosclerotic and hypertensive heart disease	Yes	• Cardiomegaly (an enlarged heart weighing 700 grams • Biventricular dilatation • Left ventricular hypertrophy with patchy fibrosis • Scarring consistent with a remote (old) heart attack (myocardial infarction) • Moderate to severe occlusive coronary artery disease (CAD) • Moderate obesity (Body Mass Index of 43 kilograms per square meter [kg/m2]	PDF
F2002-08	Aug 09, 2000	Firefighter dies at kitchen fire—North Carolina	Hypoxia due to pulmonary edema due to cardiomyopathy	Yes	• Dilated cardiomyopathy • Status postmitral valve replacement • Severe pulmonary edema • History of rheumatic heart disease • Cardiomegaly (an enlarged heart weighing 475 grams) • Evidence of chronic ischemia • Morbid obesity (Body Mass Index of 43 kg/m2) • Mild occlusive coronary artery disease (CAD)	PDF
F2002-07	Feb 11, 2002	One career firefighter dies and another is injured after partial structural collapse—Texas	Multiple blunt-force injuries	Not mentioned	None	PDF
F2002-06	Mar 07, 2002	First-floor collapse during residential basement fire claims the lives of two firefighters (career and volunteer) and injures a career firefighter captain—New York	Asphyxia due to the inhalation of smoke and soot	Not mentioned	None	PDF

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F2002-05	Dec 14, 2001	Firefighter suffers sudden cardiac death and crashes tanker while responding to a chimney fire—Colorado	Heart failure as the immediate cause of death due to arterio-sclerotic heart disease	Yes	• Cardiomegaly • Old healed myocardial infarct [heart attack] involving the interventricular septum and the anterior wall left ventricle • Atherosclerotic coronary artery disease, severe poststent replacement coronary arteries • Atherosclerotic degeneration abdominal portion of the aorta • Small old infarct right cerebral hemisphere [stroke], internal capsule, brain • No evidence for any of the following: epidural, subdural, or subarachnoid [skull] hemorrhage, recent stroke, pulmonary embolus • Blood screen for illicit drug use or alcohol was negative	PDF
F2002-04	Jan 21, 2002	Motor-vehicle incident claims life of volunteer firefighter—Ohio	Laceration of the brain secondary to blunt impacts to the head	Not mentioned	None	PDF
F2002-03	Dec 24, 2001	Firefighter suffers cardiac arrest while responding to a structure fire—Texas	Arteriosclerotic cardio-vascular disease	Yes	• Atherosclerosis of the coronary arteries • Cardiomegaly (enlarged heart weighing 600 grams) • Old posterolateral myocardial infarction (prior heart attack) • Bilateral ventricular dilatation • Drug screen was negative for alcohol, illicit drug use, and carbon monoxide	PDF
F2002-02	Dec 15, 2001	Firefighter dies dur-ing fire department standby—Arizona	"Probable acute myocardial ischemia" due to "coronary atherosclerosis" due to "diabetes mellitus" as the immediate cause of death and a "history of previous myocardial infarction" as an other significant contributing condition	No	Perform an autopsy on all onduty firefighter fatalities	PDF

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F2001-40	Mar 06, 2000	Firefighter suffers cardiac arrest at structure fire—Illinois	Cardiac arrhythmia	Yes	• Atherosclerosis of the coronary arteries • 50% to 75% narrowing of the proximal left anterior descending coronary artery • Cardiomegaly due to left ventricular hypertrophy • Ischemic heart disease	PDF
F2001-39	Nov 19, 2001	Volunteer firefighter killed and an assistant chief injured in tanker truck crash—west Virginia	Blunt-force traumatic head injury	Not mentioned	None	PDF
F2001-38	Sep 25, 2001	Volunteer firefighter dies and two others are injured during live-burn training—New York	Asphyxia due to smoke inhalation	Not mentioned	None	PDF
F2001-37	Jun 18, 2001	Firefighter suffers heart arrhythmia and dies at wildland fire—Washington	Probable cardiac dysrhythmia due to fibrosis of the conduction system of the heart	Yes	• Fibrosis of the conduction system of the heart • Focal moderate to severe atherosclerosis of the proximate left anterior descending (LAD) coronary artery • Mild perivascular fibrosis with adjacent areas of myocyte hypertrophy of the left ventricle and interventricular septum • Possible dilated right ventricle	PDF
F2001-36	Aug 19, 2001	Volunteer firefighter dies when tanker crashes into boulder and tree—Oregon	Blunt-force head trauma	Not mentioned	None	PDF
F2001-35	Oct 13, 2001	Volunteer firefighter drowns during multiagency dive-rescue exercise – Illinois	Drowning	Not mentioned	None	PDF
F2001-34	Aug 12, 2000	Firefighter suffers probable heart attack at fire station—kentucky	Acute myocardial infarction	No	Perform an autopsy on all firefighters who were fatally injured while on duty	PDF
F2001-33	Oct 13, 2001	High-rise apartment fire claims the life of one career firefighter (captain) and injures another career firefighter (captain)—Texas	Asphyxia due to a lack of oxygen.	Not mentioned	The victim's blood level of carboxyhemoglobin measured 18% saturation	PDF

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F2001-32	Aug 13, 2001	Firefighter dies at three-alarm structure fire—New York	Hypertrophic and arteriosclerotic cardiac disease	Yes	• A carboxyhemoglobin level (to assess the victim's carbon monoxide exposure) was not performed. • "To assist the investigation of fire-related deaths, we [NIOSH]recommend performing carboxyhemoglobin levels to rule out carbon monoxide poisoning." • Borderline cardiomegaly (an enlarged heart weighing 400 grams) • Dilated cardiac chambers • Pulmonary congestion and edema • Fatty liver • Hepatosplenomegaly	PDF
F2001-31	Apr 23, 2001	Firefighter suffers a fatal heart attack during a training exercise—Michigan	"Acute myocardial infarction" as the immediate cause of death and "arterio-sclerotic cardiovas-cular disease" as the underlying cause	Yes	• Acute myocardial infarction due to arteriosclerotic cardio-vascular disease with acute subepicardial antero-lateral myocardial infarction • Coronary atherocalcinosis with maximal manifestation and 75% luminal stenosis in left mid descending coronary artery • Cardiomegaly with dilated cardiomegaly and left ventricu-lar hypertrophy	PDF
F2001-30	Apr 02, 2001	Firefighter suffers fatal heart attack after returning home from fire—Iowa	"Acute myocardial infarction" as the immediate cause of death and "severe arte-riosclerotic coronary vascular disease—right coronary artery" as the underlying cause	Yes	• Severe atherosclerotic coronary artery disease—distal right coronary artery • Remote myocardial infarctions. . . . One probably occurred months ago, and another is at least 7 days in age • Respiratory congestion and edema, severe • The result of a blood test for carboxyhemoglobin (an indicator of carbon monoxide exposure) was reported as "0.0%," but the blood was drawn almost 2 hours after Engine 1 departed the fire scene and after 50 minutes of oxygen (which accelerates the clearing of carboxyhemo-globin) administered via endotracheal tube. (At autopsy, the result of another carboxyhemoglobin test was also reported as "0.0%.")	PDF

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F2001-29	Feb 12, 2001	Firefighter dies of complications of heart failure suffered at fire scene—Wisconsin	Hypoxia/Ischemia, Acute [of the brain and spinal cord]" as the immediate cause of death, various autopsy findings as intermediate causes, and "Overexertion from responding to a fire call with Fire Dept" as the underlying cause	Yes	• Congestive heart failure • Arteriosclerotic coronary artery disease with luminal occlusion of over 95% in the proximal circumflex which arises aberrantly from the right sinus of Valsalva [and] up to 50% occlusion in anterior interventricular artery, distal circumflex, and posterior intraventricular artery, heart • Anomalous coronary artery distribution • Bronchopneumonia, focal, mild, acute, lungs • Hypoxia/ischemia, acute, varying severity, semiglobal, (cerebral, cerebellar, and spinal cord) • Infarct, acute/recent, middle and inferior temporal gyrus and occipital lobes, bilateral) • Atherosclerosis, moderate to severe, right vertebral artery, basilar artery, temporal branch of right middle cerebral artery • Status postcardiac arrest (pulseless time 6-8 minutes)	PDF
F2001-28	Dec 23, 1995	Firefighter receives severe electrical shock causing cardiac complications, forcing his retirement, and eventually causing his death—Massachusetts	"Arteriosclerotic coronary heart disease" as the immediate cause of death, with "hypertensive heart disease" as a contributing, but not an underlying, cause of death	Yes	• An enlarged heart (cardiomegaly) of 500 grams • All four chambers of the heart were dilated • Thickened left ventricle wall of 1.8 centimeters (normal <1.2 centimeters) • Severe arteriosclerosis with diffuse calcification • Contusion and laceration on the left side of the head without internal injury	PDF
F2001-27	Jun 16, 2001	Career firefighter dies after single-family-residence house fire—South Carolina	Complications due to second- and third-degree burns	Not mentioned	None	PDF
F2001-26	Jul 26, 2001	Career firefighter dies from injuries when stationary fill tank becomes over-pressurized and suffers catastrophic failure—California	Head injury due to blunt impact	Not mentioned	None	PDF

NIOSH REP. #	DATE OF INCIDENT	Title	CAUSE OF DEATH	AUTOPSY	AUTOPSY COMMENTS	PDF LINK
F2001-25	Jun 15, 2001	Firefighter dies after completing job task evaluation—Alabama	Per death certificate: "cardiac arrest" as the immediate cause of death. Per autopsy: "cardiac arrhythmia" due to "myocardial ischemia" due to "coronary artery disease"	Yes	• Moderate coronary atherosclerosis with 50% narrowing of the right coronary artery and the left main artery; 75% narrowing of the left circumflex; 80% narrowing of the left anterior descending coronary artery; left anterior descending coronary artery thrombosis • Acute myocardial ischemia • Severe concentric left ventricular hypertrophy	PDF
F2001-24	Feb 05, 2001	Firefighter suffers sudden cardiac death while exercising during his shift—California	Cardiac dysrhythmia associated with exertion due to dilated cardiomyopathy	Yes	• The heart had a rounded "globoid" configuration rather than the normal pyramidal shape • The heart was enlarged (weighing 480 grams) • All four chambers of the heart were moderately dilated (enlarged) • Both heart ventricles were hypertrophied (thick). • No evidence indicated old or recent myocardial infarctions (heart attacks) • No atherosclerotic changes were evident in the coronary arteries (no blockage in the coronary arteries) • Microscopic examination of the left ventricle, the right ventricle, and the interventricular tissue showed myocyte hypertrophy (muscle cell thickening) characterized by enlarged "box car" nuclei and some patchy interstitial fibrosis (scar tissue between some of the muscle cells) • There was no evidence of vasculitis, myocarditis, sarcoidosis, Fabry's disease, amyloidosis, or hemochromatosis • No illicit drugs, alcohol, or steroids were found • Blood lead level, the urine arsenic level, and the urine mercury level were below the laboratory's level of detection (<3 micrograms (mcg) per deciliter, <15 mcg per liter (mcg/l), <5 mcg/l, respectively). The urine lead level was elevated at 76 mcg/l and when corrected for urine creatinine was 165 mcg per gram creatinine (reference range <50)	PDF

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F2001-23	Jun 17, 2001	Hardware store explosion claims the lives of three career firefighters—New York	Victims #1 & #3: massive blunt force trauma Victim #2: Asphyxia due to smoke inhalation.	Not mentioned	None	PDF
F2001-22	Mar 10, 2001	Firefighter dies while on duty—Texas	Hypertensive and arteriosclerotic cardiovascular disease	Yes	• Severe occlusive coronary artery disease with 75% narrowing of the right coronary artery and the diagonal branch; 50% narrowing of the left anterior descending coronary artery and the left circumflex • Cardiomegaly (enlarged heart) • Left ventricular hypertrophy • Pulmonary congestion and edema	PDF
F2001-21	Jan 18, 2001	Firefighter dies in sleep during his work shift—Michigan	Arteriosclerotic cardiovascular disease	Yes	• Significant occlusive coronary artery disease with 85% narrowing of the left main coronary artery, 60% narrowing of the left anterior descending coronary artery, 30% narrowing of the left circumflex, and 25% narrowing of the right coronary artery • Enlarged heart • Left ventricular hypertrophy • Pulmonary congestion and edema	PDF
F2001-20	Dec 02, 1998	Firefighter has sudden cardiac death during training—Texas	Atherosclerotic cardiovascular disease	Yes	• Carboxyhemoglobin level was 1%, suggesting the firefighter was not exposed to excessive concentrations of carbon monoxide (CO). • Atherosclerotic cardiovascular disease • Moderate to severe narrowing of the coronary arteries • Mild to moderate narrowing of the aorta • Mild narrowing of the cerebral arteries • Remote myocardial infarction, multiple, left ventricle	PDF

NIOSH REP. #	DATE OF INCIDENT	Title	CAUSE OF DEATH	AUTOPSY	AUTOPSY COMMENTS	PDF LINK
F2001-19	Feb 19, 2000	Firefighter dies after assisting an injured person—Ohio	Severe occlusive coronary artery disease	Yes	• Severe occlusive coronary artery disease with calcification; 70-80% narrowing of the left anterior descending coronary artery and the right coronary artery; Recent thrombus right coronary artery • Left ventricular hypertrophy • Pulmonary congestion and edema • Congestion of viscera	PDF
F2001-18	May 09, 2001	Career firefighter dies after becoming trapped by fire in apartment building—New Jersey	Asphyxiation	Not mentioned	None	PDF
F2001-17	Mar 06, 2001	Motor-vehicle incident claims the life of a volunteer assistant chief—Alaska	Multiple blunt-force injuries	Not mentioned	None	PDF
F2001-16	Mar 08, 2001	Career firefighter dies after falling through the floor fighting a structure fire at a local residence—Ohio	Complications of thermal burns to 60% of total body surface	Not mentioned	None	PDF
F2001-15	Mar 18, 2001	Residential fire claims the lives of two volunteer firefighters and seriously injures an assistant chief—Missouri	Asphyxiation due to smoke inhalation	Not mentioned	None	PDF
F2001-14; Grant Number R43-OH-004173	Feb 18, 2001	Firefighter dies after returning from mutual-aid fire call—Connecticut	"Cardiac arrest" is listed as the immediate cause of death, and "hyperlipidemia" and "diabetes mellitus" are listed as contributing factors	No	None	PDF
F2001-13	Mar 14, 2001	Supermarket fire claims the life of one career firefighter and critically injures another career firefighter—Arizona	Thermal burns and smoke inhalation	Not mentioned	The victim's carboxyhemoglobin level was listed at 61% at the time of death	PDF

NIOSH REP. #	DATE OF INCIDENT	Title	CAUSE OF DEATH	AUTOPSY	AUTOPSY COMMENTS	PDF LINK
F2001-11	Nov 16, 2000	Driver/Operator suffers a cardiac arrest during a wildland fire exercise—Georgia	Per death certificate: atherosclerotic cardiovascular disease Per autopsy: "heart rhythm disturbance (arrhythmia)" as the cause of death and atherosclerotic cardiovascular disease as the contributing factor.	Yes	• Atherosclerotic cardiovascular disease with 70% stenosis, left main coronary artery; 70-90% stenosis, multifocal, left anterior descending coronary artery; complete occlusion, circumflex coronary artery • Vascular congestion, all internal organs	PDF
F2001-10; Purchase Order 0000136411	Dec 23, 2000	Firefighter dies at house fire—New Hampshire	Atherosclerotic and hypertensive cardiovascular disease with cardiac arrhythmia following stress and exertion during firefighting	Yes	• A nontoxic carbon monoxide level • Detectable blood ethyl alcohol • Pulmonary emphysema • Atherosclerosis of the coronary arteries. Specifically, the artery supplying the anterior wall of the heart was focally occluded, and two other major arteries were 40-50% occluded – Acute thrombi (blood clots) were noted	PDF
F2001-09	Feb 25, 2001	Volunteer firefighter dies and another firefighter is injured during wall collapse at fire at local business—Wisconsin	Anoxic encephalopathy and chest compression asphyxia	Not mentioned	None	PDF
F2001-08	Feb 17, 2001	Two volunteer firefighters die fighting a basement fire—Illinois	Asphyxiation caused by inhalation of products of combustion	Yes	None	PDF
F2001-07	Jan 09, 2001	A volunteer firefighter died after being struck by a motor vehicle while directing traffic—New York	Multiple injuries consisting of a massive closed head injury, pulmonary contusion, and chest injury	Not mentioned	None	PDF

NIOSH REP. #	DATE OF INCIDENT	Title	CAUSE OF DEATH	AUTOPSY	AUTOPSY COMMENTS	PDF LINK
F2001-06	Jan 12, 2001	Firefighter dies after the tanker truck he was driving strikes a utility pole and overturns while responding to a grass fire—kentucky	Blunt-force injuries	Not mentioned	None	PDF
F2001-05	Oct 13, 2000	Driver/Operator dies at his station after respond-ing to three emergency incidents—Massachusetts	Cerebral event as the immediate cause of death, due to cere-bral hypoperfusion and coronary artery disease	No	Autopsies should be performed on all onduty firefighters whose death may be cardiovascular-related	PDF
F2001-04	Jan 11, 2001	Volunteer firefighter (lieuten-ant) killed and one firefighter injured during mobile home fire—Pennsylvania	Asphyxiation	Not mentioned	None	PDF
F2001-03	Dec 28, 2000	Roof collapse injures four career firefighters at a church fire—ArKansas	No deaths	NA	NA	PDF
F2001-02	Aug 17, 2000	A firefighter drowns after attempting to rescue a civilian stranded in flood water—Colorado	Apparent drowning	Not mentioned	None	PDF
F2001-01	Nov 16, 2000	Volunteer firefighter dies and junior firefighter is injured after tanker rollover during water shuttle training exercise—kentucky	Massive internal injuries	Not mentioned	None	PDF
F2000-45	Jun 23, 2000	Firefighter suffers a heart attack after expressing symptoms while on duty—New Jersey	Arteriosclerotic cardio-vascular disease	Yes	• Three arteries are calcified with 10% to 50% obstruction multifocally • Nonadherent thrombus in the right coronary artery • Mild atherosclerosis of the mitral and aortic valves • A 1 cm scar in the posterior wall of the left ventricle, inferiorly	PDF
F2000-44	Nov 25, 2000	Residential house fire claims the life of one career firefighter—Florida	Asphyxia due to smoke inhalation and carbon monoxide poisoning	Yes	Positive carbon monoxide reading of 69.5% was recorded	PDF

NIOSH REP. #	DATE OF INCIDENT	Title	CAUSE OF DEATH	AUTOPSY	AUTOPSY COMMENTS	PDF LINK
F2000-43	Oct 29, 2000	A volunteer assistant chief was seriously injured and two volunteer firefighters were injured while fighting a townhouse fire—Delaware	No deaths	NA	NA	PDF
F2000-42	Feb 13, 2000	Lieutenant suffers a cardiac arrest during a structural drill—kentucky	"Hypertensive athero-sclerotic cardiovascular disease" as the cause of death and "diabe-tes, hyperlipidemia, tobacco use, and hypertension" as contributing factors	Yes	• Hypertensive atherosclerotic cardiovascular disease • Cardiomegaly • High-grade stenosis (80%) of the circumflex and proximal left anterior descending arteries • Total occlusion of the mid-left anterior descending artery • Stent within the right coronary artery • Acute thrombus of the right coronary artery • Circumferential scarring of the left ventricular free wall and septum • Peripheral vascular disease of the abdominal aorta • Nephrosclerosis • Diabetes mellitus • Hyperlipidemia • Documented history of inferior wall infarction in 1997 • "Documented history of tobacco use" • "Documented history of hypertension"	PDF
F2000-41	Sep 27, 2000	Firefighter dies after being run over by ladder truck while attempting to board—Alabama	Multiple blunt-force injuries	Not mentioned	None	PDF

NIOSH REP. #	DATE OF INCIDENT	Title	CAUSE OF DEATH	AUTOPSY	AUTOPSY COMMENTS	PDF LINK
F2000-40	Aug 06, 2000	Firefighter collapses and dies during exercise training at his fire station—Missouri	Arteriosclerotic heart disease	Yes	• No weight taken at the time of his autopsy • An enlarged heart weighing 570 grams • Left and right ventricular dilatation • Scar formation in the left ventricle (superior aspect of the posterior wall) • Arteriosclerotic heart disease • Fresh clot (thrombus) in the right coronary artery 2 cm from its origin – 80% narrowing of the distal right coronary artery – 60% narrowing of the circumflex artery – 80% narrowing of the left anterior descending artery • Illicit drug and alcohol tests were negative • Presence of a prescription heart medication (Papaverine) • Large white layer of lipid (fat) material [suggesting a recent meal or a lipid disorder	PDF
F2000-39	Apr 29, 2000	A lieutenant dies and three firefighters of a career department were injured when the truck they were responding in was struck by another vehicle—Illinois	Multiple injuries sustained due to a motor-vehicle crash	Not mentioned	None	PDF
F2000-38	Aug 13, 2000	Firefighter/scuba diver dies during training evolution—Indiana	[Pulmonary] barotrauma	Yes	• Extensive air emboli (air bubbles in lung, brain, and heart blood vessels) • Subcutaneous emphysema (air under the skin) and alveolar hemorrhage, as well as pulmonary edema with pink foam in the airways • No pneumothorax. • Toxicology reports listed no finding which contributed to his death	PDF

NIOSH REP. #	DATE OF INCIDENT	Title	CAUSE OF DEATH	AUTOPSY	AUTOPSY COMMENTS	PDF LINK
F2000-37	Jul 18, 2000	Arson investigator dies from injuries sustained from a fall during an arson investigation—Illinois	"Multiple organ system failure" due to, or as a consequence of, (b) "peritonitis with severe hypotension, ischemic necrosis of the liver and kidneys" due to, or as a consequence of, (c) "blunt force trauma of the left chest wall with splenic hematomas and a perforated stress ulcer."	Yes -two	"Blunt force trauma of the left chest wall resulted in a massive intrasplenic hematoma and the development of a stress ulcer. The spleen was not ruptured. The stress ulcer perforated, releasing bowel contents into the peritoneal cavity, which resulted in fibrinous peritonitis. Hypotensive episodes secondary to the peritonitis led to multiple organ system failure, specifically generalized ischemic necrosis of the liver (superimposed upon hepatitis C-induced micronodular cirrhosis), acute tubular necrosis of the kidneys and infarction of the rectosigmoid colon. The combination of liver failure and renal failure constitutes so-called 'multiple organ system failure' and was the immediate cause of death. The underlying cause of death was blunt-force trauma of the left chest wall." Two days later, a second autopsy was performed by a forensic pathologist hired by the victim's widow. This autopsy essentially confirmed the findings of the first autopsy with two additional points mentioned. A left-arm contusion (bruise), a left-trunk contusion, and a left-10th-rib fracture were noted, suggesting the initial fall on July 18 was quite severe. A second point in this autopsy was that postinjury medications, in addition to chronic hepatitis C virus (HCV) infection and cirrhosis due to HCV, contributed to his liver failure	PDF
F2000-36	Jul 23, 1998	Captain suffers a heart attack at a structure fire and dies 12 days later—Illinois	Myocardial infarction (otherwise known as a heart attack) as the immediate cause of death, due to severe atherosclerotic cardiovascular disease	Yes	• A large heart (cardiomegaly) weighing 535 grams • An old posterior MI • A recent anterior septal MI • Severe coronary artery disease (CAD) • Stent in the LAD with 60-75% focal occlusion proximally • 70-80% occlusion proximally of the circumflex artery • 50-60% occlusion of the right coronary artery	PDF
F2000-35	Jul 02, 2000	Junior firefighter killed responding to call in his privately owned vehicle (pov)—Pennsylvania	Blunt-force trauma to the head and trunk	Not mentioned	None	PDF

NIOSH REP. #	DATE OF INCIDENT	Title	CAUSE OF DEATH	AUTOPSY	AUTOPSY COMMENTS	PDF LINK
F2000-34	Apr 26, 2000	Lieutenant dies at a fire in a one-and-one-half story dwelling—west Virginia	Atherosclerotic coronary disease	No	A visual inspection, rather than an autopsy, was also completed by the Assistant Medical Examiner. Based on this inspection, the following "pathologic diagnosis" was listed: • "Myocardial infarct (based on circumstances, EKG changes, and serologic testing)" • "Mild chronic obstructive pulmonary disease and hepatitis per history."	PDF
F2000-33	May 27, 2000	Pumper truck rollover claims the life of a volunteer firefighter—Missouri	Cerebral laceration, due to an open skull fracture	Not mentioned	None	PDF
F2000-32	Apr 29, 1998	Driver/Operator/Firefighter suffers a heart attack and dies while supporting fire suppression activities—New York	Hypertensive and atherosclerotic cardiovascular disease	Yes	• Marked coronary artery atherosclerosis – Near occlusive mid-right CAD – Near occlusive proximal left anterior descending CAD • Small circumscribed area (0.5 by 1.2 by 1.0 centimeter) of subepicardial fibrosis in the mid-posterior left ventricular wall (nontransmural). This finding is consistent with a remote (at least 3 months) heart attack in the distribution of the right coronary artery lesion mentioned previously • Left ventricular hypertrophy • No evidence of a blood clot (embolus) in the pulmonary arteries; • His blood carboxyhemoglobin level was less than 3%, suggesting the victim was not exposed to excessive carbon monoxide levels	PDF
F2000-31	Nov 16, 1999	Firefighter collapses at the fire house and subsequently dies due to heart arrhythmia secondary to myocardial sarcoidosis—New Jersey	Granulomatous myocarditis due to sarcoidosis, generalized	Yes	• Cardiac hypertrophy and cardiomegaly (a large heart) • No significant atherosclerotic disease of the coronary arteries • Sarcoidosis (noncaseating granulomas) of the heart, lung, lymph nodes, liver, and spleen	PDF

NIOSH REP. #	DATE OF INCIDENT	Title	CAUSE OF DEATH	AUTOPSY	AUTOPSY COMMENTS	PDF LINK
F2000-30	Sep 28, 1998	District chief dies of a stroke after serving as the Incident Commander at a structure fire—Tennessee	Intracerebral hemorrhage due to hypertension, essential (otherwise known as a "stroke")	No	Perform an autopsy on all onduty firefighter fatalities	PDF
F2000-29	Jan 12, 2000	Firefighter dies as a result of a cardiac arrest at the scene of a structure fire—Maine	Cardiac arrest	Yes	An autopsy was performed; however, medical records were not available to NIOSH personnel at the time of this report	PDF
F2000-28	Aug 20, 1998	Firefighter dies on duty—Tennessee	"acute myocardial infarction due to coronary artery disease" as the immediate cause of death and "diabetes mellitus Type II and renal failure" as other significant conditions	No	Perform an autopsy on all onduty firefighter fatalities	PDF
F2000-27	Apr 30, 2000	Volunteer assistant chief dies during a controlled-burn training evolution—Delaware	Asphyxiation and thermal burns	Not mentioned	Carbon monoxide level was listed at 41%	PDF
F2000-26	Apr 20, 2000	Residential structure fire claims the life of one career firefighter—Alabama	Thermal injuries (full-thickness burns to roughly one-third of body surface area)	Not mentioned	None	PDF
F2000-25	Apr 07, 2000	A volunteer firefighter died and a second was seriously injured after fuel tank explosion—Iowa	Multiple blunt-force injuries to the head, neck, torso, and extremities	Yes	None	PDF
F2000-24	Apr 11, 2000	Firefighter dies during search-and-rescue training—Ohio	Cardiomegaly—acute cardiac arrhythmia	Yes	• Cardiomegaly (enlarged heart) – A weight of 690 grams • Moderate coronary atherosclerosis • 50-60% blockage of the midpoint of his left anterior descending coronary artery • Chronic and acute lung congestion	PDF
F2000-23	Mar 31, 2000	Career firefighter dies and three are injured in a residential garage fire—Utah	Smoke and soot inhalation and acute carbon monoxide intoxication	Not mentioned	• CO levels were at 25% saturation but may not accurately reflect his level due to intubation and resuscitation efforts)	PDF

NIOSH REP. #	DATE OF INCIDENT	Title	CAUSE OF DEATH	AUTOPSY	AUTOPSY COMMENTS	PDF LINK
F2000-22	Mar 15, 2000	Wildland fire claims the life of one volunteer firefighter and injures another firefighter—South Dakota	Sepsis as a result of extensive thermal burns due to a grass fire	Not mentioned	None	PDF
F2000-21	Jun 02, 1998	On-duty driver/operator dies in sleep—Indiana	Probable arrhythmia due to hypertrophic cardiomyopathy, fibrosis of sinoatrial node	Yes	• Since the driver/operator was not engaged in fire suppression activities, his blood was not tested for carbon monoxide poisoning (carboxyhemoglobin levels) • Moderate coronary artery disease – Up to 50% stenosis of the proximal circumflex artery – Up to 50% stenosis of the mid left anterior descending coronary artery – Intramyocardial tunneling of coronary artery – Fibrosis of the sinoatrial node • Concentric hypertrophic cardiomyopathy – Diminished left ventricular cavity – Dilated right ventricle – Significant myocyte hypertrophy with nuclear enlargement and fiber disarray involving the septum of both ventricles • Biventricular and ventricular septum hypertrophy • Severely congested lungs bilaterally with edema • Hepatosplenomegaly with passive congestion • Hashimoto's thyroiditis	PDF
F2000-20	Feb 10, 1998	Driver/Operator dies at a motor vehicle fire—Wisconsin	"Myocardial infarction" as the immediate cause of death, due to "severe atherosclerotic cardiovascular disease."	Yes	• Severe arteriosclerotic heart disease – High-grade atheromatous plaques of up to 100% occlusion of the left anterior descending and the right coronary arteries • Large remote myocardial infarct in the lateral wall of the left ventricle • Three graft vessels • Cardiomegaly (enlarged heart) (750 gms)	PDF

NIOSH REP. #	DATE OF INCIDENT	Title	CAUSE OF DEATH	AUTOPSY	AUTOPSY COMMENTS	PDF LINK
F2000-19	Mar 17, 2000	Motor-vehicle incident involving amtrak train claims life of career firefighter/engineer—North Carolina	Multiple blunt-force injury from the fire truck/train collision	Not mentioned	None	PDF
F2000-18	Jan 17, 2000	Tanker rollover claims life of volunteer fire chief—Missouri	Massive neck trauma and upper chest trauma	Not mentioned	None	PDF
F2000-17	Feb 11, 2000	A volunteer firefighter/driver was killed and another volunteer firefighter was injured while responding to a motor vehicle incident with injuries—California	Adult respiratory distress syndrome [lung failure]/ischemia and encephalopathy due to motor vehicle crash	Not mentioned	None	PDF
F2000-16	Mar 03, 2000	Arson fire claims the life of one volunteer firefighter and one civilian and severely injures another volunteer firefighter—Michigan	Asphyxiation	Not mentioned	None	PDF
F2000-15	Oct 15, 1997	Battalion chief suffers a heart attack and eventually dies while participating in a fitness program—California	Cardiogenic shock due to enterobacter sepsis due to multiorgan failure due to ischemic cardiomyopathy	No	Perform autopsies on all onduty firefighter fatalities	PDF
F2000-14	Feb 06, 2000	Firefighter dies at a single-family dwelling fire—Iowa	"Occlusive coronary artery disease" as the immediate cause of death due to "atherosclerotic vascular disease"	Yes	• Atherosclerotic vascular disease – Severe coronary artery disease – Right coronary artery, 75% stenotic – Left circumflex artery, 80% stenotic – Left anterior descending artery unavailable due to organ harvesting for donation • Focal contraction band necrosis in the right ventricle • Acute pulmonary congestion, agonal • Pulmonary anthracosis without emphysema • Carbon monoxide level of 4%	PDF

NIOSH REP. #	DATE OF INCIDENT	Title	CAUSE OF DEATH	AUTOPSY	AUTOPSY COMMENTS	PDF LINK
F2000-13	Feb 14, 2000	Restaurant fire claims the life of two career firefighters—Texas	Asphyxia due to smoke inhalation	Yes	None	PDF
F2000-12	Jan 17, 2000	Sector captain suffers fatal heart attack—Texas	"Myocardial infarction" (heart attack) as the immediate cause of death, and "diabetes" as a significant condition	No	None	PDF
F2000-11	Jan 15, 2000	Volunteer firefighter drowns during dry-suit training dive—North Carolina	Severe metabolic acidosis as the result of near drowning	Not mentioned	None	PDF
F2000-10	Oct 28, 1999	A captain and a firefighter die from injuries in a tanker rollover—Indiana	Victim #1: Cardiac arrhythmia Victim #2: Sepsis	Not mentioned	None	PDF
F2000-09	Jan 27, 2000	Volunteer firefighter dies fighting a structure fire at a local residence—Texas	Smoke inhalation	Yes	None	PDF
F2000-07	Jan 17, 2000	Volunteer firefighter dies after 9-foot fall from ladder—Pennsylvania	Blunt-force trauma to the head	Not mentioned	None	PDF
F2000-06	Nov 14, 1999	Tanker rollover results in the death of one volunteer firefighter—Texas	Blunt trauma	Yes	None	PDF

NIOSH REP. #	DATE OF INCIDENT	Title	CAUSE OF DEATH	AUTOPSY	AUTOPSY COMMENTS	PDF LINK
F2000-05	Dec 13, 1999	Firefighter dies at a barn fire—Ohio	"Fatal cardiac arrhythmia" as the immediate cause of death due to "acute thrombotic occlusion of the right coronary artery" (heart attack), "80-90% narrowing of the left anterior descending coronary artery, and severe coronary atherosclerosis."	Yes	• Coronary artery disease – Severe coronary atherosclerosis – Complete acute thrombotic occlusion of the right coronary artery – Narrowing of the left coronary artery – Proximal and middle left anterior descending branch, near complete occlusion – Generalized moderate atherosclerosis • Hypertrophy and dilatation of the heart • Acute and chronic marked congestion of the lungs • Splenomegaly The victim's blood was not tested for carbon monoxide poisoning (carboxyhemoglobin levels) although the department requested this be done	PDF
F2000-04	Dec 22, 1999	Structure fire claims the lives of three career firefighters and three children—Iowa	Victim #1: Smoke inhalation and sudden exposure to intense heat Victim #2: Smoke inhalation and sudden exposure to an extremely hot environment Victim #3: Sudden exposure to intense heat	Not mentioned	Victim #1: 15% Carboxyhemoglobin level Victim #2: 25% Carboxyhemoglobin level Victim #3: 1.0% Carboxyhemoglobin level	PDF
F2000-03	Jul 04, 1999	Captain dies as a result of a cardiac arrest at the scene of a structure fire—Alabama	Myocardial infarction	No	Note: No blood was sent for laboratory analysis during resuscitative efforts. According to post-mortem toxicology forensic specimen analysis, the victim's carboxyhemoglobin level was "negative." An autopsy was not performed Perform an autopsy on all onduty firefighter fatalities	PDF

NIOSH REP. #	DATE OF INCIDENT	Title	CAUSE OF DEATH	AUTOPSY	AUTOPSY COMMENTS	PDF LINK
F2000-02	Jul 06, 1998	Forestry worker dies while bulldozing a fire line at a wildland fire—Alabama	Per death certificate: "cardiac arrest" as the immediate cause of death and "respiratory failure" as the underlying cause Per autopsy: "acute myocardial infarction" (heart attack)	lYes	• Atherosclerotic cardiovascular disease, trivessel, very severe (Ninety-% occlusion of each of the following arteries: left anterior descending, right, and circumflex arteries) • Myocardial infarctions, old, remote, multiple • Myocardial infarction, recent, acute Toxicological analysis reported a 10-percent carboxyhemoglobin level. In an interview, the head of the Toxicology Section who performed this analysis communicated that the victim's actual carboxyhemoglobin range was within 5 to 10 percent, a range he considered indicative of carbon monoxide exposure during this fire suppression but not indicative of a toxic exposure	PDF
F2000-01	Dec 18, 1999	Motor-vehicle incident claims the life of a volunteer firefighter and injures a volunteer chief—Virginia	Atlanto-occipital dislocation (severe neck spinal cord damage) resulting from motor-vehicle violence	Not mentioned	None	PDF

Appendix C: Examination of Personal Protective Equipment

In some cases, performance of protective clothing and equipment will be a factor in the incident outcome. The condition of all protective clothing and equipment must be properly documented as part of the investigation and can have an impact on a determination for the cause of death during an autopsy. The impounded equipment should be examined at the scene if possible, and again after it has been secured. While at the scene, it is important to note the condition of the equipment in addition to its operational status. Closer examination of equipment may be done following impoundment.

Each item of protective clothing and equipment should be examined carefully. The clothing and equipment always should be photographed. Begin the series of photographs with an overview picture of the item (both front and back). Additional pictures should be taken of every significant component or feature of the clothing and equipment. Pay particular attention to valves, knobs, buttons, and hoses of self-contained breathing apparatus (SCBA) and interface areas for clothing, such as the front closure and collar of pants, ear covers, and visor or goggles of helmets. Table C-1 provides a list of photographs that should be taken for each item of protective clothing and equipment.

Areas of damage or charring also should be photographed. Schematic drawings of protective clothing and equipment should indicate location and extent of the damage. Investigators should take detailed and descriptive notes of all observations. It is as important to note that something was functional or in good condition as it is to note failure or damage. Most performance tests of clothing is destructive. Therefore, it is important to document the condition of the clothing and equipment properly through a detailed written description and photographs/video before any testing is conducted. Note testing always must be authorized by the department before the testing is conducted. Any testing should be identified in advance by:

- the type of test;
- the laboratory where the test will be conducted;
- a description of any samples or specimens removed from the clothing or equipment;
- the purpose of the test; and
- the deposition of any samples that are tested.

Evaluation of SCBA is critical to the investigation. Do not make any adjustments to the SCBA unless absolutely necessary. The positions of straps and knobs should be photographed, and then marked with an indelible marker or grease pencil. Valves should not be opened or shut under any circumstances. If the investigators wish to test breathing air, a SCBA that was filled from the same source at approximately the same time should be used. Several observations should be made at the incident scene:

- Was the victim wearing SCBA?
- If not, where was SCBA found in relation to the victim?
- Was the face piece intact and in place on the victim?
- Was there pressure remaining in the air cylinder?
- If so, what were the gauge readings?
- Did all gauge readings agree?
- Were valves and regulators in their proper positions?
- Were support straps and apparatus in their proper configuration, and were they attached as would be expected for normal use?
- Was there any visible damage to the SCBA (tank, hoses, straps, regulators, mask)?
- Was there any signs of icing on the regulator (or freeze burns on the face or respiratory tract of the firefighter)?
- Was any recent maintenance done on the unit?
- What maintenance records are available on the unit?
- What were the qualifications of the technician completing the necessary repairs or modifications?
- Were there any reported problems with this specific unit or with the model?
- Did the SCBA meet the NFPA 1981 standard in effect at the time of its manufacture?

If investigators have any concerns that the SCBA may have been a factor in the death or injury of firefighters, then the SCBA should be sent to the National Institute for Occupational Safety and Health (NIOSH), in Morgantown, West Virginia. Upon written request, NIOSH investigators will conduct an independent inspection and evaluation of the SCBA. This letter should be sent to NIOSH along with the SCBA to be inspected.

Each member of the fire department who is involved in fire suppression activities is required to have and activate a personal alert safety system (PASS) before entering the hazard area. In some cases, PASS may be integrated with the SCBA and will be activated automatically when the SCBA is worn and used. Investigators should include the following in their observations.

- Was the victim wearing a PASS device when he or she entered the hazard area?
- Was it turned on?
- Is the device capable of being activated with a single gloved hand?
- Was it functioning when the victim was found?
- How did the audible alert signal strength compare with a new PASS device with a new battery?
- Was the victim carrying any other communications equipment (e.g., radio)?
- Was there any visible damage to the PASS device?
- Where was it found in relation to the victim?
- Is it possible that the PASS may have been submerged in water or had the seals to the interior compartment compromised to cause leakage?
- Was the PASS functional immediately after the incident?
- When were the PASS batteries last changed?

- When was the PASS last tested?
- Was any recent maintenance done on the unit?
- Did a certified technician complete the necessary repairs or modifications?
- Were there any previously reported problems with this specific unit or with the model?
- Did the PASS device meet the NFPA 1982 Standard in effect at the time of its manufacture?

Before beginning the inspection of protective clothing it is important to note the presence and position of the clothing. The following questions, after such documentation, should be addressed:

- What items of protective clothing was the firefighter wearing (e.g., turnout coat, turnout pants, helmet, gloves, boots, hood, goggles/face shield)?
- Were all items of protective clothing donned properly?
- Had the protective clothing been removed?
  - Purposely, by firefighter?
  - Accidently (knocked off)?
  - If so, where was the garment found in relation to the firefighter's body?
- Were any items of protective clothing removed during rescue efforts?
- Were any rips, cuts, or tears made during rescue efforts?
- Did protective clothing meet the appropriate NFPA standard at the time it was manufactured?
- Every item of protective clothing should be inspected for the following types of wear or damage:
  - Cleanliness, or lack thereof, indicates smoke or chemical exposure.
  - Char, heat damage, and burned areas indicate exposure to excessive heat and/or flame. Areas of damage may cause loss of fabric strength or protective properties. It is particularly important to check all layers of the protective garment.
  - The garment also should be checked for worn or abraded areas, rips, tears, cuts, and fraying. All seams should be checked for broken or missing stitching indicative of seam failure. Signs of discoloration or dye loss also may indicate heat or chemical exposure. Reflective trim should be inspected with a flashlight to ensure that it has not lost its reflective properties.
- If injuries have occurred, it is especially important to match injury areas on the victim with the areas of the clothing under which the injuries occurred.

Important areas for examination include the following:

- any gaps in the liner system under the outer shell;
- types of reinforcements over any injury area; and
- overall integrity of clothing when worn.

It is important also to ascertain the configuration of clothing as worn (e.g., fastening of closures, position of collar, ear covers, etc.) and whether parts of the ensemble were wet when worn (including wet from an earlier response). It is useful to compare how the clothing was worn by the deceased firefighter during the fatal event, if possible. The sizing of protective clothing and equipment should also be noted in the investigation of personal protective equipment (PPE) performance. Investigation of possible clothing failures must account for differences in clothing performance that occur through wear. It may be useful to compare clothing performance with new or unused items.

Investigation of personal protective clothing and equipment should include the following assessments (as listed by each item):

Protective Helmets

- helmet outer shell:
  - bubbling of shell material,
  - delamination of material or soft spots,
  - dents, cracks, nicks, gouges, or flaking, and
  - loss of surface gloss;
- helmet inner shell and impact liner:
  - warping,
  - wear (excessive or unusual),
  - broken or missing components, and
  - improper installation/attachment of components;
- suspension system:
  - cracked or missing suspension system components,
  - torn head band or size-adjustment slots,
  - stripped size adjustment ratchet knob,
  - signs of excessive wear;
- crown straps and ear covers:
  - improper installation and fit, and
  - signs of wear, damage, and excessive heat;
- damaged chin straps fasteners, slides, and closures; and
- faceshield/goggles:
  - signs of wear, damage, and excessive heat,
  - deformation, scratches obscuring vision, and
  - damaged fasteners, straps, and closures.

Protective Hoods

- hood integrity;
- signs of shrinkage;
- loss of elasticity;
- seam integrity; and
- signs of wear, damage, and charring.

Protective Garments (Coat and Pants)

- outer shell
  - signs of wear, damage, excessive heat, discoloration, or char on fabric,

  - seam integrity,
  - reinforcement integrity,
  - closure system integrity,
  - condition of hardware, and
  - damage to pockets; items in pockets and their respective condition;
- moisture barrier and thermal barrier:
  - delamination of seams or seals,
  - seam integrity/quilt stitching,
  - attachment system to the outer shell, and
  - signs of wear, damage, excessive heat, discoloration, or char on fabric? (In many cases, it may be necessary to open the liner to determine the condition of the film or coated side of the moisture barrier.);
- reflective trim
  - signs of wear, damage, excessive heat, melt, discoloration, or char on trim,
  - seam/stitching integrity, and
  - loss of reflectivity; fluorescence;
- reinforcements (shoulders, elbows, knees, sleeve ends, pant cuffs):
  - signs of wear, damage, excessive heat, melt, discoloration, or char on exterior or interior layers,
  - seam/stitching and attachment integrity integrity,
  - permanent compression;
- protective wristlets:
  - shrinkage,
  - loss of elasticity,
  - seam integrity, and
  - thumbhole elongation;
- suspenders:
  - melting or other heat damage,
  - shrinkage,
  - loss of elasticity,
  - seam integrity, and
  - condition of hardware;

Protective Gloves

- glove integrity;
- shrinkage;
- loss of elasticity/flexibility;
- seam integrity;

- liner pullout; and
- signs of wear, damage, excessive heat, discoloration, or char on leather/fabric (both exterior and interior).

Protective Footwear (Rubber)

- loss of elasticity;
- delamination of seam seals;
- material damage;
- steel toe or shank damage;
- sole tread wear; and
- loss of liquid-tight integrity (waterproofness).

Protective Footwear (Leather)

- seam integrity;
- material damage (rips, tears, holes);
- steel toe or shank damage;
- sole tread wear;
- loss of liquid-tight integrity (waterproofness);
- closure system;
- uniform integrity;
- seam integrity;
- material damage (rips, tears, holes);
- closure system; and
- signs of wear, damage, excessive heat, discoloration, or char on fabric.

Protective clothing and equipment experts may be required. On occasion, certain garments and equipment may need to be sent out to testing labs for verification that it meets the current set of applicable standards to which the item was certified; however, judgment must be applied if the specific property being measured would be a contributory factor to the firefighter fatality. Other reasons for testing would be to determine whether the item in question was operating properly and, if not, whether it contributed to the incident.

Once the items have been impounded by the investigation team and their condition documented, outside assistance should be requested. All issues involving SCBA testing should be handled by NIOSH. Other protective clothing and equipment testing may be conducted by appropriately qualified experts or independent testing laboratories. Impounded items should be transferred to the testing laboratory following strict chain-of-custody procedures. The testing laboratory should be asked to compare the item performance at the time of the incident with the performance requirements of the appropriate NFPA standard. The independent expert or laboratory may be asked further to determine the range of heat and temperature conditions to which the item may have been exposed. The testing laboratory's report should be summarized in the body of the investigation report and attached as an appendix to the report.

Manufacturer's technical experts may have useful information and should be invited to examine the item in the presence of investigation team members. The manufacturer's written comments should be requested for inclusion in the report. At no time should a manufacturer's representative be given custody of an impounded item or left alone with impounded items.

Table C-1 Recommended Photographs of Protective Clothing and Equipment

Clothing or Equipment Item	Minimum Recommended Photographs
Self-contained breathing apparatus (SCBA)	• Complete SCBA resting on back plate with cylinder shown in front and facepiece off to side • Complete SCBA show harness side • Base of cylinder showing cylinder valve and position • Closeup of manufacturer product label and certification mark • Closeup of cylinder valve and first-stage regulator • Closeup of pressure gauge • Closeup of second-stage regulator • Front of facepiece • Interior of facepiece • Closeup of facepiece exhalation valve • Integrated PASS (if present) • Any specific areas of damage to valves, harness, backplate, hoses, facepiece straps, or accessory items
Personal alert safety system (PASS)	• Complete PASS (top view) • Complete PASS (bottom view) • Closeup of manufacturer product label and certification mark • Closeup of battery panel • Any specific area of damage, particularly for condition of seals in PASS case (if PASS can be opened, the condition of interior components, if warranted by investigation)
Protective helmet	• Front top of helmet (showing shield and emblem) • Left top of helmet • Right top of helmet • Back top of helmet • Interior of helmet showing ear covers (two photographs may be needed to adequately show both sides) • Closeup of product label and certification mark (if possible) • Any specific area of damage such as shell, edge beading, straps, suspension, and ear covers)

Clothing or Equipment Item	Minimum Recommended Photographs
Protective hood	• Left side of hood (lying flat) • Right side of hood (lying flat) • Closeup of product label and certification mark • Any specific area of damage to material or face opening
Protective garments	• Front of garment with closures secured • Back of garment with closures secured • Interior of garment shell (liner removed and shell turned inside out)—both front and back • Removed liner—moisture barrier side—both front and back • Removed liner, turned inside out—thermal barrier side—both front and back • Closeups of all product labels and certification marks on both shell and liner • Any specific area of damage to shell, liner, hardware, trim, reinforcements, and other items on garments (where damage occurs on one side, attempt to photograph other, especially in case of thermal damage)
Protective gloves	• Back side of gloves • Palm side of gloves • Closeup of product label and certification mark • Any specific areas of damage to glove exterior, lining, gauntlet, or wristlet
Protective footwear	• Left side of footwear (standing upright) • Right side of footwear (standing upright) • Footwear soles • Closeup of product label and certification mark (if possible) • Any specific areas of damage to exterior, lining, sole, hardware, or other features of footwear

INCIDENT REPORT DOCUMENTATION

PURPOSE

The Hanover Park Fire Department has a responsibility to accurately report incident operations (both Fire and EMS related) in a timely manner. For Fire Incidents the Hanover Park Fire Department has the responsibility to accurately report factors contributing to a fire, as well as losses occurred as the direct result of a fire.

The information collected and recorded using the National Fire Incident Reporting System (NFIRS) is transmitted monthly to the National Fire Data Center (NFDC) in Emmitsburg, MD. Reporting NFIRS data is required by Illinois law and is a prerequisite for receiving funds under the Aid to Firefighters Grant program.

The information collected is disseminated to federal, state and local government to develop fire protection strategies and monitor fire losses and casualties. This information is also made available to product testing and consumer alert agencies that make recommendations for the recall of products. In addition, the information obtained can lead to recommendations for changes to firefighting equipment and protective gear.

SCOPE

This Standard Operating Procedure (SOP) is applicable to all members of the Hanover Park Fire Department at all times.

1. Responsibilities

1.1. An incident report shall be generated by the fire department for any and all incident responses. Responses may be generated by DuComm, a walk-in report, or first-hand knowledge. This includes emergency responses as well as mutual aid and request for assistance by other agencies. The shift Battalion Chief is responsible for ensuring that incident numbers are generated and documentation is completed.

1.2. Report writers should always remember that fire department reports are public property and shall be cognizant of the laws and ordinances governing the Freedom of Information Act and its timetable for releasing records

2. Procedures

1.1. All Incident reports for all incidents shall be completed using Firehouse Software® by the completion of the shift on which the incident occurred. Battalion Chiefs may exempt the completing of the report for reasons such as on-going investigations, information not available, incident on-going, computer malfunctions, etc.

1.2. It shall be the responsibility of the Officer-In-Charge to ensure that all information is entered into the report completely and accurately.

1.3. It shall be the responsibility of the Battalion Chief for each shift to see that all reports are completed within the time period described above.

3. STRUCTURE FIRE INCIDENT REPORTS

3.1. For structure fires, the Battalion Chief (Actor) shall review all portions of the NFIRS incident report. The Company Officer of the first due apparatus shall be responsible for entering all pertinent information onto the report including a narrative of company actions. The Incident Commander shall add to the narrative his/her own Command Narrative accurately describing the command functions and actions.

3.2. All available sections, modules, user-defined fields, and/or additional reports shall be completed when applicable regardless whether they are specifically required by NFIRS or FIREHOUSE Software®.

3.3. All available data fields shall be completed; 'Not Applicable', 'None', 'Unknown' are valid data entries when applicable.

3.4. The Incident Commander shall be responsible for the collection of accurate data, including but not limited to:

3.4.1. Fire Loss estimates
3.4.2. Smoke Detector performance and protection system effectiveness
3.4.3. Persons Involved information including addresses, DOB, contact information
3.4.4. Insurance carrier information
3.4.5. Building size, use and age
3.4.6. Equipment involved
3.4.7. Preliminary Cause & Origin

4. Apparatus and Personnel will be completed by the Company Officer. Unit narratives may be completed by each Company Office. Actions Taken shall be required for each person listed on the report.

5. Fire Property Loss should be based on values obtained using the *Building Valuation Estimator* located at T://FireVHP/Building Valuation Estimator. To estimate the property loss based upon reconstruction costs of the structure go to: www.saylor.com. Fire Content Loss should be determined by the *Building Valuation Estimator* or by examining each item involved per room and applying an estimated replacement cost.

6. All supporting documents, including command worksheets, photos, investigation reports, police reports, and other related materials shall accompany the printed incident report in the Incident Report Envelop.

7. Completed Fire Incident Reports that have been verified by the Battalion Chief shall be forwarded to the Assistant Fire Chief who shall determine cost factors and perform a final review prior to submittal to the Fire Chief.

8. VEHICLE FIRE INCIDENT REPORTS

8.1. The Company Officer shall obtain the following information regarding each vehicle involved in the fire

8.2. Name, address, DOB and telephone number of owner of the vehicle

8.3. Name, address, DOB and telephone number of the operator (if different)

8.4. Insurance company name, telephone number and policy number

8.5. Make, model, license plate and Vehicle Identification Number (VIN)

8.6. An accurate estimate of the contents of the vehicle to check for the presence of high dollar items that might have been lost, i.e. computers, cameras, jewelry, etc.

8.7. The Company Officer shall use the Kelly Blue Book website to obtain an accurate estimate of the value of the fire vehicle. The website can be found at http://www.kbb.com/

8.8. If the vehicle is fully destroyed, assume the loss is the same as the "good condition" value of the vehicle.

8.9. If the vehicle is only partially destroyed, figure the loss as a percentage of the "good condition" value of the vehicle. For example, if the Kelly Blue Book website states the vehicle has a value of $4,000 and 25% of the vehicle was damaged by fire, the loss would be $1,000.

8.10. If the vehicle is an older passenger vehicle not listed on the Kelly Blue Book website, value the vehicle at $1,000.

9. Non-fire Reports

9.1. All other incidents shall be documented to their fullest using available sections.

9.2. Losses not due to fire shall be documented in the incident narrative.

9.3. Non-fire incident reports need not be printed (electronic only)

10. Emergency Medical Reports

10.1. The Paramedic in charge of patient care shall be responsible for the accurate completion and posting of the Patient Care Report (PCR) utilizing ImageTrend® software or other reporting software as required by the Greater Elgin Area Mobil Intensive Care Program.

10.2. The senior Paramedic on the call shall ensure that a corresponding NFIRS report is completed within FIREHOUSE Software®.

10.3. The Lieutenant or Actor shall be responsible for obtaining any additional information or signatures to complete the PCR and NFIRS report.

10.4. The Battalion Chief or Actor shall be responsible for ensuring that all PCRs are completed in a timely manner and before the conclusion of the shift.

Operation of the Non-911 Ambulance Service

1. Purpose

The Hanover Park Fire Department operates ambulances for the purpose of both first-response emergency medical care and non-emergency ambulance transports. The non-emergency transports shall be known as the Non-911 Ambulance Program. This policy shall establish guidelines for the use and operation of the Non-911 Ambulance.

2. Scope

This policy shall apply to all members at all times unless specifically prohibited by law or by a current Collective Bargaining Agreement (CBA). All members shall be responsible for adherence to all provisions of this policy and the policies and/or procedures of the Village of Hanover Park, the Fire Department and the Greater Elgin Area Mobile Intensive Care Program, including, but not limited to, the Emergency Medical Services Policy Manual and the Standing Medical Orders (current edition).

3. Responsibilities

3.1. It shall be the responsibility of the Battalion Chief of EMS to administer the Non-911 Ambulance Program and to establish rules and regulations for its operation. All rules and regulations shall be approved by the Fire Chief.

3.2. It shall be the responsibility of the Shift Battalion Chief, or the Acting Shift Commander, to oversee the daily operation of the program including, but not limited to, the scheduling of personnel, the readiness of vehicles and equipment and the completion of all documentation.

3.3. It shall be the responsibility of each Paramedic and/or EMT to ensure the readiness of the vehicles and equipment, the safe operation of the vehicles, proper and complete documentation, and the strict adherence to all medical protocols in the best interest of their patients.

4. Scheduling of Staff

4.1. The scheduling of personnel shall be in accordance with the current CBAs and procedures and shall be managed by the Operations Chief.

4.2. The scheduling of added or last-minute personnel shall be in accordance with current CBAs and procedures and shall be managed by the Shift Battalion Chief or Acting Shift Commander

4.3. The assigned personnel will ordinarily work between 08:00 and 18:00. Additional personnel may be added at the discretion of the Fire Chief. There shall be no guarantee of hours of work for any employee.

4.4. There shall be no less than one Licensed Paramedic assigned to any Non-911 Ambulance transport, who shall be accompanied by no less than one EMT or one additional Licensed Paramedic.

4.5. Every effort shall be made to schedule Non-911 Ambulance Program work hours from the list of qualified part-time employees.

4.6. If insufficient part-time employees are available, full-time employees, either working or hired back, may staff the Non-911 Ambulance at the Fire Chief's discretion.

5. Scheduling and Dispatch for NON-Claremont Facility Patients

5.1. The scheduling of Non-911 Ambulance transports shall be accomplished using the DU-COMM non-emergency telephone number of (630) 510-3860. All inquiries concerning the scheduling or details of any transport should be directed to DU-COMM at this number.

5.2. The dispatching of all Non-911 Ambulance transports shall be by DU-COMM utilizing established procedures. Each transport shall be assigned a unique Incident Number and shall be included in all NFIRS statistics.

5.3. Emergency dispatches shall always take precedence before Non-911 dispatches.

5.4. If no Non-911 Ambulances are available, DU-COMM shall dispatch the contracted back-up ambulance company and shall inform the Battalion Chief of their response.

6. Scheduling and Dispatch for Claremont Facility Patients

6.1. The scheduling of Non-911 Ambulance transports from the Claremont shall utilize ElginMedi's 24-hour dispatch center via an established 7-digit phone number.

6.2. ElginMedi dispatchers will collect all pertinent information related to the transport including customary billing information and the time the transport is needed.

6.3. If at any point the dispatcher determines the call is an emergency, they will immediately advise the caller to "hang up and call 911".

6.4. Once the dispatcher has acquired all information pertinent to the transfer, they will notify the on-duty Battalion Chief or their replacement on their direct cellphone line or by text

message. For purposes of this protocol, the test group will include all three shift Battalion Chiefs, the Fire Chief and all ambulance phones.

6.4.1. The on-duty Battalion Chief will contact ElginMedi's dispatch at the beginning of their shift at 0700.
6.4.2. The Battalion Chief will give ElginMedi's dispatch their direct cellphone line that they can be contacted at in the event a non-emergency transport from The Claremont is dispatched.
6.4.3. The Battalion Chief or his/her designee will contact ElginMedi's dispatch center to obtain all pertinent information for the call.

6.5. The on-duty Battalion Chief or their replacement will assign the call per section 7 of this guideline, Operational Procedures.

6.5.1. When the crew goes enroute to the Claremont, they will notify Du-Comm to punch a ticket for a non-emergency transport. All further communication will go through Du-Comm.
6.5.2. Specific questions related to the call will be directed to ElginMedi's dispatch center via a phone call from the responding ambulance crew.

6.6. In the event that a Hanover Park ambulance is not available to complete the transfer and the transfer cannot be postponed until an ambulance can become available, ElginMedi will respond in our place.

7. Operational Procedures

7.1. Ambulance 381 (Station 1) and Ambulance 382 (Station 2) shall be staffed 24 hours per day with shift personnel.

7.2. Ambulance 383 (Station 1) shall be ordinarily staffed for 10 hours per day.

7.3. Emergency incident response shall be assigned to the closest available ambulance.

7.4. Every effort shall be made to maintain at least one ambulance available for emergency incident response. Mutual aid requests may be altered and/or declined if no other ambulance is available and Non-911 transport are scheduled for that day.

7.5. Response to fire emergency responses shall be in accordance with existing alarm cards. Ambulance 383, if no Non-911 transports are scheduled, shall respond to all General Alarms and report as part of Tower 371.

7.6. In the event Ambulance 381 is on a prior call, Ambulance 383 shall replace them in the General Alarm response order and operate Tower 371.

8. Non-911 Incident Documentation

8.1. All *Patient Care Reports* (PCR) shall be entered utilizing ImageTrend® software and uploaded as soon as practical.

8.2. All patients shall have complete HIPAA documentation.

8.3. A *Physician's Certification for Non-Emergency Ambulance Service* shall be completed and attached for all transports that are not part of a managed care program.

8.4. All documentation received from the originating facility shall be listed in the PCR.

8.5. All completed PCRs and attached documents shall be forwarded to the Battalion Chief of EMS or placed in a secure area designated for such reports.

Hazardous Materials Incident Response

Purpose

This plan provides a basic philosophy and strategic plan for hazardous materials situations. All Hanover Park Fire Department Standard Operating Procedures, unless superseded by a specific part of this plan, remain in effect for hazardous materials incidents.

Hazardous materials incidents encompass a wide variety of potential situations including fires, spills, transportation accidents, chemical reactions, explosions and similar events. Hazards involved may include toxicity, flammability, radiological exposure, corrosives, explosives, health and chemical reactions, or a combination of factors. This plan provides a general framework for handling a hazardous materials incident, but does not address the specific tactics or control measures for particular incidents.

Scope

Every incident presents the potential for exposure to hazardous materials; even the products of combustion of an ordinary fire may present severe hazards to personnel safety.

This procedure applies to all members at all times. This procedure is specifically applicable to known hazardous materials incidents, but it does not reduce the need for appropriate safety precautions at every incident. The use of full protective clothing and SCBA as well as special protective clothing and the use of all Standard Operating Procedures on a continuing basis are foundational for this plan.

1. Common Terminology

1.1 Chemical Protective Clothing: A single or multi-piece garment constructed of chemical protective clothing materials designed and configured to protect the wearer's torso, head, arms, legs, hands and feet. It covers the wearer's head, hands, and feet with detachable or attached hoods, gloves and boots. It completely encloses the wearer by itself or in combination with the wearer's respiratory equipment, hood, gloves and boots.

1.2 Contamination Reduction: also known as Decontamination; the physical and/or chemical process of reducing and preventing the spread of contamination from persons and equipment used at a hazardous materials incident.

1.3 Control Zones: The designation of areas at a hazardous materials incident based upon safety and the degree of hazard. Many terms are used to describe the zones involved in a hazardous materials incident. For purposes of this standard, these

zones shall be defined as the hot (hazard zone), warm (limited access zone) and cold (support) zones.

1.4 **Decontamination Area:** The area on the incident scene where decontamination takes place usually located in the WARM ZONE. This area will be restricted to persons and equipment that are contaminated, and the decontamination team.

1.5 **Decon:** Abbreviation for Decontamination or Contamination Reduction.

1.6 **Degradation:** A chemical action involving the molecular breakdown of a protective clothing material due to contact with a chemical. The term degradation may also refer to the molecular breakdown of the spilled or released material to render it less hazardous.

1.7 **Exposure:** The process by which people, animals, the environment and equipment are subject to the harmful action or influence of a hazardous material. The magnitude of exposure is dependent primarily upon the duration of exposure and the concentration of the hazardous material.

1.8 **Full protective clothing and equipment:** Minimum protection for all personnel operating at the scene of a hazardous materials incident will be full firefighter turnout gear, including helmet, coat, bunker pants, gloves and self-contained positive pressure breathing apparatus. Other specified clothing may be required at varied incidents.

1.9 **Hazardous Materials:** Hazardous materials are defined in the Code of Federal Regulations, Title 49, Parts 100 through 199, as revised. A hazardous materials incident may be defined as one or more of those materials and/or other materials that may be leaking, spilled, burning or have a potential release thereof, that may endanger life, property and/or the environment.

1.10 **Hazard/Hazardous:** Capable of posing an unreasonable risk to health, safety or the environment capable of causing harm.

1.11 **Hazard Sector:** The function of an overall management system that deals with the mitigation of a hazardous materials incident. It is directed by a sector officer and principally deals with the technical aspects of the incident.

1.12 **Hazardous Materials:** (DOT Definition): Any substance or material in a quantity or form which may be harmful or injurious to humans, domestic animals, wildlife, economic crops or property when released into the environment.

1.13 Hazardous Material Incident: The involvement of hazardous materials, with or without containment that poses a threat to the health and safety of the public.

1.14 Hazardous Material Class/Division: The general category of hazard assigned to a hazardous material under the DOT regulations. The division is a subdivision of a hazard class.

Class 1 (Explosives)
Division 1.1 Explosion with a mass explosion hazard
Division 1.2 Explosives with a projection hazard
Division 1.3 Explosives with predominately a fire hazard
Division 1.4 Explosives with no significant blast hazard
Division 1.5 Very insensitive explosives
Division 1.6 Extremely insensitive explosive articles

Class 2
Division 2.1 Flammable Gas
Division 2.2 Non-flammable, non-poisonous compressed gas
Division 2.3 Poison Gas
Division 2.4 Corrosive Gas

Class 3
Flammable Liquid
Combustible Liquid

Class 4
Division 4.1 Flammable Solid
Division 4.2 Spontaneously Combustible Material
Division 4.3 Dangerous when wet material

Class 5
Division 5.1 Oxidizer
Division 5.2 Organic Peroxide

Class 6
Division 6.1 Poisonous Material
Division 6.2 Infectious Material

Class 7
Radioactive Material

Class 8
Corrosive Material

Class 9
Miscellaneous hazardous material
ORM-D Material

1.15 Haz Mat Response Team: Personnel specifically trained to deal with the hazardous materials incident. Team members will be the only ones allowed to work with the equipment stored in the vehicles, under the direction of the Haz Mat Sector Commander, who will be responsible to the stricken community Incident Commander.

1.16 Incident Commander: The person responsible for all the decisions relating to the management of the incident. This is equivalent to the ***On Scene Manager*** as defined by OSHA 1910.120. The Incident Commander will be operating under the MABAS incident management system. The Incident Commander must be trained at the equivalent level of NFPA ***Hazardous Materials Incident Commander.***

1.17 Liquid Splash Protective Clothing: Clothing that protects the wearer against chemical liquid splashes but not against chemical vapors or gases. Liquid splash-protective clothing must meet the requirements of NFPA 1992.

1.18 Material Safety Data Sheets (MSDS): A form, provided by manufacturers and compounders of chemicals, containing information about chemical composition, physical and chemical properties, health and safety hazards, emergency response and waste disposal of the material as required by OSHA 1910.1200.

1.19 Penetration: The movement of a material through a suit's zippers, buttonholes, seams, flaps or other design features of chemical protective clothing, and through punctures, cuts and tears.

1.20 Permeation: A Chemical action involving the movement of chemical, on a molecular level, through intact material.

1.21 Personal Protective Clothing: The equipment provided to shield or isolate a person from the chemical, physical and thermal hazards that may be encountered at a hazardous materials incident. Personal protective equipment includes both personal protective clothing and respiratory protection. Adequate personal protective equipment should protect the respiratory system, skin, eyes, face, hands, feet, head, body and hearing.

1.22 Respiratory Protection: Equipment designed to protect the wearer from the inhalation of contaminants. Respiratory protection is divided into three types:

a) Positive pressure self-contained breathing apparatus
b) Positive pressure airline respirators
c) Air purifying respirators

1.23 Response: Will refer to the actual travel of the hazardous materials response vehicle and Response Team personnel to an incident. Responding vehicles will be considered to be in an emergency status and respond with emergency warning equipment.

1.24 Response Team Personnel: Personnel, selected by the Fire Chief of a participating fire department who has attained the required level of training. Must be certified pursuant to guidelines promulgated for their level of expertise by the Haz Mat Co-Op Training Committee and approved by the Executive Committee. Must comply with medical criteria required for that qualification level.

1.25 Technical Assistant: Those personnel who possess unique qualifications which may be useful to the response team for specific purposes. This individual may perform assigned duties at the scene of an incident, during training or whenever deemed appropriate by the Incident Commander, Co-Op Coordinator or the Executive Committee.

1.26 Vapor Protective Clothing: Clothing that protects the wearer against chemical vapors and gases. Vapor protective clothing must meet the requirements of NFPA 1991.

2. Dispatch

DuComm will attempt to obtain any information from the person reporting a hazardous materials incident. The information should, if possible, include material name and/or type, amount and size of container(s), problem (leak, spill, fire, etc.) and dangerous properties of the materials as well as the number of persons injured or exposed. The incident taker should remain on the telephone with the caller to gain additional information after entering the call for the dispatch. Any additional information shall be relayed to responding units after dispatch. This should include the safest approach or best access to the incident if available.

If the call comes from a person with particular knowledge of the hazardous situation, that person should be instructed to meet and direct the arriving units. DuComm shall relay that person's location and level of knowledge to responding units.

DuComm will dispatch the appropriate companies to all reported hazardous materials incidents in accordance with department procedures. DuComm will inform units as to the prevailing wind speed and direction if that information is readily available and deemed to be accurate for the location.

3. First Arriving Unit

The first arriving officer will establish Command and begin a size-up. The first unit must consciously avoid committing itself to a dangerous situation. When approaching, assess any visible activity taking place. Evaluate effects of wind, topography and location of the situation. Route any other responding companies away from any hazards.

Command should consider establishing Level II Staging whenever possible for other responding units. Staged companies must be in a safe location, taking into account wind, spill flow, explosion potential and similar factors in any situation. The DOT Guidebook, NFPA Reference Materials, The NIOSH Pocket Guide, or any other material such as MSDS or shipping papers available to them should be used to establish a safe distance for staging. The first arriving company shall begin entering information using the Hazardous Materials Spill Worksheet (form 512) found in the *Hazardous Materials First Response Documents* publication.

4. Size-Up

Command must make a careful size-up before making a commitment. It may be necessary to take immediate action to make a rescue or evacuate an area. This should be attempted only after a risk/benefit analysis is completed. Personnel must take advantage of available personal protective equipment in these situations. The objective of the size-up is to identify the nature and severity of the immediate problem and to gather sufficient information to formulate a valid action plan. Hazardous materials incidents require a cautious and deliberate size-up.

Avoid premature commitment of companies and personnel to potentially hazardous locations. Proceed with caution in evaluating risks before formulating a plan and keep uncommitted companies at a safe distance.

Identify a hazardous area based on potential danger, taking into account materials involved, time of day, wind and weather conditions, location of the incident, and degree of risk to unprotected personnel. Take immediate action to evacuate and/or rescue persons in critical danger, if possible, providing for safety of rescuers.

The primary objective is to identify the type of materials involved in a situation, and the hazards presented, before formulating a plan of action. Look for labels, markers, DOT identification numbers, NFPA 704 symbol or shipping papers, etc. Refer to pre-fire plans

and ask personnel at the scene for additional information (plant management, responsible party, truck drivers, fire department specialist, etc.). Use reference materials carried on apparatus and have the dispatch center contact other sources for assistance in sizing up the problem (state agencies, fire department specialists, manufacturers of materials, etc.).

5. Action Plan

Based on the initial size-up and any information available, Command will formulate an action plan to deal with the situation.

The Incident Action Plan Must Provide for:

1. Safety of all emergency response personnel
2. Evacuation of endangered area
3. Need for additional resources
4. Control of the situation
5. Stabilization of hazardous materials
6. Disposal or removal of hazardous material
7. Demobilization of resources and finalizing the incident

Most hazardous materials are intended to be maintained in a safe condition for handling and use through confinement in a container or protective system. The emergency is usually related to the material escaping from the protective container or system and creating a hazard on the exterior. The *strategic plan* must include a method to control the flow or release, get the hazardous material back into a safe container, neutralize it, allow it to dissipate safely, or coordinate proper disposal.

The specific action plan must identify the method of hazard control and identify the resources necessary to accomplish this goal. It may be necessary to select one method over another due to the unavailability of a particular resource or to adopt a "holding action" to wait for needed equipment or supplies.

6. Haz Mat Response Team

If the Incident Commander determines the incident is of such a magnitude that exceeds the limitations of first responding units, a MABAS “Haz Mat Response Team” may be requested. A General Alarm will be struck if only Advisors are needed whereas a MABAS Box should be requested if full teams and trailers are needed.

The determining factors could include:

- Harmful characteristics of the chemical
- Size (area) of the spill or release
- Quantity of the product spill or release

- Need for additional resources
- Capabilities of first response personnel
- Limitations of first response personnel

The Incident Commander shall request mutual aid assistance in accordance with MABAS Guidelines. This should include:

- Address of the Incident
- Location of the Command Post
- Location of the Staging
- Direction of travel (if applicable)

MABAS Division 12 Hazardous Materials Standard Operating Procedures, Appendix A, shall be utilized for mitigation and termination of the incident to assure the highest level of safety for emergency responders and the public. Outside agencies such as OSHA, EPA and CHEMTREC may be requested as determined by consultation with the Haz Mat Sector Officer.

7. Decontamination (Decon)

The purpose of decontamination is to assure that any potentially harmful or dangerous residues on personnel, equipment or apparatus are confined. Decontamination is intended to prevent the spread of contaminants and reduce or eliminate the hazardous material from protective clothing, tools and equipment. This procedure may vary with the characteristics of the hazardous material. All factors must be considered for effective decontamination.

Command is responsible for assuring that decontamination is established at incidents that involve a potential decontamination problem. This sector should be assigned to personnel from those trained at the appropriate level. Each member assigned to Decon Sector must wear chemical protective clothing no less than one level below the required clothing of entry personnel. When in doubt about contamination, decon all affected personnel, equipment and apparatus.

To prevent the spread of contaminants, command should establish a decontamination corridor that extends from the zone where the chemical is located, commonly referred to as the “hot or red zone” to the “cold or green zone”. This area in between is commonly referred to as the “warm or yellow zone”. This provides a lane for contaminated personnel to safely transit from the source of contamination. There should be designated locations in the decon process for the deposit of tools, equipment, protective clothing and other items.

Personnel traveling through decon should undergo a decreasing amount of contamination. When showers or spray nozzles are used, adequate space must be provided to avoid contamination of other areas or persons and to prevent runoff of contaminated water.

8. Training and Response Levels

It will be the responsibility of the Incident Commander to assure that all personnel functioning within the haz mat sector are trained and equipped to the appropriate level. The three recognized levels are defined by the National Fire Protection Association (NFPA) 472 *Standard on Professional Competence of Responders to Hazardous Materials Incidents* as follows:

8.1 Haz Mat First Responders: at the Operational Level shall be trained to meet all competencies at the first responder awareness levels and the competencies of this section. First responders at the operational level also shall receive any additional training to meet applicable United States Department of Transportation (DOT), United States Environmental Protection Agency (EPA), Occupational Safety and Health Administration (OSHA), and other appropriate state, local, or provincial occupational health and safety regulatory requirements.

Definition: First responders at the Operational Level are those persons who respond to releases or potential releases of hazardous materials as part of the initial response to the incident for the purpose of protecting nearby persons, the environment, or property from the effects of the release. First responders at the operational level are expected to respond in a defensive fashion to control the release from a safe distance and keep it from spreading.

8.2 Haz Mat Technician: shall be trained to meet all competencies at the first responder awareness and operational levels and the competencies of this section. Hazardous Materials Technicians also shall receive any additional training to meet applicable United States Department of Transportation (DOT), United States Environmental Protection Agency (EPA), Occupational Safety and Health Administration (OSHA), and other appropriate state, local, or provincial occupational health and safety regulatory requirements.

Definition: Hazardous Materials Technicians are those persons who respond to releases or potential releases of hazardous materials for the purpose of controlling the release. Hazardous Materials Technicians are expected to use specialized chemical protective clothing and specialized control equipment.

8.3 Haz Mat Incident Commander shall be trained to meet all the competencies for the first responder awareness and operational levels and the competencies of this section. Incident Commanders also shall receive any additional training to meet applicable United States Department of Transportation (DOT), United States Environmental Protection Agency (EPA), Occupational Safety and Health

Administration (OSHA), and other appropriate state, local, or provincial occupational health and safety regulatory requirements.

Definition: The Incident Commander is that person who is responsible for all decisions relating to the management of the incident. The Incident Commander is in charge of the incident site.

9. Summary

This guideline defines the minimum requirements to:

- Identify an incident involving hazardous materials
- Analyze the incident
- Determine the required level of response
- Develop a plan of action
- Request resources as needed
- Reduce the exposure to personnel
- Decontaminate tools, equipment and personnel

Appendix:

Forms

..\Operations 200-PDF Format\OPS 200 SOG 064 HazMat Incidents_507 HazMat Manpower Usage Appendix.pdf

..\Operations 200-PDF Format\OPS 200 SOG 064 HazMat Incidents_510 HazMat Spill Info Appendix.pdf

..\Operations 200-PDF Format\OPS 200 SOG 064 HazMat Incidents_511 HazMat Guide_OPS 200 SOG 064 HazMat Incidents Appendix .pdf

..\Operations 200-PDF Format\OPS 200 SOG 064 HazMat Incidents_512 HazMat Spill Worksheet Appendix.pdf

..\Operations 200-PDF Format\OPS 200 SOG 064 HazMat Incidents_513 HazMat Entry-Exit Form_Appendix.pdf

..\Operations 200-PDF Format\OPS 200 SOG 064 HazMat Incidents_514 HazMat Forms_Appendix.pdf

..\Operations 200-PDF Format\OPS 200 SOG 064 HazMat Incidents_515 HazMat Tactical Worksheet page 1_Appendix.pdf

..\Operations 200-PDF Format\OPS 200 SOG 064 HazMat Incidents_516 HazMat Level B Dress Matrix_Appendix.pdf

..\Operations 200-PDF Format\OPS 200 SOG 064 HazMat Incidents_517 HazMat Sector Objectives_Appendix.pdf

..\Operations 200-PDF Format\OPS 200 SOG 064 HazMat Incidents_518 HazMat Site Safety Plan_Appendix.pdf

HANOVER PARK FIRE DEPARTMENT
HAZ MAT TACTICAL WORKSHEET

Date: _____/____/_____ Time of Alarm: _____ Location: _____

Nature of Incident: _____ Air Temperature: _____

Wind Speed: _____ Wind Direction: _____ Staging Area: _____

IMMEDIATE LIFE HAZARDS
Explosion / BLEVE
Uncontrollable Fire
Uncontrollable Toxic Plume

Product Name: _____

Classification: _____

UN# _____ ERG Guide # _____

Y N	**HEALTH Hazards (LIST)**
Y N	**FLAMMABILITY Hazards (LIST)**
Y N	**REACTIVITY Hazards (LIST)**
Y N	**SPECIAL Hazards (LIST)**

SITE SAFETY CONSIDERATIONS

ISOLATION

- ❑ Safe Distance: Uphill / Upwind
- ❑ Scene Control / Scene Access
- ❑ Establish Emergency Decontamination

  Protection Options
  - ❑ Evacuation
  - ❑ Protection in Place

IDENTIFICATION

- ❑ Occupancy / Location
- ❑ Container / Shape and Size
- ❑ Placards / Markings
- ❑ MSDS / Shipping Papers

NOTIFICATION

- ❑ GENERAL ❑ BOX ALARM BOX ALARM LEVEL: _____
- ❑ Other Agencies

IEMA	1.800.782.7860	CHEMTREC	1.800.424.9300
NRC	1.800.424.8802	Pesticide	1.800.858.7378
CDC	1.404.633.5315	INFOTRAC	1.800.535.5053
DUCOMM	1.630.690.8245	IEPA	

HANOVER PARK FIRE DEPARTMENT
HAZ MAT TACTICAL WORKSHEET
2

N

INCIDENT PLANNING DIAGRAM

***Include**: Hot, Warm, and Cold Zones*
Note directions (compass and wind)
Indicate product movement

MITIGATION (T.A.P.E.S)

- ❑ Initial Hazard Analysis Completed *(Possible Reference ERG)*
- ❑ Protective Clothing Type Needed
- ❑ Establish Zones (Hot, Warm, Cold)

Action Options

- ❑ Non-intervention
- ❑ Defensive
- ❑ Offensive

Decontamination

- ❑ Emergency Decontamination
- ❑ Personnel Decontamination
- ❑ Civilian Decontamination

Emergency Medical Services

- ❑ Ambulance / Field Treatment
- ❑ Hospital Notifications
- ❑ Receiving Hospitals
- ❑ Supply Receiving Hospitals with Chemical Data

TERMINATION

- ❑ Health Impact
- ❑ Property / Environmental Impact
- ❑ Debriefing / Documentation
- ❑ Reports and Records
- ❑ Incident Stand Down and Transfer

T --- Proper level of training to make the decision
A --- Apparatus to do the work
P --- Properly trained personnel in sufficient quality
E --- Equipment to do the task of mitigation
S --- If you have all of the above, you will have a safe operation

HANOVER PARK FIRE DEPARTMENT

HAZARDOUS MATERIALS

NON-ENCAPSULATING LEVEL B DONNING MATRIX

Dress-Out Leader:_____

- ❑ All components of Level B ensemble are gathered and staged next to the member to be dressed
- ❑ All components of the suit ensemble must be inspected for mechanical defects
- ❑ Establish baseline set of vital signs and register results on Entry/Exit Record

IF ANY MEMBER DOES NOT MEET THE SUIT ENTRY CRITERIA, THEY SHALL NOT BE PERMITTED TO DRESS IN ANY CHEMICAL PROTECTIVE CLOTHING

- ❑ Final briefing from Safety, Entry, and Decon sector officers shall be completed at this time if not already executed
- ❑ Final check of any equipment to be used in the hot or warm zones shall be completed at this time if not already executed
- ❑ Review and perform emergency hand signals for all members
- ❑ Remove all personal items and place in safe container
- ❑ Remove shoes
- ❑ Sit down on stool
- ❑ Place feet in suit, one at a time
- ❑ Place feet in over boots, one at a time
- ❑ Stand up
- ❑ Don SCBA harness
- ❑ Register tank pressure on the entry record
- ❑ Perform electronic communications test
- ❑ Don SCBA facepiece, perform positive and negative pressure checks
- ❑ Don protective head gear, perform bend over test

- Gloving Matrix
    - Nitrile
    - Chemical resistive gloving
- Place arms into suit, one at a time
- Register in suit time on entry record
- Tape member's wrist openings at gloves and leg openings at boots
- Connect regulator to mask
- Perform final suit inspection
    - If any discrepancies do occur:
        - Notify sector leader
        - Attempt to correct problem
        - If problem cannot be corrected, rotate back up member into team

Return all entry records to the entry officer

Team members are now ready to move into the hot zone

HANOVER PARK FIRE DEPARTMENT
Hazardous Materials Incident Objectives

- **Incident Commander**:_____

Objectives

- ❑ Arrives on the scene and performs size-up
- ❑ Announces name and location of incident command
- ❑ Uses vest and clipboard
- ❑ Obtains a situation evaluation
- ❑ Collects passports and implements the accountability system
- ❑ Initiates, maintains the communication process
- ❑ Identifies a strategy
- ❑ Develops an action plan
- ❑ Assigns companies to situation appropriate assignments
- ❑ Develops and incident management organization
- ❑ Identifies and communicates tactical objectives
- ❑ Evaluates, reviews, and revises action plans continuously
- ❑ Oversees and coordinates the entire incident's operations
- ❑ Practices good judgment and implements effective safety operations

HANOVER PARK FIRE DEPARTMENT
Hazardous Materials Incident Objectives

- **HazMat Branch Officer**:_____

Objectives

- ❑ Uses vest and clipboard
- ❑ Establishes role and responsibility of Hazardous Materials Officer
- ❑ Establishes initial isolation zone
- ❑ Establishes initial evacuation zone
- ❑ Site Safety Plan is developed and implemented
- ❑ Complete hazard and risk evaluation
- ❑ Complete briefings with Entry and Decon Sectors
- ❑ Oversees the tactical objectives are established and implemented within the entry team's scope of practice
- ❑ All hot zone operations are coordinated with the Incident Commander to ensure all tactical objectives are being met
- ❑ Coordinates and communicates with Entry Officer, Decon Officer, and Haz-Mat Safety Officer
- ❑ Completes all assigned paperwork

HANOVER PARK FIRE DEPARTMENT
Hazardous Materials Incident Objectives

- **Safety Officer**:_____

Objectives

- ❑ Uses vest and clipboard
- ❑ Establishes the roles and responsibilities of the Hazardous Materials Safety Officer
- ❑ Establishes accountability and performs on-going assessments of accountability checks
- ❑ Participates in the development and implementation of the Site Safety Plan
- ❑ Advises the Haz-Mat Officer of all the aspects of health and safety
    - o Includes the work/rest cycles for the entry teams
- ❑ Controls hazard zones
- ❑ Possess and exercises the ability (if necessary) to cease any unsafe operations occurring on the scene
- ❑ Protects all personnel from the physical, chemical, and/or environmental hazards
- ❑ Control apparatus placement
- ❑ Control hazard operations personnel
- ❑ Accounts for and monitors all personnel operating within the hot zone
- ❑ Monitors all radio traffic frequencies
- ❑ Establishes emergency warning system
- ❑ Establishes the Haz-Mat EMS Sector and ensures the units, personnel, and equipment are provided and coordinated
- ❑ Completes Site Safety Plan
- ❑ Obtains all rehab information from the Haz-Mat EMS Officer
- ❑ Ensures all the health exposure logs and records are maintained for all personnel
- ❑ Coordinates and communicates with entry, decon, and EMS sectors regularly
- ❑ Completes all assigned paperwork

HANOVER PARK FIRE DEPARTMENT
Hazardous Materials Incident Objectives

- **Entry Officer**:_____

Objectives

- ❑ Uses vest and clipboard
- ❑ Establishes roles and responsibilities of Entry Officer
- ❑ Establishes accountability system for entry team members
- ❑ Assigns an "Entry Team Leader" for each entry team
- ❑ Recommends actions to be taken to the Haz-Mat Officer to control the situation within the hot zone
- ❑ Implements and evaluates the offensive and defensive operations as recommended by the Haz-Mat Officer
- ❑ Acquire proper level CPC
- ❑ Directs rescue attempts as necessary
- ❑ Check SCBA
- ❑ Initiate vital signs
- ❑ Inspect CPC
- ❑ Verify CPC compatibility
- ❑ Reviews hand signals
- ❑ Seals suit
- ❑ Checks communications equipment
- ❑ Completes "time on" and "time off" SCBA
- ❑ Tracks and documents the working times of entry teams
- ❑ Coordinates and communicates with Entry Team Leader, Decon Sector Officer, and Haz-Mat Safety Officer
- ❑ Completes all assigned paperwork

HANOVER PARK FIRE DEPARTMENT
Hazardous Materials Incident Objectives

- **Decon Officer**:_____

Objectives

- ❑ Uses vest and clipboard
- ❑ Establishes the roles and responsibilities of the Decon Officer
- ❑ Establishes accountability for decon team members
- ❑ Makes proper site selection
- ❑ Acquires appropriate CPC
- ❑ Set up appropriate decon corridor prior to personnel are allowed into hot zone
- ❑ Controls the entering and exiting of decon operations
- ❑ Establish initial decon zone
- ❑ Re-evaluate the isolation and decon placement
- ❑ Re-evaluate the effectiveness of the decon procedure
- ❑ Record all deconed persons and equipment
- ❑ Complete check sheet
- ❑ Coordinates the transfer of any decontaminated patients needing medical treatment and transportation with Haz-Mat EMS Officer
- ❑ Coordinates and communicates with Decon Team Leader, Entry Sector Officer, and EMS Sector Officer
- ❑ Completes all assigned paperwork

HANOVER PARK FIRE DEPARTMENT
Hazardous Materials Incident Objectives

EMS Officer:_____

Objectives

- ❑ Uses vest and clipboard
- ❑ Establishes roles and responsibilities of the Hazardous Materials EMS Officer
- ❑ Make proper site selection in coordination with the Entry and Decon Officers
- ❑ Communicates with Medical Control and relays information such as:
  - o Quantity of patients
  - o Possible exposures/MSDS
  - o Patient assessments and triage
  - o Decontamination procedures performed
  - o Hospital's ability to receive patients
- ❑ Establishes treatment/transportation areas
- ❑ Establishes the need for rehab area
- ❑ Advises Haz-Mat Officer the need for additional ambulances and personnel (if necessary)
- ❑ Provides appropriate CPC for EMS personnel
- ❑ Supervises EMS operations
- ❑ Provides EMS supplies
- ❑ Provides litter barriers for contaminated EMS supplies
- ❑ Supervises and coordinates patient transport
- ❑ Coordinates with Haz-Mat EMS Team Leader, Entry, and Decon Sector Officers
- ❑ Sets the criteria to remove personnel from working within the warm and hot zones and communicates this to the Haz-Mat Safety Officer and Haz-Mat Officer
- ❑ Provides the rehab information to the Haz-Mat Safety Officer and advises the need to remove personnel from activity if necessary
- ❑ Coordinates with the Entry and Decon Officers and Hazardous Materials Safety Officer
- ❑ Completes all assigned paperwork

HANOVER PARK FIRE DEPARTMENT

Hazardous Materials Site Safety & Health Plan

I. Incident Specifics

Date: Time:

Location:

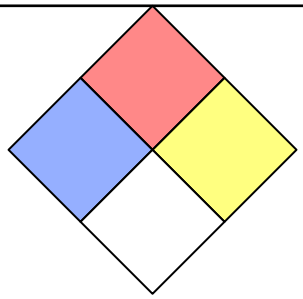
II. Site Description

Command Post Name:

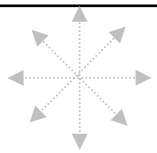
Initial Isolation Area:

Staging Area at:

Topography (Site Sketch Below) drawn by:



North



HANOVER PARK FIRE DEPARTMENT

Hazardous Materials Site Safety & Health Plan

Weather

Current: Forecasted:

Temperature:
Wind Speed & Direction: mph
Humidity: %
Barometric Pressure: mmHg

Initial On-Scene Observations

Area Affected By Hazard

Potential Areas Affected

Scene Access

HANOVER PARK FIRE DEPARTMENT

Hazardous Materials Site Safety & Health Plan

III. Identification

List all known or suspected Chemicals and their primary hazards

Substance	Hazard

IV. Hazard Analysis

Risk Evaluation & Summary

Other Hazards Anticipated On-Scene

HANOVER PARK FIRE DEPARTMENT

Hazardous Materials Site Safety & Health Plan

V. Site Control / Monitoring

A. Monitoring

All monitoring shall be documented on approved forms and attached to this plan.

Equipment Used	Yes	No	Comments
Radiation Monitor □α □β □γ	□	□	_____
pH Paper	□	□	_____
Oxygen Sensor	□	□	_____
Combustible Gas Indicator	□	□	_____
Colorimetric Tube (type)	□	□	_____
Organic Vapor Analyzer	□	□	_____
Photo-ionization Detector	□	□	_____
Flame-ionization Detector	□	□	_____
Other:	□	□	_____

Initial Monitoring Results / Time:

Operational Period Results / Time:

Final Monitoring Results / Time:

V. Site Control / Monitoring (Continued)

B. CONTROL BOUNDARIES have been established in the following manner and marked/identified as follows: (Also include in sketch drawing page #1)

Exclusion Zone (HOT):

IDLH Conditions:

WARM Zone / Emergency Decon:

WARM Zone / Decon Corridor:

COLD Zone / Support Zone

HANOVER PARK FIRE DEPARTMENT

Hazardous Materials Site Safety & Health Plan

VI. Notification / Personnel Assignments

☐	**Incident Commander**	
☐	Incident Safety Officer	
☐	Public Information Officer	
☐	Liaison Officer	
☐	Historian / Documenter	
☐	**Operations Branch Officer**	
☐	**Planning Branch Officer**	
☐	**Logistics Branch Officer**	
☐	**Finance Branch Officer**	
☐	**HazMat Sector Officer**	
☐	HazMat Safety Officer	
☐	HazMat Science Officer	
☐	HazMat Recon Team Leader	
☐	HazMat Entry Team Leader	
☐	HazMat Decon Team Leader	
☐	HazMat EMS Officer	
☐	Fire Suppression Sector Officer	
☐	Site Security Officer / Police	
☐	Village Government	
☐	Public Works	
☐	Street Department	
☐	County ESDA	
☐	State / IEMA (1-800-782-7860)	
☐	Federal / FEMA	
☐	A.T.F.	
☐	F.B.I.	
☐	C.D.C. (1-404-633-5315)	
☐	CHEMTREC (1-800-424-9300)	
☐	N.R.C. (1-800-424-8802)	
☐	Red Cross	

HANOVER PARK FIRE DEPARTMENT

Hazardous Materials Site Safety & Health Plan

VII. Decontamination

Emergency Decon established and located as described (show on sketch):

ALL PERSONNEL & EQUIPMENT LEAVING THE HOT ZONE MUST BE DECONTAMINATED.

Level ☐A ☐B ☐C ☐D decon shall be established and set up according to the diagram shown below, and located at: _____

Decontamination Solution:_____

Decon Line Diagram

VIII. Emergency Procedures

The following emergency procedures shall be observed by all on-site personnel. The HazMat Sector Officer is charged with the duty of ensuring the appropriate procedures are followed and shall be notified in the event of any injury.

Injury in the Hot Zone

Upon notification of an injury in the Hot Zone, the designated emergency signal shall be sounded.

All personnel in the Hot Zone will assemble at the Decontamination Area upon the sounding of the emergency alarm. If unable to go to the Decon Area, the members shall meet at the Emergency Exit.

The Back-up Team will be briefed on how to enter the Hot Zone to remove the injured party and bring them to the Decon Area.

The HazMat Safety Officer and the HazMat Sector Officer shall evaluate the nature of the injury. The affected person shall be decontaminated to the extent possible prior to being removed to the Cold Zone.

The on-site EMS personnel shall initiate the appropriate first-aid treatment and transport to a medical facility.

NO PERSON SHALL RE-ENTER THE HOT ZONE UNTIL THE NATURE OF THE INJURY OR ILLNESS HAVE BEEN DETERMINED.

Injury in the Cold Zone

Upon notification of an injury in the support zone, the HazMat Safety Officer will assess the nature of the injury. If the cause of the injury or the loss of the injured person does not affect the performance of other site personnel, operations may continue. The on-site EMS personnel will initiate the appropriate first-aid and necessary follow-up as stated above.

If the injury increases the risk to others, the Emergency Signal shall be sounded.

All personnel shall move to the Decon Area and await further instructions.

All activities except those involving rescue of personnel shall be suspended until the operational risk is re-assessed.

Failure of Personal Protective equipment (PPE)

If any personnel experience a failure of protective equipment, that person and their partner shall immediately leave the Hot Zone and proceed to the Decon Area.

Re-entry will not be permitted until the cause of the PPE failure is determined

Emergency Escape Routes

The following emergency escape routes are designated for use in those situations where egress from the Hot Zone cannot occur through the Decon Area.

In the event of an on-site emergency which results in the evacuation of the Hot Zone, no personnel will be permitted to re-enter the Hot Zone until:

1. The condition(s) causing the emergency have been corrected
2. The hazards have been re-assessed
3. The Site Safety Plan has been reviewed
4. Personnel have been briefed on any changes in the Site Safety Plan

HANOVER PARK FIRE DEPARTMENT

Hazardous Materials Site Safety & Health Plan

IX. Emergency Medical Support

Rank	Name	Agency

Closest Hospital Any Patient Level 2 or Higher

Name	
Location/City	
Contact Person	

Closest Hospital Contaminated Patient

Name	
Location/City	
Contact Person	

Closest EMS Service if not Fire based

Name	
Location/City	
Contact Person	

EMS personnel and hospitals have been briefed on the hazards and substances

☐ **Yes** ☐ **No**

X Personnel Hazard and Medical Monitoring

Personal exposure sampling will be implemented when deemed necessary by a toxicologist, industrial hygienist or other qualified individual.

Heat and cold stress will be monitored at all times at the incident site. All personnel wearing chemical protective clothing will be given a pre-entry medical evaluation prior to donning the suit and a post-entry evaluation after exiting. The Donning sheet for the type of chemical protective clothing will be used.

Personal Monitoring by: _____

XI. Communication Procedures

RADIO COMMUNICATIONS IN THE HOT ZONE WILL BE ON CHANNEL _____

Personnel in the Hot Zone shall remain in visual contact or radio contact with the HazMat Sector Officer. Failure of radio communication mandates an emergency signal and an evacuation of the Hot Zone.

The following hand signals have been reviewed by all personnel:

- ☐ ***I am OK***
- ☐ ***Low Air***
- ☐ ***Out of Air***
- ☐ ***Emergency***

RADIO COMMUNICATIONS OUTSIDE THE HOT ZONE WILL BE ON CHANNEL _____

HANOVER PARK FIRE DEPARTMENT

Hazardous Materials Site Safety & Health Plan

XII. Personal Protective Equipment

Due to the known or suspected hazards, the following levels of Personal Protective Equipment have been designated for the work areas described below:

	Task	Level	Type
☐	Recon		
☐	Entry 1		
☐	Entry 2		
☐	Decon Station ___		
☐	Decon Station ___		
☐	Decon Station ___		
☐	Decon Station ___		
☐	Decon Station ___		
☐	Decon Station ___		
☐	Decon Station ___		
☐	Evacuation		
☐	Protect In Place		

NO Changes to the specified levels of Personal Protective Equipment shall be made without the approval of the HazMat Safety Officer

	PPE Specifications
Level A	
Level B	
Level C	
Level D	

HANOVER PARK FIRE DEPARTMENT

Hazardous Materials Site Safety & Health Plan

XIII. Site Work Plans

TEAM 1 Members	Tasks/Assignments

TEAM 2 Members	Tasks/Assignments

TEAM 3 Members	Tasks/Assignments

TEAM 4 Members	Tasks/Assignments

TEAM 5 Members	Tasks/Assignments

Specific Work Diagram

Medical Response at Hanover Park Police Headquarters

Purpose

This policy outlines the procedures for an emergency response to the Hanover Park Police headquarters for medical services. Emergencies in the building as well as a step-by-step process for the transfer of patients in custody while at the holding facility are included. This process is adopted in conjunction with the Hanover Park Police Department and shall be reviewed on an ongoing basis by the Fire Department in order to ensure complete and timely care of patients treated by Hanover Park Fire Department personnel.

Scope

This policy pertains to all fire department personnel when a request for EMS services has been initiated to the Hanover Park Police headquarters building. For actions or questions outside the scope of this policy, personnel should consult a custodial officer on the scene of the emergency.

Procedure

1. Response to patients in the custody of the Hanover Park Police Department

1.1. Du Comm will relay to crews that the request has been originated for a prisoner of the Hanover Park Police.
1.2. The requested apparatus will arrive at the west garage door of the Hanover Park Police headquarters building.
1.3. Hanover Park Police radio room personnel shall monitor the camera on the west side garage door and will remotely open the overhead door.
1.4. The ambulance will back into the garage utilizing the prescribed procedures in the Standard Policy and Procedures: Chapter 200, Section 056, Part 15 – Backing.
1.5. The ambulance shall continue into the garage until the sensor pad is cleared in order to allow the overhead door to close. Once accomplished the Hanover Park Police radio room personnel will remotely close the west garage door.
1.6. The ambulance will then be shut off in order to eliminate the accumulation of exhaust.
1.7. Medical personnel and all required equipment will enter the facility at the door between the evidence processing garage and the specialty vehicle garage. Radio room personnel will again monitor these doors to ensure access can be remotely activated to allow entrance.
1.8. When leaving, the above procedure will be reversed.
1.9. While transferring the patient into the ambulance all garage doors must remain secure and closed, only after the patient is secured in the ambulance and the crew is ready to leave, a Hanover Park Police officer will contact the radio room and the west garage door will be opened.

1.10. If at any time contact with the radio room or a Hanover Park Police officer is in question, Du Comm should be radioed in order to communicate with Hanover Park Police personnel.

2. Response for patients not related to the holding facility

2.1. Du Comm will notify responding crews that the request is not for a person in custody.
2.2. Medical crews will park in the front of the building and enter the main entrance.
2.3. Once inside, contact with Hanover Park Police radio room personnel will be made at which time crews will be directed to the portion of the building where the patient may be found.
2.4. An escort will be needed in order to access any areas of the building, caution should be taken to ensure crews do not become separated and that quick exit of the building with the patient is possible.

Photovoltaic Installations

Purpose

This Standard Operating procedure is to be used as a guideline when dealing with Photovoltaic Cells or Arrays, commonly known as solar panels. Photovoltaic Arrays can injure firefighters in a variety of ways and this policy addresses some of the precautions necessary when dealing with the panels, the panel assemblies and the resulting electrical current. This Standard Operating Procedure is designed to meet the department's requirement for NFPA 1500 Standard on Fire Department Occupational Safety and Health Program 2007 Edition.

Scope

The procedure shall be used when responding to emergencies involving Photovoltaic Panels or Arrays and/or buildings that have such installations, regardless of size or electrical output. This policy should be consulted when constructing building fire pre-plans for occupancies that have such installations. This procedure applies to all members at all times.

1. Definitions

1.1. Photovoltaic (PV) is a method of generating electrical power by converting solar radiation into direct current (DC). The Direct Current, stored in batteries, is then inverted to Alternating Current (AC) for consumer use. Solar cells need protection from the elements and are typically housed behind glass panels. Solar cells are often linked together for arrays in order to generate greater amounts of electrical current. PV is often used in conjunction with standard electrical supply grids such as provided by Commonwealth Edison.

1.2. Photovoltaic systems are **ALWAYS ON** and cannot be turned off.

1.3. Personal Protective Equipment (PPE) includes full turnout gear and Self Contained Breathing Apparatus (SCBA). Firefighting turnout gear is **not** designed to resist electrical current and **is not equivalent to electrical PPE**.

1.4. Inhalation hazardous by-products which should be considered as carcinogens may include:

Boron
Cadmium Telluride
Gallium Arsenide
Phosphorus

1.5. Electrical shock can be defined into the following:

Perception - Tingling sensation
Startle Reaction – Involuntary muscle reaction
Muscle Tetanization – Painful shock, inability to let go
Respiratory Arrest
Ventricular Fibrillation

2. Hazards

2.1. Electrical shock

2.2. Inhalation

2.3. Falls from roof

2.4. Roof collapse

2.5. Battery products

3. Pre-Incident Planning

3.1. All occupancies, both commercial and residential, that utilize PV shall be pre-planned and documented in FIREHOUSE® Software. Use preplan code PV.

3.2. Shift Battalion Chiefs shall ensure that all company officers are familiar with the locations and preplans of buildings that have PV.

4. Emergency Response

4.1. All emergency responses shall utilize the Incident Command System (ICS) and the National Incident management System (NIMS).

4.2. The Incident Commander (IC) shall announce the presence and location of the PV and batteries on all radio channels used at the incident as part of his/her on-going size-up. The IC shall appoint a Safety Officer and inform the SO of the presence of a Photovoltaic Array.

4.3. The IC shall immediately notify Commonwealth Edison of any building fire that involves PV.

4.4. Whenever possible firefighters should avoid the PV arrays and the system components. No part of the PV system should be dismantled by the fire department. Avoid cutting or sawing near PV components.

4.5. Never attempt to disconnect the batteries. Always wear SCBA when working around batteries as they may emit toxic gases.

4.6. Firefighters should avoid working under roof lines that have PV as they may slide off during operations.

4.7. Vertical ventilation should never be attempted by breaking through a PV array.

4.8. If the PV array is involved in fire, use a broken stream at no less than a 10% fog from a distance of at least 20 feet.

4.9. Never use water on a battery fire.

4.10. PV components, including lead-acid batteries, involved in fire should be extinguished using Class C type CO_2 or dry chemical extinguishers.

5. Additional Considerations

5.1. Dark, opaque tarps may reduce the sunlight and lower the electrical output, but will not stop the generating of electrical current. Foam should never be used to try to block sunlight.

5.2. Nighttime operations may see a drop in voltage produced, but light from streetlights, low ambient light, light from a fire and vehicle lights will be enough to produce an electrical current. Damaged parts will become energized in the daylight.

5.3. PV arrays will add significant weight to the building.

5.4. Damaged PV arrays may energize the metal framing and/or roof components.

5.5. Photovoltaic systems will have both AC and DC currents. Tools and meters designed for one type of current will not work on the other type.

Personal Combined Radiation Detector-Dosimeter PM1703MO-1

Purpose

To provide an initial detection of radiation that is above normal background radiation. The Personal Combined Radiation Detector-Dosimeter PM1703MO-1 provides a means to determine if the alarm is due to radiation from legal sources (medical, metal diagnostics) or from an illegal source (potential criminal act). There is always radiation present; not all radiation constitutes an emergency.

Scope

This policy shall apply at all times to all personnel. This policy is part of the Fire Department Risk Management plan as outlined in the National Fire Protection Association (NFPA) 1500 Standard on Fire Department Occupational Safety and Health Program 2007 Edition.

1. Definition

1.1. Personal Combined Radiation Detector-Dosimeter PM1703MO-1 will be referred to as a PRD monitor throughout this policy.

1.2. Normal background radiation is the ionizing radiation constantly present in the natural environment of the Earth, which is emitted by natural and artificial sources.

2. Policy

2.1. PRD monitors are assigned to the first-response Engines. They are to be in the ready position at all times.

2.2. Any activation of the PRD monitors above normal background radiation will be investigated. The investigation will result in a finding of:
2.2.1. No Problem
2.2.2. Potential Problem- further action required.

2.3. Any activation of the PRD monitor above normal background radiation will be reported to the Hazardous Materials Coordinator.

2.4. All PRD monitors will be maintained and serviced as required by the manufacturer. The Hazardous materials Coordinator is responsible for all maintenance and record keeping.

3. Procedure

3.1. Ready position of PRD monitors:

3.2. PRD monitors are to be in the “ON” position at all times.

3.3. PRD monitors will remain in holders unless investigating an alarm.

3.4. Investigation of alarms

3.4.1. Utilize the cards provided in the clip board along with the IEMA Group A Form. These will help you work through any potential radiological emergency.
3.4.2. Use proper monitoring procedures whenever monitoring for contaminants.
3.4.3. Determine if rise in background is normal for situation (No Problem), or a potential problem which will require further investigation.
3.4.4. If crew is using the monitor for further detection or there is a source of radiation, remember to go in a slow pattern in the sign of a cross, holding the monitor by the sides since the front and back of the monitor is where the sensors are. Always maintain situational awareness. Once you get activation of an alarm, more in depth monitoring is required.

4. Reporting

4.1. All alarms above normal background radiation are to be documented on the PRND IEMA Group A Form (Appendix B) located in FD Forms.

4.2. If possible please try to be exact of where and when the alarm has activated.

4.3. Examples:
4.3.1. Chemotherapy Patients name.
4.3.2. Address and name of business where it was activated.
4.3.3. License Plate number on the vehicle that you are next to.

4.4. Completed forms shall be forwarded to the Hazardous Materials Coordinator.

4.5. Once received, forms are to be submitted to IEMA by end of the duty day.

5. Maintenance

5.1. Battery of the PRD monitor should be checked during the weekly of the assigned vehicle.

5.2. When performing the weekly on the PRD monitor, check:

5.2.1. Battery
5.2.2. Confirm if there is an “H” flashing on the screen. If there is an “H” flashing, notify the Hazardous Material Coordinator so that the history can be cleared from the PRD monitor and report can be made to IEMA.
5.2.3. If the battery is low, replace with an AA battery. Remember it is **only hand-tight**. After replacement of the battery the PRD monitor will automatically do a recalibration.

5.3. You DO NOT need to recalibrate the PRD monitor unless there has been a battery change, where it is done automatically. The PRD monitor will be calibrated by the Hazardous Materials Coordinator when history needs to be cleared.

5.4. If an error message appears on the PRD monitor, take the PRD monitor out of service and notify the Hazardous Materials Coordinator so that it can be repaired.

Appendix A

FIELD PROTOCOL FOR USE MINI-RADIAC & PERSONAL COMBINED RADIATION DETECTOR/DOSIMETER PM1703MO-1. MABAS-IEMA-ITTF

RADIATION DETECTION PROTOCOL:

- Turn meter on only with cause and reason (below)
- Verify alarm sensor activation. Audible and visual alerts and reading.
- Take detection readings and sample area – note meter readings:
  - Low Rate Alarm: 100µR/hr.
  - High Rate Alarm: 200mR/hr.

***Decision for rescue limited to an exposure of 25 R or less.**

  - **5 R – Low dose alarm**
  - **10 R – High dose alarm, maximum 95 exposure levels for property conversation.**
  - **25 R – Maximum exposure for life safety actions.**
  - **Greater than 25 R evacuate area; cease active rescue operations and exit hot zone.**
- **Rule out innocent sources (review card).**
- **If major, threatening source with reading confirmed call IEMA at: 217-780-7860**
- **Review other side of this car for innocent and safe sources of radiation where rescues can be performed.**

CAUSE AND REASON TO TURN UNIT ON:

- **Numerous natural radiation sources exist which are innocent and safe. Safe sources can cause alarms.**

- **Review innocent and dangerous reference cards.**
- **Cause to turn the detection unit on, include:**
  - **Haz-mat involvement**
  - **Transportation accident**
  - **Where placards are involved**
  - **Terrorist suspicious package**
  - **Any event where an explosion occurred**
  - **Where by reason, it is appropriate to turn unit on**
- **Screen scene for rescue decisions**

VERIFICATION/VALIDATION

- **If alarm sensors activate:**
  - **Turn unit off for 5 seconds**
  - **Turn unit back on and verify original readings**
- **Contact IEMA at 217-782-7860 if a major concern is validated**

DANGEROUS RADIATION SOURCES:

Isotopes of Major Concern (Nuclear weapons, special nuclear materials, and neutron sources):

Rescue can be safely performed, rapid rescue may or may not be an option, time and distance exposure critical factor. Meter exposure reading 25 R or less.

- **Plutonium (Pu-239)**
- **Enriched Uranium (U-235)**
- **Uranium (U-233)**
- **Neptunium (Np-237)**

Sources commonly used in Industry (may be of concern if misused):

Americium (Am-241)
Barium (ba-133)
Cesium (Cs-137)
Cobalt (Co-57)
Thorium (Th-232)
Cobalt (Co-60)
Iridium (Ir-192)
Radium (Ra-226)
Strontium (Sr-90)

Common Commercial Neutron Sources and Isotopes:

Solid density gauges and well logging sources

- **Californium 252 (Cf-252) – neutron source**
- **Americium/Beryllium (Am/Be) – neutron source**
- **Polonium/Beryllium (Po/Be) – neutron source**
- **Plutonium/Beryllium (Pu/Be) – neutron source**

INNOCENT AND RELATIVELY SAFE RADIATION SOURCES:

Medical Isotopes:

These may be in a person's bloodstream or implanted as pellets. Someone who has received a nuclear medical treatment within the past couple of weeks may trigger a radiation alarm. Common Medical Isotopes include:

Gallium-67	**Iodine-131**	**Thallium-201**
Indium-111	**Iridium-192**	**Technicium-99m**
Iodine-123	**Molybdenum-99**	**Xenon-133**
Iodine-125	**Palladium-103**	

Items and products that may contain radioactive sources:

- **Agricultural produces (e.g., fruits & leafy vegetables; tobacco, marijuana, etc.)**
- **Bananas (Large quantities), because bananas contain Potassium-40.**
- **Antique items including; ceramic-glazed products in orange, red, or yellow; e.g., antique cups and plates, decorative floor tiles, jewelry, pottery, and Vaseline glass (emerald green glass used in some antique cups, plates, etc.)**
- **Camera lenses and high-quality optical lens system.**
- **Radio-luminescent Products (Radium paint); watches, clocks, and instrument gauges.**
- **Dental ceramics**
- **Irradiated gemstones**
- **Lantern mantels (natural Thorium)**
- **Polishing powders**

- **Propane tanker trucks (from radioactive deposits on tanker's interior walls)**
- **Smoke detectors (Am-241)**
- **Kitty Litter**
- **Thoriated aluminum (an alloy containing Th-232)**
- **Thoriated tungsten arc-welding electrodes (often labeled Thoriated welding rods)**
- **Uranium ore samples**
- **Some other materials that often contain naturally occurring radioactive material:**
    - **Marble, Monazite sand, sandstone, slate, concrete, feldspar, fertilizer, granite.**

<u>Innocent Radiation Sources:</u>

Gamma Radiation Producers **Safe – No Threat**

<u>Innocent and Safe Radioactive Materials:</u>

(emits gamma)

Potassium (K40) **Thorium (Th-232)**

Radium (Ra-226) **Uranium (U-238)**

IEMA
Illinois Emergency Management Agency
Division of Nuclear Safety

Personal Radiation Detector (PRD) Alarm Reporting Form

Web Login & Additional Forms available at:
http://tier2.iema.state.il.us/PRND

GROUP A INFORMATION

(1st Responders Fill out this section only)

Responder **Information**	**Date: Time:**	
	Name: Agency/Dept.:	
	Contact number:	
	Contact email:	
	Dept. Specific Report# *(if any)*:	
Incident **Information**	**Location:**	
	Actions Taken:	
Alarm Information	**PRD Reading:**	
	PRD Serial Number:	
	Description or picture of suspect material available?	

GROUP A: Indicate Status of Alarm:

☐ **No Assistance Needed** ☐ **Need Assistance**

GROUP B INFORMATION

(RIID Equipped, Group B Personnel - Fill out this section)

Responder **Information**	**Date: Time:**	
	Name: Agency:	
	Contact number:	
	Contact email:	
	Dept. Specific Report# *(if any)*:	
Alarm **Information**	**Equipment Type and Serial Number:**	
	1. **Background Spectra:** *(specify file number)* 2. **Unknown Sample Spectra:** *(specify file number)*	
	Dose Rate:	
	1st Nuclide Identified:	**Confidence Level:**
	2nd Nuclide Identified:	**Confidence Level:**
	Distance from source:	**Shielding:** *(thickness/type)*
Description or picture of suspect material available?		

GROUP B: Indicate Status of Alarm:

☐ **No Assistance Needed** ☐ **Need Assistance**

Shipping Papers and Spectra: Email to: EMA.PRND.GROUPC@ILLINOIS.GOV **Fax: (217)782-7774**

1035 Outer Park Drive • Springfield, Illinois 62704 • Telephone (217) 782-7860 • http://www.iema.illinois.gov

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Concealed Weapon Policy

Purpose

The purpose of this guideline is to outline practices and procedures as it pertains to carrying a concealed deadly weapon (Firearm) in Village of Hanover Park owned and/or operated buildings, vehicles and properties. The intent of this policy is to reduce the potential risk of injury to department personnel and the public. This policy serves as the department's compliance with NFPA 1500 *Standard on Fire Department Occupational Safety and Health Program* and the Illinois Concealed Carry Act.

Scope

This policy applies to all personnel of the Hanover Park Fire Department at all times. These guidelines describe the best practices for promoting the safety of the public and the personnel of the Hanover Park Fire Department.

Deadly Weapon means any instrument, device, or thing capable of inflicting death, and designed or specially adapted for use as a weapon, or possessed, carried or used as a weapon. Handgun means any firearm that has a short stock and designed to be held and fired by the use of a single hand. Firearm means any deadly weapon capable of expelling or propelling one or more projectiles by the action of an explosive or combustible propellant. Firearms include an unloaded firearm, and any firearm that is inoperable but can readily be rendered operable.

1. Village Buildings

1.1. In accordance with 430 ILCS 66/65 (5), all Village of Hanover Park buildings are weapons-free facility "forbidden-carry zone" under the Illinois Concealed Carry Act. Forbidden-carry zone signs shall be conspicuously posted at all entrances. (Attachment A)

1.2. All fire department personnel shall secure their firearms in their personal vehicle prior to coming on duty.

1.3. All fire department personnel shall not be permitted to have access to firearms while on duty or in uniform.

1.4. All visitors to fire stations are to be informed that all village buildings are weapons-free facility "forbidden-carry zone" and instruct them that they must secure their firearms in their personal vehicle prior to entering the building. Persons who refuse to secure their weapon(s) in their vehicle will be denied access to fire stations. Notify the Hanover Park Police Department any time someone refuses to follow this policy.

1.5. Commissioned law enforcement officers who are in uniform, or who present photo identification or other government-issued credentials, are exempt from these guidelines.

2. Village Vehicles

2.1. In accordance with 430 ILCS 66/65 (8) all Village of Hanover Park owned and/or operated vehicles are considered weapons-free "forbidden-carry zone".

2.2. Fire department personnel are prohibited from having firearms in village vehicles.

2.3. All passengers in village vehicles shall be informed that village vehicles are weapons-free "forbidden-carry zone" and instructed to secure their weapon prior to getting into the vehicle. If they refuse they are not permitted into the vehicle. If there is nowhere for them to secure their weapon contact the police.

3. Emergency Call Guidelines

3.1. All fire department personnel should anticipate that any patient may have a concealed weapon. The safety of department personnel and healthcare personnel is paramount. Department personnel should never approach a patient who appears threatening with a weapon, no matter how ill the person seems. Law enforcement shall be called to secure the scene and to disarm the threatening individual(s). Ideally patients will self-disclose that they have a weapon. However it is likely that at times patients may choose not to declare or may not be able to indicate that they have a weapon. The following considerations pertain to the discovery of a weapon on a patient:

3.1.1. Department personnel should always assume that all firearms are loaded. Optimally weapons should be safely secured by the patient at their residence and not to be transported with the patient or family/friend in a village vehicle to a healthcare facility.

3.1.2. Patients with altered level of consciousness, severe pain, or with difficulties in motor control should not be encouraged to disarm themselves. Department personnel may need to obtain control of the weapon for the safety of the responding personnel, the public and the patient. Caution should be used at all times when handling a weapon. Department personnel shall not attempt to unload a firearm regardless of the person's familiarity with firearms; there is no way to know if the weapon is in proper working order.

3.1.3. Patients carrying a firearm while under the influence of alcohol or drugs are committing a criminal offense and the Hanover Park Police Department shall be notified.

3.1.4. Department vehicles are considered "Forbidden-Carry Zone" and signage shall be posted in vehicles to declare them "Forbidden-Carry Zones". The Police Department shall be requested if a patient and or family/friends insist on carrying weapons in emergency vehicles or in healthcare facilities that have declared themselves as no-carry zones.

3.1.5. Under no circumstances should department personnel compromise their safety in regards to these guidelines. When in doubt about a patient or family/friend with a weapon or the weapon itself, personnel should contact the Police Department. Police officers will make the decisions regarding disarming the patient and the weapon.

3.1.6. When requesting the Police Department, inform DuComm that you need their assistance with securing a firearm.

4. PREHOSPITAL ACTIONS OF EMERGENCY MEDICAL SERVICES

4.1. Department personnel may discover a weapon on a patient at the scene, or in some instances during a secondary survey while en route to a hospital. Based on the possible scenarios previously listed, department personnel shall adhere to the following steps when a weapon is discovered.

4.1.1. Conscious Patient willing to relinquish a weapon.

4.1.1.1. Patients who are alert and oriented and for whom the emergency response is occurring at their place of residence should be asked to leave their weapon(s) in a secure location at their home prior to transport. Patients can be told that EMS vehicles and hospitals are no-carry zones. Patients for whom the emergency response is occurring away from their residence may relinquish their weapon(s) to a police officer on scene if one is available.

4.1.1.2. If a patient is not at their residence, a police officer is not available or the patient's condition does not permit waiting for an officer to arrive, personnel should follow Lock Box Procedure (Section 5).

4.1.2. Conscious Patient Unwilling to relinquish a weapon.

4.1.2.1. Department personnel should engage alert and oriented patients in a calm discussion about the rational to secure the weapon prior to transport. Simple explanations should be given including that these guidelines are in place.

4.1.2.2. If the patient continues to refuse to relinquish the weapon, personnel should refrain from continuing the assessment and from transporting to a medical facility.

4.1.2.3. Personnel should be suspicious of the ill or injured patients unwilling to relinquish weapon. The Police Department should be called to intervene in the situation.

4.1.2.4. If the situation becomes threatening personnel should evacuate the scene to a secure rendezvous point at a safe distance away and notify the Police Department.

4.1.3. Patients with Altered Levels of Consciousness

4.1.3.1. Department personnel must use extreme caution when approaching patients with altered levels of consciousness. If a weapon is found on a patient with an altered level of consciousness, personnel should not attempt to have the patient hand over the weapon.

4.1.3.2. Department personnel should not attempt to remove a weapon from a patient whose level of consciousness could precipitate the use of that weapon against them. The police should be called to assist in disarming these patients. If a weapon is removed by a police officer, the officer will maintain possession of the weapon.

4.1.3.3. If the patient is unconscious and requires emergent care but a police officer is not on the scene, personnel will need to carefully separate the weapon from the patient prior to transport. Optimally a firearm should be removed from the patient while still in the holster. If removing the holster and the weapon together jeopardizes the safety of the patient or department personnel, or it is physically impossible to remove the holster and the firearm together, the weapon may be removed without the holster. Once removed the weapon should be secured per Lock Box Procedures.

4.1.4. Family members and friends who have weapons and want to be with the patients in emergency vehicles.

4.1.4.1. Department personnel shall ask family members/friends to declare if they have a concealed weapon. Explain to them that no unsecured weapons are permitted in department vehicles and that they are "Forbidden-Carry Zone". Instruct them that they must secure their weapon to be permitted to ride in the vehicle. If they refuse to secure their weapon, inform them they are not permitted to ride in the vehicle. If they are unable to secure their weapon due to the location of the call not being their residence contact the police in order to secure their weapon. If the patient's condition does not permit enough time to wait for police, then follow Lock Box Procedures (Section 5).

5. Lock Box Procedure

5.1. This procedure should be used as a last resort and only if a police officer is not available, or the patient's condition requires leaving the scene before a police officer can arrive.

5.1.1. Place or have the patient place the deadly weapon into the "Lock Box". The barrel of the firearm should be pointing in the direction that is indicated on the box.
5.1.2. Secure the Lock Box and place the box in the locked cabinet or locked exterior vehicle compartment for transport.
5.1.3. Complete and have the patient sign the Chain of Custody form (Attachment B).
5.1.4. Conduct a thorough secondary survey.
5.1.5. If additional weapon(s) are found, begin at step 1 (Section 5.1.1). If no additional weapons are found then load the patient into the vehicle and transport to the appropriate medical facility.
5.1.6. While en route, personnel shall notify the receiving facility that a secured weapon is being transported with the patient.
5.1.7. At the facility follow the facility's procedures on who shall receive the weapon and document it on the Chain of Custody form.

Appendix A

WEAPONS CHAIN OF CUSTODY FORM

Documentation of Weapon(s)

#_____ Firearm(s) #_____ Knives #_____Legal Incendiary Compounds #_____ Other

FD Incident # _____ Address _____ Unit # _____

Confinement of Weapon(s)

Patient / Other (circle one) Signature of Release to Secure Weapon _____

LOCK BOX Snap Lock Number(s) _____

Placed by _____ _____ on _____
Print Name Signature Date

Witness _____ _____ on _____
Print Name Signature Date

Delivery of Weapon(s) from Ambulance to Hospital

LOCK BOX Snap Lock Number(s) _____

Given by _____ _____ on _____
Print Name Signature Date

Received by _____ _____ on _____
Print Name Signature Date

Delivery of Weapon(s) from Fire Department to Police Department

LOCK BOX Snap Lock Number(s) _____

Given by _____ _____ on _____
Print Name Signature Date

Received by _____ _____ on _____
Print Name Signature Date

Release of Weapon(s) from Fire Department to Owner

LOCK BOX Snap Lock Number(s) _____

Given by _____ _____ on _____
Print Name Signature Date

Received by _____ _____ on _____
Print Name Signature Date

☐ Proof of Identification ☐ Proof of Concealed Carry Permit ☐ Other

Hydrogen Cyanide Monitoring

Purpose

To develop a procedure to ensure the department's compliance with OSHA regulations and to monitor the air quality of Immediately Dangerous to Life and Health (IDLH) environment prior to any personnel removing their self-contained breathing apparatus (SCBA) face pieces.

Scope

This policy shall apply to all members at all times. All department personnel who operate in and/or around a hazardous environment or potentially hazardous environments shall be subject to this procedure.

For the purpose of this procedure an atmosphere is to be considered hazardous if it contains any quantity of heat, smoke, toxic or flammable gases or is oxygen deficient or has the potential to rapidly deteriorate.

1. Safety

1.1. Safety of first responders is the first priority, therefore SCBA are required until a safe atmosphere can be determined by the Incident Commander or the Incident Safety Officer.

1.2. Hydrogen cyanide exposure may be difficult to determine. Its symptoms are similar to that of carbon monoxide exposure, which may include headache, nausea, fatigue and dizzy spells at low levels and respiratory problems, unconsciousness, and cardiac arrest for high levels.

1.3. Hydrogen cyanide is a combustible gas and will add to the fuel load in a fire.

2. Properties

2.1. A Health Protection Agency Fact Sheet is attached in Appendix A

2.2. NIOSH describes the appearance and odor of Hydrogen Cyanide (HCN) as a colorless gas or bluish-white liquid with a bitter almond odor. An air odor threshold concentration for hydrogen cyanide of 0.58 ppm has been reported.

2.3. The most common environment likely to produce HCN is a structure fire. Therefore the common appearance and odors associated with hydrogen cyanide will be severely masked in the smoke.

2.4. HCN is lighter than air and will rise in the heated atmosphere of a structure fire. In an enclosed environment without ventilation vapors will linger.

3. Personal Protective Equipment

3.1. Self-Contained Breathing Apparatus (SCBA)

3.1.1. SCBA is the best preventive measure for HCN exposure, as inhalation is the primary route of entry for exposure.

3.1.2. SCBA is required on **all** structure fires that present a smoke condition, to include kitchen and cooking fires.

3.1.3. SCBA is required on **all** vehicle fires until completely extinguished and all smoke has dissipated.

3.2. Structural Turnout Gear

3.2.1. Turnout gear helps protect personnel from absorbing HCN through the skin, which is a secondary route of exposure.

3.2.2. Personnel are to wash turnout gear following structure fires that heavily soil and saturate gear with products of combustion.

4. Monitoring

4.1. All structure fires are to be monitored by utilizing one of the approved HCN and 4 Gas meters.
4.2. HCN meters will be located on 306, 361, 362 and 4 Gas meters will be located on 300, 301, 306, 361, and 362.
4.3. SCBA is **not** to be removed until the atmosphere can be monitored and deemed safe.
4.4. The following conditions will warrant atmospheric monitoring:
- 4.4.1. When SCBA has been used during a working structure fire, ventilation is complete, and the removal of SCBA is requested.
- 4.4.2. When personnel are found operating inside the structure without SCBA.
  - 4.4.2.1. The HCN and 4 gas meter is to be used immediately in the area where crews were found to be operating.
  - 4.4.2.2. The HCN and 4 gas levels are to be communicated to the Incident Commander along with the personnel who were found to be operating in the area.
  - 4.4.2.3. The Incident Commander must then determine the length of time the personnel were operating in the environment without SCBA, and report the readings.
  - 4.4.2.4. If readings and operating time period is of sufficient length personnel are to be transported to the hospital for immediate evaluation.
- 4.4.3. Vehicle fires within a structure.

4.5. The following conditions will **not** warrant atmospheric monitoring.
- 4.5.1. When the fire is contained to the cooking container where food has burned, but no damage was caused to the container.
- 4.5.2. Vehicle fires in the open atmosphere.
- 4.5.3. When burning odor is detected and there is no smoke visible or only a light haze.
- 4.5.4. If an operational HCN is not available at the scene a reading of 20 ppm or lower of carbon monoxide is required in order to operate without SCBA. If personnel will be operating for an extended period of time SCBA are recommended.

5. Action Levels

5.1. Hydrogen cyanide is twenty-four times more dangerous than carbon monoxide. Because of this the action level for HCN is lower than CO.
5.2. The action level in order to operate without SCBA is an environment where HCN is present will be **5 ppm**. This is the Short Term Exposure Limit (STEL) for HCN as recommended by NIOSH.
- 5.2.1. STEL as defined by NIOSH is a 15-minute TWA (Time-Weighted Average) exposure that should not be exceeded at any time during a workday.
- 5.2.2. Immediately Dangerous to Life and Health (IDLH) for HCN is 50 ppm.

5.3. The action level for carbon monoxide will be 35 ppm. The atmosphere must meet both the action level for HCN and CO in order for personnel to operate without SCBA.

6. Decontamination

6.1. Personnel should practice good personal hygiene by washing hands prior to drinking and eating in rehab.
6.2. Once the incident is under control a random selection of personnel known to have been operating in the structure should have their PPE monitored.
6.3. If turnout gear has a reading higher than 5 ppm a hose line is to be used to decontaminate the gear.

6.3.1. Briefly rinse with a soft fog pattern to prevent saturation.
6.3.2. All personnel operating inside the structure should be decontaminated.

6.4. Gear should be washed as soon as possible in an approved gear extractor.
6.4.1. Turnout gear, hood, and helmet ear flaps should be washed in extractor per NFPA 1851.
6.4.2. Gloves should be washed by hand with hose or in sink.

6.5. If gear extractor is unavailable, then a garden hose and a brush can be used.

7. Reporting

7.1. The reporting officer will be responsible for recording of all monitoring results and any significant exposures during a structure fire.

7.2. Exposure reporting
7.2.1. Anytime personnel are operating outside the safe range without SCBA a notation is to be made in the FIREHOUSE Software® (NFIRS) report under the Fire Service Casualty section.

8. Calibration

8.1. Hydrogen Cyanide Meters are to be calibrated every 6 months by the distributor.

8.2. If meters are exposed to a high concentration and register "out of range" on the LED display the meter will need calibration.
8.2.1. Notify the hazmat coordinator as soon as possible to have the meter calibrated.

9. Exposure

9.1. Hydrogen cyanide can cause rapid death due to metabolic asphyxiation. Death can occur within seconds or minutes of inhalation of high concentrations of hydrogen cyanide. Sources report that 270 ppm is fatal after 6 to 8 minutes, 181 ppm after 10 minutes and 135 ppm after 30 minutes [Hathaway et al. 1991]. These levels are not uncommon during routine structure fires.

9.2. Acute exposure symptoms including weakness, headache, confusion, vertigo, fatigue, anxiety, dyspnea, and occasionally nausea and vomiting. Respiratory rate and depth are usually increased initially and at later stages become slow and gasping. Coma and convulsions occur in some cases. If cyanosis is present, it usually indicates that respiration has either ceased or has been inadequate for a few minutes. If large amounts of cyanide have been absorbed, collapse is usually instantaneous; unconsciousness; often with convulsions, is followed almost immediately by death.

9.3. If personnel are found to have been operating in an IDLH atmospheres or experiencing severe health effects it is strongly recommended they be transported for medical evaluation.
9.3.1. HCN has a have life of one hour, therefore it is imperative that the exposed personnel be given immediate medical attention to include blood work and tested for HCN levels in blood.
9.3.2. It is important that when transported the hospital be advised that the firefighter was operating in a known hazardous environment containing hydrogen cyanide.

Hydrogen cyanide

Incident management

Key Points

Fire

- Extremely flammable
- Incompatible or reactive with amines, oxidisers, acids, sodium hydroxide, calcium hydroxide, sodium carbonate, water, caustics and ammonia
- Emits very toxic cyanide fumes when heated to decomposition
- In the event of a fire involving hydrogen cyanide, use alcohol resistant foam or fine water spray and gas-tight protective clothing with breathing apparatus

Health

- Exposure is usually by inhalation of hydrogen cyanide vapour. Hydrogen cyanide liquid is rapidly absorbed through the skin
- Exposure to high concentrations may be rapidly fatal

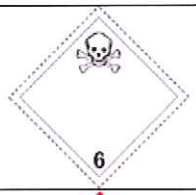
Environment

- Dangerous to the environment
- Inform Environment Agency of substantial release incidents

Prepared by J D Pritchard,
CRCE HQ, HPA
2011
Version 3

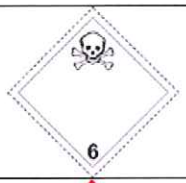
Hazard Identification

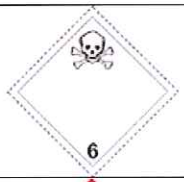
Standard (UK) Dangerous Goods Emergency Action Codes[a]

UN		**1613**	Hydrocyanic acid, aqueous solution (hydrogen cyanide, aqueous solution) with not more than 20% hydrogen cyanide	
EAC		**•2WE**	Use alcohol resistant foam but, if not available, fine water spray. Wear liquid-tight chemical protective clothing in combination with breathing apparatus*. Spillages and decontamination run-off should be prevented from entering drains and watercourses. Substance can be violently or explosively reactive. There may be a public safety hazard outside the immediate area of the incident**.	
APP		**A(fl)**	Gas-tight chemical protective suit with breathing apparatus ***	
Hazards	**Class**	**6.1**	Toxic substance	
	Sub risks	**3**	Flammable liquid	
HIN		**663**	Highly toxic, flammable (flash point not above 61 °C inclusive)	

[a] Dangerous Goods Emergency Action Code List, HM Fire Service Inspectorate, Publications Section, The Stationery Office, 2009.

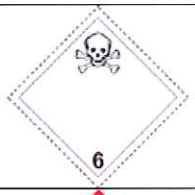
Standard (UK) Dangerous Goods Emergency Action Codes[a]

UN		**1614**	Hydrogen cyanide, stabilised, containing less than 3 % water and absorbed in a porous inert material	
EAC		**2WE** [(1)]	Use fine water spray. Wear liquid-tight chemical protective clothing in combination with breathing apparatus*. Spillages and decontamination run-off should be prevented from entering drains and watercourses. Substance can be violently or explosively reactive. There may be a public safety hazard outside the immediate area of the incident**.	
APP		**A(fl)**	Gas-tight chemical protective suit with breathing apparatus ***	
Hazards	**Class**	**6.1**	Toxic substance	
	Sub risks	**3**	Flammable liquid	
HIN		**-**		

UN		**3294**	Hydrogen cyanide, solution in alcohol, with not more than 45% hydrogen cyanide	
EAC		**•2WE**	Use alcohol resistant foam but, if not available, fine water spray. Wear liquid-tight chemical protective clothing in combination with breathing apparatus*. Spillages and decontamination run-off should be prevented from entering drains and watercourses. Substance can be violently or explosively reactive. There may be a public safety hazard outside the immediate area of the incident**.	
APP		**A(fl)**	Gas-tight chemical protective suit with breathing apparatus ***	
Hazards	**Class**	**6.1**	Toxic substance	
	Sub risks	**3**	Flammable liquid	
HIN		**663**	Highly toxic, flammable (flash point not above 61 °C inclusive)	

[a] Dangerous Goods Emergency Action Code List, HM Fire Service Inspectorate, Publications Section, The Stationery Office, 2009.

Standard (UK) Dangerous Goods Emergency Action Codes[a]

UN		**1051**	Hydrogen cyanide, stabilised, containing less than 3% material	
EAC		**2WE**[1]	Use fine water spray. Wear liquid-tight chemical protective clothing in combination with breathing apparatus*. Spillages and decontamination run-off should be prevented from entering drains and watercourses. Substance can be violently or explosively reactive. There may be a public safety hazard outside the immediate area of the incident**.	
APP		**A(fl)**	Gas-tight chemical protective suit with breathing apparatus ***	
Hazards	**Class**	**6.1**	Toxic substance	
	Sub risks	**3**	Flammable liquid	
HIN		**-**		

UN – United Nations number; EAC – Emergency Action Code; APP – Additional Personal Protection; HIN - Hazard Identification Number

(1) Not applicable to the carriage of dangerous goods under Regulations Concerning the International Carriage of Dangerous Goods by Rail (RID) and in the European Agreement Concerning the International Carriage Dangerous Goods by Road (ADR)

* Liquid-tight clothing conforming to BS 8428 with breathing apparatus conforming to BS EN 137.
** People should stay indoors with windows and doors closed, ignition sources should be eliminated and ventilation stopped. Non-essential personnel should move at least 250 m away from the incident.
*** Gas-tight chemical protective clothing conforming to BS EN 943 part 2 in combination with self-contained open circuit positive pressure compressed air breathing apparatus to BS EN 137.

[a] Dangerous Goods Emergency Action Code List, HM Fire Service Inspectorate, Publications Section, The Stationery Office, 2009.

Chemical Hazard Information and Packaging for Supply Classification[a]

Hydrogen cyanide, hydrocyanic acid

Classification	**F+**	Extremely flammable	
	T+	Very toxic	
	N	Dangerous for the environment	
Risk phrases	**R12**	Extremely flammable	
	R26	Very toxic by inhalation	
	R50/53	Very toxic to aquatic organisms, may cause long-term adverse effects in aquatic environment	
Safety phrases	**S1/2**	Keep locked up and out of the reach of children	
	S7/9	Keep container tightly closed and in a well ventilated place	
	S16	Keep away from sources of ignition – No smoking	
	S36/37	Wear suitable protective clothing and gloves	
	S38	In case of insufficient ventilation, wear suitable respiratory equipment	
	S45	In case of accident or if you feel unwell seek medical advice immediately (show the label where possible)	
	S60	This material and its container must be disposed of as hazardous waste	
	S61	Avoid release to the environment. Refer to special instructions/Safety data sheets.	

[a] Annex VI to Regulation (EC) No 1272/2008 on Classification, Labelling and Packaging of Substances and Mixtures- Table 3.2.
http://esis.jrc.ec.europa.eu/index.php?PGM=cla (accessed 11/2011)

*Globally Harmonised System of Classification and Labelling of Chemicals (GHS)[a]**

Hydrogen cyanide, hydrocyanic acid

Hazard Class and Category	Flam. Liq. 1	Flammable liquid, category 1	
	Acute Tox. 2 *	Acute toxicity (oral, dermal, inhalation), category 2	
	Aquatic Acute 1	Acute hazards to the aquatic environment, category 1	
	Aquatic Chronic 1	Chronic hazards to the aquatic environment, category 1	
Hazard Statement	**H224**	Extremely flammable liquid and vapour	
	H330	Fatal if inhaled	
	H400	Very toxic to aquatic life	
	H410	Very toxic to aquatic life with long lasting effects	
Signal Words	DANGER		

* Implemented in the EU on 20 January 2009.

[a] Annex VI to Regulation (EC) No 1272/2008 on Classification, Labelling and Packaging of Substances and Mixtures- Table 3.1.
http://esis.jrc.ec.europa.eu/index.php?PGM=cla (accessed 11/2011)

Physicochemical Properties

CAS number	74-90-8
Molecular weight	27
Empirical formula	HCN
Common synonyms	Hydrocyanic acid; Prussic acid
State at room temperature	Gas
Volatility	Vapour pressure = 400 mm Hg at 9.8 °C
Specific gravity **Vapour density**	Liquid: 0.7 at 20 °C (water = 1) Gas: 0.9 (air = 1)
Flammability	Extremely flammable
Lower explosive limit	5.6%
Upper explosive limit	40%
Water solubility	Miscible with water
Reactivity	Incompatible or reactive with amines, oxidisers, acids, sodium hydroxide, calcium hydroxide, sodium carbonate, water, caustics and ammonia
Reaction or degradation products	Emits very toxic cyanide fumes when heated to decomposition
Odour	Bitter almond-like odour
Structure	H—C≡N

References[a,b,c]

[a] WHO / UN / ILO International Programme on Chemical Safety: International Chemical Safety Card (ICSC) 0492: Hydrogen Cyanide, 2003.
[b] Hydrogen Cyanide (HAZARDTEXT® Hazard Management). In: Klasco RK (Ed): TOMES® System. Thomson Micromedex, Greenwood Village, Colorado (accessed 02/2010).
[c] The Merck Index (14th Edition), Entry 4795: Hydrogen Cyanide, 2006.

Threshold Toxicity Values

EXPOSURE VIA INHALATION		
ppm	**mg m^{-3}**	**SIGNS AND SYMPTOMS**
50	**55**	Difficulty breathing, rapid heart rate, paralysis, palpitations, unconsciousness, respiratory arrest, death
150	**166**	Endangering to life (30 – 60 minute exposure)
100 – 200	**111 – 221**	Lethal (30 – 60 minutes)
300	**332**	Death in minutes

Reference[(a)]

[a] Hydrogen Cyanide (MEDITEXT® Medical Management). In: Klasco RK (Ed): TOMES® System. Thomson Micromedex, Greenwood Village, Colorado (02/2010).

Published Emergency Response Guidelines

Emergency Response Planning Guideline (ERPG) Values[a]

	Listed value (ppm)	Calculated value (mg m^{-3})
ERPG-1*	N/A	N/A
ERPG-2*	10	11
ERPG-3*	25	28

* Maximum airborne concentration below which it is believed that nearly all individuals could be exposed for up to 1 hr without experiencing other than mild transient adverse health effects or perceiving a clearly defined, objectionable odour.
** Maximum airborne concentration below which it is believed that nearly all individuals could be exposed for up to 1 hr without experiencing or developing irreversible or other serious health effects or symptoms which could impair an individual's ability to take protective action.
*** Maximum airborne concentration below which it is believed that nearly all individuals could be exposed for up to 1 hr without experiencing or developing life-threatening health effects.
N/A – not appropriate

Acute Exposure Guideline Levels (AEGLs)[b]

	ppm				
	10 min	**30 min**	**60 min**	**4 hr**	**8 hr**
AEGL-1†	2.5	2.5	2.0	1.3	1.0
AEGL-2††	17	10	7.1	3.5	2.5
AEGL-3†††	27	21	15	8.6	6.6

† The level of the chemical in air at or above which the general population could experience notable discomfort.
†† The level of the chemical in air at or above which there may be irreversible or other serious long-lasting effects or impaired ability to escape.
††† The level of the chemical in air at or above which the general population could experience life-threatening health effects or death.

[a] American Industrial Hygiene Association (AIHA). 2010 Emergency Response Planning Guideline Values and Workplace Environmental Exposure Level Guides Handbook, Fairfax, VA (accessed 01/2011).
[b] U.S. Environmental Protection Agency. Acute Exposure Guideline Levels, http://www.epa.gov/oppt/aegl/pubs/chemlist.htm (accessed 01/2011).

Exposure Standards, Guidelines or Regulations

Occupational standards

WEL[a]	LTEL(8 hour reference period): No guideline value specified
	STEL(15 min reference period): 10 ppm (11 mg m^{-3})

Public health guidelines

DRINKING WATER QUALITY GUIDELINE[b]	50 µg L^{-1} (cyanide)
AIR QUALITY GUIDELINE	No guideline value specified
SOIL GUIDELINE VALUE AND HEALTH CRITERIA VALUES	No guideline value specified

WEL – Workplace exposure limit; LTEL - Long-term exposure limit; STEL – Short-term exposure limit

[a] List of approved workplace exposure limits (as consolidated with amendments October 2007). http://www.hse.gov.uk/coshh/table1.pdf (An update to EH40/2005: Workplace Exposure Limits 2005. The Stationery Office, London) (accessed 01/2011)

[b] The Water Supply (Water Quality) Regulations 2000 (England) and the Water Supply (Water Quality Regulations 2001 (Wales) (accessed 01/2011).

Health Effects

Major routes of exposure[a]

- Extremely toxic by ingestion, inhalation and dermal exposure.

Immediate signs or symptoms of acute exposure[b,c]

- Inhalation causes headache, nausea, dyspnoea, drowsiness, dizziness, anxiety confusion, tachycardia and palpitations. High concentrations cause hyperventilation, brief episodes of loss of consciousness, convulsions, vomiting and hypotension. In severe poisoning deep coma, fixed unreactive pupils, cardiovascular collapse, respiratory depression, myocardial ischaemia, cardiac arrhythmias and pulmonary oedema may develop. Cyanosis is often a late sign and may not occur, even in patients with cardiovascular collapse.
- There may be the characteristic "bitter almond" odour on the patient's breath (due to excretion of hydrocyanic acid). However it is estimated that 20-40% of people are genetically unable to detect this odour.
- Inhalation: mild poisoning causes nausea, dizziness, drowsiness, hyperventilation, anxiety. Moderate poisoning causes reduced conscious level, vomiting, convulsions, hypotension. Severe poisoning causes coma, fixed dilated pupils, cardiovascular collapse, respiratory failure, cyanosis.
- Ingestion: mild poisoning causes nausea, dizziness, drowsiness, hyperventilation, anxiety. Moderate poisoning causes reduced conscious level, vomiting, convulsions, hypotension. Severe poisoning causes coma, fixed dilated pupils, cardiovascular collapse, respiratory failure, cyanosis.
- Dermal exposure may produce systemic effects.
- Ocular exposure may cause irritatation the eyes. Any resultant absorption may produce systemic effects (see below).

TOXBASE - http://www.toxbase.org (accessed 01/2011)
[a] TOXBASE: Hydrogen cyanide, 12/2000.
[b] TOXBASE: Cyanide – features and management, 01/2009.
[c] TOXBASE: Hydrogen cyanide – medical briefing

Decontamination and First Aid

Important Notes

- Ambulance staff, paramedics and emergency department staff treating chemically-contaminated casualties should be equipped with the Department of Health approved, gas-tight (Respirex) decontamination suits based on EN466:1995, EN12941:1998 and prEN943-1:2001, where appropriate.
- Decontamination should be performed using local protocols in designated areas such as a decontamination cubicle with adequate ventilation.
- Flammability warning: prevent exposure to all sources of ignition such as naked flames, electrical equipment, oxidising chemicals and the smoking of tobacco products.
- Hydrogen cyanide is volatile and secondary contamination from exposed individuals is unlikely.

Dermal exposure[a,b]

- Remove patient from exposure.
- The patient should remove all clothing and personal effects.
- Double-bag soiled clothing and place in a sealed container clearly labelled as a biohazard.
- Wash hair and all contaminated skin with copious amounts of water (preferably warm) and soap for at least 10-15 minutes. Decontaminate open wounds first and avoid contamination of unexposed skin.
- Pay special attention to skin folds, axillae, ears, fingernails, genital areas and feet.

Ocular exposure[c]

- Remove patient from exposure.
- Remove contact lenses if necessary and immediately irrigate the affected eye thoroughly with water or 0.9% saline for at least 10-15 minutes.
- Patients with corneal damage or those whose symptoms do not resolve rapidly should be referred for urgent ophthalmological assessment.

Inhalation[b]

- Remove patient from exposure.
- Ensure a clear airway and adequate ventilation.
- Give 100 % oxygen to symptomatic patients via a high flow mask with a rebreather bag or endotracheal tube.
- Monitor pulse, blood pressure, respiratory rate, oxygen saturation and cardiac rhythm.
- Correct hypotension by raising the foot of the bed and by giving an appropriate fluid challenge. Treat brady and tachyarrhythmias appropriately.
- Apply other supportive measures as indicated by the patient's clinical condition.

TOXBASE - http://www.toxbase.org (accessed 01/2011)
[a] TOXBASE: Hydrogen cyanide, 12/2000.
[b] TOXBASE: Cyanide – features and management, 01/2009
[c] TOXBASE: Chemicals splashed or sprayed into the eyes, 07/2007.

Ingestion[b]

- Ensure a clear airway and adequate ventilation.
- Give 100 % oxygen to symptomatic patients via a high flow mask with a rebreather bag or endotracheal tube.
- Monitor pulse, blood pressure, respiratory rate, oxygen saturation and cardiac rhythm.
- Correct hypotension by raising the foot of the bed and by giving an appropriate fluid challenge. Treat brady and tachyarrhythmias appropriately.
- Apply other supportive measures as indicated by the patient's clinical condition.

Further management[a]

- Cyanide is rapidly detoxified in the body and any casualty who is fully conscious and breathing normally more than five minutes after removal from exposure of hydrogen cyanide will recover spontaneously and does not require antidotal treatment.
- Patients with minor symptoms only should be administered supplemental oxygen.

[a] TOXBASE: Hydrogen cyanide – medical briefing, 2000.

RESPONSE TO POWER LINES/ENERGIZED ELECTRICAL EQUIPMENT

Purpose

This model guideline will establish a standard approach and response to the report of power lines down. Power lines may come in contact with the ground as a result of storm related activity, fire, or vehicles striking power poles. In all cases, the potential for electrical shock/electrocution and secondary fire(s) must be considered when assessing risk and establishing an Incident Action Plan. This policy serves as the department's compliance with NFPA 1500 Standard on Fire Department Occupational Safety and Health Program.

Scope

It is the practice of the Hanover Park Fire Department to respond to reports of power lines down and other hazards involving energized electrical equipment (transformers, substations, electric vaults) for fire control and public safety. It is the responsibility of the company officer to establish a level of safety until arrival of the utility company. This policy applies to all department personnel that respond to this type of incident.

1. ELECTRIC SAFETY AWARENESS

Electricity will travel any conductive path it can as it seeks a ground. A direct path to ground can occur when contact is made between something energized and a portion of your body such as your hand, arm, head, or other body part. An indirect path to the ground occurs when you are holding or touching an object or person that is in contact with an energized source. This may include tools or other equipment you may be holding or when touching a fence, vehicle, or other object that may be in contact with an energized source.

1.1. Gradient Voltage (Step and Touch Potential)

When power lines are down, they will energize the ground around them. The voltage will lessen as it radiates out from the point of ground contact. If your feet are in areas where there is a voltage difference, you could complete the circuit and be the source to ground. This is called "step potential." This danger could be indicated by a tingling sensation in the feet and serve as a warning to back away from the area. Step potential is more severe when the ground is wet.

Key Points

- Downed lines must always be considered energized with potentially lethal current.
- Power lines may reset and become "hot" or "energized" again by manual operation of a switch, by automatic re-closing methods (either method from short or long distances away), by induction where a de-energized line may become hot if it is near an energized line, or through back-feed conditions.
- A power line tends to have "Reel Memory" and may curl back or roll on itself when down.
- Use caution when spraying water on or around energized electrical equipment. Hose streams conduct current. Never direct streams directly onto power lines. Use a fog spray at the base of the pole. Your primary responsibility is to protect the surrounding area.
- Polychlorinated Biphenyl (PCB) hazards: Smoke is potentially fatal; avoid and contain pools of oil around transformers.
- You cannot tell the voltage of a power line by the size of the conductor. Most overhead conductors are not insulated.

- Voltage can travel through both dry and especially wet ground for considerable distances.
- Pad-mounted and overhead transformers may explode.
- Until grounded, equipment can contain electric potential, which may cause severe injury or death.
- Electricity can flow through the ground or other conductive objects, (fences) to a point far from the scene.

2. RESPONSE TO POWER LINES DOWN

2.1. Perform a Risk Assessment and establish an Incident Action Plan
2.2. Request utility company to respond
2.3. Consider all down wires as "energized."
2.4. Place apparatus away from "down lines and power poles" and out from under involved overhead lines that could fail and fall onto equipment or personnel.
2.5. Secure the area/deny entry. Provide barriers or alerting techniques which are effective and distinguishable under the conditions in order to prevent entry into an identified danger zone.

3. DOWN POWER LINES & VEHICLES

3.1. Perform a Risk Assessment and establish an Incident Action Plan
3.2. Request utility company to respond.
3.3. Do not touch vehicle.
3.4. Have occupants remain inside the vehicle.
3.5. Place all apparatus a safe distance away from down lines. Ensure all firefighters are aware of the hazard.
3.6. If occupants must leave the vehicle, (fire or other threat to life) instruct them to open the door, **DON'T** step-out! They should jump free of the vehicle without touching vehicle and ground at the same time; they should walk away from the vehicle with very small steps.

4. SUB-STATION, TRANSFORMER, ELECTRICAL VAULT AND MANHOLE FIRE

4.1. Perform a Risk Assessment and establish an Incident Action Plan
4.2. Request utility company to respond.
4.3. Clear the area.
4.4. Be aware of explosion potential.
4.5. Place apparatus in a safe location away from overhead power lines.
4.6. Protect exposures.
4.7. Do not make entry until the utility representative has verified that the above electrical equipment has been de-energized. The utility representative may have to make entry to uninvolved sections to safely de-energize the equipment.

5. WORKING NEAR DOWN POWER LINES

5.1. Perform a Risk Assessment and establish an Incident Action Plan
5.2. Ensure personnel maintain a safe distance from the energized hazards until the conductor is de-energized.

5.3. Provide barriers or alerting techniques to prevent firefighters from entering an identified danger zone.
5.4. Ensure all fire ground safety broadcasts are acknowledged and repeated.
5.5. Ensure that team continuity is maintained and personnel accountability is in place on the fire ground during fire suppression operations.
5.6. Ensure that a clearly marked and monitored collapse zone is established once a defensive firefighting strategy has been called and a structure has been identified at risk of collapsing.