F.D.N.Y.

PROBATIONARY FIREFIGHTERS MANUAL

VOLUME I

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Updated: 10/18/2024

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FIRE DEPARTMENT
Fire Academy, Randall's Island, New York

CAPTAIN ROY COTIGNOLA
Executive Officer Probationary Firefighters School

August 22, 2023

I would like to recognize the following members for the effort put forth updating the Probationary Firefighters School Manuals.

Captain Francis Li
Captain Ryan Brito
Captain Jonathan Kappel
Lieutenant Sean Brennan
Lieutenant Kyle Demasters
Lieutenant Daniel Salfrank
Lieutenant Michael Keighron
Lieutenant John Keaveny
Lieutenant Keith Gilligan
Lieutenant Chris Fischer

On May 31, 2022 these ten members came off-line to assist me in taking on this major project.

We had a start date of September 12, 2022 for the next Proby Class.
The first run date was August 16, 2022 and the candidates are issued their books on their run day.

The Reproduction Unit generally requires an order placement two months in advance.
Special thanks to the staff at Reproductions for their effort, getting these manuals to us in weeks, not months.

This gave us a very narrow window of time to complete the project. The new manuals would have to be reviewed not only by me, but the staff of Proby School Instructors and then back to my team for the necessary additions and redactions.

The project came together in record time and included a change in the formatting. Our manuals are now similar to the FDNY manuals which will assist Probationary Firefighters with their readings once they leave the Academy.

I would like to publicly thank all involved in this project. It was your hard work that made this project possible. Thank you.

Captain Roy Cotignola

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INTRODUCTION
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ORIENTATION

Congratulations on your appointment to the Fire Department of New York City

On behalf of the Fire Commissioner and the Chief of Department, welcome to the New York City fire Academy. Each of you have passed the written and physical examinations and further being qualified both mentally and medically, have demonstrated a fine potential for service to the city of New York and to the people who live and work here.

The FDNY is a semi-military organization. Rules and regulations govern the conduct and actions of all members of the department.

The department requires people with intelligence, determination, integrity, self-discipline, strength and character, endurance, and willingness to work hard. During your stay at the Academy, the training you will be receiving is designed to teach you the basic fundamentals of firefighting and help develop some of the discipline, toughness and self-reliance required of a firefighter.

Analyze yourself as objectively as you can. Become a member of the FDNY because you accept its opportunities and are willing to meet its demands and obligations. Drive yourself to your best efforts, develop your talents and strive to rise to higher ranks of the department.

Your success in training can make you part of the greatest firefighting force in the world.

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WORK HOURS: _____
REPORTING TIME: _____

UNIFORM

1. Dark blue trousers and black belt
2. Dress blue shirt and tie
3. Black, plain toe, laced, military shoe
4. Black socks
5. Cap and badge
6. Official dark blue jacket
7. Black duffel bag, no logos

Above items shall be worn to and from the Fire Academy each day.

We suggest you compose a **PERSONAL DATA SHEET** to assist you in completing the many forms that you will be receiving during orientation. Some of the information that will be needed is listed below.

1. Social Security Number. (Self and Spouse)
2. Birth dates of your immediate family. (COPIES of birth certificates for dependents)
3. Marriage dates. (COPY of marriage certificate)
4. Person(s) to be notified in case of an emergency, i.e. Their address and telephone number.
5. Fire Department unit nearest your residence if you live within the city limits.
6. Prior civil service employment, dates and other pertinent data.
7. Prior health plan and health plan number.
8. Military service; dates entered and discharged.
9. Veteran status.
10. Blood type.
11. The name, address and phone number of an alternate person to be notified in case of serious injury or death.
12. The name, address and phone number of a friend or relative to accompany the chief officer and chaplain to the home of the person to be notified in case of serious injury or death.
13. The house of worship nearest the member's residence representing your religious affiliation.
14. Clothing size; neck, sleeve, waist.
15. Supply your own lunch.
16. Lock for your locker
17. Names and unit number of family members affiliated with the department.

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Probies shall park their automobiles in the parking lot located **outside** the Academy. The parking lot is across from the main gate as you enter the Fire Academy grounds.

1) Automobiles belonging to Firefighters 6th Grade are prohibited from parking inside the Academy Gates.
2) Commercial vehicles – such as tow trucks, dump trucks, trucks with advertising, etc. are prohibited.

Probies requesting medical leave shall promptly notify, or where necessary, have a responsible person notify, Probationary Firefighter School and the medical leave desk prior to 0700 by telephone of any injury or illness that requires the granting of medical leave.

Medical Desk	(718) 330-2204
P.F.S.	(212) 360-4429
Housewatch, if unable to contact PFS	(212) 360-4421

Probies shall report to the Bureau of Health Services at headquarters on the same day unless otherwise instructed.

When a trainee is admitted to or discharged from a hospital, he/she shall promptly notify the P.F.S. Office. If personal notification can not be made, notification shall be made by a responsible person.

Any notices received which might be of interest to the Fire Department must be delivered to the P.F.S. office as soon as possible. Such notices might include but are not limited to: military orders, subpoenas, jury notices and court appearances.

The P.F.S. shall be immediately notified of any change of residence, signature or telephone number.

GENERAL GUIDELINES

- Always wear the complete uniform and PPE as prescribed by the Officer in Charge of the Probationary Firefighter School (PFS) while attending the Fire Academy.
- Conduct yourself at all times in a manner which will not bring reproach or discredit upon the Department.
- Extend military courtesy to all officers and instructors at the Fire Academy.
- Not engage in a physical or verbal altercation, or perform any act which may be, or intend to be, detrimental in arousing religious or racial matters.
- Not engage in any activity, whether by actions, speech, writings, or dissemination of material which may cause sexual harassment as defined in Title VII of the Civil Rights Act of 1964 and Mayoral Directive 80-5, which are set forth in the Supplement to Department Order No. 28, dated February 27, 1981. (D.O. 60/84).

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- You will not use the FDNY logo or name on any social media websites or on any webpages. You will not make any postings that will bring discredit upon the FDNY or will bring this Department or any of its members into disrepute if viewed by other members or the public. **You will be held responsible for what you post**.
- You will not post photographs of yourself or any other member in PPE or uniform unless worn during an event for which the uniform is required.
- You will not consume, or be under the influence of, alcohol while on duty.
- You will not use, or have in your possession, narcotics, tranquilizers, methadone, drugs of the amphetamine group, barbiturate derivatives or non-prescribed medications. Paraphernalia used to administer the above are also banned.
- Not make a false statement, report or record with the intent to deceive.
- Not maliciously damage any Department property, tools or equipment.
- Not engage in any extra departmental employment, profession, occupation, or business while attending Probationary Firefighter School, including working as a Volunteer Firefighter or on a Volunteer Ambulance.
- Not carry, possess, store or use any firearm while on Departmental property.
- Report loss of badge and/or I.D. card or other Department property immediately to the Administrative Officer of the PFS.
- Remain with their squads at all times and not absent themselves from an assigned class or other duty unless otherwise directed by an official of PFS.
- You will not use first or second floor bathrooms, except for auditorium and the designated restroom in the second tube.
- You will not fraternize with field units.
- You will not read newspapers on Fire Department grounds. Read your proby manual.
- No walking on or crossing sidewalks except passage between bldgs. 11 and 12, bunker locker room, and auditorium.
- Do not use glass doors to enter or exit building 11 or 12.
- Be at least one hour early for roll call. **Lateness will not be tolerated and could lead to your termination.**
- Stay hydrated, drink plenty of fluids. You will always carry a water bottle.
- "MAKE WAY" – First Proby to See an Instructor shall yell "MAKE WAY" and promptly step aside. Everyone else will repeat the command loudly and step to the side, back to the wall.
- You will follow all orders from instructors, exactly as they are given.
- You will form up in roll call area 15 minutes prior to scheduled roll call.
- You will yell "good morning/afternoon, sir/ma'am", whenever you make eye contact with any FD member on the rock.

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- Always have kneepads on your bunker pants and always wear your suspenders.
- If one person makes a mistake, everyone pays the price. You are a team. You will act like a team.
- You will never travel alone.
- You will show respect to all superiors. **Everyone** is senior to you.
- No sitting, lying or leaning on objects outside during evolutions.
- Raise your hand if you have a question and speak up. Begin with "sir, probationary firefighter_____" then your question.
- When your name is called, sound off loud and clear "here sir / ma'am".
- When asked a question, your response will be "yes/no sir / ma'am".
- Squad leaders are an extension of the drill instructors. You will treat them with the same respect.
- Always utilize the chain of command.
- When you hear the command "LOCK IT UP" you will repeat the command loudly, stop moving and stop speaking, until given the command "carry on".
- Take the initiative to empty garbage cans and pick up trash from the floor. Don't wait for someone to tell you.
- Police the locker room every day prior to final formation.
- You will make sure to maintain clearly and neatly marked gear.
- We are always there for you if you show us you want to learn. Don't be afraid to ask for help.
- Give 110% every day in everything you do here. Poor attitudes will not be tolerated.
- Always finish on this job. Quitting prior to completing your task is not an option.
- If someone asks for a volunteer, everyone should step up.
- Committee work will be performed every day (instructor and common areas).
- You will enter the academy everyday carrying only your black bag in your left hand
- You will enter and leave the rock in your class A uniform every day.
- Use or possession of cigarettes, cigars or smokeless tobacco of any kind is prohibited on the Rock or at Fort Totten at any time. This includes electronic cigarettes or vapors.
- **Absolutely no cell phones on the Rock or Fort Totten at any time, unless special permission is obtained from the DI's.**
- You will not wear jewelry of any kind, earrings, body piercings, etc. This includes wedding rings.

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- Medical leave or light duty will result in missed training days and could result in your termination.
- You will maintain Fire Dept. grooming standards. Your face will be clean shaven daily, your uniform clean and pressed and your shoes polished. You will have your hair cut weekly to the required specifications.
- You will provide your own lunch every day, and it will be secured in the large refrigerators located outside of the auditorium. Make sure your belongings are clearly marked.
- You will need a black bag with no markings, a notebook, 3 black pens, 3 sharpened #2 pencils and a black permanent marker with you at all times.
- You will bring your **entire** proby manual to every class every day unless otherwise instructed.

FDNY HISTORY

Organized fire fighting began in New York in 1648 when the first *Fire Ordinance* was adopted by the Dutch Settlement of New Amsterdam. Fines levied for dirty chimneys provided funds for the maintenance of buckets, hooks and ladders. It also established a fire watch of eight Wardens and required that each male citizen stand his turn on watch.

Old time method of transporting water buckets to a fire. Buckets were made of leather by the Dutch shoemakers.

After the first Wardens were appointed, an organization known as the ***Prowlers*** was formed and furnished with buckets, hooks and ladders. Often called the *rattle watch*, they patrolled the streets on the lookout for fire from nine o'clock at night until dawn.

When the colonists were organized in 1658, bucket brigades were formed and equipped with 250 leather buckets made by Dutch shoemakers of the colony. Thus, our first inauspicious beginning was made. Seven years later, in 1664, the colony became a British settlement and was renamed New York.

It was not until 74 years later, in 1731, that fire brigades were put into service. Two hand-drawn pumpers, brought from distant London were the first fire engines to be used in the colony. They were designated as Engine Company 1 and Engine Company 2. All able bodied citizens were required to respond to alarms and perform duty under the supervision of the Aldermen.

Faced with the problem of a fast growing colony, the General Assembly established the volunteer Fire Department of the City of New York, in December of 1737. Able, discreet and sober men were appointed as firemen to be ready for service by night and day and be diligent, industrious and vigilant.

Following the Revolutionary War, the Department was reorganized and incorporated as the **Fire Department of the City of New York.**

The volunteer Fire Department continued to protect the lives and property of the citizens of the city until after the close of the Civil War when, in 1865, they were superseded by the paid Metropolitan Fire Department. The change created resentment and bitter actions were taken by some who opposed the elimination of the volunteers. This resulted in rough and tumble battles fought on both personal and political levels.

The introduction of the steam engine spelled the final doom of the volunteer department in New York. The steam apparatus eliminated the need for men to pump the water, and the horses ended the problem of hauling engines by hand.

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At the beginning, the paid fire service extended only to certain parts of New York City (Manhattan). The Act of 1865 united Brooklyn and New York (cities) to form a Metropolitan District. By the end of 1865 the department consisted of 13 Chief Officers and
552 Company Officers and firemen. They worked a continuous tour of duty, with 3 hours a day for meals and one day off a month. They were paid salaries according to their rank or grade. The first regulations were also formulated and they were fairly strict and straight-laced.

First Company of paid Fire Department to go "in service" was Engine Co. 1, located in lower Manhattan at 4 Centre Street. Apparatus was horse-drawn Amoskeag steam-powered pumper which was same type issued to later companies. Wheels were steel rimmed.

The volunteers, despite their disappointment, accepted the decision and publicly declared that they would continue to function and serve until properly relieved by paid units.
The Act provided that members of the volunteers were to be given preference over all others in filling the rolls of the paid department.

Due to major fires, which resulted in excessive fire losses and a rise in insurance rates, the department was reorganized in 1866 under the command of General Alexander Schaler. Under military discipline, the department began to realize its full potential and fire losses began to generally reduce.

The merit system of promotion in the Fire Department was instituted in 1870.

In 1874 Westchester County (later called the Bronx) was annexed and gradually volunteers there were replaced by companies of the paid department, until the last volunteer unit was disbanded in 1928.

A further consolidation occurred in 1887 covering what we now know as the Borough of Queens. Again volunteer units were gradually replaced by paid companies until, by 1929, this Borough was protected by the paid department of the City of New York.

Richmond became a part of the greater City of New York in 1898. No change in the volunteer status took place, except for nominal supervision, until 1905 when the first group of volunteers was disbanded and replaced by paid units. More paid companies were installed in 1915, 1928, 1932 and 1937, when all but two volunteer companies were disbanded. These two were the only legal volunteer companies still active in the City of New York.

New Year's Day 1898 heralded the consolidation of the different areas of the city and the beginning of a new era for the Fire Department. All fire forces in the various sections were brought under the unified command of the first Commissioner of the Fire Department.

Following this amalgamation many changes took place involving many aspects of the job including installation of the high pressure systems, motorization of fire apparatus, creation of a Marine fleet, adoption of vastly improved working conditions and the utilization of perfected radio communications.

*In September 1982 the first women were sworn in to the FDNY

Today the Fire Department protects more than 8,000,000 residents in an area of 320 square miles. The department is administered by the Fire Commissioner appointed by and responsible to the Mayor. The uniformed force is under the command of the Chief of Department and consists of more than 11,400 Fire Officers and fire fighters. In addition, the Department includes 2,800 Emergency Medical Technicians, Paramedics and Supervisors assigned to the Bureau of Emergency Medical Service (EMS), as well as 1200 civilian employees.

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ABBREVIATIONS

ADD	ADDENDUM
APP	APPRATUS
AUC	ALL UNIT CIRCULAR
BISP	BUILDING INSPECTION SAFETY PROGRAM
BS & RF	BROWNSTONE & ROWFRAME
CH	CHAPTER
CO	COMPANY
COMM	COMMUNICATIONS
ENG	ENGINE
ENG OPS	ENGINE OPERATIONS
EV	EVOLUTIONS
FFP	FIREFIGHTING PROCEDURES
HAZ MAT	HAZARDOUS MATERIALS
HR	HIGH RISE
HRFPMDS	HIGH RISE FIREPROOF MULTIPLE DWELLINGS
LAD	LADDER
LAD OPS	LADDER OPERATIONS
MD	MULTIPLE DWELLING
NFPMD	NON FIREPROOF MULTIPLE DWELLING
NLT	NEW LAW TENEMENT
OLT	OLD LAW TENEMENT
OPS	OPERATION
P	PAGE
PD	PRIVATE DWELLING
SB	SAFETY BULLETIN
SCBA	SELF CONTAINED BREATHING APPARATUS
SEC	SECTION
TB	TRAINING BULLETIN
TL	TOWER LADDER
VEIS	VENT ENTER ISOLATE SEARCH

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PROBY MANUAL BREAKDOWN AND ABBREVIATIONS

The following information shows the abbreviations used on the Reading Assignment Schedule:

VOLUME 1:

AUC's All Unit Circulars
BISP Building inspection safety program
Comm Communications Manual
Emergency Procedures
Haz Mat Hazardous Materials (Includes ERP-Emergency Response Plan)
PA/ID's Personal Administrative/Information Directives
SB Safety Bulletins
TB Training Bulletins and Training Bulletins Tools
Company Journal

VOLUME 2:

FFP Firefighting Procedures
In this volume, the primary focus is on Firefighting Procedures.
FFP may precede the actual Reading Assignment on the schedule. Example: FFP MD's
Pay attention to the Building Type in the Reading Assignment.

Book 1 Multiple Dwellings (MD's)
Glossary
Chapter 1 Non-Fireproof Multiple Dwellings (NFPMD's)
Old Law Tenements (OLT) and New Law Tenements (NLT)
Chapter 2 High Rise Fireproof Multiple Dwellings (HRFPMD's)
Chapter 5 Wind Impacted Fires in Fireproof Multiple Dwellings
Book 2 Brownstones (BS) and Rowframes (RF)
Book 3 Vacants
Book 4 Taxpayers
Book 5 High-Rise Office Buildings (HR-Office)
Book 6 Private Dwellings (PD's) Consisting of Chapters 1, 2, 3, 4, and 6
Book 7 Structural Collapse Operations (Collapse)
Book 10 Ventilation
Book 13 Overhaul Operations
Eng Ops Engine Company Operations (These bulletins are a Volume [V2] within itself)
Ladder Ops Ladder Company Operations (These bulletins are a Volume [V3] within itself)
MMID Managing Members in Distress (These bulletins are a volume [V4] in itself)
DO NOT CONFUSE THE READINGS. The assignment clearly shows FFP Ladder Ops V3 or V4.
Evolutions
Appendix Ladder Company Tools and Portable Fire Extinguishers

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ALL UNIT CIRCULARS (AUC)
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UNDERGROUND ELECTRIC UTILITY FIRES AND EMERGENCIES

1. GENERAL

1.1 In New York City, the electric power delivery system is comprised of three distinct sub-systems; Generation, Transmission and Distribution. Central power plants generate electricity which is carried over high-voltage **transmission lines** to area substations. Substations reduce the voltage to primary distribution levels and high voltage **primary lines** distribute the power to street transformers. Street transformers step down the voltage once again to supply a low voltage secondary system (**secondary lines**). Individual buildings are supplied by secondary line power through a **building service line**.

1.2 ***Redacted for PFS***

1.3 Power is distributed throughout the city by Consolidated Edison (Con Ed) with the exception of Rockaway Queens which receives their power from PSEGLI. Approximately 86% of electric delivered by Con Edison is carried by the underground network distribution system (manholes) with the rest delivered by overhead cable wires. Almost all of PSEGLI network in Rockaway is overhead wire.

2. UNDERGROUND STRUCTURES

2.1 Electric Manholes

2.1.1 Electric manholes are large vaults in the ground which can be found both under the street or under the sidewalk. The covers can be round, square or rectangular in shape and will be either a solid cover or vented design. They are interconnected by ***ducts*** through which cable (underground wires) pass into other manholes or out of the manhole to above-ground structures. These ducts permit the migration of water, air, gases and smoke between manholes.

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Solid Manhole Cover

Vented Manhole Cover

Square Manhole Cover

2.1.2 An electric manhole can contain either primary or secondary cables or both. When both are present, secondary cable will be mounted on the wall near the top of the manhole. Primary cable will be mounted on the wall near the bottom of the manhole. During an underground electrical fire, an explosion in a manhole can occur and cause one or more manhole covers to be blown into the air.

2.1.3 In certain areas, the underground and overhead systems are interconnected by a ***conduit*** (Photo 1 and Photo 2) that runs up the side of an electric utility pole. In this case, cable runs from the manhole through this conduit to the top of the utility pole and joins the overhead system. Electrical fires in the underground system can spread to the overhead system or vice versa via this conduit.

Photo 1

Photo2

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2.2 Electric Service Boxes

2.2.1 These structures are shallow electrical boxes that contain low voltage secondary cable connection points. They are located near the curb line of the street and their covers can be solid or vented. During an underground electrical fire, an explosion of a service box can cause its cover to be blown into the air. Electric service box explosions have caused a vehicle parked above it to flip on its side.

Service Box (Solid Cover)

Service Box (Vented Cover)

2.3 Underground Transformers

2.3.1 Some manholes contain transformers. They are most commonly found in large rectangular shaped underground vaults. They can be located under the street or under the sidewalk. Transformers must be vented, so they typically have grated covers. Transformers are used to step up or step-down voltage and in either scenario the transformer itself carries high voltages. They can be filled with as much as 2000 gallons of combustible oil, which acts both as an insulator and a coolant.

Transformer Vault (Street)

Transformer Vault (Sidewalk)

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2.4 SILO Transformers

2.4.1 Some underground transformers are cylindrical in shape and similar to those found mounted on utility poles. These are called SILO transformers. These transformers will be found in a manhole with a unique vented circular manhole cover. A SILO cover will be a generic grate without the Con Edison logo in the center.

Silo Transformer
(Generic Grate Cover no Con Ed Logo)

Regular Vented Manhole Cover
(Note the presence of the Con Ed Logo)

3. UNDERGROUND HAZARDS

3.1 Toxic & Explosive Smoke

3.1.1 May migrate throughout the underground network.

3.1.2 May enter buildings.

3.2 CO Explosions

3.2.1 Occurring in manholes.

3.2.2 Occurring inside buildings, usually in cellars. Sometimes at the electric box caused by FD shutting power to the building (opening the house main). Other times, rare but usually more significant, when explosive concentrations of CO enter the cellar and find an ignition source.

3.2.3 Occurring in light pole bases, traffic control boxes and sewers as a result of the movement of CO into these structures and the subsequent ignition.

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3.3 Manhole Covers

3.3.1 Weigh 300 pounds and their location can be obscured by snow.

3.3.2 Can be blown into the air with little or no warning.

3.3.3 Explode with such force that they have been found to land on the roof of a 6 story building, hit overhead wires or flip a parked car over.

3.3.4 Explosions have caused rocks, pebbles and other debris embedded in the cracks around the cover to become dangerous projectiles.

3.3.5 Stray voltage can electrify manhole covers causing a shock or electrocution risk.

3.4 Primary and Secondary Cables

3.4.1 Primary and secondary cables pose shock/electrocution hazard.

3.4.2 Underground primary cable is covered in white wrapping called ***Arc Proofing*** which acts as a fire retardant. Older types of arc proofing can be Asbestos Containing Material (ACM).

3.4.3 Wire insulation is made of rubber and is highly toxic when it burns.

3.4.4 Arcing from electric cables can damage gas infrastructure causing a natural gas leak or gas fed fire. Arcing includes a visible electric arc between components (usually a blue flash) or hissing, buzzing or crackling noises without a visible indicator.

3.4.5 Almost all manhole fires involve the secondary cable network. Primary cables have more substantial insulation which make them less vulnerable to breakdown and they have breakers which generally trip in the event of any type of fault occurring.

3.5 Transformers

3.5.1 Can fail internally, sometimes violently, and spray burning oil out into the surrounding area.

3.5.2 During a violent rupture, parts of the transformer can be projected from the vault.

3.5.3 Combustible liquid fire from a transformer can have a ***Boil over*** if water is added.

3.5.4 Transformers are considered PCB-contaminated.

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4. MANHOLE FIRES (TACTICS)

4.1 Apparatus shall be positioned outside of the affected area. Ensure units do not park on top of or close to an electric manhole, a transformer vault or a service box.

4.2 During a manhole fire, avoid walking near electric manholes or service boxes. When the location of manholes or service boxes are obscured, including by snow, avoid walking in the street. More often than not, electric manhole covers, and service boxes will be located in or near the parking lane. Generally, when the locations of electric manholes and service boxes are unknown, it is safer to walk on the sidewalk.

4.3 A safety area shall be cordoned off to vehicular and pedestrian traffic. Request PD to assist as necessary. This area should include:

4.3.1 The area with one (1) non affected manhole in each direction beyond those with activity.

4.3.2 Traffic control boxes and bases of light poles which can be subject to explosion.

4.4 Inspect exposures for extension of fire, smoke, CO or natural gas migration.

4.4.1 Pay particular attention to the Point of Entry (POE) of gas, electric and sewer utilities.

4.4.2 Also include the Point of Entry (POE) of communication equipment (telephone & TV cable entry and nearby communication boxes). Experience has shown communication conduits entering buildings are less likely to be packed (sealed) and more susceptible to smoke and CO migration.

4.4.3 Carbon Monoxide Meters and Combustible Gas Meter (Altair) shall be used during these investigations.

4.4.4 Manhole fires have caused plastic gas mains to fail causing a natural gas leak.

4.4.5 Report findings and evacuate building(s) or building areas as deemed necessary.

4.5 Members should ***avoid*** de-energizing any electric components by opening switches (shutting power at the main) ***during an underground electrical fire***. Even if lights are flickering, it is dangerous to shut power. CO has the potential to build up in the conduits leading from the burning manhole and migrate into the electrical panels within the building. It is possible for CO to be in its explosive range inside the panel, while the CO meter may read little or no CO nearby. When opening the breaker or switch an arc is created which can ignite the CO and cause an explosion of the electric panel.

4.5.1- 4.5.2 ***Redacted for PFS***

4.6 Precautionary hoselines shall be stretched as necessary. Generally, it is preferred to await the arrival of Con Edison without placing water or FireIce into a manhole, vault or service box. However, if size up dictates, water or FireIce may be operated into these underground

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structures prior to the arrival of Con Edison by order of an on-scene FD Chief Officer (BC/ABC or higher in rank).

4.7 When operating water into a manhole, vault or service box, be guided by the following:

4.7.1 It is most effective if the cover is of the vented type or the cover is already removed (by explosion or by Con-Ed).

4.7.2 Maintain a distance of at least 25 feet from the nozzle to the manhole, vault or service box.

4.7.3 Use a fog nozzle to reduce or prevent any shock hazard.

4.7.4 Adjoining manholes & service boxes should be identified and clear of civilian and FD personnel **before** starting water.

4.7.5 Success in the use of water hinges upon directly contacting the burning cables with the stream. The cables are hung on the walls inside the manhole. For this reason, reposition as necessary to have the stream penetrate manhole from different angles.

4.7.6 CO readings and flammability readings should be monitored in exposures before, during and after water application.

4.7.7 The use of water streams or Fire Ice into a manhole/service box can cause smoke and CO to be pushed into adjoining buildings and/or adjoining manholes/service boxes. In rare cases this can trigger an adjoining manhole/service box to explode due to the wide explosive range of CO.

4.7.8 Do not use water or FireIce as *an initial tactic* on a combustible liquid transformer fire (indicated by a large volume of fire/ flames 10 feet or more in height). Use of water or water agents such as Fire Ice may cause a boil-over in this situation. (A boil over is a dangerous fire event).

4.8 Vehicles within the area which are parked over manholes, transformer vaults or service boxes can be moved at the direction of a Chief Officer or left in place and protected by a handline. The method chosen will be based on the size-up of a Chief Officer.

4.8.1 ***Redacted for PFS***

4.8.2 When an FDNY member will move the vehicle, the member shall be given the keys and shall be fully donned in PPE. The vehicle shall be approached from the safest direction which may not necessarily be the driver's side door.

4.8.3 ***Redacted for PFS***

5. ***Redacted for PFS***

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6. TRANSFORMER FIRES

6.1 There can be different types of fires in a transformer vault. Cable (wires) connected to the transformer can fail and burn, rubbish fires can sometimes develop in the vault, sustained arcing at the transformer can develop or a more serious, total failure of the transformer may occur casing an explosion and fire.

6.1.1 Cable (Wire) fires are the most common fire that develop in a transformer vault. Cable fires will present with more smoke visible than actual flames. Flames may protrude from the vault but will not consist of a large volume of fire. You may follow the procedures for manhole fires for these incidents. (Await Con Ed if possible, using water and proper stand-off distances if necessary)

6.1.2 Rubbish fires can be extinguished with a class C extinguisher or by using water with proper stand-off distances.

6.1.3 Sustained Arcing is when a fault develops on the unit and the limiter (breaker) fails to clear. A persistent bluish arcing flash will develop but may not be visible. Arcing can also be indicated by hissing, buzzing or crackling noises without a visible indicator. While it is common for this condition to occur on cables in a manhole, if it occurs on a transformer, this condition can result in catastrophic failure of the transformer. Isolate the area of civilians, and FD members should monitor from an area of safety. There are no actions members can take to prevent catastrophic failure. You cannot suppress a transformer fire with sustained arcing. The electric utility must remove power from the unit.

6.1.4 A transformer fire will present with an extremely heavy fire condition usually with flames burning 10 or more feet in the air. This is a true transformer fire and is the combustible oil inside the transformer burning. **For the purposes of this bulletin and tactics provided, a transformer fire will mean a failed transformer with a combustible liquid fire.**

Cable Fire in a Transformer Vault

Transformer Fire
(Note height of the flames in relation to FD engine)

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6.2 Transformers contain up to 2000 gallons of transformer oil. Although most PCBs have been removed from transformers, there are some that still contain PCBs as recently as January 2021. Full PPE and SCBA use shall be mandatory. Exposure to any amount of smoke can cause PCB contamination.

6.3 Water applied to a failed transformer with a combustible liquid fire may cause a boilover to occur. A boilover is the rapid expansion and expulsion of vaporized oil caused when water is added to an oil fire. A boilover usually causes a large plume of burning liquid to expel from the container. Water is acceptable to use to protect exposures but applying water directly on the transformer should be avoided as **an initial tactic**.

6.4 Transformer Fire (Tactics Conducted Prior to Arrival of Electric Utility):

6.4.1 ***Redacted for PFS***

6.4.2 Operate Purple K on the transformer fire. This is the only agent recommended to be used directly on the transformer fire prior to utility arrival. Standoff distance is 10 feet.

6.4.3-6.4.7 ***Redacted for PFS***

6.5-6.6 ***Redacted for PFS***

7. ***Redacted for PFS***

BY ORDER OF THE FIRE COMMISSIONER AND CHIEF OF DEPARTMENT

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FIREICE DRY-CHEM EXTINGUISHING AGENT

1. INTRODUCTION

1.1 FireIce is a dry-chemical extinguishing agent that is intended for use at manhole fires (class C fires) involving electrical cables. This product has been approved for use on Class C (electrical) fires by Con Edison and a third party independent testing laboratory as per operational guidelines Units are also reminded to follow all policies and procedures outlined in AUC 180 - *Procedures for Fires and Emergencies in Manholes and/or Related Installations*.

2. DESCRIPTION/USE OF EQUIPMENT

2.1 FDNY in conjunction with Con Edison jointly utilize FireIce, a powder which when added to water produces a firefighting gel for the purpose of insulating and extinguishing burning electrical cables at manhole fires and reducing the levels of Carbon Monoxide.

3. *Redacted for PFS*

4. OBJECTIVE

4.1 When assigned on the initial alarm for manhole fires, FireIce units shall respond with their associated apparatus which carries the product and associated equipment. FireIce units will be designated by the letter suffix "I" on the response ticket when assigned to respond as a FireIce unit (e.g., E228I). FireIce units may also be "special called" by the IC.

Note: Only members trained in conducting FireIce operations can utilize the specialized equipment.

4.2 The application of FireIce gel will coat and insulate burning cables preventing the spread of fire from manholes, reduce the levels of Carbon Monoxide and minimize secondary manhole explosions. It is anticipated that this will reduce amount of time units must remain on scene and lessen multiple responses to same incident(s).

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5. PRODUCT DESCRIPTION

5.1 FireIce is a potassium-based dry powder that produces a firefighting gel when educted through FDNY hoselines. The product has the consistency of a fine, white granular powder.

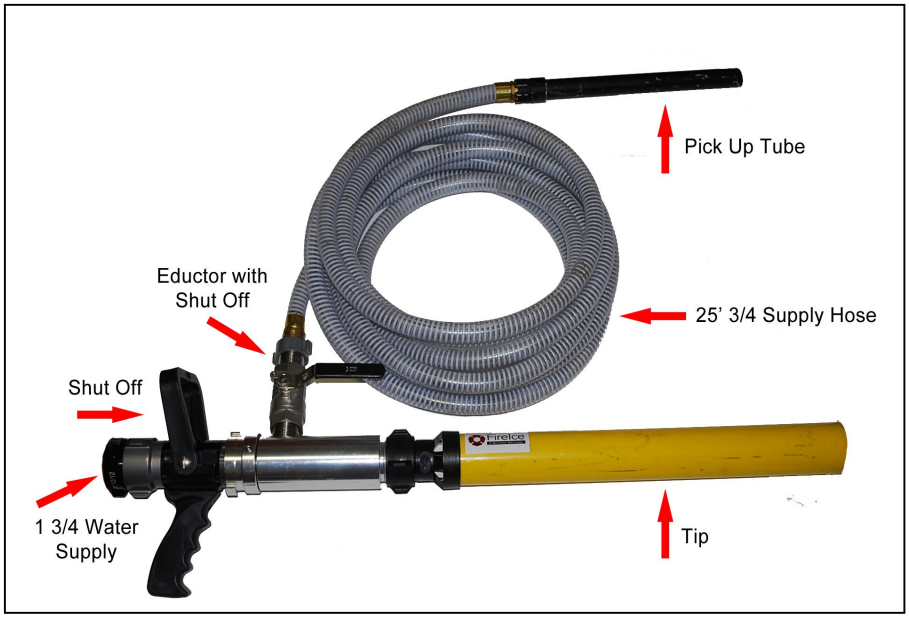
5.2 FireIce works as an extinguishing agent by coating and insulating burning electrical cables, and thereby prevents cable fires from extending beyond the affected manhole. The product is also designed to reduce the amount of carbon monoxide generated by burning cables and minimize secondary manhole explosions. These attributes should reduce overall operational time at such incidents.

6. EQUIPMENT

6.1 Both Con Edison supervisors and the participating FireIce units will carry a supply of FireIce extinguishing agent and the associated equipment to apply the product.

The equipment includes:

- Specifically designed nozzle/tip equipped with a built-in eductor and shutoff. The built-in eductor does not have a traditional proportioning meter.
- 25′ length of ¾″ hose connected to the eductor with a pick-up tube attached.
- The system is supplied by a 1 ¾″ handline.
- 25-pound container of FireIce.



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7. OPERATIONS

7.1 ***Redacted for PFS***

7.2 FireIce shall only be applied by trained units.

Note: ***Redacted for PFS***

7.3 FireIce is **not** effective on class B fires. Therefore, it is not intended for use at any type of transformer fire; that includes transformers located in below-grade vaults or rooms, and transformers that are mounted on poles.

7.4 As per AUC 180, units shall take carbon monoxide readings in surrounding occupancies throughout the operation to ensure that the use of FireIce is not adversely affecting these occupancies. It is important that all provisions of AUC 180 *Procedures for Fires and Emergencies in Manhole and/or Related Installations* are followed throughout the operation.

8. SPECIFIC TACTICAL INSTRUCTIONS

8.1 FireIce is a fine, white granular powder that is educted from its container using the Venturi effect in a similar manner to our foam operations. In this regard, members shall insert the pick-up tube directly into the product container and employ a circular vacuuming motion with the tube in order to draw the product up to the nozzle. The member responsible for educting the product must be attentive and shall not remove the pick-up tube from the product until the operation is concluded. Any lapse in the pick-up operation will disperse plain water without FireIce solution into the manhole.

8.2 The product container shall be placed at the point of the nozzle operation, ensuring that the 25-foot length of ¾" hose is fully extended without any kinks (the eductor is connected to the nozzle).

8.3 The operating pressure at the nozzle shall be between 60-100 psi. Using pressures lower than 60 psi will adversely affect the Venturi process, as these pressures are too low to create the suction needed to educt the FireIce powder through the pickup tube. Using pressures higher than 100 psi will make it difficult to direct the product into the sub-surface area or manhole. Using a nozzle pressure between 60-80 psi is optimal.

Note: Pressures must be determined at the apparatus pump panel, as the FireIce equipment does not include an in-line pressure gauge.

8.4 The member operating the nozzle should commence operations at a safe standoff distance of 50 feet. After establishing an adequate gel solution, and as conditions allow, the nozzle team may advance toward the manhole while maintaining **a minimum safe distance of 25'** from the manhole opening. A dry 50-foot length of hose can be used to accurately judge distances.

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8.5 Direct the stream of FireIce solution to fall **approximately one foot** in front of the manhole opening and allow the product to flow into the manhole. Keep the stream in operation until any arcing or burning cable subsides. Con Edison supervisors will be on the scene for technical advice regarding whether further re-application of the product is necessary.

9. SAFETY HAZARDS

9.1 Members should be aware that a mixture of FireIce and water could create a slipping hazard in the operational area. When operations are completed, and conditions dictate, units shall ensure that the affected area is either washed down or that other measures are taken to leave the area in a safe condition (e.g. Speedy-dry, Sanitation sander, area taped off). Con Edison is responsible for any clean-up that may be required.

9.2 MSDS product sheets list the product as both a mild eye and respiratory irritant. Members are to be advised to operate upwind from the product and to refrain from positioning themselves directly over the product container when using the eductor. Further, members shall avoid any inhalation and prevent any dust or powder from coming in contact with users' eyes. If contact with any airborne product is unavoidable, members shall consider the use of SCBA with facepiece.

10. CLEANING AND STORAGE

10.1 Once operations have concluded, remove the pick-up tube from the FireIce container and close the eductor shutoff. Flush the nozzle with fresh water for a minimum of 30 seconds. Water from this flushing operation may be used to remove any product from the street area in order to minimize the slipping hazard. It will not be necessary to clean the pick-up tube in the traditional manner in which a foam pick-up tube is cleaned.

Note: The pick-up tube and hose must be dry before any use or re-use.

11. *Redacted for PFS*

BY ORDER OF THE FIRE COMMISSIONER AND CHIEF OF DEPARTMENT

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A.U.C. 202
September 2, 2022

SUBSTANCE POLICY: DRUGS / ALCOHOL

1. PRELIMINARY STATEMENT

This Circular:

1.1 Sets forth Department policy concerning the use and possession of illegal drugs; use and possession of legally prescribed drugs in a manner or purpose other than that which is lawfully prescribed; and use and possession of alcohol and marijuana by Department members.

1.2 Sets forth prohibited conduct related to illegal drugs and alcohol and marijuana.

1.3 Clarifies responsibility for enforcement of this policy.

1.4 Establishes conditions for mandatory testing for the presence of illegal drugs, marijuana or alcohol.

2. POLICY

2.1 As first responders to fires, public safety and medical emergencies, disasters and terrorist acts, the FDNY protects the lives and property of New York City residents and visitors. The Department advances public safety through its fire prevention, investigation and education programs. The timely delivery of these services enables the FDNY to make significant contributions to the safety of New York City and homeland security efforts. The efficient performance of this mission demands the highest level of mental and physical fitness of Department members. The lives of citizens and co-workers are dependent upon the fitness, stamina and alertness of firefighters and fire officers. Drugs and alcohol alter alertness, judgment, physical agility and the ability to fulfill one's work responsibilities. Any impairment of the member's physical and mental capabilities increases the danger of accidents and injuries, not only to the member, but to fellow firefighters and to the public. Accordingly, this circular sets forth the Department's policy with respect to alcohol, marijuana and illegal drugs. The purposes of this policy are as follows:

2.1.1 To ensure the safety of all members.

2.1.2 To prevent accidental injury to persons or property caused by impaired ability.

2.1.3 To promote good health and job fitness of all members.

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2.1.4 To provide assistance to any member who seeks the Fire Department's help in overcoming addiction to, dependence upon or problems with alcohol or drugs.

2.1.5 To maintain the reputation of the Fire Department and its members as responsible public servants worthy of public trust.

2.2 All members are required to be familiar with and to follow the policies and procedures set forth in this AUC and any addenda.

2.3 All members must be cognizant that time is of the essence with respect to substance-related misconduct, and that their duties as set forth below in Section 5 must be fulfilled immediately.

2.4 Violation of this policy may result in disciplinary action up to and including termination. A range of penalties is set forth in Section 8, below.

3. DEFINITIONS

3.1 Alcohol: any substance, including medication, that contains alcohol in any amount.

3.2 Illegal drugs include:

3.2.1 Any substance listed in Section 3306 of the N.Y.S. Public Health Law (including, but not limited to, amphetamines, anabolic steroids, barbiturates, cocaine, codeine, hashish, heroin, LSD, mescaline, methadone, methylenedioxymethamphetamine (ecstasy), morphine, narcotics, opiates, PCP, tranquilizers) that are:

a. obtained **without** a lawful prescription, or
b. used in a manner or for a purpose other than that which is lawfully prescribed.

3.2.2 Any substance used in a manner prohibited by State and local laws, rules and regulations.

3.3 Level of alcohol that elicits a positive test result: .05 blood alcohol concentration ("BAC") (this is the amount of alcohol in your blood) as determined by a urine, blood or saliva test.

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3.4 Levels of illegal drugs that elicit a positive test result:

Substance	Urine EMIT Test Level	Urine GC/MS Confirmation Test Level
1. Methadone	**300 ng/ml**	**300 ng/ml**
2. Opiates	**2000 ng/ml**	**2000 ng/ml**
2.a. 6MAM (Heroin)		**10 ng/ml**
3. Cocaine	**300 ng/ml**	**150 ng/ml**
4. Barbituates	**200 ng/ml**	**200 ng/ml**
5. Benzodiazepine	**300 ng/ml**	**300 ng/ml**
6. Darvon	**300 ng/ml**	**300 ng/ml**
7. PCP	**25 ng/ml**	**25 ng/ml**
8. Amphetamines	**1000 ng/ml**	**500 ng/ml**
9. Methaqualone	**300 ng/ml**	**300 ng/ml**

3.5 Positive test result: A laboratory test result that is certified by the Chief Medical Officer, or his or her designee, after reviewing the laboratory report and the completed Drug and/or Alcohol Testing Questionnaire (BHS-1) form or the Random Drug Testing Questionnaire (T-1) form, as applicable.

3.6 Premises: any FDNY division or battalion office, firehouse, ambulance station, or other location owned, leased or operated by FDNY including parking facilities adjacent to such premises.

3.7 Substance: alcohol or illegal drugs as defined in Sections 3.1. and 3.2.

3.8 Substance Test: A test for the presence of alcohol and/or illegal drugs analyzed by a laboratory facility licensed by the New York State Department of Health to perform forensic toxicology and approved by the Department.

3.9 Use: any ingestion, inhalation or injection of alcohol or illegal drug(s).

4. PROHIBITED CONDUCT

The following conduct by members is strictly prohibited:

4.1 Use, positive presence, possession, attempted possession, sale, transport or delivery of any ***illegal drug*** as defined in Section 3.2 while on-duty or off-duty; or while in uniform; or while in any Department premises, property or vehicle(s).

4.2 Use, possession, sale, transport or delivery of any ***drug paraphernalia (e.g. hypodermic needles used to inject illegal substances)*** while on-duty; or while in uniform; or while in any Department premises, property or vehicle(s).

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4.3 Use, positive presence, possession, sale, transport or delivery of ***alcohol or related paraphernalia (e.g. beer taps, beer kegs)*** while on-duty; or while in uniform; or while in any Department premises, property or vehicle(s).

4.4 Use, possession, attempted possession, sale, transport or delivery of marijuana while on-duty or while in uniform; or while in any Department premises, property or vehicle(s).

4.5 Any use of alcohol that may elicit a positive test result while on-duty.

4.6 Refusal to cooperate in any substance test ordered by the Fire Department, including the completion and signing of any required forms.

Note: This policy is not intended to prohibit conduct that is permitted by the Marijuana Regulation and Taxation Act that went into effect on April 1, 2021.

5. DUTIES REGARDING SUBSTANCE POLICIES

Duties of All Members

5.1 Every member (who is on duty or is off-duty and present in any Department premises, property or vehicle) who reasonably suspects or knows of a violation of this policy is required to report the violation **immediately** to the officer on-duty at the location of the violation, to the direct supervising officer of the member who may be in violation of this policy or, if appropriate, to the next superior officer. Any member who fails to report a suspected or known violation of this policy shall be subject to disciplinary action.

5.2 Use of Prescription Medication(s)

Every member on light or full duty who is taking a prescribed medication that might be impairing the mental or physical ability to fulfill his or her work duties shall immediately notify his or her commanding officer (or civilian supervisor, if the member has such a supervisor). No member is required to reveal any confidential medical information to their commanding officer or other supervisor. The member may provide a simple statement without revealing either the nature of the medication or the condition for which it was prescribed. Failure by a member to report this information to his or her commanding officer may subject the member to disciplinary action. The member's supervisor shall seek a determination from the Bureau of Health Services ("BHS") by ordering the member to BHS for a fitness for duty determination. The member's supervisor shall document the referral to BHS in the Unit Journal, or if a Unit Journal is not maintained, in a memorandum to his or her immediate supervisor. The member is required to inform BHS of all relevant medical information.

Duties of All Officers

5.3 Every officer on-duty or while in any Department premises, property or vehicle(s) will be held accountable for compliance by their subordinates with these policies. Failure on the part of officers to enforce these regulations will result in appropriate disciplinary action and will be reflected in the officer's performance evaluation.

5.4 Every officer who observes a member exhibiting possible signs of alcohol or drug abuse shall consult with the Counseling Service Unit ("CSU") and may refer the member to CSU.

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5.5 Every officer (whether on-duty or while in any Department premises, property or vehicle(s)) who reasonably suspects or knows that any member has engaged in conduct prohibited by this AUC or any addenda **shall immediately**:

1. Prohibit on and off-duty members present at the time of discovery of any violation of this policy from leaving premises without permission of the investigating officer. If any member is permitted to leave premises during an investigation, the investigating officer shall document the reason for the release in a report to be sent to the Chief of Department via the chain of command.
2. Immediately relieve the on-duty member(s) from emergency response duty.
3. Immediately have the affected unit placed out of service.
4. Notify the administrative Battalion Chief or, if appropriate, the next superior officer.
5. Notify the Bureau of Investigations and Trials ("BITs").
6. Document the incident in the company journal.
7. An Unusual Occurrence Report (UOR) shall be completed in accordance with Regulations, Chapter 30.3, for any instance where a member has a suspected or known violation of this policy. Documentation on the UOR should include all observations (positive or negative) of the member's appearance, behavior, speech, performance indicators, or body odors and any other observations that indicates violation of this policy.

Duties of All Chiefs

5.6 ***Redacted for PFS***

Duties of Investigating Officer

5.7 The officer charged with investigating a suspected or known violation of this policy **shall immediately**:

1. Conduct a roll call. All on-duty and off-duty members present in premises shall be part of the roll call.
2. Advise all officers and firefighters whom the investigating officer reasonably believes may be subject to charges of their right to representation before being questioned.
3. Following notification, conduct an investigation to ascertain which member(s) may have engaged in any conduct prohibited under this policy.
4. If the officer has reason to believe that any member(s) has violated this policy, the officer shall immediately order that such member(s) be tested for alcohol, marijuana and illegal drugs. If the officer orders testing, he or she shall document the reasons for the determination in a report to the Chief of Department via the Chain of Command. If the officer determines that there is no reason to believe that this policy has been violated, he or she shall not order testing and shall document the reasons for his or her determination in a report to the Chief of Department via the Chain of Command.

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Duties of Other FDNY Units and Personnel

5.8 After a suspected or known violation of this policy has been reported, Fire Officers, Medical Officers, BITs and the Testing Unit are authorized to order testing for alcohol, marijuana and illegal drugs. All testing ordered by a Fire Officer, BHS, BIT or the Testing Unit may be conducted by BHS, BIT or the Testing Unit. All reasons for testing shall be properly documented by the person or unit ordering the testing.

6. TESTING OF MEMBERS

6.1 All Members

The following members shall be tested for the presence of illegal drugs and/or alcohol, marijuana:

6.1.1 Every member ordered for testing pursuant to Section 5 of this policy.

6.1.2 Every member who has been arrested on or off-duty for any reason related to the prohibited conduct specified in section 4.3.

6.1.3 Every member who has been arrested on or off-duty for any reason related to the use or possession of an illegal drug.

6.1.4 Every member whose on-duty conduct leads to a reasonable suspicion that he or she is violating any provision of this policy.

6.1.5 Every member who has been on disciplinary leave or suspension that resulted from (a) the alleged use or possession of alcohol or illegal drugs, or (b) any violation of this AUC or any addenda (including the Random Drug Testing Policy). The BHS shall ensure that the testing takes place prior to the member's return to duty. Such testing may be conducted by BHS or the Testing Unit.

6.1.6 Every member who has operated a Department vehicle that has been involved in a major accident as defined in Safety Bulletin 3. The highest ranking officer who has responded to the accident shall ensure that the testing takes place in an expeditious manner and shall coordinate such testing with the Testing Unit. If any personnel required to be tested are immediately transported to a hospital, the Medical Officer on-duty shall ensure that the personnel transported are tested in an expeditious manner, and shall coordinate such testing with the Testing Unit, BIT or other required BHS personnel. The highest ranking officer (or where applicable, the Medical Officer), shall document the reasons for the failure to test a member via the chain of command in a written report to the Fire Commissioner and Chief of Department.

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6.1.7 Every member who, after a supervisory referral to the CSU, fails to comply with the treatment recommendations of the CSU. CSU will send the employee to BHS for a duty status evaluation that will include a substance test. The employee's noncompliance will be reported by BHS to the BITs. Any member who receives a supervisory referral and fails or refuses to comply with the treatment program recommended or approved by CSU will be deemed:

A. To have disobeyed an order to comply with the treatment plan recommended;

B. To have exhausted this treatment opportunity.

6.1.8 Every Probationary Firefighter, Firefighter, Wiper, Marine Engineer, Pilot, Fire Marshal, Lieutenant, Captain, Supervising Fire Marshal, Battalion Chief, Medical Officer, Deputy Chief, Deputy Assistant Chief, Assistant Chief Fire Marshal, Assistant Chief, Chief of Staff, Chief Fire Marshal, Chief of Operations, and Chief of Department shall be subject to illegal drug testing on a random basis.

6.1.9 Every member ordered for testing by a Fire Officer, BHS, BITs or the Testing Unit.

6.2 ***Redacted for PFS***

6.3 **Probationary Firefighters**

6.3.1 Every probationary firefighter shall be administered an illegal drug test as part of the 5th Grade medical examination.

6.4 **Members Who Have Signed a Testing Agreement**

6.4.1 Every member who has signed an agreement to be tested for illegal drugs and alcohol as a condition of employment or in settlement of a disciplinary matter shall be tested according to the terms of the agreement at the discretion of the Department and without prior notice.

6.4.2 Members subject to drug and alcohol testing pursuant to agreements with the Department may be tested while on-duty at any work locations. Testing Unit personnel shall administer such testing. Upon arrival of the Testing Unit, all personnel at the work location of the member to be tested shall comply with the instructions of the Testing Unit. The member's supervisor shall be responsible for promptly locating the member and for ensuring full and prompt cooperation with Testing Unit personnel.

6.4.3 Members shall not make any public announcement over the intercom or otherwise regarding the arrival of the Testing Unit personnel assigned to conduct substance testing of members.

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6.4.4 Members on light duty or administrative assignment shall be tested as follows. The ranking Commanding Officer of the unit where member is on administrative assignment or light duty will order the member to report to the Testing Unit forthwith when so informed by the Testing Unit. Transportation will be provided if necessary.

7. TESTING PROCEDURES

7.1 The Department shall test members according to the following procedures, unless the Department is conducting random drug testing.

7.1.1 In all instances, the Department will make every effort to ensure the integrity of the testing procedure and the privacy and dignity of members being tested.

7.1.2 A request to a member to provide urine blood constitutes an order. Every member shall comply with such orders. Members must cooperate fully in providing urine or blood specimens and shall follow instructions given by a Department doctor, nurse, BITs or Testing Unit personnel.

7.1.3 Trained personnel assigned to BITs or the Testing Unit will administer a urine test.

7.1.4 A doctor or nurse assigned to BHS will administer any blood tests.

7.1.5 BHS, BITs or the Testing Unit shall confirm the identity of the employee being tested by checking the member's:

- FDNY photo identification card; or
- New York State Driver license.

7.1.6 Members shall list on the Drug and/or Alcohol Testing Questionnaire (BHS-1) form:

- all prescriptions, over-the-counter medications or dietary supplements ingested, inhaled or injected, or otherwise taken within the previous 72 hours; and
- all substances containing alcohol consumed within the last twenty-four (24) hours, and
- all food ingested within the previous 24 hours. The information must be as specific and exhaustive as possible.

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7.1.7 Re-Testing Procedure

1. Any employee who has tested positive for any illegal drugs may, within 30 days of notification of such result, submit a Request for Drug and/or Alcohol Re-Test (T-3 Form) to BITs, seeking that the specimen be re-tested by a laboratory other than the one that conducted the first test.

2. Such request shall be granted provided that:

   A. The laboratory selected by the member for re-test is certified by the New York State Department of Health and approved by the Department for such testing;

   B. The member had provided a specimen sufficient for additional testing;

   C. The re-test by the second laboratory is performed solely at the member's expense;

   D. The re-test by the second laboratory is performed on a specimen contributed at the same time as that specimen tested by the Department's designated laboratory;

   E. The specimen is transported directly from laboratory to laboratory without handling by the member or any agent of the member, and

   F. The second laboratory provides test results directly to the Department as well as to the member.

7.2 Random Drug Testing

7.2.1 The FDNY shall comply with the random drug testing procedures set forth in AUC 202, Addendum 1. Every member who is subject to testing and other Department personnel shall comply with random drug testing as defined in AUC 202, Addendum 1.

7.3 Substance Testing for Members Who Have Signed Testing Agreements

7.3.1 Testing Unit personnel will call the officer on-duty, after the start of the tour, to ascertain that the member is working. The member is not to be notified until the tester arrives.

7.3.2 When the Testing Unit arrives at the work location, the officer on-duty should direct the member to report to the company office where the member will receive further instructions in connection with the testing to be administered.

8. GUIDELINES FOR VIOLATIONS OF THIS POLICY

The Department regards violations of this Substance Policy as serious offenses, and has established penalty guidelines for its violation. These guidelines are designed to cover the most common infractions, but there may be cases that do not fit precisely within them. The Department reserves the right to depart from these guidelines as the exacerbating or extenuating circumstances of each individual case require (including the number of supervisory referrals available to the member pursuant to PA/ID 8, Ch. 14). Moreover, settlement and testing agreements may contain additional conditions.

The following are guidelines only and are not meant to abrogate in any way the due process rights provided under the N.Y.S. Civil Service Law, the N.Y.C. Administrative Code or any applicable collective bargaining agreement. In addition, the Department's use of these guidelines will take into consideration any findings and recommendations made by an Administrative Law Judge after a N.Y.C. Office of Administrative Trials and Hearings trial or by a Hearing Officer after a disciplinary proceeding.

8.1-8.5 ***Redacted for PFS***

8.6 Termination of Probationary Firefighters

8.6.1 A probationary firefighter shall be terminated under the following circumstances:

A. Refusal to cooperate in a required substance test; or
B. Positive drug test indicating conduct prohibited by this policy.

8.6.2 A probationary firefighter may be terminated for any violation of this policy.

BY ORDER OF THE FIRE COMMISSIONER AND CHIEF OF DEPARTMENT

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DCN: 3.02.12

A.U.C. 207
March 15, 1997

SUBWAY AND RAILROAD TRACK OPERATIONS

1. INTRODUCTION

This Department, on many occasions, will be called upon to operate in the track areas of the numerous subway and railroad systems that serve all areas of the City. Fires and emergencies will occur on the elevated portions, in open cuts, in tunnels, or stations. There are general hazards prevalent in all systems and some hazards peculiar to a particular system. Within their area of response, all units, including Battalions and Divisions, must define and evaluate the hazards, problems, and conditions which may be present in the event of a fire or emergency on the subway or railroad system. This AUC will establish Department policy and general guidelines to assure a safe and efficient operation.

2. *Redacted for PFS*

2.1 Fire Department personnel will never be permitted to operate on track areas unless assured that the power is off. This rule may be ignored only if life is in imminent peril and direct and immediate action is required to save life. In the latter instance, every possible precaution should be taken to minimize the risk.

2.2 - 2.3 ***Redacted for PFS***

2.4 When every assurance has been given and verified in relation to the power shut-off, continue to operate with every precaution. Unexpected train traffic, restoration of power, or sudden panic must always be anticipated.

2.5 - 2.6. ***Redacted for PFS***

3. GENERAL OPERATIONS

3.1 When the Transit Authority requests the response of the Fire Department for an emergency or fire, they will supply the Fire Department with as much information as possible. Usually this will be limited and consist only of a reported fire or emergency at a specific station and the street location.

3.2 The first consideration on arrival at an operation involving electrified track will be a determination of whether the power is to remain on or turned off.

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3.2.1 When power removal is required it shall be accomplished at all times via apparatus radio through our own Dispatcher.

3.2.2 - 3.2.3 ***Redacted for PFS***

3.2.4 Exception: When there is immediate danger and power must be shut-off to save lives in imminent danger.

A. The nearest power removal box shall be used and the Desk Superintendent shall immediately be notified via the emergency telephone that power is to remain off. Failure to notify the Desk Superintendent will result in immediate restoration of power.

B. This power removal box and emergency telephone will be located near a blue light.

C. In any case, confirmation will be assured via Fire Department radio.

Note: ***Redacted for PFS***

3.2.5 Whenever power is removed, lights in the right of way, the station lights, signals, drainage pumping equipment, tunnel ventilation equipment, and train headlights will not be affected. Interior subway car lights, found to be either on or off, shall be no indication that power has been removed. The only verification that power has been removed shall be via the FDNY Dispatcher, as per Section 2.3 of this bulletin.

3.2.6 Subway cars can receive power from the third rail via a contact rail shoe(s). When members are required to operate under a subway car, request that Transit personnel protect the contact rail shoes of the affected cars with wooden slippers to further insure that no power can be transmitted.

3.3 If power is reported off on our arrival:

3.3.1 The Fire Department Dispatcher must still be notified to confirm power removal.

3.3.2 The possibility of coasting trains must always be expected. When power in a section of track is removed, the train operator will not necessarily be aware of this fact. In any case, he/she is instructed to coast into the next station to allow the safest method of passenger unloading.

3.4 When conditions do not require power removal, reconnaissance may be conducted by an Officer and a firefighter operating as a team and only from platforms or catwalks. Tracks shall not be entered or crossed.

3.5 ***Redacted for PFS***

3.6 Engine Companies shall not connect to a hydrant until the fire is located. Determination of the most direct means to the fire will be made before a line is stretched.

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3.7 Emergency exits might prove the most direct means of access to a fire area. However, evacuating passengers will always be given priority use of this means. When ordered to use an emergency exit, the officer should check his TA emergency exit booklet and make sure that he is on the correct line and track before members are committed to the track area. All units that have emergency exits in their district or first response area should have all members aware of their location.

3.8 Many operations will require more than one engine company due to long stretches. All efforts will be concentrated on stretching and placing in operation the initial line before back up lines are ordered.

4. COMMUNICATIONS

4.1 Handi-Talkie Relay: In underground areas, handi-talkie communication with the surface will be adversely affected. A relay system shall be set up to overcome this. Handi-talkie communications are poor from level to level. Communications in a straight line are from fair to poor. Some subway stations have multiple levels underground, which will require additional handi-talkies. The objective is to keep radios within range of each other to be able to communicate to grade level. An engine and truck can set up a relay with 2 to 6 members. The members who are part of the communications relay must maintain their position throughout the operation until relieved by the Incident Commander.

Truck Chauffeur	Bottom of subway entrance stairs. If the token clerk booth is within 50 yards of stairs to street, contact train dispatcher through the clerk. (There is a telephone in the token clerk's booth. Try to obtain additional information for the Company Officer and Incident Commander). The LCC should relay the token booth phone number to the Truck Officer in case it is necessary to call the booth from a blue light telephone.
Outside Vent FF	The foot of the stairs leading to the platform if it is within 50 yards of the Chauffeur.
Roof FF	Approximately 50 yards from the stairs on the platform for relay.
Engine Officer	Approximately 100 yards (line of sight) from Roof FF on the platform.
Truck Officer	To location of the fire.

Additional HT equipped members every 100 yards, if necessary.

Conditions may be such that all members are not needed in the relay to transmit messages to grade level. In this case, only members needed to establish an effective relay shall be used, beginning with the Truck Chauffeur. Any member after the Truck Chauffeur that is not needed in the relay, as determined by the Truck Officer, shall proceed to the location of the incident with the Truck Officer.

Note: Members in the relay are reminded to use proper intra-unit communications. The Officer of the unit will be identified by the unit number (Ladder 4). Other members in the relay will be identified by unit number and riding assignment and the term "RELAY" (Ladder 4 OV Relay).

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EXAMPLE:

Company Officer: "Ladder 4 to Ladder 4 Roof Relay. Notify Command there is a rubbish fire 100' south of the southbound platform."
Ladder 4 Roof: "Ladder 4 Roof Relay to Ladder 4 OV Relay. Notify Command there is a . . . the southbound platform."
Ladder 4 OV: "Ladder 4 OV Relay to Ladder 4 Chauffeur Relay. Notify Command there is a . . . the southbound platform."
Ladder 4 LCC: "Ladder 4 Chauffeur Relay to Command. Ladder 4 reports there is a rubbish fire 100' south of the southbound platform."

4.2 - 4.5 ***Redacted for PFS***

5. UNIT OPERATIONS

5.1 ENGINE COMPANY OPERATIONS

Depending on the route to be taken to gain access to the fire, whether Emergency Exit or main subway entrance, it may be advantageous for the Engine Company to be in close proximity to that location, and a supply line relayed from another pumper. In this manner the stretch can be started and when the relay company starts to feed the supply line with water, it will join in the stretch. Engine company chauffeurs should not hook up until the location of the fire is determined. All engine company personnel should be committed to getting the first line into operation. This will be a difficult and time-consuming stretch. Members should be spaced apart from each other. Water should not be started until it is assured that there is sufficient hose to reach the fire. Once this line is charged it will be almost impossible to move.

An FT-2 nozzle should be used for:

- Safety of a hollow stream over a solid stream in relation to conducting electricity.
- A rubber tipped nozzle (for the same reason).
- Has the effect of a fog stream for ventilation.

5.2 TRUCK COMPANY OPERATIONS

Can FF should carry a wooden hook instead of a Halligan hook. Truck FFs will possibly be operating in remote areas searching the tunnel area for civilians, making reconnaissance of the fire area and searching for the fire. All these operations might be in heavy smoke, with poor radio communications and over long distances.

Truck personnel shall:

- Always work in pairs.
- Have at least one radio per search team.
- Use extreme caution with metal tools.

5.3 FIRE IN STATION

Most fires in a station are of a minor nature, e.g. rubbish fire in trash receptacle, papers on railroad ties, or overheated ballast at station lights. A can will usually control these fires. There are occasions when the fire will be under the platform. If this is the case, members will not be permitted in track area unless:

- Power is removed.

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- Confirmation of power removal by F. D. Dispatcher.
- Members are posted at each end of platform to act as safety people.
- An alternate area of refuge is assured in case of train movement.

5.4 FIRE IN TRACK AREA

5.4.1 Fire in the track area may or may not require the power to be off, depending on the severity of the fire and smoke conditions. If a determination is made to leave the power on, wait until a train comes into the station and notify the train operator that you are walking out on the benchwall to extinguish the fire. With the train in the station, and the train operator advised to wait until our return back to the station, we are assured of trains not moving on that particular track. If the fire is on an express track, and our extinguisher cannot reach the fire, then power will have to be removed. UNDER NO CIRCUMSTANCES will members be allowed on tracks until the power is off, and confirmation of this fact relayed to us (the operating forces) by the FD Dispatcher. The only justification for being on the track area with live (energized) 3rd rail power and moving trains, is if civilians are on the tracks, and we must keep them away from the third rail to save their lives or if we are going to the blue light to remove power because of life hazard. By civilians it is meant people other than TA workers. TA workers are trained to be on live tracks.

5.4.2 When walking out on the benchwall to extinguish a fire in the track area of a tunnel, the Officer and the Can FF should be sufficient to achieve our purposes. Other members of the company should act as safety people and be stationed on the platform where the benchwall is located, and also on the opposite platform. Notification of oncoming trains should be made by radio and verbal communications by these members.

5.5 FIRE IN TRAIN

5.5.1. If there is a fire in a train, a determination has to be made as to its location. If the fire is in the car itself it may be insulation under the seat, a door motor, fan motor, light fixtures, or a smoldering fire under the seats in newspapers set by vandals.

5.5.2. A fire outside the train may be in the motor, switch-relay, journal box, or a hung up brake shoe. Once a fire starts and ignites the aluminum body of the car, a serious fire situation will develop with very acrid smoke and panicked civilians. Visibility in the tunnel will be zero.

5.6 ***Redacted for PFS***

5.7 ELEVATED ROADWAYS

5.7.1-5.7.2 ***Redacted for PFS***

5.7.3 When operating on elevated roadway, use extreme caution. The catwalks may be rotted, in disrepair, or eaten away from previous fires.

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5.8 ***Redacted for PFS***

6. *Redacted for PFS*

7. *SAFETY* CONSIDERATIONS

7.1 ***Redacted for PFS***

7.2 Contact with the third rail or the third rail cover must be avoided even when power is confirmed to be off. Unexpected restoration of power must be anticipated. Members crossing the third rail must not step on the third rail cover, but rather, over it.

Always operate as if power is on and avoid contact or proximity to the third rail and the third rail contact shoes. Even with power off there are elements within the undercarriage electrical system that possess enough voltage to cause a shock. Contact with any undercarriage electrical components must be avoided.

7.3 Whenever members are committed to a track area, firefighters shall be assigned in pairs to act as warning guards. The Officer in Charge shall assure that they are posted at the perimeter of an operation. Their primary function will be to warn all operating members of unexpected train traffic.

7.4 A member directed to halt traffic shall use a light. The light is to be held chest high and moved in a wide horizontal motion of at least four feet. Train Operators are accustomed to seeing trackwalkers (inspectors) carrying lights. If this horizontal motion is not used, the firefighter might be mistaken for a walker and the train will not stop. Members must use extreme caution**;** stopping a moving train with a light is not assured. They shall ensure themselves a position of safety and warn any endangered members to stand clear.

7.5 ***Redacted for PFS***

7.6 A pre-selected area of safety shall be a constant thought of all members for use in an emergency situation.

7.7 Every member shall be equipped with a flashlight. Operating in a subway without one will place his/her life and the lives of others in jeopardy.

7.8 A very dangerous condition exists when operations occur in proximity to a tunnel entrance or exit. Visibility will be extremely poor and must be counteracted by additional observers and extreme caution.

7.9 The possibility of no clearance between a moving train and the sidewall is very pronounced in some tunnel and railroad cut areas. The pre-selected area of safety, minimum staffing commitment and alert observers are essential in this instance. All items of clothing must be fastened securely to prevent the possibility of loose clothing being caught on a moving train.

7.10 Never assume power is off when railroad personnel are seen working on a 3rd rail. They are trained and equipped to operate while tracks are "live".

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Note: It is the constant awareness, preparedness, and paying attention to basics that have kept firefighters alive.

7.11 New York City Transit uses diesel powered work trains throughout their system. Members must remain vigilant for the movement of these trains even after power has been confirmed off and train traffic has been halted.

8. Redacted for PFS

8.1 BLUE LIGHT

Near the blue light there is a power removal box, a telephone, and fire extinguisher. The power removal box is operated by a pull-down lever located inside the box. If we find people on the tracks and we are forced to remove power, it is imperative that the telephone near the blue light be used to inform the Desk Superintendent that power is to be removed and the reason why (e.g., FD on scene, people on tracks and in danger of electrocution). To operate the telephone at these locations, remove the handset from inside the box and depress the button on the handset, keeping it depressed at all times during the conversation. Releasing the button will terminate the call. Dial the four-digit Subway Control Center number listed on the inside of the door cover (see Figure # 1). If unable to make contact with the Control Center using the primary number, release the handset button terminating the call, then depress the button on the handset and proceed to dial one of the two alternate numbers. This communication shall be made in order to ensure that the power is not restored. If the Desk Superintendent does not receive an immediate call from the person who operated the power removal box, power will immediately be restored on all tracks.

Figure #1

The Power Removal Box may not necessarily be located under the blue light, but it will be in proximity to it or across the tracks from it. This will require us to cross live third rails and be subject to moving trains. The correct way to cross a third rail is walk over it and not step on the third rail cover; it may fail from a person's weight if stepped on. In those cases where the power removal box is across the tracks, consider sending a member in another direction that does not require crossing the tracks. Remember that the only reason for operating on track areas without the assurance that power off is when life is in imminent peril and direct and immediate action is required to save life. While awaiting the arrival of a hand line, there should be a dry chemical extinguisher available to us at the blue light, but this may be missing due to vandals.

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Whenever NYC Transit personnel determine that a Power Removal Box or the Telephone is out of service, they will be covered with a bag to identify them as being out of service. This bag will be white, with red lettering, and it will state "Out Of Service. If a member encounters an out of service Power Removal Box, the member should use the associated Telephone to contact the Rail Control Center (RCC) to request the removal of power. The member must identify him/herself, state the reason that the power must be removed, and remain on the phone until they receive confirmation that power has been removed. All members are reminded that the use of a Power Removal Box to remove power should only be used as a last resort, when there is an imminent life hazard. The power limits

associated with the activation of a Power Removal Box can be very extensive and may result in many trains and passengers being needlessly stranded, requiring assistance, evacuation, and thereby compounding the incident.

The activation of a Power Removal Box, or the use of the associated telephone, does not alleviate the Officer in Command of the responsibility of requesting and confirming the removal of power via Department Radio, with the Borough Communications Office.

8.1.1 The blue light telephone as a communication link to a token booth.

A. The blue light telephone and token booth telephone are part of a Centrex system, very similar to the FDNY telephone system. In the Transit Authority, they dial the last four digits to contact another telephone number in the same exchange (an exchange is the first three digits of the telephone number).

B. If the token booth telephone is on a different exchange than the blue light telephone, you have to replace the three-digit exchange with the two-digit access code before dialing the four-digit number. These access codes are usually listed inside the blue light telephone box.

To Call Exchange	Dial Access Code
714	21
243	22
927	26
694	27
544	62
430	63
334	65
424	67
Example: 424-2145 becomes 67-2145	

C-D. ***Redacted for PFS***

8.2 CONTACT SHOES

Contact shoes are pieces of metal that conduct electricity from the third rail to car motors. They stick out from the sides of the car near the wheels. There are contact shoes on both sides of the cars. If any contact shoe is on the third rail, all contact shoes of car will be energized.

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8.3 CUT OUTS

Some benchwalls are provided with cut outs (safety niches) which are indented spaces in the wall of the tunnel. They provide room for a person to stand while a train passes by. When using a cutout, Firefighters are required to use the reduced-profile maneuver for their masks. The main problem with these areas of refuge is that track gangs sometimes use these spaces to store tools and equipment. When passing cutouts on a catwalk, observe to see if it is clear. If a train should come by unexpectedly, go back to the cutout you just passed, if it is clear.

8.4 EMERGENCY CAR DOOR CONTROL

The controls to open the doors in an emergency mode are located on the bulkhead near the doors. Depress the red handle and slide the door into the pocket. On older subway cars, lift the plastic seat closest to the door, pull the handle up, and slide the door into the pocket.

8.5 FIREFIGHTING EQUIPMENT

8.5.1 Dry chemical extinguishers at the power removal boxes, found along right of way, approximately 600 ft. apart.
8.5.2 All under river tubes of the NYC Transit are equipped with wet standpipe systems.
8.5.3 All of these under river tubes have siamese connections that are located on each end of the tube.
8.5.4 Water supplies for wet systems are city main connected at each end and protected from freezing.
8.5.5 Gate valves with Fire Department threads are located at approximately 200-ft. intervals.
8.5.6 The standpipes are equipped with 1½" hose and adjustable fog and straight stream nozzles.

8.6 NO CLEARANCE SIGNS

Along the walls of tunnels we will find "no clearance" signs. They are identified by diagonal red and white stripes painted on a wall. It may appear that there is clearance at this location but train overhang on turns and contact shoes will hit you if you are standing there.

8.7 STEEL DUST

Some subway tunnels have been in existence since the turn of the 20th century. Wheels and brake shoes on subway cars are made of steel. When brakes are applied on a train there is metal to metal contact producing steel dust. Over many years this dust mixes with oil from the passing trains. This dust forms on the walls, benchwalls, track-bed, and under carriage of the trains. Members are cautioned to use their eye shields even for a "Can" job as this dust is everywhere, and the minute particles of steel in the dust have been known to blind people.

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8.8 SUBWAY EMERGENCY EXITS

Emergency exits are stairways that lead up to the street from the track area. On the surface, they are located on sidewalks and in ventilating towers near the river. There are counter balance weights that will assist people to open the door. There is a bar across the door similar to a panic bar. When a person depresses the bar, the counter balance weight activates and the door opens. A prism-shaped sign or a cluster of 5 white lights identifies emergency exits in subway tunnels.

Note: Redacted for PFS

8.9 SUBWAY EMERGENCY KEYS

All companies are issued Subway Emergency Keys. There are three different key shapes and a pry bar on this tool. All the Subway lines (IND, BMT, IRT) emergency exits can be opened with this one key. The pry bar end is used to lift the emergency exit door, and to scrape out debris between the door and the door buck. However, some emergency exit locks are now appearing with other than the standard shapes. If this is the case, a pair of vise-grips or pliers will have to be used to open the emergency door.

8.10 SUBWAY GRATINGS

Gratings cover vents for subway tunnels and are usually found in sidewalks. If smoke is showing at the grating, and there is a light smoke condition in the station, this is usually an indication that the fire is in the setback in the tunnel vent directly under the grating.

8.11 SWITCHING AREA

An area where trains are routed from one track to another. If a member has a foot in this moving track, serious injury may result, even when power is off.

8.12 TRAIN CONSTRUCTION

Trains are a mass of transformers and relays, generators, switching equipment and compressors. Trains have air conditioning with large amounts of freon. There is oil for wheel bearings, insulation for seats, and wiring- all very toxic when burning. Batteries installed in subway cars for emergency lighting give off hydrogen gas, which is highly explosive. When fire ignites the aluminum of the car, toxic-irritating smoke will develop. All electrical components under the car shall be considered an extension of the third rail and charged with electricity. Use caution at all times.

9-10. ***Redacted for PFS***

BY ORDER OF THE FIRE COMMISSIONER AND CHIEF OF DEPARTMENT

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A.U.C. 207
ADDENDUM 3
January 9, 2024

ACCESS TO MTA NYC TRANSIT SUBWAY STATIONS

1. GLOBES

1.1 The MTA New York City Transit has color coded globes on all light posts at subway street entrances. These globes indicate what type of access is available when using the stairway entrance.

1.2 There are two globe colors being used at these entrances:

Red Globe: Indicates that there may or may not be a token booth clerk at this location, and that the stairway will be closed at some point during a 24-hour day.

Green Globe: Indicates that the entrance is open 24 hours a day. There may or may not be a token booth clerk at this location. In areas that are not served by a token booth clerk, access will be via a High Entrance/Exit Turnstile (HEET) or a gate.

1.3 When it is necessary to replace one of these globes, the new replacement globe will be a split-type design. The split-type globe will have the top half of the globe color coded (either red or green) denoting the type of access, and the bottom half of the globe will be clear (luminescence), providing better lighting for the stairway entrance.

1.4 Members are advised that where these light posts are installed, the first point of access, if possible, should be an entrance with a green globe.

2-3. Redacted for PFS

Type text here

4. HIGH EXIT ENTRY TURNSTILES (HEETs) & MEDECO KEYS

4.1 All stations within the MTA New York City Transit system have at least one entrance that is staffed full-time by an MTA NYC Transit Station Agent (Token Booth).

4.2 Due to the installation of HEETs, a number of station entrances that had been open part-time are now open full-time (Green Globe). On the gate that is adjacent to the HEET there is a lock that can be opened with a Medeco key that has been distributed to units. This will allow access to the system (see Photos 1 and 2).

4.3 ***Redacted for PFS***

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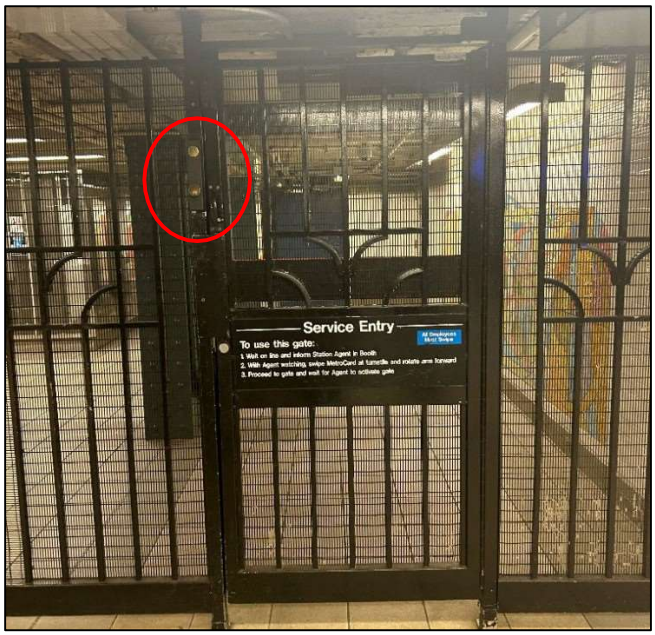

Photo 1

Photo 2

BY ORDER OF THE FIRE COMMISSIONER AND CHIEF OF DEPARTMENT

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DCN: 3.02.12 **A.U.C. 207, ADDENDUM 10**
March 7, 2000

SOUND POWERED TELEPHONES AND DRY STANDPIPES IN SUBWAY STATIONS

1. INTRODUCTION

The New York City Transit Authority is in the process of installing dry standpipes and hardwired sound-powered telephone systems at selected and/or newly renovated subway stations throughout the city. The dry standpipe will consist of a 4" pipeline with a 3" siamese connection at the street level and outlets in standpipe cabinets at the platform level. The sound-powered telephone system will be comprised of a hardwire installation with outlet jacks located in secure metal boxes at the siamese connection on the street level and at the platform level, in most cases, inside the stainless steel standpipe cabinet. **Note:** For additional information on Sound Powered Phones see TB Tools 31.

2. DESCRIPTION

2.1 The siamese connection (figure 1) will be located at the street level with appropriate signage stating that it is a supply for NYC Transit subway.

2.2 Standpipe outlets at the platform level will be located inside a locked stainless steel cabinet (figure 2). The cabinet can be opened by using the standard subway emergency exit key and will not contain hose.

Figure 1

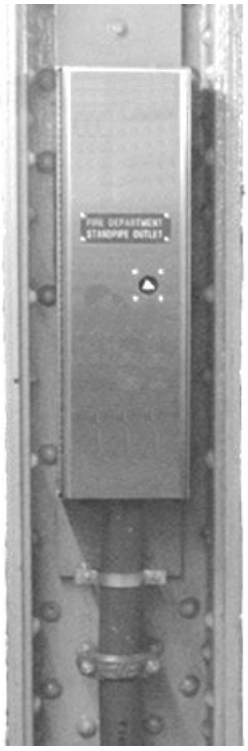

Figure 2

Figure 3

2.3 Sound-powered telephone outlet jacks will be located in a secure metal box that can be opened with an FDNY 1620 key. In most cases, the outlet jack box will be inside the stainless steel standpipe cabinet (figure 3).

2.4 The sound-powered telephone jacks are compatible with the handset equipment used by the Field Communication Unit and various other Fire Department units.

2.5 Sound-powered phone outlet jack boxes are not equipped with handsets. Handsets for sound-powered telephones will be distributed to field units by the Public Transportation Safety Unit, Bureau of Operations.

3. FIREFIGHTING OPERATIONS

3.1 Upon the installation of sound-powered phones and a dry standpipe system, the Public Transportation Safety Unit will contact the local Battalion and designated units to arrange for the issuance of sound-powered phones. The Public Transportation Safety Unit will issue sound-powered phones to the selected units, and conduct an on site familiarization drill with these units at the designated subway station.

3.2 Local units shall familiarize themselves with the new installations and Battalion Chiefs shall arrange multi-unit drills for these facilities. During these multi-unit drills, Battalion Chiefs shall ensure that all members are instructed in the use of sound-powered phones, and that Officers of units issued sound-powered phones conduct periodic drills with all members of their unit.

3.3 Administrative units shall generate a Critical Information Dispatch System (CIDS) card listing the location of the siamese connection and the street level sound-powered telephone outlet jack.

3.4 Normal subway operations dictate that the Engine Company shall not stretch a hose line until the location of the fire is determined and a stairway is selected which would best serve as the closest access point to the fire. Any firefighter who recognizes that the involved station is served by a dry standpipe system shall relay this information back to the engine officer and chauffeur.

3.5 Units equipped with sound-powered phones shall bring a telephone handset, a 1620 key, and a subway emergency exit key to the station platform level. Another telephone handset and a 1620 key shall be brought to the street level location of the sound-powered phone outlet jack box.

3.6 The standard handi-talkie relay procedure for communicating during subway emergencies can be augmented by sound-powered telephones, depending on the circumstances and the location of the incident.

3.7 If the dry standpipe is going to be utilized for firefighting purposes, the engine company shall carry the rolled up lengths of hose, standpipe kit, a subway emergency exit key, and a 1620 key.

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4. SAFETY

4.1 Firefighters are never permitted to operate on track areas unless assured that power is off through the FDNY dispatcher. This rule may be ignored only if life is in imminent peril and immediate action is required.

4.2 Engine company chauffeurs should be alert to the development of high nozzle pressures when pumping into a standpipe which is below grade. Head pressure should also be taken into consideration.

5. *Redacted for PFS*

BY ORDER OF THE FIRE COMMISSIONER AND THE CHIEF OF DEPARTMENT

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AUC 207, Addendum 11
October 13, 2000

NYC TRANSIT AUTHORITY
EMERGENCY EVACUATION DEVICE

1. INTRODUCTION

1.1 The Emergency Evacuation Device (EED) was designed by the New York City Transit Authority's Office of System Safety. EEDs are provided for FDNY use and are located throughout the Transit Authority's subway system.

2. DESCRIPTION

2.1 The EED is a yellow, 7-foot long device with steps on the front (Figure 1) and a flat surface on the backside (Figure 2). A non-skid surface is applied to both sides. Each unit weighs approximately 42 pounds.

2.2 These devices are constructed of fiberglass reinforced plastic and are electrically non-conductive for use within the confines of the subway environment.

2.3 When positioned against the side or end doors of a subway car the EED will reach the roadbed at approximately a 70° angle (safe for ascent / descent) and the steps will provide a horizontal stepping surface (Figure 3). A notch cut in the beams on one end of the ladder helps to anchor the EED in position against the car and or platform.

3. LOCATION

3.1 At underground and grade level stations, the EED is located at the first Blue Light location south of the southbound platform (typically within 50 feet of the platform end).

3.2 At elevated stations, the EED will be located in the area of the full time token booth.

3.3 An EED is located at the base of the emergency exit, at both ends of each under river tunnel.

3.4 Keys to remove EEDs from their mounting brackets are available at every token booth.

3.5 In Staten Island, EEDs are located near Tower B, at the Saint George Rail Terminal and near the crew quarters at the Tottenville Train Yard.

4. ACCESS

4.1 Metal mounting brackets are provided at each location and are secured with a corrosion resistant padlock. If a key can not be obtained, the locks can be forced using conventional forcible entry methods.

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5. OPERATIONS

5.1 The Emergency Evacuation Device can be used in the following three ways.

5.1.1 When passengers are being evacuated to the roadbed, the EED is positioned with the cut out against the edge of the car floor with the step side up. The ladder provides a safe angle for most ambulatory passengers to descend, however personnel must be assigned to both the top and the bottom of the ladder, to provide assistance and stability to the passengers.(Figure 3).

5.1.2 The EED can also be used as an evacuation stair to access the platform level from the roadbed.

5.1.3 When a rescue train is used, the EED can be positioned step side down, to form a bridge between two adjacent cars. The flat surface provides a stable platform to walk passengers from one car to another. Personnel must be stationed in each car to provide assistance and stability to the passengers.

Figure 1

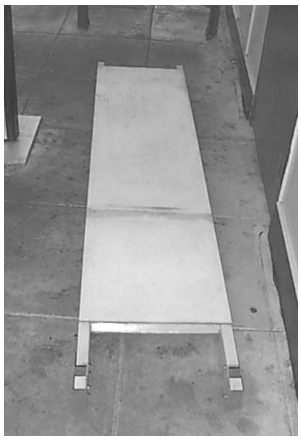

Figure 2

Figure 3

BY ORDER OF THE FIRE COMMISSIONER AND THE CHIEF OF DEPARTMENT

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A.U.C. 220
July 15, 2010

SELF CONTAINED BREATHING APPARATUS (SCBA) POLICY

1. INTRODUCTION

1.1 The wearing/use of an SCBA, including all types issued by the Department, shall be in accordance with this circular.

- **WEARING** an SCBA shall mean having the harness on, with the facepiece in a standby position.

- **USING** an SCBA shall mean having the facepiece on with the regulator donned.

1.2 ***Redacted for PFS***

1.3 The wearing/use of SCBAs may be dispensed with only when authorized by the Incident Commander. The determination to dispense with wearing/using SCBAs should be based upon the consideration of the possibility of toxic materials being present and the potential for CO, smoke, or fume injuries as well as the training opportunities presented by conducting the operation with SCBAs.

2. STRUCTURAL OPERATIONS

2.1 All members shall use SCBA when:

A. Performing interior structural firefighting operations.

B. Performing interior structural emergency operations when toxic substances or smoke are present.

C. Operating at exterior positions where exposed to smoke or toxic substances.

Note: During the initial stages of an operation, members operating from the exterior e.g., Roof firefighter operating on the roof, Outside Vent firefighter operating from a fire escape, may not be exposed to smoke or toxic substances. However, members must be aware of how suddenly conditions can change and be prepared to use their SCBA when exposed to smoke or toxic substances.

D. Operating in confined spaces, as defined in Training Bulletins, SCBA and CONFINED SPACE OPERATIONS.

E. When it is possible that the atmosphere in a work environment is an IDLH area.

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2.2 Members operating in smoke or toxic atmospheres should not remove SCBA regulator except:

A. If the members cylinder becomes depleted.

B. If the member's SCBA is malfunctioning, so as to cut off the air supply.

2.3 Leaving the facepiece donned and removing only the regulator will provide some protection to the member's face.

2.4 In all circumstances, where a member's cylinder becomes depleted or his/her SCBA is malfunctioning cutting off the air supply, member shall notify their Officer and immediately leave the contaminated area accompanied by another member using an SCBA. The removal of the facepiece shall be accomplished in an uncontaminated atmosphere whenever possible**.** ***Redacted for PFS***

2.5 All members must be teamed-up when operating within an IDLH atmosphere. When a member needs to leave the IDLH area to service their SCBA, they MUST notify their Officer and be accompanied to a safe area by another member using an SCBA. ***All members shall comply with the provisions of Firefighting Procedures, Volume 4, Book 1, Chapter 1 titled Safety Team***.

2.6 ***Redacted for PFS***

2.7 Facepiece sharing with other members and/or civilians is **PROHIBITED**. Facepiece sharing hampers the search for an exit and depletes the limited air supply in less time, thus posing risk to both member or civilian and rescuer. Facepiece sharing increases the exposure to airborne contaminants such as Carbon Monoxide (CO), Hydrogen Cyanide (HCN), as well as numerous other carcinogenic toxins. Therefore, the member or civilian should be removed from the contaminated area as soon as possible, to a location where proper medical treatment can be administered.

2.8 If it is not possible to remove the member or civilian from the contaminated atmosphere, then one of the following options can be used to provide an air supply while freeing the trapped individual.

A. For trapped members, utilize the nearest available FAST Pak.

B. For civilians, utilize a FAST Pak other than the one assigned to the FAST Unit.

C. Utilize a spare SCBA to provide air strictly to the trapped member or civilian.

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3. OTHER THAN STRUCTURAL OPERATIONS

3.1 SCBAs are required to be worn/used at operations other than structural, including but not limited to the following:

A. Outside fires involving rubbish, brush, dumps, ADVs, autos/trucks/buses, street transformer vaults, etc.

B. Certain non-structural emergencies.

C. Any other incident where there is a possibility of exposure to toxic substances.

4. *Redacted for PFS*

5. RESPONSIBILITY FOR COMPLIANCE

5.1 *Redacted for PFS*

5.2 **The practice of "cheating", (the intermittent use of SCBA while in smoke or toxic atmospheres) the use of cheaters, or any other unauthorized modifications, is expressly forbidden. (See Reference 1)**

5.3 **Members shall comply with grooming standards as per PA/ID 8 Ch 1 in order to maintain a good seal between the SCBA facepiece and face.**

5.4-5.5 *Redacted for PFS*

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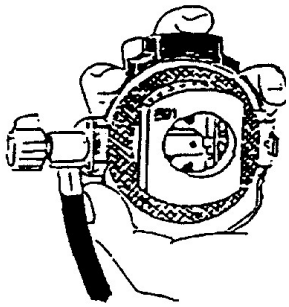
Reference 1

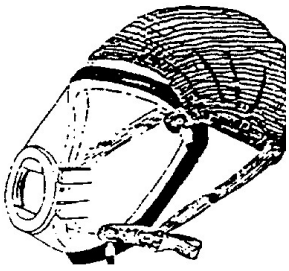
WHO IS BEING CHEATED?



YES

Use of **Cheaters** or any **other unauthorized modifications** are not only hazardous to the user's health; there is also a potential liability to the officer who allows its use. Carcinogens and other toxins can enter your body via the nose, throat and eyes.

NO



Permanent damage and pain can and will occur to eyes and lungs as a result of repeated exposure to fire gases.

The potential liability a supervisor may incur if they knowingly violate an OSHA/PESH regulation that results in a serious injury or death is both criminal and civil. In addition, the Department can be fined substantially and will be **prohibited** from paying the monetary penalties on behalf of the **supervisor**.

USE YOUR SCBA PROPERLY
MAKE SURE THE MEMBERS USE THEIRS!!!

BY ORDER OF THE FIRE COMMISSIONER AND CHIEF OF DEPARTMENT

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A.U.C. 230
EMS OGP 106-14
January 8, 2019

REHABILITATION AND CARE PROCEDURES

1. INTRODUCTION

1.1 Emergency incident operations can be physically and mentally taxing to firefighters and emergency medical personnel operating on the scene. Fire and EMS responders perform physically demanding work while operating in personal protective equipment (PPE). The physical stressors are intensified during the performance of duties by the environmental factors of high heat and humidity as well as cold weather and wind.

1.2 On scene rehabilitation as defined in NFPA 1584 is an intervention designed to mitigate against the physical, physiological and emotional stress of firefighting in order to sustain a member's energy, improve performance, and decrease the likelihood of on scene injury or death. Recovery is defined as the process of returning a member's physiological and psychological states to levels that indicate the person is able to perform additional emergency tasks, be reassigned, or released without any adverse effects. It is the intent of this policy to ensure an effective rehabilitation and recovery of all members following an emergency response.

2-4. *Redacted for PFS*

5. MEMBER RESPONSIBILITIES

5.1 Participate in rehabilitation activities when assigned.

5.2 Maintain adequate hydration levels.

5.3 Advise their officer when they believe their level of fatigue or exposure to heat or cold is approaching a level that could negatively affect them or the operation in which they are involved.

5.4 All members shall remain aware of the health and safety of other members of their unit.

5.5 Five gallon water jugs carried on Fire apparatus shall be checked and refilled with fresh water at each roll call.

6-7. *Redacted for PFS*

8. ENVIRONMENTAL FACTORS

8.1 The difference between the member's core body temperature and the environmental temperature is called the thermal gradient. If the environment is warmer than the member, heat will flow from the environment to the member. If the environment is cooler than the member, heat will flow from the member to the environment. The greater the thermal gradient, the more rapid will be the subsequent heat transfer.

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8.2 Members subjected to heat stress and fatigue can sometimes suffer life-threatening emergencies such as heat stroke or cardiac arrest. Bunker gear can impede heat dissipation and traps moisture next to the skin. To reduce heat stress and prevent life-threatening emergencies due to an elevated core body temperature, members will use active and passive cooling methods in a designated Rehabilitation Group.

8.2.1 Active cooling is the process of using external methods or devices (e.g., misting fans) to reduce elevated core body temperature.

8.2.2 Passive cooling is the process of using natural evaporative cooling (e.g., sweating, moving to a cool environment) to reduce elevated core body temperature.

8.3 The impact cold weather has on members and operations must be recognized. Cold weather requires special consideration in regard to incident scene operations. A significant factor for members is the combination of cold and wind. The presence of wind increases the transfer of heat by the forces of convection. The wind increases the transfer of heat away from the person's body.

BY ORDER OF THE FIRE COMMISSIONER AND CHIEF OF DEPARTMENT

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A.U.C. 230, ADDENDUM 2
January 4, 2022

HEAT STRESS – HEAT RELATED ILLNESS

1. INTRODUCTION

1.1 It is important that all members be aware of the dangers associated with increased physical stress levels. Due to our work environment, PPE and other factors, these illnesses can occur any time of the year, even in the fall/winter. Heat stress illnesses can result in heat cramps, heat rash, heat exhaustion, heat syncope, heat stroke and rhabdomyolysis.

1.2 Firefighters are exposed to heat from several sources, including heat from a fire, ambient temperature, and heat generated by muscles during physical exertion.

1.3 Heat stroke and rhabdomyolysis are potential life-threatening emergencies and require immediate medical attention and are discussed in this document.

1.4 **Dehydration which will also be discussed in this document is the most common type of heat-related illnesses. Other heat related illnesses are often exacerbated or begin as dehydration.**

1.5 Because exertion in challenging environments and situations is such a fundamental part of firefighting, firefighters need to know the signs and symptoms of these illnesses, quickly recognize the potential danger and seek medical attention when necessary.

1.6 **Warmer weather increases our members risk to heat related illnesses. However, due to our work environment, PPE and other factors, these illnesses can occur any time of year in any type of weather.**

1.7 The heat contribution from physical exertion should be appreciated as a potential health hazard just as serious as potential heat contribution from warm or hot outside air temperatures.

2. STATISTICS

2.1 According to the United States Fire Administration (USFA) statistics on firefighter fatalities, heart attacks continue to be a leading cause of line of duty deaths.

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3. ILLNESSES

3.1 **Heat Stroke:** is one of the most serious heat-related illnesses. It occurs when the body becomes unable to control its temperature. The body's temperature rises rapidly, the sweating mechanism fails, and the body is unable to cool down. When heat stroke occurs, the body temperature can rise to 106°F or higher within 10 to 15 minutes. Heat stroke can cause death or permanent disability if emergency treatment is not given. It can be fatal if treatment delayed.

3.1.1 **Symptoms:** Confusion, altered mental status, slurred speech; Loss of consciousness (coma); Hot, dry skin or profuse sweating; Seizures; Very high body temperature.

3.1.2 **Treatment:** Move the firefighter to a shaded, cool area and remove their outer clothing. Cool the firefighter quickly with a cold water or ice bath if possible; wet the skin, place cold wet cloths on the skin, or soak clothing with cool water; Circulate the air around the firefighter to speed cooling. Place cold wet cloths or ice on the head, neck, armpits, and groin; or soak the clothing with cool water.

3.2 **Rhabdomyolysis:** is a breakdown of damaged muscle tissue that releases proteins and electrolytes into the bloodstream which can cause heart and kidney damage. Rhabdomyolysis can have debilitating or deadly consequences if not quickly diagnosed and treatment started. Structural firefighting and training often involves exposure to heat and prolonged, intense exertion. These factors increase the risk for this dangerous condition known as rhabdomyolysis (often referred to as rhabdo). This condition can occur for many reasons, including engaging in the type of extreme physical exertion common with firefighting.

3.2.1 **Symptoms:** Muscle cramps, aches, or pain that are more severe than expected**;** Weakness; Exercise intolerance – unable to complete a usual workout routine**;** Abnormally dark (tea- or cola-colored) urine**;** Symptoms may not appear for up to several days after a firefighter was physically active or exposed to heat. Rhabdo symptoms may look similar to heat cramps and dehydration and potentially be misdiagnosed. For this reason, it is important to let the healthcare provider know you are a firefighter. The only way to tell for certain if rhabdo is occurring is to have a healthcare provider draw blood to check for creatine kinase (CK) or obtain a urine sample and test for myoglobin. These are proteins released from muscle tissue when muscle is injured.

3.2.2 **Treatment:** When you experience any of the symptoms listed above: Immediately stop the activity you are performing, cool down and drink fluids.

A. When symptoms occur on the fireground or during training - immediately notify the Incident Commander or supervisor and seek immediate medical attention.

B. When symptoms occur away from work, seek immediate medical attention.

C. Inform the healthcare provider that you are a firefighter and ask to be checked for rhabdo.

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3.2.3 **Risk factors:** Heat exposure; Intense physical exertion; Certain cold and allergy medications; Dietary supplements such as creatine; Common prescription medications such as statins that lower cholesterol; Certain antibiotics; Certain genetic predispositions, such as sickle cell trait. These factors increase one's risk, but for most the increased risk is small and manageable with proper hydration. Even firefighters with no known risk factors can get rhabdo. It can happen following activities you have done in the past without a problem. Even athletes and physically fit firefighters can develop rhabdomyolysis. Suspect rhabdomyolysis with heat-related illnesses and dehydration, muscle pain, or exercise intolerance and seek immediate medical attention.

3.3 **Dehydration:** occurs when you use or lose more fluid than you take in, and your body doesn't have enough water and other fluids to carry out its normal functions. If you don't replace the lost fluids, you will get dehydrated. If you're dehydrated, you're also likely to have low blood pressure, especially when moving from a lying to a standing position; a faster than normal heart rate and reduced blood flow to your extremities.

3.3.1 **Dehydration is the most common of heat-related illnesses. Other heat related illnesses are often exacerbated or begin as dehydration.**

A. **Symptoms:** Extreme thirst; Less frequent urination; Dark-colored urine; Fatigue; Dizziness; Confusion.

B. **Causes**:

1. Diarrhea / vomiting: Severe, acute diarrhea — that is, diarrhea that comes on suddenly and violently — can cause a tremendous loss of water and electrolytes in a short amount of time. If you have vomiting along with diarrhea, you lose even more fluids and minerals.

2. Fever: In general, the higher your fever, the more dehydrated you may become. The problem worsens if you have a fever in addition to diarrhea and vomiting.

3. Excessive sweating: You lose water when you sweat. If you do vigorous activity and don't replace fluids as you go along, you can become dehydrated. Hot, humid weather increases the amount you sweat and the amount of fluid you lose.

4. Increased urination: Certain medications, such as diuretics and some blood pressure medications, also can lead to dehydration, generally because they cause you to urinate more.

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4. PREVENTION

4.1 One of the best ways a firefighter can minimize their risk of heat related illness is to stay properly **HYDRATED**. Hydration is essential to bodily function. Firefighters must make this a focus of their day-to-day operation, especially during highly arduous and taxing evolutions, whether in training or on the fireground.

4.1.1 There are many factors that impact and determine a firefighter's optimal fluid intake. Fluid needs can be estimated from bodyweight. Hydration levels can be measured based on urine color, though this is not one hundred percent effective - it is reliable enough to be consistently encouraged.

4.1.2 Failure to maintain hydration may decrease the body's ability to self-regulate internal temperature, reduce sweating and cooling, while increasing the likelihood of metabolic or systemic failure. Even a loss of 1 to 2 percent of bodyweight due to fluid loss during an evolution can have a marked reduction in effectiveness of the member. Hydration is key to safety and success.

4.2 As a general rule, firefighters should drink a minimum of 80 ounces of water every day. Since dehydration can occur over a several day period, this recommended minimum fluid intake should be followed on off days as well as days on duty.

4.3 Members should drink before, during, and after training evolutions or physical activity to maintain an electrolyte balance. For example:

4.3.1 Drink 16 ounces of fluid 2 hours before physical activity.

4.3.2 Drink another 8 to 16 ounces 15 minutes before physical activity.

4.3.3 During physical activity, drink 4 to 8 ounces of fluid every 15 to 20 minutes (some athletes who sweat considerably can safely and comfortably tolerate up to 48 ounces per hour).

4.3.4 After physical activity, drink 16 to 20 ounces of fluid for every pound lost during physical activity to return to normal hydration status.

4.4 It is important to be aware that excessive fluid intake in a short period of time can be dangerous to one's health. Do not consume water or fluids in excess to make up for lack of preparation.

5. CONCLUSION

5.1 As stated earlier, certain heat related illnesses can have debilitating or deadly consequences if not quickly diagnosed and treatment started. Knowing the signs and symptoms can save your life.

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5.2 ***Redacted for PFS***.
Acclimatization to warmer outdoor temperature usually occurs after 7-14 days of exposure to a hot environment. Therefore, unseasonably warm day's particularly in the spring and early summer when firefighters may not be acclimated to higher temperatures may require more frequent relief.

5.3 Company Officers need to notify the IC of the future need for relief of their units before their members become physically over-stressed. This is important for the overhaul stage, but even more so during the pre-control phase of the operation so that vital operations are continued without interruption and without any associated safety impact on members.

5.4 Firefighters must constantly monitor and be aware of their own physical stress levels. Members often concentrate on the task at hand to the exclusion of their own personal safety. Members should inform their Officers of the need for relief prior to becoming physically over-stressed.

5.5 After members have been relieved, they should be aware of the following guidelines for recuperation and rehabilitation:

5.5.1 Members should seek cool, shady areas when possible during rehabilitation.

5.5.2 Casually moving about will enhance rehydration due to increased blood circulation.

5.5.3 Members should make use of the RAC unit's equipment and supplies (ice, water, drinks, and cold towels).

5.5.4 Members should remove their helmets and coats, and open the front flap of their pants as soon as operations safely permit to remove pent up heat and humidity within the Bunker Gear.

5.5.5 No member should be alone during any phase of the recuperation process; maintain the "buddy system" for the duration of R&R.

5.5.6 Any member exhibiting any signs or symptoms of heat stress related illness should be evaluated and monitored by EMS.

5.6 *ALL MEMBERS MUST RECOGNIZE THE NEED TO PROPERLY WEAR ALL THEIR PPE AT OPERATIONS. DO NOT OMIT THE USE OF ANY PPE TO ALLEVIATE HEAT STRESS.*

BY ORDER OF THE FIRE COMMISSIONER AND CHIEF OF DEPARTMENT

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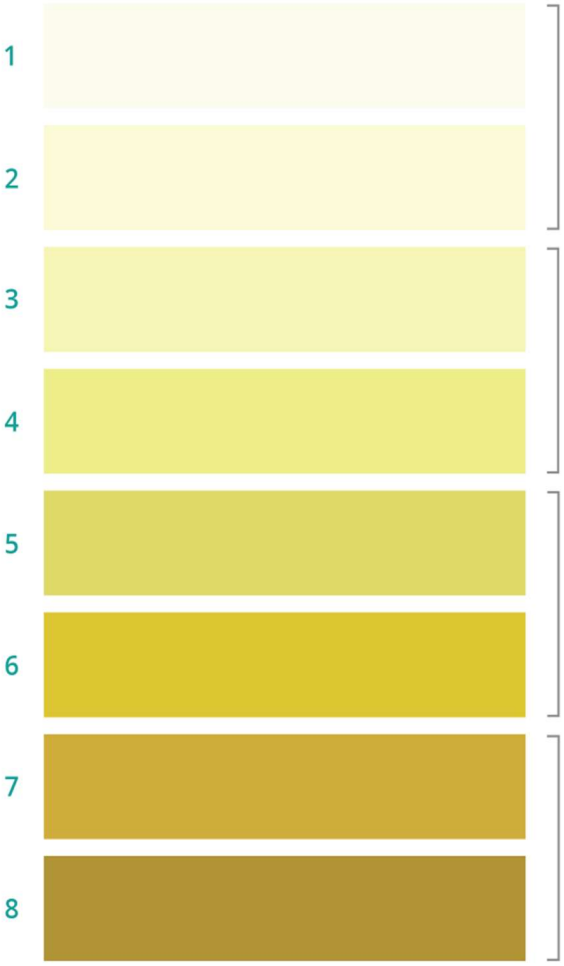
URINE CHART

DEHYDRATION IS A SERIOUS ISSUE.
IT CAN LEAD TO HEAT STROKE, RHABDO AND EVEN DEATH

Unfortunately, thirst isn't always a reliable gauge of the body's need for water. A better parameter is the color of your urine. Clear or a light-colored urine means you are well hydrated, whereas a dark yellow or amber color usually signals dehydration.



1 TO 2: HYDRATED
Pale, odorless and plentiful urine is often an indication that you are well hydrated.

Keep drinking at the same rate.

3 TO 4: MILDLY DEHYDRATED
Slightly darker yellow urine can indicate that you need to drink more water.

Drink a glass of water now.

5 TO 6: DEHYDRATED
Medium-dark yellow urine is often an indication that you are dehydrated.

Drink 2-3 glasses of water now.

7 TO 8: VERY DEHYDRATED
Darker, strong-smelling urine in small amounts can be a sign of dehydration.

Drink a large bottle of water immediately.

Your target is to make sure that your urine is the same color as numbers 1, 2, or 3.
Colors 4 and 5 suggest dehydration
While 6 and 7 indicates severe dehydration.

Abnormally dark (tea- or cola-colored) urine (number 8) is a sign of possible Rhabdomyolysis (often referred to as rhabdo). This condition requires immediate medical attention!

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PERSONAL PROTECTIVE EQUIPMENT (PPE)

1. UNDERSTANDING YOUR BUNKER GEAR

1.1 FDNY firefighters need to be aware of the vital protection provided by their bunker gear. Bunker gear is one of the most important pieces of equipment the FDNY members are issued to protect themselves in countless different FDNY operations. FDNY bunker gear is designed to be tough and durable while at the same time maintain comfort and breathability essential to minimize fatigue and heat stress.

1.2 Historically, the level of firefighter protection has increased dramatically over the years. The early use of leather or canvass trench coats has been replaced with today's modern fabrics (e.g. Arameids such as Nomex, Kevlar and PBI) creating a combination of jacket and pants with suspenders. Bunker gear with its mandated fluorescent striping is familiar as the visual recognition of a "firefighter". However, the actual function and inner workings of the bunker gear are less known. As a key element of FDNY members PPE (Personal Protective Equipment), bunker gear provides them protection against many injuries over a wide range of conditions while also minimizing heat stress. To accomplish this complicated task, bunker gear is comprised of three distinct layers; the outer shell, the moisture barrier, and the thermal liner. These layers in combination are specifically designed to assist in insulating the wearer from extreme hot and cold environments. In addition each layer serves other specific functions.

2. THE OUTER SHELL

2.1 The outer shell is the very outer layer and is the first line of defense. It provides flame resistance and also protection from abrasion, cutting, and tearing. More importantly it helps to protect the effectiveness of the thermal liner and moisture barrier.

3. THE MOISTURE BARRIER

3.1 Although the outer shell provides some resistance to water, the moisture barrier provides additional resistance to water plus protection from chemicals and viral agents. This is accomplished by a permeable film barrier laminated to a flame-resistant substrate material. This substrate specifically designed in combination with the other layers is the mechanism for shedding body heat by allowing moisture vapor (sweat) to escape.

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4. THE THERMAL LINER

4.1 The thermal liner is the most critical component in bunker gear because in conjunction with the vapor barrier, the two account for approximately three quarters of the thermal protective performance (the other quarter is made up by the outer shell). This is accomplished by air trapped in or between the layers of material that is quilted (attached) to the face cloth material. The face cloth material is the inner most part of the bunker gear which offers wick ability (absorbs less moisture and remains dryer) and smoothness which improves comfort, mobility, and assists in moisture management.

4.2 There is a broad range of offerings for the different composites and components of the three layers that make up a members bunker gear. One of the most important factors in this selection is to match the specific fabric combinations based on geographic location and climate, activity level, and crew. The FDNY has done extensive research to provide FDNY members with the composite that provides optimal thermal protection while at the same time assists in heat and stress reduction. Thermal protection, mobility, breathability, comfort, moisture protection, and total heat loss have all been considered in selecting the FDNY bunker gear.

4.3 Firefighting bunker gear requires some of the most extensively tested items in the protective clothing industry. There are hundreds of tests administered to the many materials, components, and overall clothing manufacturing itself in order to certify that they meet the National Fire Protection Association (NFPA) 1971 Standard on protective clothing for structural firefighting. All FDNY bunker gear meets or exceeds the NFPA 1971 requirements.

4.4 Of the numerous tests that are required most deal with accepted tests and requirements universally accepted in the safety garment industry. There are several tests that are often associated with firefighting bunker gear that it may be beneficial for wearers to have some familiarization with:

- **Vertical Flame** test evaluates flame resistance of materials when contacted by flame.

- **Forced Air Oven** test is a convective heat exposure which ensures materials will not melt, drip, or ignite when exposed to an exposure of 500 degrees Fahrenheit for five (5) minutes.

- **Thermal Protective Performance (TPP)** which is designed to measure the amount of heat transferred through the composite (the combination of the three layers) when exposed to heat and thermal radiation. This exposure is intended to simulate the heat energy associated with a flashover.

  Note: It is important to understand that TPP measurements do not imply certain protection time, because the test only simulates one of an unlimited set of exposure conditions

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- **Conductive and Compressive Heat Resistance (CCHR) t**est is utilized for evaluating added protection in areas of the bunker gear that is known to be compressed during normal operations. This test provides a method of assessing the added insulation required by comparing the insulation provided by garment reinforcements when contacted with hot surfaces. All garments must have additional insulation for added protection in the shoulder (SCBA straps) and knee (from crawling) areas. When the composites are **co**mpressed they lose the trapped air in the thermal liner which is critical for the thermal protection.

- **Total Heat Loss (THL)** test is designed to measure the ability for bunker gear to allow body heat to escape. The total heat loss test creates a mechanism to measure bunker gear's breathability. This test also provides the balance between thermal protection and evaporative cooling required for stress reduction. Having a basic understanding of the make-up and testing certifications required for bunker gear is important to ensuring its continued safety performance to be there when members need it. Inspection, care, and maintenance of all members PPE will provide members the best advantage when performing their daily firefighting duties.

5. PPE DISTRIBUTION

5.1 All members will be issued the following(at the completion of PFS):

- Two sets of bunker gear (BFI is issued one set)
- Two pairs of bunker boots
- Two pairs of gloves
- Two hoods
- One Helmet

6. DESCRIPTION

6.1 The PPE consists of:

- Bunker Gear
  A. Bunker Coat
  B. Bunker Pants
- Bunker Boots (Leather)
- Station Uniform
- Gloves
- Helmet
- Protective hoods

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6.2 Company Commanders are directed to ensure that all members comply with the procedures for marking bunker gear as follows:

Bunker Coat - shall be marked with a permanent black marker. First Initial, last name, and assigned unit number shall be printed in one inch (1") letters on the liner inside the right edge of the coat, between the snap for the liner and the coat edge.

Bunker Pants - Shall be marked with a permanent black marker. First Initial, Last name, and assigned unit number shall be printed in one inch (1") letters on the liner on the right side of the fly, between the Velcro closure and the manufacturer's label.

6.3 **Bunker pants shall never be worn without knee pads in place.** It is prohibited to remove or alter **any part** of the bunker gear.

6.4 Bunker Gear shall be kept clean. Dirty Bunker Gear can absorb more heat, causing the degree of protection to become lessened, increase your risk of developing cancer, and may actually cause the material to ignite.

6.5 Bunker Gear when properly used and maintained will afford a limited period of protection to exit an area which has become or is about to become untenable. It is not a "Proximity Fire Fighting Ensemble" such as that used in Airport Crash and Fire Rescues.

6.6 The wearing of Bunker Pants Suspenders is an essential part of the Bunker Pants function in protecting the lower extremities. The wearing of the suspenders is **mandatory**. When members are not wearing the suspenders during fire operations, the Bunker Pants have a tendency to slide down especially when wet, thereby reducing the effectiveness of the knee pads in fully protecting the knee area from burns. The lower back and bunker pants and bunker coat interface will also be affected by not wearing suspenders

6.7 The hood is part of your PPE and its use is mandated by the Department. **The hood shall be worn whether dry, damp, or saturated with moisture.**

6.8 It must be understood that wearing the hood in a hostile environment somewhat reduces your ability to note changing fire conditions in the immediate area. **Therefore, you must leave the area immediately upon feeling any pain or discomfort through the hood, unless the area can be immediately cooled by a hoseline. Remember; always stay alert to deteriorating conditions.**

7. DONNING OF BUNKER GEAR

7.1 Bunker Gear must be donned in the following order:

1. Pants and Boots (Personal Safety System and suspenders in place)

2. Handie-Talkie (remote speaker clipped to outside of coat)

3. Protective Hood*- The Protective Hood must be donned in the following manner to ensure a proper seal of the SCBA facepiece.

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- Don the hood completely over your head before putting on the Bunker Coat.
- Don the Bunker Coat.
- Push back the hood from your head onto the back of your neck to store the hood in the ready position.
- Before entering an IDLH environment, the SCBA facepiece is to be donned, **followed** by the pulling up of the hood over the head and around the facepiece.
- **WARNING:** Failure to don the SCBA facepiece first, before the hood, will result in an improper seal of the facepiece resulting in the loss of air from the positive pressure facepiece.

4. Bunker Coat

7.2 Responding

7.2.1 **Structural Fires** - Due to the possibility of members operating without full PPE and also due to the negative perception by the public, all members except chauffeurs shall don their PPE prior to responding. In hot weather, if the apparatus is not equipped with a functioning air conditioning unit, coats and protective hoods may be dispensed with while responding.

7.2.2 **Non-Structural Fires and Response to BARS Alarms, Non-Fire Responses, ERS NC, and Class E Alarms** - In hot weather, coats and protective hoods may be dispensed with while responding. Responding without PPE is permissible. This also includes CFR responses.

7.2.3 When responding from other than quarters the above rules apply.

7.2.4-7.2.5 ***Redacted for PFS***

8. OPERATING AT FIRES AND EMERGENCIES

8.1 Chief and Company Officers shall ensure that all members wear the proper level of protective equipment while operating at the scene of fires and emergencies. Any member entering a fire building must have all PPE properly donned.

8.2 ***Redacted for PFS***

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9. OPERATIONAL FACTORS AND LIMITATIONS

9.1 Members wearing Bunker Gear must be alert to rising heat levels and heat buildup. The thermal protection provided by Bunker Gear can mask signs of high heat conditions, allowing members to over-commit or delay backing out when conditions warrant. This can greatly increase the member's risk of incurring a serious burn injury. A bunker equipped member exposed to moderate heat conditions for a prolonged period may eventually be burned through the clothing.

9.1.1 Members wearing Bunker Gear and protective hoods retain more body heat and are more readily subjected to exhaustion.

10. OPERATIONAL CONSIDERATIONS

10.1 The removal of pent up heat and humidity within the Bunker Garment is a high priority. This is of particular importance during the summer months. Because of the debilitating effect of operating while in Bunker Gear, Chief and Company Officers must be more keenly aware of the need for relief of units that have been engaged in firefighting.

10.1.1 Units must be promptly relieved. Additional units should be utilized to perform overhaul and salvage functions, where necessary.

10.1.2 Lack of oxygen contributes to heat stress; therefore a greater emphasis on SCBA usage during extinguishment and overhaul is **mandatory**.

Rotation and relief of personnel during the firefighting periods are an essential part of good fire management when companies have been engaged in operations that are unusually demanding.

10.2 The fire environment must be continuously monitored to detect elevated heat levels.

10.3-10.4 ***Redacted for PFS***

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11. CARE AND MAINTENANCE

11.1 There are two types of bunker gear cleaning: routine & advanced. FDNY bunker gear receives advanced cleaning by a private contractor, (Minerva) also known as an Independent Service Provider (ISP). This advanced cleaning is MANDATORY and tracked for compliance by the Department. These are the scheduled pickup dates from each firehouse. Bunker gear is scheduled to be picked up approximately once every 6 months. This procedure is in place to ensure both sets of issued bunker gear receive the required annual advanced cleaning. The ISP also inspects the bunker gear, which is also a yearly requirement of NFPA 1851. **Sending bunker gear out for decontamination to the DSU does not satisfy the requirements of NFPA 1851**.

Upon return of bunker gear, the member must inspect bunker gear for serviceability. If there are any doubts on the serviceability of the gear, an evaluation shall be made at the Quartermaster.

11.2 Routine Cleaning – Routine cleaning can be accomplished by washing your gear as per AUC 310 Addendum 1. Routine cleaning is recommended whenever your gear becomes contaminated at an operation in between advanced cleanings.

12. DELIVERY OF BUNKER GEAR TO THE QUARTERMASTER

12.1 There are two separate procedures for delivering bunker gear to the Quartermaster for an integrity examination. The procedure to be used depends on whether or not the member who had been wearing the bunker gear has incurred a burn injury which requires medical leave to be granted.

A. When the affected member does not require medical leave for a burn injury, the Division messenger of member's assigned Division shall deliver his/her bunker gear to the Quartermaster at the Fort Totten location only. If necessary, the member can obtain loaner gear from the Decontamination Support Unit (DSU).

B. When the affected member does require medical leave for a burn injury, the Officer on Duty must comply with section 11.3.36 of the Regulations by tagging the bunker gear, placing it Out of Service, and contacting the Safety Battalion for instructions. The Safety Battalion will arrange for the collection of the bunker gear for its own investigation. At the conclusion of its investigation, the Safety Battalion will determine if the garment should be examined at the Quartermaster for repair or replacement due to thermal damage. Safety will deliver the garment to the Quartermaster for this evaluation.

Note: If the Safety Battalion will be retaining control of the bunker gear for an extended period, pending completion of the investigation, they shall forward a report to the Chief of Safety and a copy to the member's unit indicating that loaner gear shall be issued to the affected member.

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13 REPAIR OR REPLACEMENT OF BUNKER GEAR

13.1 If a determination is made that the bunker gear is to be repaired, the Quartermaster will arrange for the gear to be cleaned and repaired.

13.1.1 The Quartermaster will notify the officer on duty of the member's assigned unit when the repairs have been completed. The member's assigned Division messenger shall report to DSU to return any loaner gear that has been issued and obtain a signed receipt. The Division messenger then proceeds to the Quartermaster with signed receipt and picks up member's repaired gear and signs Quartermaster's voucher.

13.2 If a determination is made that the bunker gear is to be condemned and replaced, the Quartermaster will either issue new bunker gear, if the member is present, or notify the officer on duty of the member's assigned unit to notify the Division that the affected member's new gear is ready to be picked-up by the member's assigned Division messenger.

13.2.1 The member's assigned Division messenger shall report to DSU to return any loaner gear that has been issued and obtain a signed receipt. The Division messenger then proceeds to the Quartermaster with signed receipt and picks up member's replacement bunker gear and signs Quartermaster voucher.

14. SECOND SET OF BUNKER GEAR

14.1 This will consist of member's second bunker coat and bunker pants. The two sets of bunker gear shall be worn alternately by members between advanced cleanings. Members shall commence wearing the one set of bunker gear continuously from tour to tour when the other set of gear is picked up for advanced cleaning. On return from advanced cleaning, this second set of gear shall be stored and worn only when the first set of gear is drying or being repaired. After the first set of gear is dry or repaired, the member shall place the second set back in storage and wear the first set of gear. Approximately six months later, when the first set of gear is picked up for advanced cleaning, the member shall start wearing the second set of bunker gear continuously from tour to tour for the next six months, except when it is drying or being repaired. Members shall continue on the schedule, alternating use of each set of bunker gear approximately every six months, with the advanced cleaning cycle indicating when to switch wearing the sets of gear.

14.2 If during the time period between advanced cleanings, the member has their gear laundered by the services of DSU, the member shall still send in the bunker gear that is due to be sent to the ISP. Advanced cleaning by an ISP is **MANDATORY**. Sending bunker gear out for decontamination to the DSU does not satisfy the requirements of NFPA 1851.

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14.3 The purpose of alternating the wearing of the two sets of bunker gear on a six month cycle is to ensure that neither set is subjected to more advanced cleanings than necessary. At this cycle, each set of gear would undergo advanced cleaning 10 times over the ten year cycle of bunker gear. This is to prevent various elements of the bunker gear from wearing out prematurely and lowering the levels of protection afforded to members. This also allows for each garment piece to annually undergo an advanced inspection to identify unserviceable gear that requires repair or replacement.

15. CONTAMINATION FROM BODILY FLUIDS AND BLOOD BORNE PATHOGENS

15.1 The following procedures shall be followed for the collection, bagging, temporary replacement, transporting and cleaning of contaminated non-disposable personal protective equipment and work duty uniform.

15.2 When personal protective equipment or work duty uniforms are contaminated with large amounts of body fluids, Form EDR-1 shall be completed by the Officer on Duty. Form EDR-1 can be accessed from the Department Intranet under the Forms tab.

15.3 The IC shall have all items requiring decontamination prepared as per AUC 310 Addendum 5. Bagged items shall be placed on the apparatus in an appropriate location to preserve the integrity of the bag and transported to quarters. The bagged items shall be placed in a light traffic area (remote location) on apparatus floor pending collection by DSU.

15.4 If in the opinion of the IC a member(s) must remove their PPE and/or work duty uniform at the scene of a fire or emergency, the IC shall select a suitable location where the member shall change into a coverall. The IC shall ensure the members PPE and/or work duty uniforms are bagged for decontamination.

15.5 Body Substance Isolation shall be followed when handling bagged items. Disposable gloves and eye shield/face mask shall be worn by the member bagging the contaminated items.

15.6 Distribution of replacement equipment and collection points for bagged items shall be established by the IC.

15.7 The IC shall notify DSU of the need for temporary replacement equipment if necessary.

15.8 Contaminated PPE must not be forwarded to the Quartermaster.

15.9 Officers and members are reminded to review and consult with the CFR Manual for any additional information or questions in regards to contamination by bodily fluids and bloodborne pathogens.

BY ORDER OF THE FIRE COMMISSIONER AND CHIEF OF DEPARTMENT

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PERSONAL PROTECTIVE EQUIPMENT (PPE) ROUTINE CLEANING

The following procedures shall be used for routine cleaning by hand of Personal Protective Equipment (PPE) in a utility sink. PPE exposed to contaminates not removed by routine cleaning shall be sent to Decontamination Support Unit (DSU) using form EDR-1. Sending bunker gear to the DSU does not satisfy the requirements for advanced cleaning – All bunker gear is required to be sent to the Independent Service Provider (ISP) for advanced cleaning.

Note: Chapter 7 of NFPA 1851 outlines the cleaning and decontamination of PPE.

"7.2.2 The end user shall be responsible for the routine cleaning of their issued ensemble and ensemble elements."

Note: For bloodborne pathogen decontamination procedures, members shall comply with Section 15 of CFR-D Manual, Chapter 3 titled Infectious Control Program.

Importance of Clean and Maintained PPE:

It is important that you keep your PPE clean, free of contamination, and properly maintained at all times. PPE that is dirty or contaminated pose significant hazards. The wearing of soiled or contaminated clothing and equipment can cause acute or long-term health hazards. Many contaminants can be absorbed by the skin, and some are carcinogenic. In addition, many types of contamination are flammable. Do not wear your PPE unless it is properly cleaned.

1. BUNKER BOOTS

- Utilize the sink that is specifically designated for cleaning protective clothing; do not use a kitchen sink or other sink that is employed for personal products.
- Brush off any loose debris.
- Fill the utility sink with warm water.
- Use a mild detergent in volume according to the detergent supplier's instructions. Scrub the exterior of the footwear gently using a soft-bristle brush.
- Drain the sink and thoroughly rinse the exterior of the footwear. Conduct a second rinse if necessary.
- Inspect the footwear and where necessary, either rewash any portions of the footwear that do not appear clean or send to DSU for cleaning.
- Air dry footwear in a well ventilated area but not in direct sunlight. Do not force-dry the footwear with a hair dryer, or place it over a heating duct or radiator. Forced drying may damage the footwear. You may also insert dry absorbent towels inside the footwear to help soak up any moisture.
- Rinse the utility sink using routine cleaning procedures.

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2. BUNKER COAT AND PANTS

- Choose a utility sink that is specifically used for cleaning protective clothing; do not use a kitchen sink or other sink that is employed for personal products.
- Brush off any loose debris.
- Fill the utility sink with warm water.
- Use a mild detergent in a volume according to the detergent supplier's instructions.
- Scrub the garment gently using a soft-bristle brush
- Drain the sink and thoroughly rinse the garment. Conduct a second rinse if necessary.
- Inspect the garment and where necessary, rewash the protective garment or submit the garment for advanced cleaning procedures.
- Do not attempt to wring out clothing as this action may cause damage to the garment.
- Hang the garment for air drying, preferably on a non-corrosive hanger in a well-ventilated area, but not in direct sunlight. Do not force-dry the garment with a hair dryer, or place the garment over a heating duct or radiator.

3. PROTECTIVE HOOD

- Choose a utility sink that is specifically used for cleaning of protective clothing; do not use a kitchen sink or other sink that is employed for personal products.
- Brush off any loose debris.
- Pre-treat heavily soiled or spotted areas.
- Fill the utility sink with warm water.
- Use a mild detergent in volume according to the detergent supplier's instructions.
- Scrub the hood gently using a soft-bristle brush. Use only a soft-bristle brush, as stiff brushes will snag and damage the hood.
- Drain the sink and thoroughly rinse the hood. Conduct a second rinse if necessary.
- Inspect the hood and, where necessary, rewash the protective hood or submit it for advanced cleaning procedures.
- Air dry the hood by hanging it in a well ventilated area, but not in direct sun light.
- Rinse the utility sink using routine cleaning procedures.

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4. GLOVE CLEANING

- Choose a utility sink that is specifically used for cleaning of protective clothing; do not use a kitchen sink or other sink that is employed for personal products.

- A common technique for washing your gloves is to put them on your hands and rub them together, using a mild detergent. When washing gloves using this technique, it is important to wear latex or nitrile EMS gloves under the firefighter gloves to protect your hands from exposure. A soft-bristle brush may help remove some of the imbedded combustion products. Rinse thoroughly in warm water.

- Inspect the gloves and where necessary, rewash the glove or submit them for advanced cleaning procedures.

GLOVE DRYING

- Gloves should be air dried.

- Drying racks in well-ventilated areas assist in drying. Do not turn the gloves inside out to dry, this may tear or damage the moisture barrier layer or inner lining.

- Do not lay the gloves on radiators or dry them in hot air dryers. Hot air drying will stiffen the leather and severely shorten the service life of the gloves.

- Do not dry the gloves in direct or indirect sunlight, or in fluorescent light. Light will severely reduce the strength and protective qualities of the gloves.

- Do not wring dry your gloves; wringing may tear the Moisture Barrier Layer. The gloves may be gently squeezed to remove excess water from the leather shell.

- Never dry clean your gloves. Dry cleaning will damage the gloves and reduce their protective qualities.

5. HELMET CLEANING

Routine Cleaning – Clean your protective helmets after each use or whenever your helmet has become soiled. You may clean your helmet together with the ear covers, headband/ratchet pads, and chinstrap. Use the following procedures for routine cleaning by hand of your protective helmet in a utility sink:

- Choose a utility sink that is specifically used for cleaning of protective clothing: do not use a kitchen sink or other sink that is employed for personal products.

- Brush off any loose debris.

- Fill the utility silk with warm water.

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- Use a mild detergent in volume according to the detergent supplier's instructions.
- Scrub the helmet using a soft-bristle brush.
- Drain the sink and thoroughly rinse the helmet. Conduct a second rinse if necessary.
- Inspect the helmet and, where necessary, rewash any portions of the protective helmet that do not appear clean.
- Dry the helmet by air drying in a well ventilated area, but not in direct sunlight. Do not force-dry the helmet with a hair dryer, or place it over a heating duct or radiator. Forced drying may cause damage to the helmet suspension.
- Rinse and clean the utility sink using the routine cleaning procedures.

BY ORDER OF THE FIRE COMMISSIONER AND CHIEF OF DEPARTMENT

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A.U.C. 310, ADDENDUM 2
March 29, 2019

LAUNDERING OF BUNKER GEAR

1. INTRODUCTION

1.1 There are two types of bunker gear cleaning: routine & advanced. FDNY bunker gear receives advanced cleaning by a private contractor, (Minerva) also known as an Independent Service Provider (ISP). This advanced cleaning is MANDATORY and tracked for compliance by the Department. These are the scheduled pickup dates from each firehouse. Bunker gear is scheduled to be picked up approximately once every 6 months. This procedure is in place to ensure both sets of issued bunker gear receive the required annual advanced cleaning. The ISP also inspects the bunker gear, which is also a yearly requirement of NFPA 1851. **Sending bunker gear out for decontamination to the DSU does not satisfy the requirements of NFPA 1851**.

2-3. ***Redacted for PFS***

4. PREPARATION OF GEAR

4.1 Advanced cleaning is ***MANDATORY.*** This cleaning is tracked by the Department for compliance by all members.

4.2 Every member assigned to a scheduled unit shall provide one set of gear for cleaning (except members on long term details to another unit who shall follow instructions as per section 3.4). Member must alternate the bunker gear turned into the ISP.

4.3 Boots will not be laundered. They shall be removed from the bunker pants. Members should take this opportunity to clean these items as per manufacturers cleaning instructions as outlined in AUC 310, Addendum 1.

4.4 Pants shall be folded and placed inside the bunker coat, the clasps of the coat shall be fastened and the sleeves tied across the front of the coat. (Do not use cord or rope - tie the sleeves to one another.)

4.5 Members shall ensure that suspenders and hoods are included as part of the items sent for advanced cleaning.

4.6 Member shall make sure that all personal property (tools, gloves, hose straps, etc.) is removed from the pockets of the bunker gear.

4.7 Company officers shall ensure that members going off duty prior to the pickup day leave their gear prepared in the prescribed manner.

Note: Only one set of bunker gear per member will be cleaned on the scheduled date.

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5. ***Redacted for PFS***

6. MEMBER

6.1 Upon receipt of cleaned gear, members are responsible to inspect gear for serviceability.

6.2 It is each member's responsibility, regardless of their work assignment or location to ensure that each set of issued bunker gear is cleaned by the ISP at least annually.

Note: Member may drop off bunker gear to be laundered at the Quartermaster. The ISP (Minerva) picks up bunker gear every Friday from the Quartermaster. A receipt will be given to the members. The gear will be returned to the Quartermaster and the member will be notified.

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A.U.C. 310, ADDENDUM 3
March 29, 2019

STORAGE AND WEARING OF BUNKER GEAR IN QUARTERS

1. PURPOSE

1.1 Documented research has confirmed that firefighter personal protective equipment (PPE) can be exposed to large quantities of contaminants at a fire scene. These fireground contaminants are easily transferred and can cross contaminate all areas of the firehouse. This policy seeks to minimize cross contamination, particularly in the areas of the station that are used as firefighter living quarters.

1.2 In order to reduce the possibility of bringing fireground contaminants or bloodborne pathogens into the living areas of the firehouse, the FDNY ***strictly prohibits*** members from wearing or bringing their firefighting protective ensemble or ensemble elements into any such areas. Living areas are kitchens, sitting rooms, television rooms, housewatch areas, offices, bunkrooms, gym areas, and other such areas where firefighting protective ensembles are not routinely stored or worn for protective purposes. The firefighter protective ensemble includes the bunker coat and pants, helmet, gloves, boots, and the protective hood.

PPE should only be worn responding to, operating at and returning from alarms. Do not spread fireground contaminants, especially to hospitals, supermarkets, and other public spaces.

2. EXAMPLES OF PROHIBITED CONDUCT

2.1 Examples of prohibited conduct include, but are not limited to the following:

2.1.1 Preparing the meal in the kitchen while wearing bunker gear.

2.1.2 Conducting a drill wearing bunker gear in designated “living areas”.

2.1.3 Packing the Life Saving Rope (LSR) in designated “living areas” while wearing bunker gear.

3. DESIGNATED STORAGE AREA AND SIGNS

3.1 In order to comply with the OSHA Bloodborne Pathogen Standard (CFR 29 §1910.1030), while in quarters the firefighter protective ensemble shall only be kept at the designated storage area on the clothing rack, at the designated location on or near the apparatus for rapid donning by on-duty members, or in a separate area designated for such storage. Firefighting protective ensembles shall not be stored in personal lockers.

3.2 A supply of “No Bunker Gear” signs (Figure 1) have been distributed to all units. These signs shall be displayed at the entrances to all living areas that adjoin any area where the wearing of bunker gear is permitted (e.g., apparatus floor) as per this AUC.

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Figure 1

3.3 ***Redacted for PFS***

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A.U.C. 310, ADDENDUM 4
March 29, 2019

TRANSPORTATION OF FIREFIGHTER PERSONAL PROTECTIVE EQUIPMENT (PPE)

1. PURPOSE

1.1 Under the OSHA Standards for Hazardous Materials and Bloodborne Pathogens, when members are required to transport any of the elements comprising firefighting PPE such items must be transported in an approved gear bag to prevent hazardous material and bloodborne pathogen exposure.

1.2 The Department has provided FDNY gear bags for the use of members transporting their firefighting PPE. Gear bags have been issued to all members up to and including the Fire Commissioner and Chief of Department. The use of gear bags will minimize cross contamination of fireground and other contaminants.

1.3 The FDNY strictly prohibits members from transporting firefighter PPE without the use of provided gear bags.

1.4 When transporting the firefighting PPE in a private vehicle, such items shall be placed in the gear bag prior to being placed in the passenger compartment or the trunk of the vehicle. Prior to placement into the gear bag, the firefighting protective ensemble shall be placed into a plastic bag supplied by the Department.

Doing so will help prevent the cross contamination of fireground contaminants into private vehicles. Furthermore, the firefighting PPE shall be kept within the gear bag at all times and should never be stored in the living area of a home.

2. DECONTAMINATION PROCEDURES – BLOODBORNE PATHOGEN

2.1 Grossly contaminated gear bags caused by a bloodborne pathogen exposure shall not be cleaned by members. If grossly contaminated the following procedure must be taken.

1. The gear bag should be placed in double (two) clear bags, tied or taped closed.

2. An Equipment Decontamination Report (EDR-1) shall be completed and placed in between the two bags, facing outward, for identification purposes. Bagged items shall be left, if possible, in a light-traffic area adjacent to housewatch for pickup by the DSU.

3. A loaner gear bag will be provided by the DSU.

2.2 If the gear bag is slightly contaminated, the member shall clean the bag following the guidelines outlined in the CFR-D Manual, Chapter 3.

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3. OTHER

3.1 Members are responsible to use the gear bag with the plastic bag liner anytime they transport firefighting PPE.

3.2 Members are responsible to maintain and store assigned gear bags in an area free from contamination. Poorly maintained or contaminated gear bags, negate the benefits of minimizing cross contamination into private vehicles.

3.3 Damaged gear bags shall be exchanged at the FDNY quartermaster as per existing procedures.

3.4 Gear bags are the property of the Department and are for official use only. Gear bags shall not be used for any purpose other than transporting members firefighting PPE.

3.5 ***Redacted for PFS***

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A.U.C. 310, ADDENDUM 5
March 29, 2019

PERSONAL PROTECTIVE EQUIPMENT (PPE) DECONTAMINATION PROCEDURES

1. INTRODUCTION

1.1 As part of its continuing commitment to the protection of its members' health and safety, the Department staffs a unit capable of cleaning and decontaminating FIRE PPE. The Decontamination Support Unit (DSU) provides the Department with an in-house capability to meet the day to day decontamination needs of the Department.

2. PROCEDURES

2.1 All equipment contaminated with blood or other potentially infectious material FIRE personnel shall comply with procedures outlined in CFR-D Manual Chapter 3.

2.2 Radios, tools and other hard surface items shall be decontaminated in quarters with a chlorine bleach solution as per CFR-D Manual Chapter 3.

2.3 Prior to forwarding contaminated PPE, remove all items from pockets (e.g. coins, nails, tools, pens, etc). Place items in **double (two) clear bags, tied or taped closed. An Equipment Decontamination Report** (EDR-1) shall be completed and placed in between the two bags, facing outward, for identification purposes.

2.4 Bagged items shall be left, if possible, in a light-traffic area adjacent to housewatch for pickup by DSU members.

NOTE: RED OR BLACK BAGS WILL NOT BE ACCEPTED

2.5 If both bunker pants and Personal Safety System (PSS) system have been contaminated, members shall separate the PSS from pants prior to bagging both items.

The PSS System shall not be bagged with bunker coat and pants

2.5.1 For fireground contamination, the **PSS** shall be decontaminated in quarters using a sponge and water. A mild detergent may be used if necessary. (Reference Training Bulletin Rope 3 and 4 for further information)

2.5.2 When the **PSS** has been grossly contaminated by other than fireground contamination; it shall be bagged separately as directed above. Units shall record all serial numbers, and then contact their Division for a replacement.

2.5 Member shall use their second set of bunker pants and bunker coat until the cleaned gear is returned.

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2.6 The DSU will decontaminate personal harnesses and PSS. After decontamination, components of the PSS are forwarded to Research & Development (R&D) for evaluation. Units shall record all serial numbers, and then contact their Division for a replacement.

2.7 If loaner gear is needed, a Loaner Equipment Tracking Report shall be completed and faxed to the DSU. Unit shall contact their Division messenger to pick up loaner gear at the quarters of the DSU.

2.8 Clear plastic bags (40" x 48") may be ordered from the Central Storehouse. Item number is 66524200040.

2.9 All fields of the EDR-1 must be completed. Pickup of items as well as appropriate decontamination cannot be assured without all necessary information.

2.10 The completed EDR-1 shall be faxed to the Decontamination Support Unit.

2.11 Pickup is generally completed the same or following day.

3. EQUIPMENT DECONTAMINATION REPORT (EDR-1)

3.1 EDR-1 report can be accessed on the FDNY Intranet under Forms/Fire Admin forms.

3.2 Complete all information and **fax the EDR-1 report to (718) 478-3457:**

FDNY HAZ-MAT OPERATIONS
DECON SUPPORT UNIT
104-32 43rd Ave Corona, NY 11368
Phone # (718) 478-3150
Fax # (718) 478-3457

3.3 All members with the same contaminant shall be listed on a single form. **Separate forms are required for different contaminants.**

Note: The combination to the lock for access to the Facility must be included. If there is no combination lock to access the Facility, write "key lock" in the Combo# section of the EDR-1.

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PPE DECONTAMINATION PROCEDURES

1. FIRE and EMS personnel shall comply with procedures outlined in CFR-D Manual Chapter 3.
2. When forwarding contaminated items, remove all items from pockets (e.g. coins, nails, tools, pens, etc). Place items in **double (two) clear bags, tied or taped closed. An Equipment Decontamination Report** (EDR-1) shall be completed and placed in between the two bags, facing outward, for identification purposes.
    - FIRE - Bagged items shall be left, if possible, in a light-traffic area adjacent to housewatch for pickup by Decon Support Unit (DSU) members.
    - EMS - DSU members shall make contact with the Officer on duty and obtain the bagged items awaiting pick up.

NOTE: RED OR BLACK BAGS WILL NOT BE ACCEPTED.

3. FIRE - If both bunker pants and PSS system have been contaminated, members shall separate the PSS system from pants prior to bagging both items. If the PSS System is not contaminated, do **not** send the PSS system.
4. Radios, tools and other hard surface items shall be decontaminated in quarters with a chlorine bleach solution as per CFR-D Manual Chapter 3.
5. The DSU will decontaminate personal harnesses and PSS systems. After decontamination, components of the PSS are forwarded to R & D for evaluation. Units shall record all serial numbers, and then contact their Division for a replacement.
6. FIRE - If loaner gear is needed, a Loaner Equipment Tracking Report is to be completed and faxed to the DSU. As per AUC 310, the Unit shall contact their Division messenger to pickup loaner gear at the quarters of the DSU.
7. Clear plastic bags (40" x 48") may be ordered from the Central Storehouse. Item number is 66524200040.
8. Please ensure all EDR-1 fields are completed accurately. Pickup of items as well as appropriate decontamination cannot be assured without all necessary information.
9. The completed EDR-1 shall be faxed to the Decon Support Unit. Pickup is generally completed the same or following day.

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A.U.C. 310, ADDENDUM 6
April 14, 2022

PERSONAL PROTECTIVE EQUIPMENT (PPE) GUIDELINES

1. Only Personal Protective Equipment (PPE) issued by the Quartermaster may be worn when on-duty. Items issued by the quartermaster are National Fire Protection Association (NFPA) compliant, which conform to their standards for manufacture, testing and certification.

2. No other unauthorized PPE shall be worn when on-duty. This includes NFPA compliant PPE not issued by the quartermaster. PPE shall be worn in accordance with procedures outlined in the Regulations and other official Department publications. Chief and Company officers shall utilize roll calls to ensure compliance.

3. Members issued this equipment are responsible for its care.

4. No member is permitted to make any repairs, alterations or modifications to any protective items.

5. When repair or replacement of protective items is warranted, such equipment shall be brought for inspection before the department's Quartermaster, who will determine its serviceability.

6. Condemned or damaged gear, and those items that are no longer listed for use, are **not** permitted to be worn for any reason.

7. ***Redacted for PFS***

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A.U.C. 310, ADDENDUM 8
January 23, 2024

FIELD WIPES

1. INTRODUCTION

1.1 To assist in promoting the contamination reduction initiative, the Department has issued Field Wipes to all units.

1.2 Rehabilitation and Care (RAC) Units have also been issued Field Wipes to be used after operations.

2. USE

2.1 Members should utilize Field Wipes after operations when soap and water is not immediately available. They should be used to clean your hands, arms, face, neck, and other exposed areas of the skin.

2.2 Members are encouraged to use these wipes from RAC Units when they are on the scene.

2.3 Each company shall carry a bucket of wipes on their apparatus for use when a RAC Unit is not at the scene.

2.5 Members shall wash with soap and water as soon as possible when returning to quarters from any types of incidents.

2.6 DO NOT use these wipes to clean tools, equipment, PPE or the apparatus.

3. REPLACEMENT

3.1 DO NOT discard the bucket as bags of refills will be available.

3.2 ***Redacted for PFS***

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A.U.C. 323
June 10, 2015

PROBATIONARY FIREFIGHTERS DEVELOPMENT PROGRAM

1. INTRODUCTION

1.1 The Probationary Firefighters Development Program ensures that apprentice firefighters continue their education after graduation from Probationary Firefighter School. Field training that utilizes reading assignments, training videos, company drills, fire critiques, cross unit details and the input of senior firefighters is an essential component of the probationary firefighter professional development.

1.2 Company officers play a vital role in the ongoing educational process. Their guidance is indispensable in helping probationary firefighters obtain the knowledge and skill needed to become proficient.

1.3 Company officers should be flexible and take advantage of training opportunities as they arise. Training can take place during hydrant inspection, after an incident or anytime the officer feels there are lessons to be learned.

2. PROCEDURES

2.1 Probationary firefighters are provided with monthly training modules consisting of reading assignments and training videos that emphasize the fundamentals of firefighting. The Probationary Firefighter can access the training modules by going to the "Probie Corner" section on the Diamond Plate Home Page. At the end of each monthly training module is a twenty (20) question quiz that must be completed. When practical, reading assignments should be coordinated with discussion periods, hands on drills and familiarization drills. While company officers generally lead the drill periods, the participation of all members, in particular senior members, is necessary to pass on the lessons learned and the considerable experience of these members.

Probationary firefighters get three (3) attempts to pass each quiz. If a passing mark is not attained after the third attempt, the program will be temporarily locked and will require the company officer to contact the Probationary Firefighters Development Program Group via email to 323PDPGrp@fdny.nyc.gov to re-activate.

2.2 Company commanders should continue to assign additional reading assignments that emphasize familiarization of their unit type (Engine or Ladder), Apparatus (Tiller, Rearmount, TL) and predominant building construction for that company's response area. This will afford the firefighter an opportunity to apply the knowledge gained during training sessions.

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2.3 There are several addenda to the program to assist the company commanders when new firefighters are assigned to their units:

- Probationary Firefighter Control Sheet.....Addendum 1
- Probationary Firefighter Training Notebook .....Addendum 2

2.4 The following entries shall be made in the training notebook:

Probationary Firefighter- Enter and date in blue or black ink when subject matter has been read and/or video has been viewed. When Probationary Firefighters have successfully completed the quiz at the end of the module they will print their completion receipt and staple it in their notebook.

Officer on Duty - Initial and date in red ink when the subject matter has been reviewed or drilled on.

Company Commander - Initial and date in red ink once a month. Company Commanders must ensure that modules and quizzes are being completed in a timely manner. This process guides probationary firefighters through the training program and ensures each topic is covered and reviewed. Each tour, probationary firefighters shall make an entry in the training notebook relating to lessons learned, experience gained, or information gathered from senior members during their tour. (See Addendum 2)

2.5 The Probationary Firefighter Control Sheet shall be affixed to the inside cover of the Probationary Firefighters folder (BP-90) when received for continuity within unit. (See Addendum 1)

2.6 Cross unit details of Probationary Firefighters shall be initiated by the Company Commander, in consultation with the Battalion Training Coordinator, after the Probationary Firefighter has completed 90 days of service in the firehouse. Probationary Firefighters assigned to engine companies shall be detailed to ladder companies, and those assigned to ladder companies shall be detailed to engine companies. Prior to commencement of the detail, Company Commanders shall ensure Probationary Firefighters have familiarized themselves with FDNY Firefighting Procedures/Bulletins relevant to the area in which they will be detailed. Cross unit details shall be for a period of 90 days. During this period, Probationary Firefighters shall not be detailed out of the cross training unit unless absolutely necessary. OSA-2 (Detail More Than 30 Days) shall be forwarded to the Bureau of Operations.

3. SUMMARY

3.1 The Probationary Firefighters Development Program ensures the initial training provided by the Bureau of Training continues after the probationary firefighter is assigned to the field. The ability to establish a positive attitude, encourage adherence to safety standards and promote a culture of learning are best accomplished early in a firefighter's career.

BY ORDER OF THE FIRE COMMISSIONER AND CHIEF OF DEPARTMENT

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PROBATIONARY FIREFIGHTER TRAINING NOTEBOOK

1. PROCEDURES

1.1 Every member upon completion of Probationary Firefighter School is issued a composition notebook to document their training. Notebooks shall be maintained until the end of the probationary period. The training notebook should be used by members to record:

- Questions they have concerning fire tools, equipment and operations
- Lessons learned and lessons reinforced during operations
- Information obtained at drills and training exercises
- The input and tips provided by senior members
- Knowledge gained from training videos and reading assignments

1.2 Notebook entries shall be made in the following format.

MONDAY 9/15/2007 9X6
Size-up L-3

Q-What are the 13 points of size-up?
A-

Q-When does size-up begin?
A-

TUESDAY 9/16/07 6X9
Company Drill

The senior member gave me some tips on how to maneuver a portable ladder.
(LIST THEM)

1.3 **Members shall ensure a tool list from their current unit is attached to the first page of the notebook.** The list provides a ready reference and ensures familiarization with the tools carried on the apparatus.

1.4 The training notebook is intended to be used as a positive motivational tool in the development of firefighting skills. Company officers should address any errors or inconsistent entries made in the book by conducting constructive reviews with the firefighter. To maximize the effectiveness of the training notebook, members should:

- Bring the training notebook to all drills held in quarters.
- Make entries in the training notebook either during the drill or as soon as possible after the knowledge has been obtained.

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- Review their training notebooks weekly to ensure that their questions are answered and that the new information is fresh in their minds. An entry should be made at the time of this review.
- Keep their training notebooks in the company office when not in use.

1.5 Monthly training module receipt should be printed and stapled to current training notebook page at time of completion. A training module is finished when all material has been read, videos viewed and monthly quiz successfully completed.

1.6 If the training notebook is lost or destroyed, the company commander must forward a report through the chain of command to the administrative Division within 30 days, outlining the details of the loss or destruction of the training notebook. The training notebook must be replaced at the members' expense and a notation of the replacement must be made in the report forwarded to the administrative Division. The loss or destruction of the training notebook will be noted in the subsequent evaluation report of the member and may result in disciplinary action.

1.7 Probationary firefighters shall document all leaves, other than regular leaves in their training notebook. An entry shall be made in the notebook listing the date the leave started and ended. On the first tour after the leave has concluded, the officer-on duty will verify the dates and sign the entry.

1.8 Officers reviewing or evaluating training notebooks shall initiate corrective action whenever deficiencies are noted. Examples of deficiencies that would result in a notebook being considered unsatisfactory include, but are not limited to:

- Long, unexplained time gaps between entries
- One word answers or extremely brief entries
- Insufficient number of entries for the time span
- Failure to change format or correct deficiencies noted by company or chief officers.

1.9 Members, who have had their probationary period extended, shall continue to maintain their training notebooks for a period of time equal to their extended probation.

2. REVIEW AND EVALUATION

2.1 Probationary firefighters shall ensure the training notebook is **reviewed** on a regular basis according to the following schedule:

- Probationary Firefighter- Review weekly. Initial and date in blue or black ink.
- Officer on Duty- Review each tour the member works. Initial and date in red ink.
- Company Commander- Review monthly. Initial and date in red ink.
- Chief Officers- Review during company drill visits. Initial and date in red ink.

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2.2 Company commanders shall ensure Training Notebooks are forwarded for evaluation as follows:

- 13th Month- Forward Training Notebook to the Battalion and Division Training Coordinator. Books will be returned to the member upon completion of evaluation.

- 17th Month- Forward Training Notebook to the Battalion and Division Training Coordinator. Books will be returned to the member upon completion of evaluation.

2.3 Battalions shall maintain an accurate and up to date list of all firefighters with notebooks to assist in monitoring compliance.

BY ORDER OF THE FIRE COMMISSIONER AND CHIEF OF DEPARTMENT

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ELECTRONIC RIDING LIST (EBF-4)

1. INTRODUCTION

1.1 The Electronic BF-4 (EBF-4) is a web-based software application accessible via the FDNY Intranet requiring FDNY personnel (e.g., Officers, Battalion Chiefs, Deputy Chiefs) to prepare, print, and submit an electronic version of the BF-4 riding list form. The EBF-4 shall be completed and printed for each 9x6 and 6x9 tour. Once submitted, the EBF-4 is electronically transmitted to the Fire Department Operations Center (FDOC) to provide a remote copy of personnel assigned to specific tours. The EBF-4 is directly linked to the HRIS database, the spare radio list, the SCBA spare mask list and Computer Assisted Dispatch System (CADS). The application generates Unit, Battalion, Division, Citywide and incident based riding lists.

2. PROCEDURES

2.1 The EBF-4 should be completed immediately AFTER the start of the tour, and ONLY if the company is in quarters or 10-8 and the listed members are available for dispatch. The EBF-4 should NOT be completed prior to the start of the tour; doing so could potentially create a situation where the same company could have two different riding lists on two different EFAS's at the same incident.

For example: B-99 gets a run at 0858 hours (i.e., on the night tour). L-99 is assigned as well. B-99 turns on the battalion vehicle, EFAS boots up, connects to the server, and downloads the latest riding list for that tour (the night tour). Companies arrive at the box, and B-99 transmits a 10-75 at 0902 hours (it is now the day tour). B-100 is assigned to the Box as the All Hands Chief. B-100 turns on their battalion vehicle, EFAS boots up, connects to the server, and downloads the latest riding list for THAT tour (the day tour). If the officer in L-99 had already filled out a riding list for the day tour, that is the riding list that will appear for L-99 on B-100's EFAS. This results in L-99 showing two different riding lists in EFAS at the same incident; the night tour's riding list on B-99's EFAS, and the day tour's riding list on B-100's EFAS.

2.2 ***Redacted for PFS***

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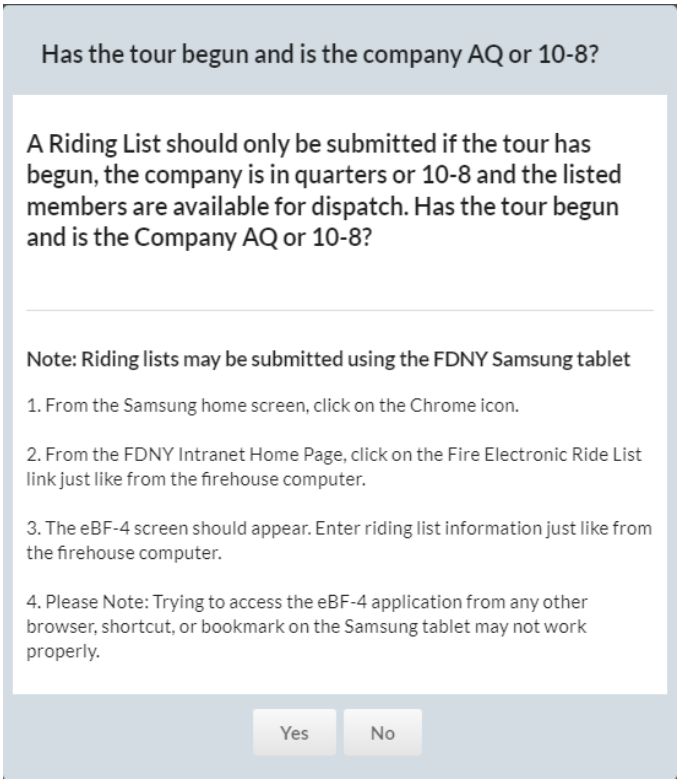
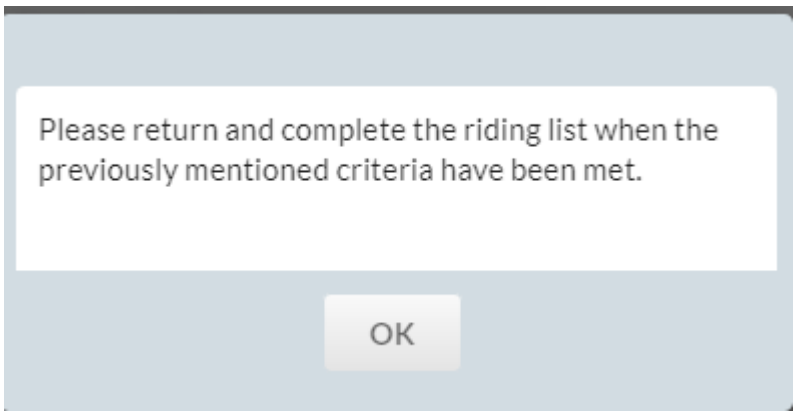
A pop-up window will appear asking if the tour has begun and if the company is AQ.



If the officer clicks "No," another pop-up window will appear advising the officer to complete the riding list once those criteria have been met.



If the officer clicks "Yes" at the first pop-up window, proceed as below.

Select the work unit using the drop-down lists provided. The application displays a list of members assigned to the unit selected. Click on and drag the selected member to the appropriate riding position. Members detailed in from other units can be accessed via the "detail in" button. The riding list is submitted by clicking the "Save" button.

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2.3 Chief and Company Officers shall submit a Preliminary or Final EBF-4 at the start of each tour.

2.3.1 Preliminary: Unit is awaiting further staffing for the tour. Members awaiting relief shall be included on the Preliminary EBF-4 pending arrival of details. The EBF-4 shall be updated after each detail arrives. Upon arrival of all details, a Final EBF-4 shall be submitted.

Note: In the past, Officers had completed the Riding List prior to the start of the tour and had saved that Riding List as "Preliminary." The designation "Preliminary" does NOT mean the Riding List is being completed/submitted before the start of the tour. It means that these are the names of the members on the rig right now, and that those names will change when members detailed into the company arrive and are placed into the Riding List. And as noted in Section 2.1, going forward, the Intranet EBF-4 should only be completed if the Company is AQ or 10-8, the listed members are available for dispatch and the tour has begun.

2.3.2 Final: All members for the tour have reported for duty and were assigned riding positions.

2.4 Final EBF-4 shall be updated anytime during the tour as necessary (e.g., ML during tour, early relief, staffing change, reduced staffing, updated radio assignment, updated mask assignment).

2.5 Only members actually riding on the apparatus of that unit shall be included on the unit EBF-4. Do not include members detailed to another unit for the tour.

2.6 Members working in another unit (e.g., mutual, detail, RSOT, MSOT) shall only be placed on the EBF-4 of the unit they are working in that tour. Members shall not be entered on more than one EBF-4 (EBF-4 system will provide a warning if this occurs).

Note: The EBF-4 application utilizes data that is found within the FDNY HRIS database. In order for a member's name to appear accurately in EBF-4, the member's status must be updated within HRIS by either OAD for officers or DSCO for a firefighter.

2.7 Print copies for both the officer and apparatus.

Note: Any riding position that is assigned a spare radio or spare mask shall have the spare radio or spare mask number listed beside that riding position on the EBF-4. Officers shall ensure that each member has the correct radio and mask and the spare radio/mask information on the EBF-4 is accurate.

2.8 If the EBF-4 cannot be completed immediately after the start of the tour (e.g., the company is operating at a fire or emergency), it should be completed as soon as possible thereafter. The company assigned Samsung Tablets should be used to accomplish this in a timely manner.

2.9-2.10 ***Redacted for PFS***

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3. ***Redacted for PFS***

4. ELECTRONIC RIDING LIST (VIA SAMSUNG TABLET)

4.1 The FDNY Samsung Tablet allows the riding list to be submitted remotely via the Electronic Ride List link on the FDNY Intranet Home Page while 10-8 and available for dispatch. The FDNY Intranet Home Page is accessed on the tablet by clicking on the Chrome Icon from the Samsung Home Screen. It is meant to supplement the existing procedure of submitting the EBF-4 while AQ.

Note: Trying to access the EBF-4 application from any other browser, shortcut, or bookmark on the Samsung tablet may not work properly.

5. PURPOSE

5.1 Maintaining an accurate EBF-4 is necessary to correctly identify members operating at an incident.

5.2 The ability to complete a riding list from the apparatus will allow for more accurate and timely completion of the riding list. Units will be able to update their riding list when they are out of quarters; this could be done either when relieving at the scene of a fire or emergency, while being relocated, or when returning to quarters. This will result in greater accuracy to the data that is being pulled by EFAS, enhancing the Department's ability to account for members on the fire ground and ensuring more accurate Rollcalls.

5.3 To ensure all members are accounted for, the EBF-4 must be kept up to date at all times, via firehouse computer or remotely from the Samsung Tablet.

6. PROCEDURES (VIA SAMSUNG TABLET)

6.1 Submitting the EBF-4 via the Samsung Tablet is very similar to the way in which the EBF-4 is submitted using the firehouse computer. Officers log in with their last name and reference number, then drag and drop members into their assigned positions. The riding list can then be saved as either PRELIMINARY or FINAL.

6.2 The EBF-4 must be completed immediately AFTER the start of the tour. If the EBF-4 cannot be completed immediately after the start of the tour (e.g., the company is operating at a fire or emergency), it should be completed as soon as possible thereafter. The Samsung Tablet should be used to accomplish this in a timely manner.

6.3 The riding list should be updated throughout the tour as needed (Details, Medical Leave Early Relief, Updated radio assignment, Updated mask assignment, etc.).

6.4 It is anticipated that most Riding Lists will be submitted from the EBF-4 Application on the Intranet.

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6.5 To ensure that submitting the EBF-4 via the FDNY Intranet on the Samsung Tablet continues to work properly, and to ensure that all Officers are familiar with it, **the Samsung Tablet must be used every Sunday on the 9x6 tour to submit the riding list instead of the EBF-4 application accessed from the firehouse computer.**

For EBF-4 related questions, please email: EBF-4@fdny.nyc.gov

BY ORDER OF THE FIRE COMMISSIONER AND CHIEF OF DEPARTMENT

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BUILDING INSPECTION SAFETY PROGRAM
(BISP)
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BISP INSPECTION FORMS

Inspection Forms:

1) The new inspectional forms were established to enhance the company's ability to perform a thorough inspection by creating a concise, comprehensive and user-friendly document. The forms will ask a series of questions, which can be answered one of three ways, see line 3. The forms will provide specific requirements, primarily enforcing the Fire Code. Linked to each line item on the inspectional forms is the method of correction, either through enforcement or referral procedures.

2) The inspection forms are formatted in sections, which should be followed in sequence if conditions permit. The Officer always has the right to make any adjustments during the inspection.

3) The inspector should list any descriptions next to the appropriate item requiring a description. When items are bolded these items are enforceable. The inspector can place a check in the compliant box for any items which complied with the law, a check in the N/A box when an item is not applicable, not available, or no access. The recommendation is to list on the form directly above the N/A box why the N/A box was checked. In the non-compliant box place a check for any conditions, which are required by law, but are not in compliance at the time of inspection. The inspector should also circle the appropriate enforcement action taken in the main body of the form when multiple actions are listed. Remember these forms serve as work sheets for the Officer and proper documentation will ensure that the form can be easily referenced in the future.

3.1 **Examples of N/A usage:**

- For example **not applicable** would be used when the C of O was not required because the building was constructed prior to 1938.
- **Not available** would be used when a C of O is found on the web site; however at the scene we are informed it's posted in the manager's office and we can not gain access to view. The Officer could use his or her discretion on the issuance of an FDNY Summons (VC 19).
- **No access** to below grade areas, see below.

3.2 **The recommendation when a unit is unable to access a specific area of the building is to follow the procedures listed below:**

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3.2.1 An inspection shall be recorded when a visit is made to an actual premises intended to be inspected. If an inspection is not made due to the lack of admittance or the inability to find a responsible person on the premises, credit for the inspection shall be recorded in the RBIS Application as per Ch.2, Addendum 1 (RBIS Company Officer User Guide).

4) The inspector has the choice on enforcement action when more than one action is listed. For example the inspector could use an A-8 and FDNY Summons or VO, however the inspector should not issue an FDNY Summons and VO for the same violation. If the violation is such that it must be corrected forthwith, issue a VO. If the situation is not forthwith issue an FDNY Summons.

5) All units should understand that these inspection forms are to be used as guides. Any other items found to be in violation, but not preprinted on the form should be recorded in the Additional Violations, Remarks, and Endorsement section on the back page of each inspection form.

6) On the back page of each form in the Additional Violations, Remarks, and Endorsement section the following statement is provided **"If enforcement action is not taken on any item not compliant with the provisions on this form please indicate the special circumstances and/or reasons which prevented the appropriate action."** This statement should be utilized by Company Officers in order to explain why a particular enforcement action was not taken, for example the Company received a run, which prevented the issuance of an FDNY S Summons or VO for the following violation.

7) **"I certify that the above information is true and accurate to the best of my knowledge and ability."** This statement is provided on each form as an affirmation statement of inspection.

8) When conducting an inspection using the FDNY Inspection Form or the School Inspection Form and the building/occupancy has fire protection systems (Sprinkler systems, Standpipes systems, or Fire alarms) use the Fire Protection Systems - Supplement Sheet in order to properly inspect these systems. Any areas not required indicate as N/A on the supplement sheet. For example if the building/occupancy has a Fire alarm but does not have a sprinkler and standpipe only check off the items on the sheet for the Fire alarms and mark the sprinkler and standpipe sections as N/A. Attach this sheet to the inspection form and file in the building folder when the inspection is completed.

9) The following inspectional forms are provided:

Add # 1 -Appendix 1: IF-1 - FDNY INSPECTION FORM

This form will be utilized to inspect all occupancies except those stated below.

Add # 1 -Appendix 2: IF-2 - FIRE SAFETY DURING CONSTRUCTION, ALTERATION, DEMOLITION, AND ABATEMENT FORM

This form will be used as stated in the title of the form.

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Add # 1 -Appendix 2: IF-2A-CDA-SAFEGUARDING UNDERGROUND OPERATIONS SUPPLEMENT SHEET

This form is a breakdown of NFPA 241 Chapter 11 as it pertains to underground operations. Members should keep in mind that all construction sites need to comply with the safety items found in Chapter 14 of the Fire Code and Chapter 33 of the Building Code (except State projects - jurisdictional issues/ they can utilize State Fire and Building Codes, **see note below**). Units should be guided by NFPA 241 only as it pertains to items not already addressed in the Fire Code. If some items are not covered by this checklist they are probably already covered by the Fire Code and therefore can be found on the original CDA form or construction guides (Ex: torch operations). Units should utilize the original CDA form checking applicable items only and the IF-2A Underground Supplement Sheet when dealing with underground operations.

Note: For State or Federal agencies use the CDA form and supplement sheet as a guide, issue VOs and then follow the procedure for non-jurisdictional agencies found in the VO bulletin. When inspecting private contractors, the CDA form and supplement sheet will be enforced as per regular procedures.

Add # 1 -Appendix 3: IF-3 - FDNY SCHOOL INSPECTION FORM

This form will be utilized to inspect any type of school, commercial day care, and college/university.

Add # 1 -Appendix 4: IF-4 - HOLIDAY INSPECTION FORM

This form will be utilized to inspect occupancies in the Holiday program. However, units conducting the first inspection of a building in the Holiday program should utilize the FDNY Inspection form only. Every inspection thereafter will be recorded as a Holiday inspection utilizing the Holiday form during the holiday season.

Add # 1 -Appendix 5: IF-5 - NEW YORK STATE FAMILY DAY CARE AND GROUP FAMILY DAY CARE HOMES

This form will be utilized to inspect Day Cares licensed by New York State, which are significantly different from NYC Department of Health licensed commercial Day Cares. The inspections of Day Cares licensed by New York State are conducted once when the unit is first informed of the operation of a Day Care in its administrative area. The unit is not required to conduct any further inspections at these locations unless requested by Fire Prevention, see Chapter 5 for more information.

Add # 1 -Appendix 6: IF-6 - FIRE PROTECTION SYSTEMS - SUPPLEMENT SHEET

This form will be utilized to inspect Fire protection systems (Fire alarms, Sprinkler systems, Standpipe systems). The form will be attached to either the FDNY Inspection form or the School Inspection form when needed. Only the appropriate sections of the form need to be completed depending on the systems in the building or occupancy. This form is only used to supplement the FDNY, School or Theater Inspection forms.

Add # 1 -Appendix 7: IF-7 - ASSEMBLY GROUP/THEATER INSPECTION FORM

This form will be utilized to inspect all theaters, playhouses, opera houses, motion picture theaters, symphony and concert halls; television and radio studios admitting an audience, and similar occupancies as per Chapter 5.

Add # 1 -Appendix 8: IF-8 - NYC TRANSIT SUBWAY STATION INSPECTION FORM

This form will be utilized to inspect all NYC subway stations.

Add # 1 -Appendix 9: IF-9 - NYC TRANSIT UNDER-RIVER RAIL TUBE INSPECTION FORM

This form will be utilized to inspect all NYC Transit Under-River Rail Tubes.

The Public Transportation Safety Unit (PTSU) will coordinate semi-annual inspections of the 14 NYC Transit Under-River Rail tubes. Under-river rail tube inspections shall commence at the emergency exit nearest the under-river tube and will conclude at the next emergency exit on the opposite side of the river. Where the tubes have emergency exits on Roosevelt Island, the inspection will conclude at the next emergency exit beyond Roosevelt Island. The tubes in both directions shall be inspected. In cases where there is no emergency exit between the nearest station and the under-river tube, the inspection shall commence and/or conclude at the tunnel-to-tube transition area.

Under no circumstances shall the members conducting inspections of the under-river rail tubes enter the track area or bench walls (aka catwalks). Inspections are limited to visual inspections conducted from inside the train.

Note: After the Fire Officer completes the inspection all applicable forms are filed in the appropriate building folder. The inspectional forms are no longer required to be forwarded to the Administrative Battalion.

Additional Note: After completion of the School Inspection Form forward a duplicate copy of this form to Fire Prevention, intermediate endorsements are not required. The building profile information on this form is required for the school desk. Units should refer to Chapter 2, Section 2.8 and RBIS User Guide, in order to add a school to an inspection set.

BY ORDER OF THE FIRE COMMISSIONER AND CHIEF OF DEPARTMENT

VIOLATION ORDER GUIDE

Violation Orders (VO)

1) A Violation Order (VO) is a written order used to remedy any violation listed in the Standard Form of Orders or as directed by Fire Department procedures. When issuing a VO, recommended compliance times are listed in the Standard Form of Orders. Variations of the time limits listed are permitted. Compliance dates should fall on a scheduled BISP period. Forthwith orders and orders with one other compliance date may be written on the same order, however, violations should be grouped to have a common date and/or time for compliance. **The recommendation is to use separate orders when compliance times are not consistent or multiple violations are cited and additional space is needed on the VO. Write as many orders as required to enforce all of the items in violation. Supplement sheets are not provided for the VO like the FDNY Summons.**

2) VO's shall either be complied with or enforced. If the violation is corrected at the time of the inspection the statement "Personally Abated-Order Dismissed", the date and member's name shall be recorded on the back of the (Yellow) reinspection, (White) book copy and filed in the building folder. If the VO is not corrected within the compliance time the officer may allow an extension if 75% of the required work has been completed, a progress notation shall be made on the back of the reinspection copy. When the VO has been complied with, a notation shall be made on the back of the reinspection copy, this copy shall be filed in the building folder. If the officer determines the order must be enforced a summons shall be issued (See summons reference).

Preparing VO (A-10B)

A copy of the VO is provided in appendix A and the numbers on the VO correspond to the section numbers below.

Section 1: Enter the name of the person who the violation is against. When the violation is against the building, name the building owner as the respondent. If the violation is against a business or an occupant within a building, list the business name or the occupant's name as the respondent. When verifying the building owner, the member shall request proper identification and documentation proving he/she is the owner. When verifying a business name, check the Business Certificate or license posted at the premises.

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The officer can verify the proper building owner by conducting an ownership search using the Finance Property Search or NY City Maps, which can be found on the FDNY Intranet under Documents/ Books, Fire Officer's Resource. Contact the BISP hotline for assistance if needed.

Section 2: Address of owner/occupant is the address where the violation is found

Section 3: Room # or floor

Section 4: Type of occupancy, ex: Residential, Public Assembly

Section 5: Enter Building Identification Number

Section 6: Enter the appropriate item number corresponding to the Standard Form of Order number (i.e. M-1). Do not use an "X" or a "check". Do not number them 1, 2, 3. If a preprinted order requires the inspector to provide details, such as location of violation, provide information in spaces provided at the bottom of the VO.

Section 7: When a preprinted order is not provided to correct a violation, an order shall be created. The company officer shall ensure the appropriate wording is used to correct the violation. The first violation should start with SP-1 and then consecutively (SP-2, SP-3, etc.) until all violations have been cited. When preparing the violation order the section of law (BC-Building Code, FC-Fire Code, NYS Multiple Dwelling Law, etc.) shall be written on the order. If the violation order is not complied with and a summons is served, the officer is required to site the section of law on the A-200 and A-201, which serve as accusatory documents in order to execute the summons.

The officer should also ensure that a remedy is provided after citing each violation. The Officer should refer to the Standard Form of Orders, which provides the violation and remedy. This information should be copied verbatim onto the A-10B. If an Officer utilizes a section of law outside the SFOs the Officer should use the words "Failure to maintain or provide" in front of the code information and provide the code/rule section number. The remedy is simply a repeat of the code; however the remedy should start with the words "Maintain or Provide".

FC 102.8 - Matters not adequately provided for in this code:

Requirements that are essential for fire safety in an existing or proposed building, structure, or premises, or in connection with the regulation of any material, operation or facility, which are not specifically provided for by this code may be established by the commissioner.

Commentary on FC 102.8: When a situation is encountered that creates a condition, which is contrary to fire and life safety and the Fire Code does not provide a provision to adequately address the condition an order shall be written to correct the problem, FC 102.8 shall be cited in these situations, see above.

Section 8: Enter the number of days in which the violation must be complied with. Recommended compliance times are listed in the Standard Form of Orders. Variations of the time limits listed are permitted. Compliance dates should fall on a scheduled BISP period.

Forthwith orders and orders with one other compliance date may be written on the same order. However, violations should be grouped to have a common date and/or time for compliance. If the different compliance dates are confusing to the person receiving the order, then the inspector should issue separate VO's for each compliance date. **The recommendation is to use separate orders. Write as many orders as required to enforce all of the items in violation.**

When a **"Comply Forthwith" or "Comply Immediately" order** is issued, the printed statement shall be amended as follows:

- Change the words "has not been" to read "is not".
- Change the words "in_____days of issuance date" to read "forthwith" or "Immediately".
- When forthwith compliance is ordered, the time (Do not use military time) that such order was issued will be indicated on the order. The word "forthwith" shall under normal conditions be construed as approximately 24 hours. When the word "Immediately" is used the work to remedy the condition shall begin at that time.

Section 9: The member shall issue the order to the owner, occupant, or a responsible person in charge. Enter the name of the person receiving the order. If available, enter the title and phone number of the individual receiving the order.

Section 10: Inspector shall enter his/her name and date.

Section 11: Unit Number, Address, Phone Number.

Section 12: Cross Streets of the address in violation requiring the issuance of a VO.

Section 13: Field Units should only list the administrative Battalion. D.O. is for district office inspectors only.

Distribution of the Violation Order

- **First (Pink) Copy-** issued to owner, agent or person in charge.
- **Second (Yellow) Re-inspection Copy-** Attached to the building card and placed in "Existing Violations" file.
- **Third (White) Copy – Forwarded to the Bureau of Legal Affairs**, Public Records Unit Room IS-58-C.
- **Fourth (White) Copy -** remains in the violation order book.

Note: If the yellow reinspection copy has been forwarded with a summons and there are other items outstanding on the same violation order, then the fourth (White) copy can be used as the reinspection copy.

Issuing a Violation Order to a City Agency
Or a Non-Jurisdictional Agency

Note: Non Jurisdictional Agency = State, Federal, Port Authority, etc.

The Public Buildings Unit of the Bureau of Fire Prevention has been designated as the Inter-Agency Liaison for the purpose of processing Violation Orders issued to City Agencies or Non Jurisdictional Agencies that are found to be non compliant.

Effective immediately the following procedure shall be adhered to whenever a violation order is issued to a City Agency or a Non Jurisdictional Agency:

1. When a Violation Order has been issued, the pink copy shall left at the premises.
2. A re-inspection shall be conducted by the issuing unit.
3. Upon discovery of non-compliance, a memo stating the condition found and a copy of the Violation Order shall be forwarded to the Public Buildings Unit for appropriate action.
4. The Public Buildings Unit will initiate corrective action pursuant to Executive Order 115 from the Mayor's Office of Operations.
5. When the Public Buildings Unit has been notified that a Violation Order has been corrected by the affected City Agency or Non Jurisdictional Agency, a request to reinspect will be forwarded via the Public Buildings Unit to the issuing unit.
6. The issuing unit requested to reinspect will forward another letterhead stating compliance or non-compliance.
7. Once the Public Buildings Unit receives the re-inspection report from the issuing unit, a dismissal letter will be forwarded to the affected City Agency or Non Jurisdictional Agency, if the condition was corrected. If the condition is still found to be in violation the Public Buildings will initiate corrective action again as per line 4.

BY ORDER OF THE FIRE COMMISSIONER AND CHIEF OF DEPARTMENT

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CROSS STREETS _____ 12

CITY OF NEW YORK
FIRE DEPARTMENT

A-10(B) 05/09

BATTALION_____ 12
D.O._ n/a for field units_____ 13

E 000000

To 1&2 _____

3 _____ ROOM # OR FLOOR

Name/Address of Owner, Occupant 4

_____ TYPE OF OCCUPANCY

5 _____ BIN #

An inspection this date of the above premises indicates the existence of the following violations under the enforcement jurisdiction of this Department. You are hereby directed to correct such violations by compliance with the following order:

SFO#	Item #	
C-16	6	Failure to obtain and/or produce required certificate of fitness to supervise the testing, inspection, and servicing for (sprinkler/standpipe/foam fire extinguishing/fire alarm/private fire hydrant/yard hydrant) system, in violation of **C901.6.3.** **Remedy:** Obtain and/or produce such certificate of fitness.
EG-1		Failure to maintain a required (means of egress/ exit/ exit access/ exit discharge) at _____ free from obstructions, in violation of **FC1027.2.** **Remedy:** Maintain such (means of egress/ exit, exit access/ exit discharge) free from obstructions. **(Comply Forthwith)**
EG-7		Failure to maintain the premise in such a manner so as not to allow it to become overcrowded, in violation of **FC1027.3.4.** **Remedy:** Reduce the amount of persons to (number of people), a level which will not allow their presence and/or location to obstruct or impede access to any means of egress. **(Comply Forthwith)**
EG-12		Failure to provide and/or maintain signs for (exit/exit access door/exit which is not immediately recognizable) at_____, in violation of **FC1027.1.** **Remedy:** Provide/maintain such signs. **1968 BC27-389 2008 BC1011.1 Labor Law § 272**
FE-1		Failure to provide (number) portable fire extinguisher(s) at _____, in violation of **FC906.1** and/or **FC906.3** **Remedy:** Provide such portable fire extinguisher(s) with a minimum _____ rating.
FPS-3		Failure to maintain (standpipe/sprinkler/fire alarm) system in good working order at all times, in violation of **FC901.6** **Remedy**: Restore such system to good working order. **(Comply Forthwith)**
GP-14		Failure to maintain (fire escape/exterior screened stairway) at _____ in good working order, in violation of **NYS Labor Law § 273-274/ NYS MD Law § 53(8)(b).** **Remedy:** Replace all defective portions of the (fire escape/exterior screened stairway). **NYS Labor Law § 268/NYS MD Law §53(8)(b).**
HA-3		Failure to provide and/or maintain enclosure around boiler with a fire-resistive rating of not less than 1 hour at _____, in violation of **NYS MD Law § 65.** **Remedy:** Provide enclosure around boiler with a fire-resistive rating of not less than 1 hour, vertically and horizontally from surrounding spaces.
HA-4		Failure to provide and/or maintain boiler room with a fireproof self closing door at _____, in violation of **NYS MD Law § 65.** **Remedy:** Provide boiler room with a fireproof self closing door.
HK-1		Failure to maintain area free of accumulations of rubbish/combustible waste at _____, in violation of **FC304.2.** **Remedy:** Remove all accumulations of rubbish/combustible waste in such area. **(Comply Forthwith)**
SPK-4		Failure to maintain and/or produce records for monthly inspection of sprinkler system by a Certificate of Fitness holder, in violation of **FC901.6.2.1.** **Remedy**: Maintain and/or produce such records.
STP- 3		Failure to maintain and/or produce records of standpipe system monthly inspections by a Certificate of Fitness holder, in violation of **FC901.6.2.1** **Remedy**: Maintain and/or produce such records.
SP-1	7	Failure to provide/maintain/repair _____ at_____, in violation of **(Section of Law)** **Remedy**: Provide/maintain/repair _____.

8 If this order has not been complied within _____ days of issuance date, a SUMMONS will be served for violations of the Administrative Code of the City of New York.

This is to certify that I have made inspection of said premises and have issued the above order to:

9 _____ NAME OF PERSON WHO RECEIVED THIS ORDER

9 _____ TITLE

_____ PHONE #

10 _____ INSPECTOR

_____ DATE

_____ UNIT

11 _____ UNIT ADDRESS

_____ UNIT TELEPHONE

BY ORDER OF THE FIRE COMMISSIONER

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COMPUTER ASSISTED DISPATCH SYSTEM

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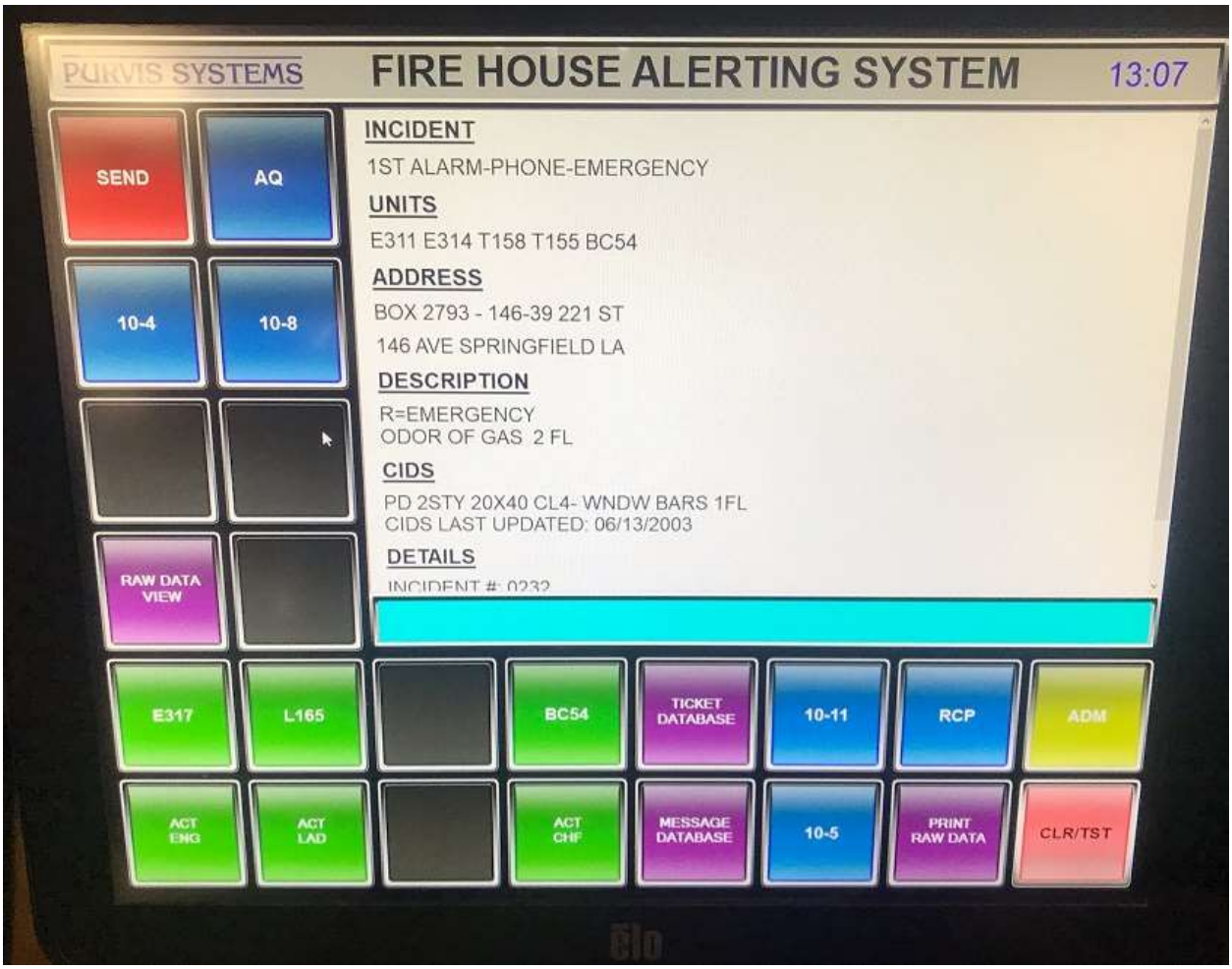
2.0 INTRODUCTION

The Computer Assisted Dispatch System (CADS) within the Bureau of Communications helps the Fire Department by facilitating the dispatch of units; maintaining coverage; and organizing information. Every unit in the Department is linked to CADS via a Personal Computer/Alarm Teleprinter Selector (PC/ATS) which:

A. provides concise information in printout form relative to response (retained printouts serve as the basis for reports, etc.)

B. transmits administrative messages.

C. provides information relative to hazardous situations contained in the Critical Information Dispatch System (CIDS).



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2.1 DESCRIPTION OF THE PC/ATS

2.1.1 The Alarm Teleprinter

A. The Alarm Teleprinter provides printouts for response, relocation, return from relocation, or administrative messages. These are preceded by two types of alert tones.

1. A response message is indicated by an Alarm Alert tone and a Beeping Alert tone at the PC/ATS.

Note: The Alarm Alert tone is followed by a ".wav" file that alerts the appropriate company (Engine, Ladder, Battalion etc.) with a computer-generated voice, which is transmitted via firehouse intercom speakers in quarters.

2. An administrative message is indicated only by a beeping Alert tone at the PC/ATS.

2.1.2 Selector Panel

A. The PC/ATS interface provides a convenient means of reporting a unit's status or acknowledging a response. The PC/ATS interface is composed of Unit Identification Buttons, Status Buttons and Function Buttons.

B. The screen is a touch screen. Most objects (finger, pen, glove, etc) can be used to select a button. Touching the screen anywhere on the button will select the button. When a button is selected, the button selected will brighten to indicate it was properly selected.

1. Unit Identification Buttons (Green)

ENGINE.....Engine Companies

LADDER .....Ladder Companies

SPL UNIT .....Special Unit, e.g. Rescue

CHIEF .....Battalion or Deputy Chief

ACTENG .....Designates a relocated Engine in quarters. It must be used in all instances affecting status of a relocated Engine.

ACTLAD .....Designates a relocated Ladder in quarters. It must be used in all instances affecting status of a relocated Ladder.

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ACTCHF.....Designates a relocated Chief in quarters. It must be used in all instances affecting status of a relocated Chief.

2. Status Buttons (Blue)

10-4 .....Acknowledges a response, relocation or return from relocation.

AQ.....Available in quarters.

10-8 .....Available on the air (BISP, securing meals, etc.). This eliminates the need for announcing 10-8 via radio.

RCP……Rest and recuperation.

3. Function Buttons

SEND (Red)……Releases information to the computer, thereby completing message.

10-5 (Blue).....Furnishes a duplicate copy of the last message received.

10-11 (Blue).....Tests operation of PC/ATS. To see if PC/ATS and computer are working, depress 10-11, followed by SEND button. The alarm teleprinter will then print out the following test message: "This is a test of the communication line." If the test message is not received, notify Starfire Control Center.

CLR/TEST (Red).....Performs the following functions:

a. Verifies that the touch screen is functioning properly.

b. Clears the Selector Panel if a button is erroneously pressed in either the identifying or reporting stage (or both).

c. Stops the audible signal beeping.

ADM (Yellow).....Is used to generate a Borough Status Report only in quarters where Battalions and Divisions are located.

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a. To obtain this report from the PC/ATS, units at the housewatch desk or in the chief's office must depress the ADM, 10-4 and SEND buttons in that order.

2.2 OPERATING INSTRUCTIONS FOR PC/ATS

2.2.1 Response Message (Alarm Receipt at PC/ATS)

A. Immediately prior to receipt of a response, the Alarm Alert tone, ".wav" file and the PC/ATS audible signal (beeping) are activated and heard in quarters.

B. Alarm message is displayed in the window and printed on the printer. The housewatch shall read the message and determines which units are to respond. The housewatch acknowledges only for those units responding from quarters.

C. The housewatch has **20 seconds** to acknowledge. If there is no response in 20 seconds, the dispatcher will prompt the unit to verify response via the Voice Alarm.

D. To acknowledge a signal the housewatch shall select the UNIT IDENTIFICATION, 10-4 and SEND buttons. If more than one unit is to respond, UNIT IDENTIFICATION buttons must first be depressed for all such units followed by 10-4 and SEND buttons. (When a unit is ACT'G follow instructions in this chapter)

E. To obtain additional copies of a response message, press 10-5 button followed by SEND. Before any copies of response messages are made, all responding units shall acknowledge.

F. The housewatch shall announce the response particulars aloud and give the printed copy to the officer(s) responding.

2.2.2 Reporting "In Service"

A. Immediately upon return to quarters, and if "available", update status by bringing unit "in service".

EXAMPLE: L123 AQ SEND

B. After the SEND button is depressed, the computer will return, in small print, an acknowledgment of the status entered.

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Note: All units in the same quarters can make themselves AQ simultaneously unless:

1. Units responded to different boxes.

2. Unit(s) did not go 10-8.

3. One unit is a relocated unit.

2.2.3 Teleprinter Messages Received while Units are 10-8

A. Check alarms to see if previously responded to. All alarms to which a unit responded while 10-8 are also printed in quarters. Upon return to quarters, the Selector Panel will be "beeping" and alarms will be printed on the Alarm Teleprinter. The housewatch should do the following:

1. Check "time out" on bottom of ticket to verify that this is a previous alarm.

2. If no response is required, press CLR/TEST button and then proceed to make the unit available in quarters.

2.2.4 Verbal Alarms

A. Units receiving a Verbal Alarm while in quarters must notify the dispatcher as soon as possible via telephone or the apparatus radio indicating:

1. The nature of the incident they are responding to.

2. The location of the incident.

3. If additional assistance is required.

2.2.5 RCP Button

A. Units that are granted R&R shall not go 10-8 when leaving the scene of an incident. Upon return to quarters, place unit on R&R via selector panel in the following manner:

EXAMPLE: E259 RCP SEND

B. At the conclusion of recuperative time, the unit will bring itself back into service in the following manner:

EXAMPLE: E259 AQ SEND

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Note: The unit's officer shall ensure that the unit comes back in service at the appropriate time via the PC/ATS.

2.2.6 ACT'G Button: Relocated Units

A. The relocated unit must use the ACT'G button at all times to identify itself.

EXAMPLE: ACT'G E033 AQ SEND

1. Indicates relocated unit is in service as E033, either initially or returning from the scene of an incident.

B. Acknowledgments and status updates involving relocated units must be done independently. For example, Box 2185 is received in quarters of E60, L17 and BC14. The following would indicate that a relocated Engine, Ladder and Battalion Chief are responding.

EXAMPLE: ACT'G E060 10-4 SEND

(immediately followed by)

ACT'G L017 10-4 SEND

(immediately followed by)

ACT'G BC14 10-4 SEND

Note: The ACT'G button can only be used by the first relocator into the original unit. If subsequent relocations are made into that unit, the ACT'G button can no longer be used. Thereafter acknowledgments and status reports must be done via Voice Alarm, radio or telephone.

C. In all instances a relocated unit would acknowledge independently of the regularly assigned units.

1. For example, Box 9027 is received in quarters of E287, L136 and BC46. The following indicates proper receipt and acknowledgment of Box 9027 where a relocated unit is acting as E287.

EXAMPLE: ACT'G E287 10-4 SEND

(immediately followed by)

L136 BC46 10-4 SEND

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D. Units must be 10-8 in order to go AQ via the PC/ATS in their quarters. If not, an error message will be generated to that unit to call the dispatcher via telephone to verify and update their status.

1. If the original unit goes 10-8 while the first relocator is in their quarters, a RETURN FROM RELOCATION ticket will be sent to that firehouse informing the relocated unit to return to its own quarters. This message must be acknowledged by using the ACT'G, UNIT, 10-4 and SEND buttons. If the ticket is not forthcoming, the relocated unit shall call the dispatcher by telephone. Under no circumstances should a unit leave before receiving a teleprinter message to do so.

2.2.7 Error Handling

A. When the wrong identifying or status buttons (or both) are pressed, merely press the CLR/TEST button momentarily and note all the buttons brighten. Start over again in the proper sequence to complete the message. If the mistake involves a response and is not noticed until after the SEND button is pressed, immediately notify the officer who in turn will call the dispatcher, by department radio, and give particulars.

Note: The status buttons are self-correcting, so if a mistake is made in that phase, pressing the correct button resolves the problem.

2.2.8 Non-Emergency Response, Unit Status

A. Units scheduled for non-emergency activities away from quarters must wait for a response message before leaving quarters. If such message is not received, units shall contact the dispatcher by telephone.

B. Receipt of a non-emergency response message must be acknowledged by use of the 10-4 button. The 10-8 button shall not be used for this purpose.

C. Units not scheduled for a non-emergency response who receive such a message to respond must contact the dispatcher by telephone for clarification. Also, units unable to leave quarters as directed shall contact the dispatcher by telephone.

D. Non-emergency response activities are:

1. Preventive Maintenance Program

2. Training at the Fire Academy

3. Education Day

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4. Medical Examinations at the Bureau of Health Services.

5. Training at a location other than the unit's own quarters when the unit will be unavailable.

6. Fire Prevention or Community Relations activities away from quarters when the unit will be unavailable.

7. Other authorized movement of unit from quarters when the unit will be unavailable.

2.3-2.4 ***Redacted for PFS***

2.5 CODED SIGNALS

2.5.1 Coded Signals Used in Teleprinter Messages

Signal (SIG) Explanation

2-2 Second Alarm announcement

3 Used in combination with a street box and assigned terminal number to indicate an alarm originating as a private fire alarm in buildings.

3-3 Third Alarm announcement and/or response

4 Battalion Chief response required

4-4 Fourth Alarm announcement and/or response

5 Engine Company response required

5-5 Fifth Alarm announcement and/or response

5-7 One Engine and one Ladder Company response required

6 Marine Company response required

7 Ladder Company response required

7-5 Notification signal that three Engine Companies (or two Engines and one Squad), two Ladder companies and a Battalion Chief are operating.

8 Squad Company response required

9 Preliminary for special units.

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10 Rescue Company response required

14 Battalion Chief Relocation or Return from Relocation

15 Engine Company Relocation or Return from Relocation

16 Marine Company Relocation or Return from Relocation

17 Ladder Company Relocation or Return from Relocation

2.6 GENERAL MAINTENANCE OF PC/ATS

2.6.1 The Alarm Teleprinter/Selector Panel (PC/ATS) is not to be tampered with in any way. The only maintenance to be performed by members is that of changing the paper roll.

A. Each unit shall maintain at least two spare rolls of teleprinter paper in the company office. Spare paper rolls may be secured at Battalion headquarters. Units in need of teleprinter paper should contact their respective battalion. Battalions shall obtain teleprinter paper from their respective Division. Scheduled deliveries are made to all Divisions. In the event a Division supply should run low before the scheduled delivery is made, Starfire Operations should be notified and an emergency supply of teleprinter paper will be provided.

2.6.2 The PC/ATS shall be clear of all obstructions. Do not place coffee cups, magazines or other objects on or near the PC/ATS.

2.6.3 The user should visibly determine that each light works as specific buttons are depressed. Failure of any light is an indication of trouble and requires servicing.

2.6.4 Members must be familiar with the location of the PC/ATS power supply source. Older quarters have a separate circuit box with an exterior ON/OFF switch. This box is clearly labeled "ALARM TELEPRINTER". All police/fire combination quarters have a breaker designated in their circuit breaker panel box. These switches or breakers are operated only upon direction from Starfire personnel.

2.6.5 On the first of every month the teleprinter emergency power system shall be examined and tested in accordance with instructions contained on the decal affixed to the front panel of the red charging unit in the vicinity of the batteries.

2.7-2.8 ***Redacted for PFS***

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2.9 PAPER CHANGE PROCEDURE FOR ALARM TELEPRINTER

2.9.1 Paper rolls must be changed when a colored watermark appears on the edge of the teleprinter paper.

2.9.2 Housewatch will notify the officer on duty of the need for a spare roll of paper.

2.9.3 Housewatch shall not turn the teleprinter off when changing paper. If an alarm is received while the paper change is bring made, let the printer continue to print. Upon completion of printing, insert paper, depress the 10-5 and SEND buttons and a copy of the message will be printed.

2.9.4 Details of Paper Change

A. Remove the gum label of adhesive securing the starting of the paper roll.

B. Lift off the cover on the teleprinter that covers the paper roll.

C. Take out the old roll of paper.

D. Move the green tabs horizontally to open the area where the paper roll is placed and insert the new paper roll.

E. Feed the leading edge of the paper roll thru the slotted opening where it prints out messages.

2.10-2.11 *Redacted for PFS*

2.12 CADS USE FOR INCIDENT PARTICULARS

2.12.1 **Incident Summary**

A. Displays pertinent information regarding incident particulars which includes: Box #, address or location, time-out, etc. If the incident is open, all units currently operating will be displayed. If the incident is closed, all units that operated will be displayed.

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1. All units are designated by a letter prefix:

BC	Battalion Chief	MK	Mask Service Unit
D	Haz Mat Decontamination	MR	Marine Unit
DC	Deputy Chief	P	Purple K Unit
DS	Decon Support Unit	RA	Recuperation and Care Unit
E	Engine	RB	Rescue Operations Battalion
F	Foam Tanker or Hi-Ex Foam Unit	RC	Rescue Collapse
FC	Field Com	RR	Rapid Response
FT	Foam Tender	RS	Rescue
H	Hose Wagon	SB	Safety Battalion
HB	Haz Mat Battalion	SQ	Squad
HM	Haz Mat Unit	ST	Satellites
HR	High Rise Unit	T	Tower Ladder
L	Ladder	TR	Technical Response Unit
MB	Marine Battalion	TS	Tactical Support

2. Units are designated by the following letter suffix when assigned a specific task at an incident:

Engine Companies		**Ladder Companies**	
C	CFR-D Engine	C	CPC Unit
D	Tech Decon Task Force Engine	D	Tech Decon Task Force Ladder
F	FAST Unit	F	FAST Unit
H	Haz Mat Tech Unit	H	Hi-Rise Roof Team
I	FireIce Unit	K	Division Task Force
K	Division Task Force	R	Rescue Collapse Transport
L	Lobby Control Unit	S	SOC Support Truck
N	High Rise Nozzle	T	Transport Backup Unit
P	High Pressure Engine	V	Ventilation Support Unit
S	Communications Unit	W	Water - Ice Rescue Unit
T	Transport Backup Unit		
W	Water - Ice Rescue Unit		
Y	Systems Control Unit		

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2.13 MDT PRINTER MESSAGES

There are three types of messages that will be received by the MDT screen and its associated printer.

2.13.1. **Response Messages**

A. Response messages include notifications to respond, relocate and return from relocation. Only the units affected receive these messages. Messages requiring a unit response contain information including the type of alarm, unit(s) assigned, source of alarm, the nearest box number and location, an incident number, CIDS information, and the date and time the message was transmitted (the time out).

2.13.2. **Administrative Messages**

A. Administrative messages are varied and appear on the display screens and printer in small print. Administrative messages generally do not appear on MDT, nor are they sent to the apparatus printers unless specifically desired by the member. Administrative messages do not require an acknowledgment.

2.13.3 **Error Message**

A. **Incorrect transaction - no action taken**

This error message will be transmitted when an incorrect transmission is attempted.

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CRITICAL INFORMATION DISPATCH SYSTEM (CIDS)

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4.0 INTRODUCTION

4.0.1 The CIDS program utilizes the teleprinter or MDT dispatch message to provide critical information about specific buildings to responding units. The information provided by CIDS alerts units to dangerous, hazardous or unusual conditions which are not necessarily apparent from the front of the building. It also provides accurate and consistent information for required fire, emergency and radio progress reports.

4.0.2 ***Redacted for PFS***

4.1 CIDS PROGRAM CONCEPT

4.1.1 CIDS information is available to responding units via the teleprinter or MDT dispatch message. The CIDS information received will enhance operational efficiency by alerting responding units to dangerous, hazardous, or unusual conditions. The CIDS program is also designed to work in conjunction with the Departments Pre-incident Guideline (PG) program. Chief Officers receiving CIDS messages beginning with the FD designation PG shall refer to such guidelines as necessary while responding to and managing incidents at these locations.

4.2 *Redacted for PFS*

4.3 IDENTIFICATION OF CIDS BUILDINGS

4.3.1 Company Officers must consider all buildings in their administrative area as potential CIDS buildings. In considering a building they must look for conditions that would not be immediately apparent to arriving units.

It is mandatory that every building that is designated as a Bowstring Truss (**BWSTRG**), CFR Hold (**CFRH**), Major Alteration (**MJALT**), Pre-Incident Guideline (**PG**), Rehabilitated (**REHAB**), Stacked High Rise **(STACKHR),** or Mega High-Rise any building over 800' (**MEGA**) be included in the CIDS program.

A. Major Alteration (**MJALT**)-should be utilized for existing structures which have extensive alterations that involve horizontal extensions, vertical extensions, or extensive changes to the structure changing its occupancy or purpose (Church is repurposed as a restaurant).

B. Rehabilitated (**REHAB**)-should be utilized for existing structures which have extensive repairs or renovations that do not involve any horizontal extension, vertical extension, or extensive changes to the structure changing its occupancy or purpose.

C. Stacked High Rise **(STACKHR)** should be utilized for when a High Rise with individual isolated occupancies is found. These occupancies use their own ground level entrance and passenger elevators within that occupancy and theyonly serve that individual occupancy. Stairwells will provide access to all floors of the High Rise.

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4.4 ***Redacted for PFS***

4.5 CIDS ENTRY PROCEDURE:

4.5.1-4.5.2 ***Redacted for PFS***

4.5.3 Transmitted Data: (See Appendix B for examples)

A. This is the portion of the CIDS entry that will appear with the teleprinter or MDT dispatch message.

B. Information in this section must be listed in the following priority order. The eCIDS application will assist user in placing the transmitted data information into proper order. See addendum 2 of this document for detailed instructions concerning the eCIDS application.

1. **FD DESIGNATION:** If applicable, one of the following designations may be used: **BWSTRG**, **CFRH** (revision of entries with current CFRH status only), **MJALT**, **PG**, **REHAB** or **MEGA**.

   Note: Application for new CFRH status will be handled as per addendum 1 of this document.

2. **OCCUPANCY:** Choose from the provided dropdown list or enter your own.

3. **DESCRIPTION OF BUILDING:**

   a. Height in stories

   b. Dimensions of building

   c. Construction Class

      i. 1938 Building Code Construction Classifications:

      Class 1: Fireproof Structure

      Class 2: Fire-Protected Structure

      Class 3: Non-Fireproof Structure

      Class 4: Wood Frame Structure

      Class 5: Metal Structure

      Class 6: Heavy Timber Structure

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ii. Many newly constructed or renovated buildings do not conform to the construction classifications of the 1938 building code and are constructed using Modern Construction Materials.

iii. To assist in identifying both lightweight and other types of structures, 5 additional construction classifications have been added for use as follows:

A. A High-Rise Fire-Protected structure which is occupied as a residential building as described in FFP Multiple Dwellings, Chapter 4, should be classified as **CL2R.**

B. A Fire-Protected structure which is constructed, renovated or repaired using metal "C" joist or steel bar joist should be classified as a **CL2LW.**

C. A Non-Fireproof structure which is constructed, renovated or repaired using **any** type of structural Light-Weight materials should be classified as **CL3LW.**

D. A Wood Frame structure which is constructed, renovated or repaired using **any** type of structural Light-Weight materials should be classified as **CL4LW.**

E. A structure which is constructed, renovated or repaired using "Mass Timber" engineered building products should be classified as **CL6MT.**

Note: Although mass-timber construction differs significantly from traditional heavy-timber construction, it is more similar to heavy-timber construction than the other classes of buildings.

1. A detailed description of the construction material or construction techniques used would be included in the transmitted data portion of the CIDS card
.
2. LW after the construction classification should prompt the reader to consult the "transmitted data" for specific information on the type of Light-Weight Construction Materials used.

3. If submitting or approving officers deem necessary, and space allows, the date the building was constructed or altered can also be included within the "transmitted data" to provide insight into the construction techniques used.

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EXAMPLE: PD 3 STY 25X60 CL4LW-L/W WOOD JOIST TRUSS ON ROOF AND FLOORING ALL FLRS-YEAR BUILT 2008

4-5. ***Redacted for PFS***

4.5.4-4.5.5 ***Redacted for PFS***

4.6-4.7 ***Redacted for PFS***

BY ORDER OF THE FIRE COMMISSIONER AND CHIEF OF DEPARTMENT

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RADIO COMMUNICATIONS

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8.0 INTRODUCTION

The Department radio facilities consist of various radio systems and portable Handi-Talkies. In this chapter the Department's radio systems are described, and the procedures, operating instructions, and code signals involved in radio use are presented. In addition, the duties and responsibilities of dispatchers and uniformed members involved in radio communications are specified.

8.1 RADIO COMMUNICATIONS NETWORK

8.1.1 The Fire Department radio is only to be used for official communications by authorized persons and in accordance with Federal Communications Commission regulations and the provisions of this Manual.

8.1.2 The objective of the radio system is to insure the rapid, accurate exchange of information between the dispatcher and mobile units.

8.1.3-8.1.4 ***Redacted for PFS***

8.2. RADIO PROCEDURES

8.2.1 Dispatchers are responsible for maintaining discipline on the air and determining message priority. Dispatcher orders must receive prompt compliance.

8.2.2 Radio conversation should be brief and concise.

8.2.3 ***Redacted for PFS***

8.2.4 Use a normal conversational tone when transmitting radio messages. Numbers, including identities of units, alarm boxes, street locations, and Department automobiles shall be transmitted digit-by-digit. The only exception is for radio code signals.

EXAMPLE: Car one-oh, Engine three-one-oh, box one-oh-nine-oh.
If a unit is relocated, give its original identity first, followed by the words "acting" and the appropriate branch of service and unit number.
EXAMPLE: "Ladder 9 acting Ladder 2"

8.2.5-8.2.6 ***Redacted for PFS***

8.2.7 The preliminary "TEN" is used in all cases as an audible, attention focusing signal. The coded signals shall always be enunciated as whole numbers.

EXAMPLE: "10-18" – Ten-Eighteen "10 75" – Ten Seventy-Five

Each transmission requiring a reply must conclude with the letter "K." The "K" means: "This is the end of my message to you and a response is necessary. Go ahead, transmit."
Enunciate the "K" as a letter in the alphabet.

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8.2.8 An alphabet code is used to ensure accuracy and to expedite radio communications. The following are examples but not intended to be limited to their use:

A	ADAM.	J	JOHN	S	SAM
B	BOY	K	KING	T	TOM
C	CHARLES	L	LINCOLN	U	UNION
D	DAVID	M	MARY	V	VICTOR
E	EDWARD	N	NORA	W	WILLIAM
F	FRANK	O	OCEAN	X	X-RAY
G	GEORGE	P	PAUL	Y	YOUNG
H	HENRY	Q	QUEEN	Z	ZEBRA
I	IDA	R	ROBERT		

EXAMPLE: Fire reported in apartment 3 Boy.

8.2.9 ***Redacted for PFS***

8.3-8.4 ***Redacted for PFS***

8.5 RADIO CODE SIGNALS

Redacted for PFS

10-1 **Call your Quarters or Other Unit**

A unit is to call its quarters or other unit by telephone.

10-2 **Return to Quarters**

A unit is to return to quarters.

10-3 **Call Dispatcher by Telephone**

A unit is to telephone the dispatcher.

10-4 **Acknowledgment**

The message has been received, understood, and will be complied with.

10-5 **Repeat Message**

The message was not understood and should be repeated.

10-6 **Stand By**

A short pause in transmission will follow.

10-7 **Verify Address/Location**

The verification of an address or location is requested. Verification request shall be specific in nature, e.g., "10-7, Box 9999, Address does not exist".

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10-8 **In-Service by Radio**

A unit leaving the scene of an incident where it had either operated or stood fast is on the air and available. This signal is also used when the PC/ATS is not in service and a unit is leaving quarters. This signal is not used when unit is leaving quarters for non-emergency response.

Code 1: Used only by a Division or Battalion to indicate it is in-service by radio when leaving a quarters other than its own at which it had been off the air and to which its alarms had been routed.

Code 2: Used by any unit to indicate it is on the air outside its response area. When the unit returns to its response area, the dispatcher must be notified again using 10-8.

10-9 **Off the Air**

A unit will be out of radio contact. (State the reason: entering tunnel; visiting quarters; at a fire or emergency, etc.). A 10-8 is to be transmitted, with code if necessary, when radio contact is re-established.

10-10 **Unit Location**

A request is made for a unit's location. The unit is to acknowledge by giving its present location.

10-11 **Radio Test Count**

A unit is to count from one to eleven for test purposes.

10-12 **Preliminary Report**

A request by a Chief Officer or dispatcher for a preliminary report by the first arriving unit. The dispatcher shall relay the report to responding units.

10-14 **Roster Staffed Engine Company**

When an engine company staffed with an Officer and four Firefighters is assigned to a structural response, the Firefighter on housewatch, if unit is in quarters, shall acknowledge receipt of the alarm via the 10-14 button at the PC/ATS.

10-18 **Return all Units, except 1 Engine AND 1 Ladder**

Transmitted for a fire or emergency, when in the judgment of the Incident Commander, conditions indicate that 1 Engine AND 1 Ladder Company are required. No further assistance is necessary.

If the required unit(s) has not arrived, the dispatcher shall be notified to have the required unit(s) continue responding to the location. Other responding units shall return to quarters or previous activity.

The Battalion Chief need not continue to the scene after a 10-18 has been transmitted unless deemed necessary. This decision must be based, in part, on the experience level of the Officer transmitting the signal.

Battalion Chiefs are to notify the dispatcher that they are 10-8 when not continuing in on a 10-18.

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10-19 **Return All Units, Except 1 Engine OR 1 Ladder**

Transmitted for a fire or emergency, when in the judgment of the Incident Commander, conditions indicate that 1 Engine OR 1 Ladder Company is required. No further assistance is necessary.

If the required unit has not arrived, the dispatcher shall be notified to have that unit continue responding to the location. Other responding units shall return to quarters or previous activity.

The Battalion Chief need not continue to the scene after a 10-19 has been transmitted unless deemed necessary. This decision must be based, in part, on the experience level of the Officer transmitting the signal. Battalion Chiefs are to notify the dispatcher that they are 10-8 when not continuing in on a 10-19.

10-20 **Proceed at Reduced Speed**

Responding units are to proceed at reduced speed. No warning devices are to be used and all traffic regulations are to be observed.

10-21 **Brush Fire**

A fire in grass, brush etc.

10-22 **Outside Rubbish Fire**

A fire in outside rubbish that has not extended to a building.

10-23 **Abandoned/Derelict Vehicle Fire (ADV)**

A fire in a vehicle that has no value other than salvage and no owner can be located.

10-24 **Auto Fire**

A fire in a vehicle with plates or in any vehicle having a value greater than that of salvage.

10-25 **Manhole or Transformer Fire or Emergency**

Any type of manhole or transformer fire or emergency.

Without Code: Situation other than as described in Codes 1, 2, 3, or 4.

Code 1: Fire has extended from a manhole, conduit, or transformer into a building.

Code 2: Fire has blown one or more manhole covers, or smoke is issuing from a manhole under pressure.

Code 3: Smoke is seeping from a manhole.

Code 4: Fire or smoke condition from a transformer at any location. i.e., pole, vault, room, etc.

Note: Utility Company will dispatch an emergency crew immediately upon receipt of a Code 1 or Code 4 signal.

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10-26 **Food on Stove**

Food on the stove or other form of cooking carelessness.

10-27 **Compactor or Incinerator Fire**

Fire has not extended from compactor or shaft.

10-28 **Subway or Railroad System - Fire, Emergency (non-medical) or Smoke Condition**

Code 1: Structural fire

Code 2: Non-Structural fire (e.g. train fire, rubbish on the tracks, etc.)

Code 3: Emergency (non-medical)

10-29 **Elevator Emergency**

Code 1: Occupied

Code 2: Unoccupied

10-31 **Assist Civilian**

All calls for assistance other than medical assignments, including a unit assigned to protect EMS by diverting or blocking traffic at a highway incident, good intention calls, calls handled by other agencies, any type of investigation, searches and complaints, and lock-outs. Chapter 4 Section 1.3 of the New York Fire Incident Reporting System (NYFIRS) lists incidents and situations codes.

NOTE: The 10-31 signal shall not be utilized for any incident/emergency involving evaluation of structural stability, any operation involving a rescue or mitigation effort, or any type of hazardous condition.

10-32 **Defective Oil Burner**

Fire has not extended from the firebox.

10-33 **Odor Condition**

Code 1: Odor of smoke. A smoke condition caused by a nearby working fire or fires such as barbecues, salamanders, etc.

Code 2: Any other type of odor.

10-34 **Sprinkler System Emergency**

Any type of sprinkler system emergency.

Code 1: Defective sprinkler device or system (defective alarm valve, broken pipe, etc.)

Code 2: Unwarranted sprinkler alarm- Not defective (surge in pressure, people working on the system, etc.)

Code 3: Sprinkler has been activated by heat source not associated with an accidental fire.

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10-35 Unwarranted or Unnecessary Alarm System Activation

Any alarm system activation that is unwarranted or unnecessary, **excluding** a sprinkler system alarm (use 10-34 Code 1, 2 or 3) or an alarm system activation resulting from a utility power fluctuation (use 10-40 Code 2).

No Code – Unwarranted alarm.
Alarm system activation caused by the **defective condition** of alarm device, equipment or system. (e.g., low battery condition, alarm activations without a known cause or when no condition is found warranting an emergency response).

Codes 1-4 - Unnecessary alarm.
Alarm device, equipment or system **operating properly but unnecessarily activated** by lack of due care. DO NOT use this code when there is a fire or other condition warranting an emergency response.

Code 1: Unnecessary alarm caused by **alarm system testing or servicing**.

Code 2: Unnecessary alarm caused by **construction activities.**

Code 3: Unnecessary alarm caused by **ordinary household activities** (toast, steam, aerosol spray).

Code 4: Unnecessary alarm caused by **other known cause**. (e.g., alarms resulting from cigarette smoking in unauthorized areas). **When this code is used, a NYFIRS report must be completed setting forth the cause of the unnecessary alarm and the relevant particulars.**

Select appropriate code based on best information available, whether observed by or reported to responding unit.

10-36 Vehicle Accident or Emergency

Code 1: Vehicle accident or emergency requiring washdown

Code 2: Vehicle accident, no injuries and no washdown

Code 3: Vehicle accident with injuries

Code 4: Vehicle accident, with or without injuries, with a trapped victim requiring extrication

No Code: Vehicle emergency other than described above

10-37 Medical Assignment Not Associated with Fire Operations

Code 1: Victim deceased.

Code 2: Victim/Patient is **NOT** breathing and requires resuscitation or may be suffering from a serious, apparently life threatening injury or illness.

Code 3: Victim/Patient **IS** breathing and suffering from a non-serious, apparently not life threatening injury or illness.

Code 4: Medical assignment where the unit is 10-84, has **no** patient contact and EMS is on-scene.

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Note: Signal 10-45 with appropriate sub-code shall be transmitted in lieu of signal 10-37 for thermal burn injuries which occur as a direct result of heat from a flame, or any injury as a result of carbon monoxide exposure of electrocution/electric emergencies.

The officer transmitting signal 10-45 for this type of burn injury shall request the response of a Battalion Chief to the scene.

Where doubt exists as to which signal to transmit, a Battalion Chief shall be requested to respond to the scene.

10-38 **Carbon Monoxide Response**

Any type of Carbon Monoxide Response

Code 1: Detector Activation: Carbon Monoxide Investigation (low battery, defective detector, unwarranted alarm, etc.)

Code 2: Detector Activation: Carbon Monoxide **Incident** (CO Meter Reading of 1-9ppm)

Code 3: Detector Activation: Carbon Monoxide **Emergency** (CO Meter Reading of greater than 9ppm or occupants are symptomatic)

Code 4: **No** Detector Activation: Carbon Monoxide Incident or Emergency (Specify) e.g.: no detector present in affected area, detector present in affected area, but did not activate.

10-39 **FD Standing By**

FD Units standing by at interagency incident, e.g. standing by at a suspicious package.

10-40 **Utility Emergency**

Code 1: Gas Emergency (Gas main leak, Gas leak in structure, Defective gas appliance, etc.)

Code 2: Electrical Emergency (Wires Down, Sparking Fixture, Short Circuit, etc.)

Code 3: Water Condition - any type of water leak or flooding condition

Code 4: Steam Leak - any type of steam leak

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10-41 **Fire Marshal Investigation Required (Specify Code)**

Code 1: Occupied Structure or Vehicle

A structure (commercial, residential, public), or vehicle (car, bus or train) which is occupied at the time of the fire. This also includes a vacant apartment in an occupied building, or a store with a dwelling above, or an occupied detached garage, shed or similar structure.

Code 2: Unoccupied Structure

A structure (commercial, residential, public), normally occupied which is unoccupied at the time of the fire.

Code 3: Unoccupied Vehicle

A vehicle, (car, bus or train) with or without plates, which is unoccupied at the time of the fire.

Code 4: Vacant Structure, or Structures **not** intended for Dwelling Purposes.

Examples include, but are not limited to the following: Vacant buildings, buildings under construction/demolition, detached garages, sheds or similar structures.

Note: If any of the above are occupied at the time of the fire, transmit Code 1.

Redacted for PFS

10-42 **Any Downed Tree Incident or Emergency**

Provide description to dispatcher and if Parks Department or electric utility is required.

10-43 **Any non-fire related rescue; any person(s) rescued/removed from a dangerous situation**

NOTE: 10-43 is a disposition code, not a request for resources and shall not be transmitted in lieu of 10-60, 10-75 or other signals.

10-44 **Request for Ambulance**

A request for an ambulance response from the EMS Command. Specify the reason and type (when possible).

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10-45 **Civilian DOA or Serious Injury (Fire Related ONLY)**

At the scene of fire operations, including vehicle fires, the signal 10-45 shall be transmitted upon the discovery of any fatality or injured civilians as a result of the fire operation. The Incident Commander shall then have this information transmitted over the Department radio as soon as possible.

After the initial transmission(s) of signal 10-45, the Incident Commander shall, as conditions allow, consult with the Medical Group Supervisor or Branch Director as to the condition of the injured civilians removed from the fire area. The IC shall also confirm that the number of patients and/or fatalities match the number of 10-45s transmitted. Once the status and number of fatalities and patients has been confirmed, the IC shall transmit the appropriate codes for each 10-45 transmitted, given to him/her by the Medical Group Supervisor or Branch Director.

The Bureau of EMS color tags their patients for treatment as follows:

Patient Condition	*Color Tag*	*Code Transmission*
Deceased	Black	Code 1
Life Threatening Injury	Red	Code 2
Non-Life Threatening Injury	Orange/Yellow	Code 3
Non-Serious Injury/Ambulatory	Green	Code 4

Notes: Signal 10-45 shall not be used to indicate a fatality or injury to an on-duty member.

10-46 **Maritime Fire or Emergency**

Code 1: Any fire in maritime environment (example: vessel, dock, pier)

Code 2: Emergency in maritime environment

Examples: Vessel in distress, person(s) in the water removed by FD personnel, hazard to navigation, hazardous materials incident in maritime environment.

10-47 **Police Response**

Police assistance is needed for crowd or traffic control, security, apprehension, etc. The dispatcher shall be advised of the specific reason for the request.

10-48 **Police Response for Harassment**

Firefighters are being harmed and Police assistance is needed immediately.

10-51 **Suspension of Outside Activities**

Transmitted over Department radio, voice alarm, and teleprinter when outside activities are suspended. Rev. 06/11/20

When conditions "that caused suspension of outside activities no longer exist, the following message will be transmitted by Department radio, voice alarm and teleprinter:

"All units resume outside activities forthwith."

10-60 **Major Emergency Response**

Major Emergency Incident e.g. collapse of a private dwelling, derailment of a subway car.

The total response will be: ***Redacted for PFS***

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10-60 Code 1 / Major Emergency Response – Enhanced 2nd Alarm

Large Scale Major Emergency Response - Additional Technical Rescue Resources Required

Note: ***Redacted for PFS***

The total response will be: ***Redacted for PFS***

10-66 Missing, Lost, Trapped, or Seriously Injured Member and Additional Resources are Required

Transmission of signal 10-66 will automatically cause the response of the following: ***Redacted for PFS***

Note: ***Redacted for PFS***

10-70 Water Supply Is Required

A notification that the first arriving engine does NOT have a positive water source. This shall be an "urgent" message to the dispatcher from the unit transmitting the signal. It will also require an "urgent" HT transmission to all units on the scene. Examples of situations that would require a 10-70 include:

1. Dead or Frozen Hydrant
2. Unable to Access a Hydrant
3. Unable to Hookup to a Hydrant
4. Insufficient Hydrant Pressure
5. No Water/Insufficient Pressure at Standpipe Outlet

The second arriving engine will be designated the “Water Resource Unit” and must be prepared to initiate water supply operations compatible with conditions encountered at the scene. Their primary objective is to assist the first arriving engine to obtain a positive water source. Options include:

- In-Line Pumping
- Water Relay
- Check standpipe system for open valves, broken pipe, check valves, etc.

When signal 10-70 is transmitted the Dispatcher shall: ***Redacted for PFS***

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10-75 **Notification of a Fire or Emergency**

A notification signal transmitted when, in the judgment of the Incident Commander, conditions indicate a fire or emergency that requires a total response of the following units:

4 - Engine companies 1 - RAC Unit
3 - Ladder companies (3rd Ladder assigned as FAST Unit)
2 - Battalion Chiefs 1 - Rescue company
1 - Deputy Chief 1 - Squad company

The Officer transmitting 10-75 shall also state if it is for a fire or emergency and if a building is involved, state:

1. **Location** of fire - What floor?
2. **Height** of building - How many stories?
3. **Type** of building - What kind of occupancy?

Example:
10-84 10-75, Box 111, we have fire on the 5th floor of a six story tenement.

Note: 10-75 transmitted for incidents below grade in facilities other than buildings (e.g. subway, tunnels, terminals, etc.) shall include; Rescue Battalion, Rebreather Unit 1 and a Communications Unit.

10-76 **Notification of a Fire in a High-Rise Building**

A High-Rise Building includes all buildings 75 feet or more in height.
Redacted for PFS

10-76 / 2nd Alarm **Notification of a Fire in a High-Rise Building**

A High-Rise Building includes all buildings 75 feet or more in height.
Redacted for PFS

10-77 **Notification of a Fire in a High-Rise Multiple Dwelling**

High-Rise Building includes all buildings 75 feet or more in height. Every 10-77 will have a HRN equipped engine (5th engine)

Redacted for PFS

10-80 **Hazardous Material Incidents**

The initial notification by field units of a hazardous materials incident. Transmission of the signal 10-80 will serve to warn responders to proceed with caution to avoid entering a restricted area. The FDNY Incident Commander will transmit the appropriate code after size up and evaluation of the incident.

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10-80 No Code

An incident that can be controlled by the on-scene unit(s) and requires no additional resources. The Haz-Mat Battalion (HB01) and Haz-Mat Co. 1 (HM01) can be contacted via the dispatcher, 800 MHz radio, or cell phone for technical information if necessary. HB01 and HM01 may be requested to respond to the incident if necessary.

Guidelines for transmitting Signal 10-80 No Code include:

- Release is of a small quantity (e.g., gas leak in a stove).
- The material and its hazards have been identified.
- Firefighters' PPE provides adequate protection against the identified hazards.
- Special equipment and specialized training are not needed.

10-80 Code 1

An incident that required a Haz-Mat response.

Redacted for PFS

10-80 Code 2

A large-scale event requiring numerous Haz-Mat resources.

Redacted for PFS

10-84 First Unit to Arrive.

All units, regardless on the order of arrival transmit a 10-84.

Redacted for PFS

10-85 Fire Marshal requires emergency police assistance (specify reason)

10-86 Alcohol Resistant Foam Operation

Transmitted for a fire or emergency requiring Alcohol Resistant foam concentrate in addition to that carried by units on the scene. The following units are to respond:
Redacted for PFS

10-87 High Expansion Foam Operation

Transmitted for a fire or emergency requiring High Expansion foam.
The following units are to respond:

Redacted for PFS

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10-91 Medical Emergency EMS – Fire Unit Not Required

To be transmitted through borough dispatcher by the responding unit for the following reasons:

- Fire Unit is canceled enroute due to EMS on scene.
- EMS downgrades the job to a segment that does not require a Fire Unit response.

Note: This signal shall be used only for medical emergency incidents.

10-92 Malicious False Alarm

Indicates that a false alarm was transmitted with malicious intent.

10-99 Unit Will Be Operating for at least 30 Minutes

An operating unit will be unavailable for at least 30 minutes. The unit is to state the reason it will not be available.

8.6-8.9 ***Redacted for PFS***

8.10 HOUSEWATCH RADIO SET

8.10.1 Scanners/radio sets assigned to quarters shall be kept at the housewatch desk to allow housewatch members to be aware of radio traffic in the borough.

8.10.2-8.10.4 ***Redacted for PFS***

8.11-8.13 ***Redacted for PFS***

8.14 RADIO EQUIPMENT DEFECTS

8.14.1-8.14.2 ***Redacted for PFS***

8.14.3 Defects in radio equipment observed by members must be immediately reported to the officer on duty. When a unit has a defective or non-operating apparatus radio, the officer on duty shall notify the Battalion and Division. In addition, the officer shall call the dispatcher requesting radio mechanic response for repairs to apparatus radio.

8.14.4-8.14.10 ***Redacted for PFS***

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COMPANY UNIT COMMUNICATIONS

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9.1 INTRODUCTION

The following procedures for handie talkie (HT) use are established to achieve greater safety, effectiveness and efficiency at fire operations. ***Redacted for PFS***

9.1.1-9.1.3 ***Redacted for PFS***

9.2 SUPERVISION

An Officer's span of control must allow for supervision of the actions of members under their command in all situations.

9.2.1 Members are under the "Immediate Supervision" of an Officer when:

A. They are within sight and/or hearing of the Officer.

B. They are working with a search line or hoseline which is under the supervision of an Officer.

9.2.2 Members are under the "Functional Supervision" of an Officer when they are HT equipped or working with a HT equipped member and are in compliance with the following:

A. Members assigned to tasks which are not under the "Immediate Supervision" of their Company Officer must contact such Officer before entering a dangerous area and advise such Officer of their status at frequent intervals, especially when attempting tasks not normally associated with their assignment.

B. If contact cannot be made with their Company Officer, they shall contact (in this priority) their Company Chauffeur, the Incident Commander or any other HT equipped member advising such member that contact cannot be made with their Officer. Any of the foregoing who are so contacted must advise the member's Officer as soon as possible.

C. Members operating alone who team up with other members shall advise their Company Officer. If they separate, notification should again be made.

D. The Company Officer upon notification as described in paragraphs A and B shall evaluate and notify the Incident Commander of the members location when:

1) Conditions encountered by the member are exceptionally dangerous, or

2) Available staffing is insufficient to assist if the member should become distressed.

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9.2.3 When operations are conducted in an area where the ambient noise level interferes with HT communications, provisions must be made to ensure effective communications.

9.3 INTER-UNIT COMMUNICATION

The importance of communications between units and the IC cannot be overemphasized. Conditions found and actions taken or contemplated must be continually reported, however, discretion **must** be used. Information of a routine nature should be communicated to the Company Officer, while more serious information should go directly to the IC.

9.3.1 ***Redacted for PFS***

9.3.2 Members operating on the roof shall communicate to the IC the following:

A. The configuration of the building.

B. Fire showing out windows (how many and location) not visible from the street and whether any exposure is affected.

C. Color and volume of smoke coming from windows.

D. Persons trapped and their exact location.

E. Location of stairways, fire escapes and party wall balconies. Unusual information affecting safety e.g., a fire escape on the rear of a brownstone.

F. If the building fronts on more than one street, and whether there is access for apparatus or equipment. Whether the access is a street, alleyway, parking lot, vacant lot, etc.

G. Whether there is any difference in the height of the building from front to rear, from side to side, or street to street.

H. Evidence of unusual heat, smoke or fire in the cockloft, or if fire has burned through roof. Need for additional saws.

I. Location of parapet and dividing walls.

J. Presence of heating ducts, ventilation ducts, air conditioning units and water tanks on roof.

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9.4 EMERGENCY HANDIE TALKIE COMMUNICATIONS

The following transmissions are to be used with discretion. The terms "MAYDAY" and "URGENT" must only be used as is indicated herein. They are intended for use in situations where immediate communication is necessary to protect life or prevent injury. Whenever the Emergency Alert Button has been pressed, and/or a MAYDAY or URGENT is transmitted, all HT communications on that frequency are to cease, except those between the member initiating the emergency transmission and the IC. If possible, the member transmitting the MAYDAY or URGENT shall begin, by pressing the Emergency Alert Button, ensuring the message gets transmitted at maximum wattage and repeating "MAYDAY" or "URGENT" three times followed by the remainder of the message. Normal HT use may be resumed upon completion of the emergency message or signal unless the IC orders otherwise.

NOTE:

1 Anytime a building or area is evacuated, units shall account for all members in preparation for a Roll Call. Missing members are to be reported immediately.

2 "MAYDAY" transmissions have priority over "URGENT" transmissions.

3 To minimize misunderstanding, the terminology used below is mandatory. All members must be completely familiar with the terminology and use it exclusively for its intended purpose. No other wording is to be used for emergency transmissions. The term "COLLAPSE" is to be used to indicate STRUCTURAL FAILURE only.

9.4.1 MAYDAY

This transmission is an indication that a life-threatening situation has developed. If possible, the member shall press the Emergency Alert Button ensuring that the message gets transmitted at maximum wattage before giving their MAYDAY message. After message is acknowledged, the member can deactivate the Emergency Alert Tone if the “Beacon” tone is no longer required. The term MAYDAY may be used only in the following **five** situations:

Note: The IC may instruct the member transmitting the emergency message to switch to channel 16, the dedicated 5-watt emergency channel. The IC may do this to free up the primary tactical channel and have communications continue with the member at 5 watts. When a member switches to Channel 16, their "Beacon" continues unless the "Emergency Alert Tone" is deactivated. The IC may instruct the member to deactivate the tones if they are hampering communications.

A. **Collapse Imminent**

1. A member becoming aware of the situation shall immediately press their Emergency Alert Button, and then contact the IC in the following format:

   "MAYDAY-MAYDAY-MAYDAY, Ladder 4 Roof to Command, MAYDAY."

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2. The IC shall respond in the following format:

   "Command to Ladder 4 Roof, go ahead with your MAYDAY."

3. The member transmitting the MAYDAY shall respond in the following format:
   "Ladder 4 Roof to Command, MAYDAY - COLLAPSE IMMINENT" and provide the following information:

   - Location of the imminent collapse such as rear wall, side wall.
   - Their location.

4. The IC shall then transmit:
   "Command to all units, MAYDAY, GET OUT OF BUILDING, GET OUT OF BUILDING" and repeat this message as often as necessary. All members shall immediately evacuate the building on transmission of this message.

5. The IC shall ensure a roll call is conducted immediately and all members are accounted for.

6. The IC shall notify all units when the MAYDAY has been resolved and that normal operations may resume

B. **Structural Collapse Has Occurred**

1. A member aware of the condition shall immediately press their Emergency Alert Button, and then contact the IC in the following format:

   "MAYDAY-MAYDAY-MAYDAY, Ladder 44 OV to Command, MAYDAY."

2. The IC shall respond in the following format:

   "Command to Ladder 44 OV, go ahead with your MAYDAY."

3. The member transmitting the MAYDAY shall respond in the following format:
   "Ladder 44 OV to Command, MAYDAY - COLLAPSE HAS OCCURRED" and provide the following information:
   - Location and extent of collapse
   - Number and nature of injuries
   - If anyone is trapped.

4-5. ***Redacted for PFS***

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C. **Unconscious or Life Threatening Injury**

1. A member discovering either an unconscious member or a member suffering a life threatening injury shall immediately press their Emergency Alert Button, and then contact the IC in the following format:

   "MAYDAY-MAYDAY-MAYDAY, Engine 222 to Command, MAYDAY."

2. The IC shall respond in the following format:

   "Command to Engine 222, go ahead with your MAYDAY."

3. The member transmitting the MAYDAY shall respond in the following format:

   A. "Engine 222 to Command, MAYDAY-INJURED MEMBER or MAYDAY UNCONSCIOUS MEMBER" and provides the following information:

   - Location
   - Unit and identity of the injured member
   - Nature and extent of the injuries, if known
   - Resources needed

4-5. ***Redacted for PFS***

D **Missing Member**

1. An Officer who becomes aware that a member under their supervision is missing shall immediately press their Emergency Alert Button, and then contact the IC in the following format:

   "MAYDAY-MAYDAY-MAYDAY, Ladder 11 to Command, MAYDAY."

2. The IC shall respond in the following format:

   "Command to Ladder 11, go ahead with your MAYDAY."

3. The member transmitting the MAYDAY shall respond in the following format:

   "Ladder 11 to Command, MAYDAY- MISSING MEMBER" and provides the following information:

   - Last known location or reference point
   - Unit the member is working in that tour
   - Name of affected member
   - Assignment (e. g., roof, nozzle)

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4. ***Redacted for PFS***

5. A member who locates a missing member shall immediately press their Emergency Alert Button, and then contact the IC in the following format:

   "MAYDAY-MAYDAY-MAYDAY, Ladder 43 FAST OV to command, MAYDAY."

   A. The IC shall respond in the following format:

      "Command to Ladder 43 FAST OV go ahead with your MAYDAY."

   B. The member transmitting the MAYDAY shall respond in the following format:
      "Ladder 43 FAST OV to command MAYDAY, MISSING MEMBER LOCATED" and provide the following information:

      - Location
      - Identity of member(s) to determine if it is the member(s) reported missing.
      - Any imminent conditions that might affect the missing member(s) e.g., fire nearby, out of air.
      - Resources needed to reach safety.

6. If the missing member is an Officer, any team member can transmit this message.

7. ***Redacted for PFS***

E. **Lost or Trapped**

1. A member who becomes lost or trapped shall immediately press their Emergency Alert Button. The lost or trapped member shall contact the IC in the following format:

   "MAYDAY-MAYDAY-MAYDAY, Ladder 133 Chauffeur to Command, MAYDAY." This member shall not activate their PASS alarm until all vital information has been given to the IC. This is to reduce as much background noise as possible.

2. The IC shall respond in the following format:

   "Command to Ladder 133 Chauffeur, go ahead with your MAYDAY."

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3. The member transmitting the MAYDAY shall respond in the following format:
"Ladder 133 Chauffeur to Command, MAYDAY-MEMBER TRAPPED (or MEMBER-LOST)" and provide the following information:

   - Location if known. If unknown, provide last recognizable reference point such as, basement near oil burner.
   - Identity and number of members involved.
   - Any imminent conditions that might affect trapped members such as fire nearby, out of air, etc.

4. ***Redacted for PFS***

5. A member who finds the trapped or lost member(s) shall immediately press their Emergency Alert Button, and then contact the IC in the following format:

   "MAYDAY-MAYDAY-MAYDAY, Ladder 105 FAST to Command, MAYDAY"

   A. The IC shall respond in the following format:

      "Command to Ladder 105 FAST, go ahead with your MAYDAY."

   B. The member transmitting the MAYDAY shall respond in the following format:

      "Ladder 105 FAST to Command, MAYDAY, TRAPPED or LOST MEMBER LOCATED" and provide the following information:

      - Identity of the member(s) involved
      - Location
      - Any imminent conditions that might affect the trapped/lost member(s) e.g., fire nearby, out of air.
      - Resources needed to reach safety

6. ***Redacted for PFS***

Note: The term "URGENT" shall **not** be used for any of the above situations; these situations are sufficiently serious to warrant "MAYDAY" transmissions.

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9.4.2 **URGENT**

This transmission is used to indicate that a member has suffered a serious injury that is not immediately life threatening, or to inform members of a serious change in conditions. If possible, the member shall press the Emergency Alert Button ensuring that the message gets transmitted at maximum wattage before giving their URGENT message. After message is acknowledged, the member can deactivate the Emergency Alert Tone if the "Beacon" tone is no longer required.

Note: The IC may instruct the member transmitting the emergency message to switch to channel 16, the dedicated 5-watt emergency channel. The IC may do this to free up the primary tactical channel and have communications continue with the member at 5 watts. When the member switches to Channel 16, their "Beacon" continues unless the Emergency Alert Tone is deactivated. The IC may instruct the member to deactivate the tones if they are hampering communications.

Examples of situations when the term URGENT may be used include the following:

A. **Non Life Threatening Injury**

1. A member discovering another member with a non life threatening injury that requires medical attention shall immediately press their Emergency Alert Button, and then contact the IC in the following format:

   "URGENT-URGENT-URGENT, Engine 161 to Command, URGENT."

2. The IC shall respond in the following format:

   "Command to Engine 161, go ahead with your URGENT."

3. The member transmitting the URGENT shall respond in the following format:
   "Engine 161 to Command, URGENT-INJURED MEMBER", and provide the following information:

   - Location
   - Unit and identity of the injured member
   - Nature and extent of injuries.
   - Resources needed

3. ***Redacted for PFS***

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B. **Transmission of Signal 10-70**

1. When the first arriving Engine Company is unable to secure a positive water source, the first arriving Engine Chauffeur shall immediately press their Emergency Alert Button, and then contact the IC in the following format:

   "URGENT-URGENT-URGENT, Engine 254 Chauffeur to Command, URGENT."

2. The IC shall respond in the following format:

   "Command to Engine 254 Chauffeur, go ahead with your URGENT."

3. The member transmitting the URGENT shall respond in the following format:

   "Engine 254 Chauffeur to Command, URGENT 10-70" and provide information to assist the IC and Water Resource Unit, e.g., dead or frozen hydrant, unable to access or hookup to a hydrant, insufficient hydrant pressure, no water or insufficient pressure at the standpipe outlet.

   All members on the scene must be aware that water may still be available through other means, e.g., booster water, roof tank; however a positive water source has not been attained.

4. This shall also require an "URGENT" message to the Borough Dispatcher. The Dispatcher shall announce over the borough frequency that the signal 10-70 has been transmitted for that box, notify the second arriving engine that they are designated the "Water Resource Unit", and notify the IC of the identity of the designated "Water Resource Unit"

   A. ***Redacted for PFS***

C. **Interior Attack Discontinued**

1. When the IC decides to discontinue an interior attack and institute an exterior attack, the IC shall immediately press their Emergency Alert Button, and then transmit a message in the following format:

   "URGENT-URGENT-URGENT, Command to all units, URGENT - ALL UNITS BACK OUT, WE ARE TRANSITIONING TO AN EXTERIOR ATTACK."

   On transmission of this message, all units shall withdraw from the building.

2-3. ***Redacted for PFS***

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D. **Danger of Collapse**

1. A member aware of a structural problem indicating the danger of a collapse shall immediately press their Emergency Alert Button, and then transmit to the IC in the following format:
"URGENT-URGENT-URGENT, Ladder 6 Roof to Command, URGENT."

2. The IC shall respond in the following format: "Command to Ladder 6 Roof, go ahead with your URGENT."

3. The member transmitting the URGENT shall respond in the following format:
"Ladder 6 Roof to Command, URGENT - COLLAPSE FEARED," and provide the following information:
   - Location
   - Conditions discovered

4. ***Redacted for PFS***

E. Fire Entering an Exposure

1. A member discovering fire extending into an exposure and any delay may considerably enlarge the fire problem shall immediately press the Emergency Alert Button, and then transmit to the IC in the following format:
"URGENT-URGENT-URGENT, Ladder 127 to Command, URGENT."

2. The IC shall respond in the following format: "Command to Ladder 127, go ahead with your URGENT."

3. The member transmitting the URGENT shall respond in the following format:
"Ladder 127 to Command, URGENT - FIRE EXTENDING," and provides the following information:
   - Location
   - Nature of extension

4. ***Redacted for PFS***

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F. **Loss of Water**

1. A member aware of a loss of water, including water loss due to a confirmed burst length, which would endanger members shall immediately press their Emergency Alert Button, and then transmit to the IC in the following format:
"URGENT-URGENT-URGENT, Engine 71 Chauffeur to Command, URGENT."

2. The IC shall respond in the following format:
"Command to Engine 71 Chauffeur, go ahead with your URGENT."

3. The member transmitting the URGENT shall respond in the following format:

"Engine 71 Chauffeur to Command, URGENT - WATER LOSS," and provide the following information:

- Nature of the problem
- Identity of the units with lines affected

4. ***Redacted for PFS***

G. **Anytime a Change in Conditions will Severely Impact an Operation or the Safety of Members**

1. A member aware of a change in conditions that will severely impact an operation or the safety of members shall immediately press their Emergency Alert Button, and then contact the IC in the following format:

"URGENT-URGENT-URGENT, Ladder 132 to Command, URGENT."

2. The IC shall respond in the following format:

"Command to Ladder 132, go ahead with your URGENT."

3. The member transmitting the URGENT shall provide the following information:

- Nature of the problem
- Location
- Members/Units affected

4. ***Redacted for PFS***

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9.4.3 The IC may want to gain control of the HT network in order to alert all units to a "MAYDAY" or "URGENT" message.
The IC can gain control of the HT network by utilizing the Emergency Alert tone created when the Emergency Alert Button is activated. This Emergency Alert tone shall be followed by the message "URGENT-URGENT-URGENT COMMAND to ALL UNITS - URGENT, ALL HANDIE TALKIE TRANSMISSIONS ARE TO CEASE". All units upon hearing a "MAYDAY" or "URGENT" transmission and/or the Emergency Alert Tone shall cease radio transmissions until advised otherwise.

NOTE: ***Redacted for PFS***

9.5 EMERGENCY ALERT TONE ASSISTED RESCUE AND FEEDBACK-ASSISTED RESCUE

Procedure – After determination is made that a member is missing, lost, or trapped, these procedures may be initiated.

9.5.1 The Emergency Alert Tone Assisted Rescue can be utilized to home in on the location of missing, lost, or trapped members e.g., a collapse situation. This procedure takes advantage of the increased wattage of the Emergency Alert Tone and maximum volume output regardless of the missing member's volume setting, and requires only one handie talkie.

9.5.2 IC announces over HT that an "Emergency Alert Tone Assisted Rescue" is to be implemented and designates a new primary tactical channel. This channel shall not be the same one on which the missing, lost, or trapped member was operating.

9.5.3 All members, except the member designated to produce the emergency alert tone, are to operate on the newly designated primary tactical channel.

9.5.5 Designated member should be located remote from search activity to avoid confusion among searchers.

9.5.6 The Emergency Alert Tone will be created by the designated member as follows:

A. HT is placed on channel which missing, lost, or trapped member was operating.

B. The Emergency Alert Button is pressed every few seconds to transmit the emergency alert tone and then pausing, allowing for the possibility of response from the missing, lost, or trapped member.

9.5.7 The emergency alert tone will be transmitted from the missing, lost, or trapped member's HT, permitting searchers to home in.

9.5.8 Search is conducted with as much ambient noise eliminated as possible.

9.5.9 Searchers listen for tone emanating from missing, lost, or trapped member's HT. When tone has been detected, searchers home in on member's location by use of this tone.

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9.5.10 When the definite location of member has been determined, the emergency alert tone should be discontinued to lessen the discomfort of trapped member and to enable communication between this member and searchers

Note: ***Redacted for PFS***

9.6 HIGH RISE BUILDINGS/HOSPITALS - GENERAL INFORMATION

9.6.1 In general, elevator cars, core areas and stairs hamper effective HT operations.

9.6.2 Certain areas in a building are conducive to good HT operations e.g., outer area of the structure, windows or unobstructed shafts. It may be necessary to move around until best location is found.

9.6.3 There is a possibility that radio frequency (RF) transmissions may affect the operation of medical equipment in hospitals.

9.6.4 Members shall, during non-emergency visits to hospitals, restrict the use of HT and other RF transmissions (cell phones, etc.) in patient care areas of hospitals.

9.6.5 Except in an emergency, members shall leave the patient care area prior to transmitting via HT.

9.7 *Redacted for PFS*

9.8 HANDIE TALKIE USE WITH SELF-CONTAINED BREATHING APPARATUS

9.8.1 All facepieces are equipped with voicemitters. The proper procedure for use of the HT with the voicemitter is to:

A. Remove the microphone from the harness clip.

B. Place the microphone directly on the voicemitter.

C. After completing transmission, the microphone can be returned to the harness clip.

9.9 RADIO DISCIPLINE

9.9.1 Many HTs will be in use at an operation. Therefore, unnecessary chatter shall be kept to a minimum to avoid monopolizing the HT frequency. Before transmitting, (excluding an emergency report) member shall make sure the HT network is clear. Once certain no transmissions are taking place, member can then transmit their message.

9.9.2 Members must also be aware that a message transmitted but not responded to should be considered not received. Member shall continue their transmission until they receive a response.

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EMERGENCY ROLL CALL PROCEDURES

1. INTRODUCTION

1.1-1.4 ***Redacted for PFS***

1.5 Engine companies will have either 4 or 5 firefighters and these members must answer the roll call according to their engine position assignments. Haz-Mat Technician Engine personnel will answer a roll call according to engine position assignments, regardless of the type of fire or emergency. The majority of the time, rescues, squads and ladder companies begin each tour with 5 firefighters and an officer. Ladder company firefighters will answer a roll call as per ladder company position assignment e.g., OV, Roof. Rescue Company firefighters will answer a roll call as per rescue company position assignments e.g., Hook, Roof. Squad company firefighters, when assigned as a squad, will answer a roll call as per squad company position assignments e.g., Irons, Can. Squad company firefighters, when assigned as an engine, will answer a roll call as per engine company assignments e.g., Nozzle, Back-up. ***Edited for PFS***

2. CONDITIONS REQUIRING AN EMERGENCY ROLL CALL

2.5 There are many situations where emergency roll calls are necessary. Some examples are:

- Mayday transmission for Collapse Imminent/Collapse Occurred, Urgent Transmission for "Interior attack discontinued and exterior attack instituted" or "Loss of water endangering members."
- Anytime a building or area is evacuated, Chief or company officers shall account for all members in preparation of a roll call by the IC.
- Anytime the IC determines an emergency roll call is necessary to account for members.
-

3-4. ***Redacted for PFS***

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ACTIONS TO BE TAKEN BY COMPANY OFFICERS

5.1-5.8 ***Redacted for PFS***

Example Roll Call:

RCO to Engine 234, account for your members.

Engine 234 to RCO, we have 4 firefighters and my Nozzle and Backup are accounted for.

RCO to Engine 234 ECC, What is your location?

Engine 234 ECC to RCO, I am operating the pumper.

RCO to Engine 234 Control, What is your location?

Engine 234 Control to RCO, I am on the floor below flaking out the line.

RCO to Engine 234, all members of Engine 234 have been accounted for.

RCO to Ladder 123, account for your members.

Ladder 123 to RCO, Ladder 123 has 5 firefighters; my Can and Irons are accounted for.

RCO to Ladder 123 Roof, What is your location?

Ladder 123 Roof to RCO, I'm on the roof of the fire building.

RCO to Ladder 123 Chauffeur, What is your location?

Ladder 123 Chauffeur to RCO, I'm on the turntable in front of Exposure 4.

RCO to Ladder 123 OV, What is your location?

Ladder 123 OV to RCO, I'm on the rear fire escape.

RCO to Ladder 123, all members of Ladder 123 are accounted for.

RCO to Rescue 1, account for you members.

Rescue 1 to RCO, Rescue 1 has 5 firefighters; my Irons, Can and Hook are accounted for.

RCO to Rescue 1 Roof, What is your location?

Rescue 1 Roof to RCO, I am on the roof of the fire building.

RCO to Rescue 1 Chauffeur, What is your location?

Rescue 1 Chauffeur to RCO, I am on the floor above.

RCO to Rescue 1, all members of Rescue 1 are accounted for.

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5.9-5.12 ***Redacted for PFS***

6. ACTIONS TO BE TAKEN BY FIREFIGHTERS WHEN AN EMERGENCY ROLL CALL IS CONDUCTED

6.1 Follow the directions included in the Mayday/Urgent transmission. Maintain radio discipline. **Do not** transmit, unless:

- Called by the RCO
- You have a Mayday/Urgent of your own
- You have a **critical** information regarding the Mayday/Urgent
- You have a **critical** message affecting the on-going operation

6.2 If firefighting operations are to continue, complete your assignment.

6.3 When a firefighter is answering an emergency roll call via the HT, they will reply giving the company number **they are working in**, firefighting assignment and location.

Example: RCO to Ladder 123 Roof, What is your location?

Ladder 123 Roof to RCO, I'm on the roof of the fire building.

This response is the procedure for all members, including details, overtime etc., that may not be working in their assigned companies.

6.4 Members not in the immediate vicinity of the member in distress must refrain from self deploying and becoming involved in any rescue efforts, unless specifically ordered. Your assignment must be addressed as assigned. If your assignment is completed, you will be re-assigned as needed by the IC. In numerous cases, when Mayday/Urgents were transmitted, self deployed members became a hindrance to the rescue efforts.

6.4.1 If a member's involvement in the rescue is necessary and they are unable complete their firefighting assignment, the IC must be notified.

6.4.2 If at anytime while operating at a fire or emergency, you come across a downed member, immediately notify the IC via the proper radio transmission.

6.4.3 Anytime a member is unable to complete their assignment, they must notify the IC.

6.5 By taking these actions you will enable the IC to take control of the HT network, have the emergency roll call conducted, and maintain effective control of on-going operations.

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ELECTRONIC FIREGROUND ACCOUNTABILITY SYSTEM (EFAS)

1. INTRODUCTION

1.1 The Electronic Fireground Accountability System (EFAS) is designed to improve the accountability of members at all operations. EFAS is installed on the MDT of all Battalion and Division vehicles, allowing the Incident Commander (IC) the capability of:

1.1.1 Immediately identifying any member(s) activating the Emergency Alert Button (EAB) on their handie-talkie (HT) by displaying their company, position, and name.

1.1.2 Manually identifying any member(s) transmitting a verbal Mayday message via HT.

1.1.3 Conducting an emergency electronic or manual Rollcall.

1.1.4 Reviewing HT transmission history.

1.2 The Electronic BF-4 (EBF-4) application is a critical part of EFAS. It is essential to enter the correct assignments of each tour to accurately reflect members on scene at incidents. Maintaining an accurate list of personnel is essential for an accurate Rollcall and to correctly identify any personnel who may have responded to an incident. EBF-4 must be updated as soon as possible during the tour as necessary.

1.3 The IC shall determine the most effective way to address Mayday transmissions based on the situation and conditions encountered.

Note: EFAS does not replace the use of Rollcall procedures currently established and outlined in Communications Manual Chapter 9, Addendum 2.

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1.4 EFAS is connected to Starfire. Units assigned on the response ticket will be displayed as "Assigned Units." (Figure 1)

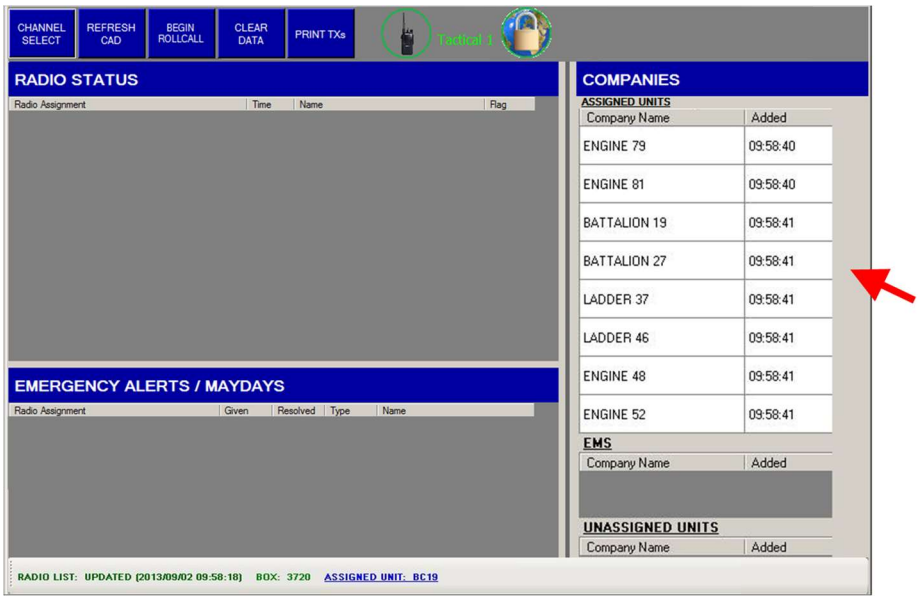

Figure 1 – Assigned Units

1.5 When a unit is selected in the "COMPANIES" column, the most current EBF-4 for that unit will populate. (Figure 2)

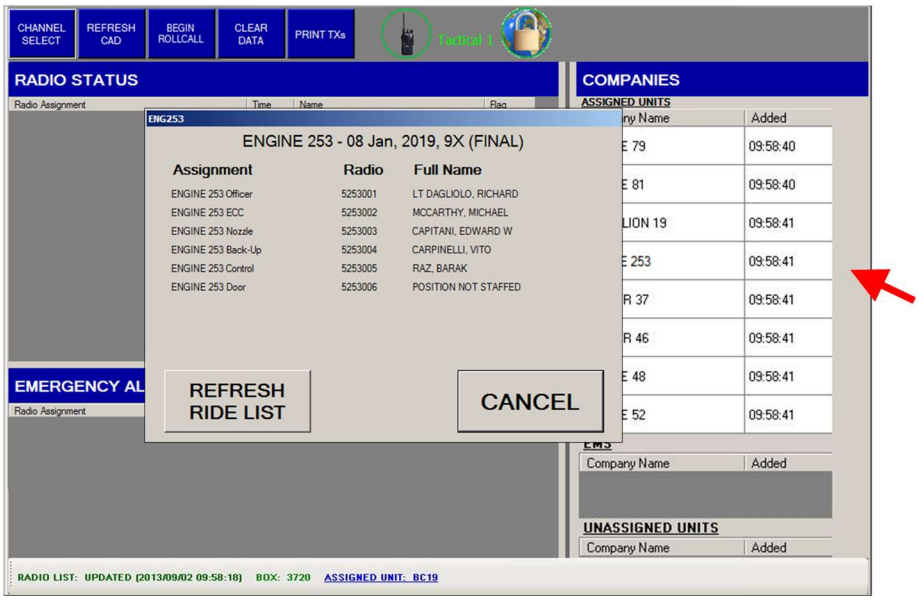

Figure 2 – Unit EBF-4 In EFAS

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2. MONITORING EFAS

2.1 It shall be the responsibility of the first arriving Battalion Firefighter, **after performing their primary duties,** to monitor EFAS until relieved by an EFAS-trained member of the Firefighter Assist and Search Team (FAST) Unit.

2.2 Upon the arrival of the FAST Unit, the EFAS-trained member designated at Rollcall to monitor EFAS shall report to the Battalion vehicle being used to monitor EFAS. This FAST Unit member will then monitor both EFAS and the Battalion's FAST Unit HT.

Note: Additional information regarding FAST Unit procedures is outlined in FFP Managing Members in Distress, Chapter 2.

2.3 When the Division is on scene, it shall be the responsibility of the Division Back-up Firefighter, if available, to report to the Battalion vehicle being used to monitor EFAS to either: Assist the EFAS trained member of the FAST unit **or** Relieve the Battalion firefighter if the Battalion firefighter has not been relieved by an EFAS-trained member of the FAST Unit.

When the Division responds to an incident from quarters, the Division Back-up Firefighter will respond with the Division. If the Division responds while out of quarters, the Division Back-up Firefighter shall proceed to the location of the fire if possible.

Note: The member monitoring EFAS shall be identified by radio designation "EFAS" when communicating by HT, e.g., "**EFAS to Command**" "**Command to EFAS**".

2.4 All regularly assigned Divisions, Battalions, Field Communications, and Marine companies 1, 6, and 9 are equipped with EFAS. If the responding vehicle is not equipped with EFAS, and its use is anticipated, the dispatcher shall be notified by Department radio. The dispatcher shall inform incoming units, and the FAST Unit if assigned.

3. PROCEDURES

3.1 Starting EFAS

3.1.1 The EFAS program automatically starts up on the MDT when the vehicle ignition is turned on. The EFAS window is designed to run behind the Starfire window. The EFAS start-up is delayed 1 minute to allow Starfire to connect. **Do not attempt to select the EFAS button during this time.** Members must wait until Starfire completely "boots up" before switching to the EFAS program.

3.1.2 EFAS may capture routine HT transmissions during the course of the tour. In the event an emergency response is received, it may be desirable to clear the EFAS window of all previously listed transmissions. This can be accomplished by switching to the EFAS window on the MDT and pressing the Clear Data button.

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3.1.3 Upon arrival and transmission of a 10-84, the EFAS button on the MDT may be depressed to switch from the Starfire window to the EFAS window. The system allows users to switch between Starfire and EFAS by selecting the Starfire or EFAS buttons. (Figure 3)

Note: When viewing the EFAS screen, units arriving on scene, and pressing 10-84 will not cause the Battalion or Division MDT to automatically switch back to Starfire.

Figure 3 – MDT Starfire and EFAS Buttons

3.1.4 Units assigned to a particular incident should automatically populate under the Companies section in the 'Assigned Units' area. If the assigned units change or if companies are added to an incident by the dispatcher, pressing the 'REFRESH CAD' button on the top menu bar will refresh the assignment reflecting the proper units assigned to an incident.

3.1.5 The MDT screen is a touch screen and shall be utilized to make all required selections.

3.1.6 On start-up, EFAS will automatically download the latest Spare Radio Database.

4. SPARE RADIOS

4.1 EFAS has the capability to convert the digital data designated by the spare radios. Members who are assigned a spare radio from the HT Depot will be identified by their Company, Riding Position, and Name.

4.2 When EFAS starts, it is programmed to automatically download the latest version of the spare radio list. This will be indicated in the task bar at the bottom of the display. It will show the following: "RADIO LIST: UPDATED" to identify the most current list (date and time shown in green letters). The task bar also shows the assigned Battalion or Division unit. (Figure 4)

Figure 4 –Radio List Updated

4.3 There may be a delay receiving the updated spare radio list. As a result, EFAS will show the last time a successful update took place. "RADIO LIST: LAST UPDATED" identifies a radio list from the last time it was updated. It will show the last time the list was updated in red letters.

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4.4 During an operation you may notice an unassigned spare radio in the "RADIO STATUS" area. This means that a spare radio was issued, and the spare radio list was not updated. If possible, the member monitoring EFAS should listen to the HT transmissions and try to identify who has the unassigned spare radio. The member who last transmitted is always shown at the top of the "RADIO STATUS" screen. The member monitoring EFAS shall note the Spare Radio ID number and the transmission made by the member. This may help to determine the identity of the member using the spare HT.

5. EMERGENCY ALERT ACTIVATION/MAYDAYS TRANSMISSION

5.1 Emergency Alert Activation

5.1.1 It is imperative that members utilize their Emergency Alert Button (EAB) when transmitting a Mayday. The member's HT wattage will automatically increase to 5 watts and the HT will also sound the Emergency Alert tone 'Beacon'. When a member activates their EAB, their identity line in EFAS will be automatically highlighted. Their company, position, and name will be listed in red in both the "RADIO STATUS" and "EMERGENCY ALERTS/MAYDAYS" areas. (Figure 5)

Note: If a vehicle with EFAS capability is within HT range of a member activating their EAB, the MDT will automatically switch from Starfire to EFAS.

A. EMS officers, Haz-Tac Ambulances, and any other EMS unit with an assigned fireground HT that activates the Emergency Alert function will show up with their EMS Unit, position, and name.

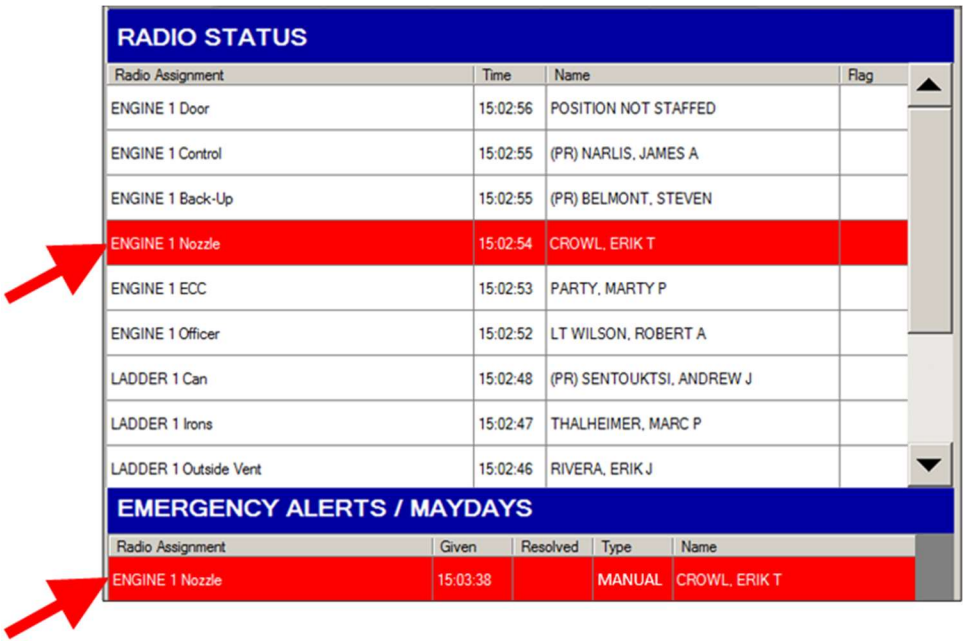

Figure 5 – Mayday Shown in Red

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5.1.2 In addition, a hard copy automatically prints showing the company, position, and time of Mayday. (Figure 6)

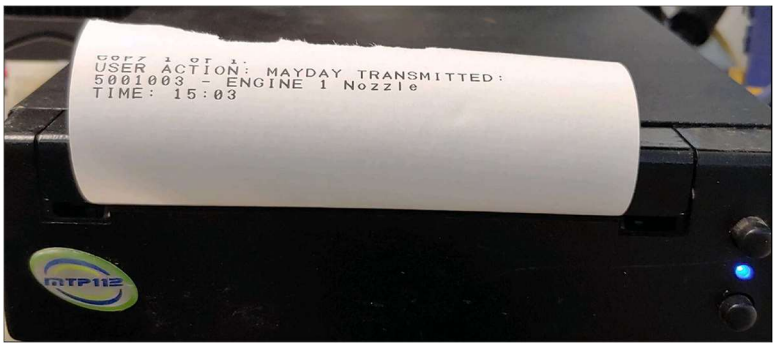

Figure 6 – Mayday Printout

5.1.3 The member's identity line will remain red in EFAS until the Emergency Alert is resolved and the HT is reset. Once cleared, the member's highlighted identity line will change from red (active) back to white in the "RADIO STATUS" area. The member's highlighted identity line will change from red (active) to yellow (cleared) and will remain in the "EMERGENCY ALERTS/MAYDAYS" area. (Figure 7)

Note: Members can resolve an inadvertent 'Manual' Emergency Alert by depressing and holding the EAB of their remote microphone until the reset tone is heard (approximately 2 seconds). Turning the radio off and on will **not** reset the EA on the Electronic Fireground Accountability System (EFAS).

Note: Refer to section 5.2.3 to resolve a 'Verbal' Mayday on EFAS.

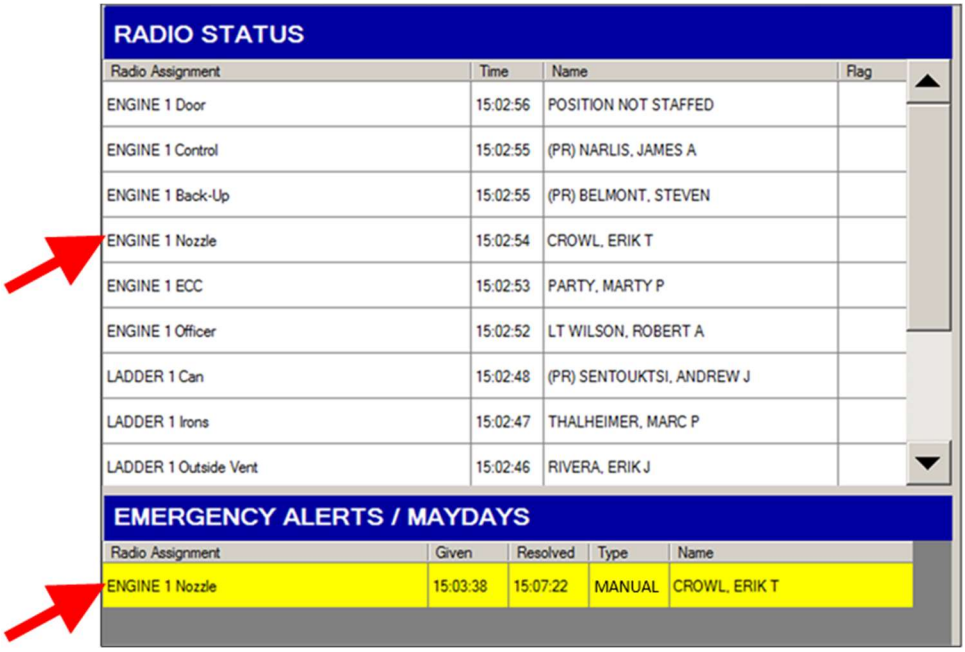

Figure 7 – Cleared Mayday

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5.1.4 The EFAS system is capable of handling multiple Emergency Alert transmissions at the same time. All active Maydays will appear in red in both the "RADIO STATUS" and the "EMERGENCY ALERTS/MAYDAYS" area. Member monitoring EFAS may have to utilize the scroll bar in the "RADIO STATUS" and "EMERGENCY ALERTS/MAYDAYS" area in order view all Maydays that were transmitted. (Figure 8)

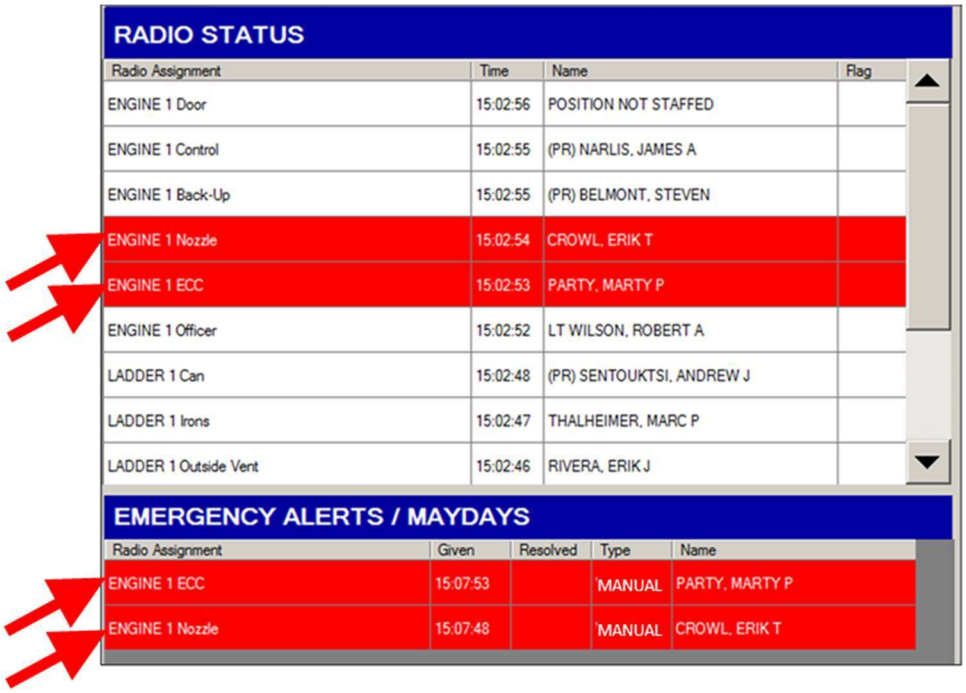

Figure 8 – Multiple Maydays

5.1.5 In the event a member transmits a Mayday for another member (e.g., unconscious member), the transmitting member shall:

A. Depress the EAB on their own HT. This will identify the member transmitting the Mayday on EFAS.

B. After the Emergency Alert activation, provide the IC with the information required for the Mayday transmission.

C. If possible, depress the EAB of the member in distress. The activation of the distressed member's EAB will identify them on EFAS. Notify the IC via HT prior to EAB activation of the distressed member.

D. Transmitting member shall reset (cancel) their HT Emergency Alert by depressing and holding the Emergency Alert button of their remote microphone for approximately 2 seconds. The distressed member's Emergency Alert shall remain activated until determined it is no longer required.

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5.2 Mayday Transmission

If a member verbally transmits a Mayday message on their HT, and does not activate their Emergency Alert Button, the member monitoring EFAS shall highlight that member by utilizing the MDT touch screen and assign them a Mayday. Once a Mayday is assigned, a hard copy will print showing the member's company, position, and the time the Mayday was assigned.

5.2.1 Select the member's name. A dialog box will appear for that member. The last person to transmit is always the top line in the "RADIO STATUS" area.

5.2.2 Select the "ASSIGN MAYDAY" button. This will highlight the member's company, position, and name, in red, in both the "RADIO STATUS" and "EMERGENCY ALERTS/MAYDAYS" areas. (Figure 9 and Figure 10)

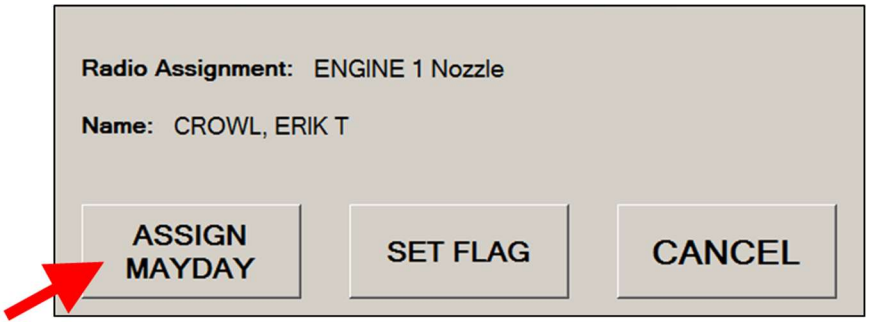

Figure 9 – Assign Mayday

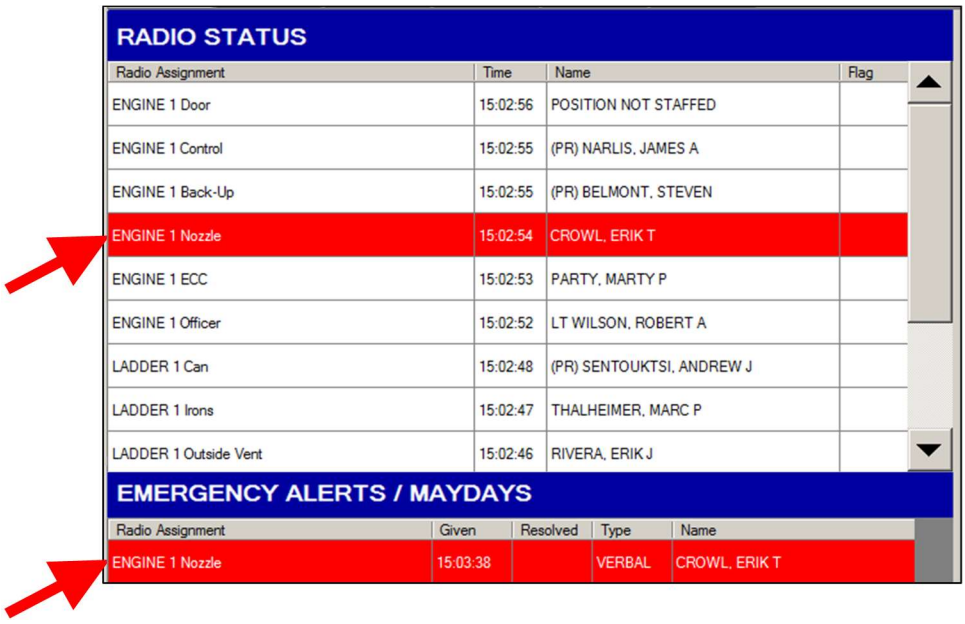

Figure 10 – Mayday Assigned

Note: When assigning a member a 'Verbal' Mayday on EFAS, the member's HT wattage is not increased to 5 watts and the member's HT does not sound the Emergency Alert tone "Beacon."

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5.2.3 To resolve a 'Verbal' Mayday on EFAS:

A. Select the member's name. A dialog box will appear for that member.

B. Select the "REMOVE MAYDAY" button. (Figure 11) Once cleared, the member's highlighted identity line will change from red (active) back to white in the "RADIO STATUS" area. The member's highlighted identity line will change from red (active) to yellow (cleared) and will remain in the "EMERGENCY ALERTS/MAYDAYS" area. (Figure 12)

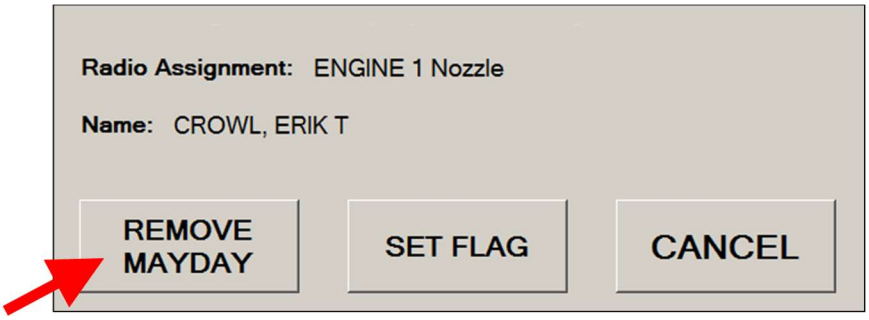

Figure 11 – Manually Account

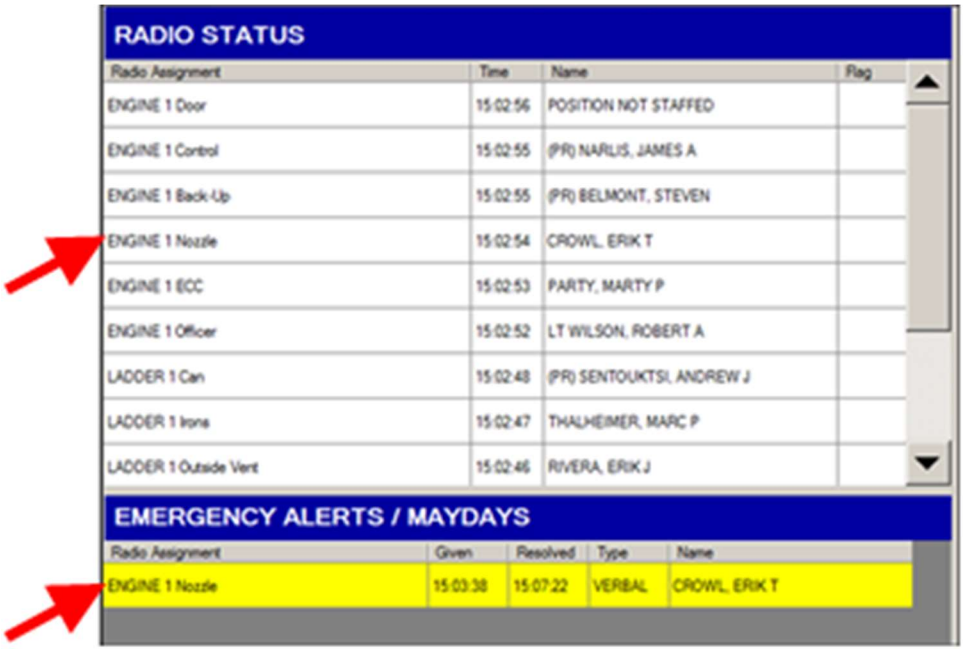

Figure 12 – Cleared Verbal Mayday

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5.3 Flags

Flags can be used to track specific member's transmitting something of concern that does not fall under the Mayday transmissions. Flags must be manually assigned by the EFAS operator.

5.3.1 Examples of transmissions which may require flagging:

A. A member who transmits a message via HT while their vibralert is going off.

B. A member who gives a HT transmission that is out of character, under stress or unusual.

C. Important tactical transmissions that impact the overall operation (e.g., Fire extending into exposures, report of a partial localized collapse, conditions deteriorating on roof)

D. A HT transmission that is garbled or incoherent but made with some urgency and requires follow-up by the IC.

5.3.2 When the EFAS monitoring member sets the FLAG they **MUST notify the Incident Commander in case further action is warranted.**

5.3.3 An assigned FLAG only appears on the EFAS device on which it was set.

5.4 Setting a Flag

5.4.1 To manually set a flag:

A. Select the member from the "RADIO STATUS" area. A dialog box will appear for that member.

B. Select the "SET FLAG" button. (Figure 13) Once set, a red flag will show in the member's identity line. (Figure 14)

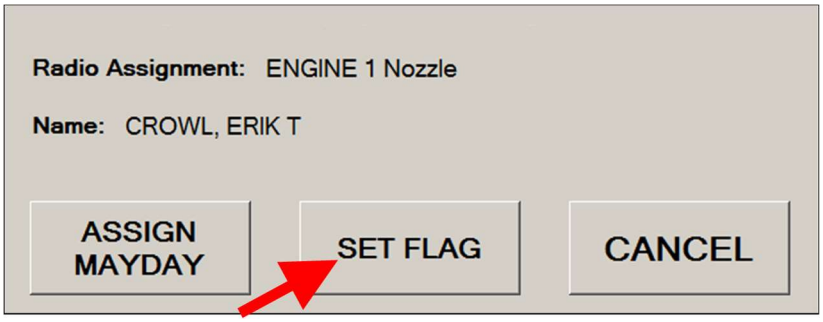

Figure 13 – Set Flag

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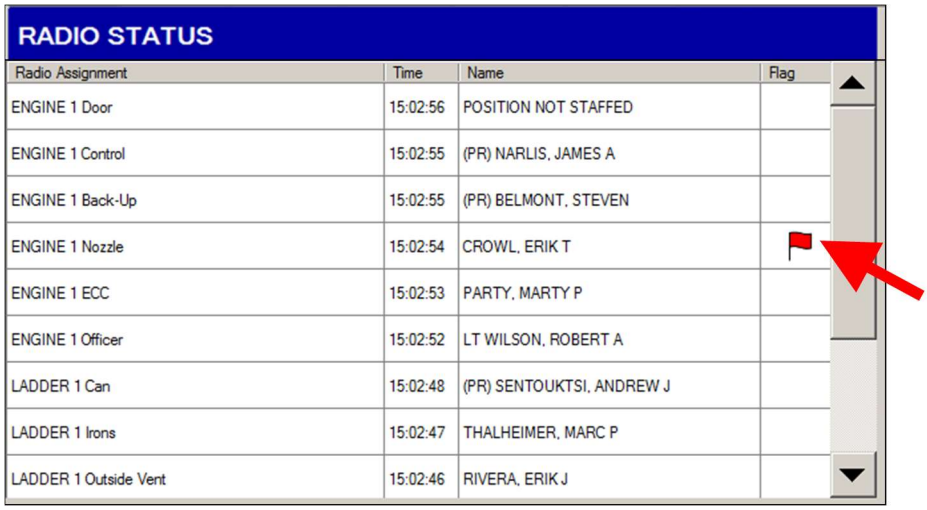

Figure 14 – Flagged Member

5.4.2 To manually clear a flag

A. Select the flagged member's name. A dialog box will appear for that member.

B. Select the "CLEAR FLAG" button. (Figure 15) Once cleared, the red flag will turn gray in the member's identity line. (Figure 16)

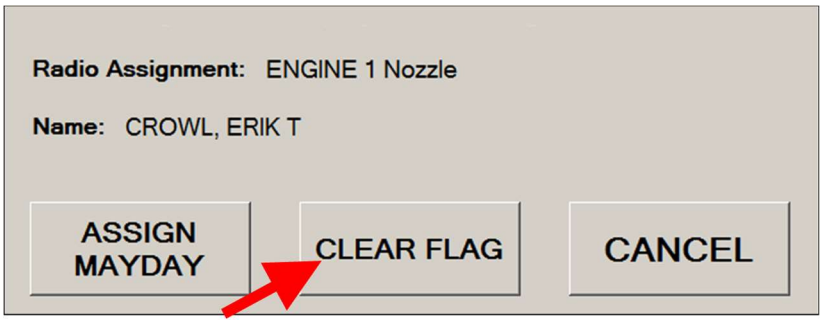

Figure 15 – Clear Flag

Figure 16 – Cleared Flag

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5.5 A flagged member will remain flagged if a Mayday is activated for that member. (Figure 17) If the Mayday is resolved for the flagged member, the flag will automatically be cleared. (Figure 18)

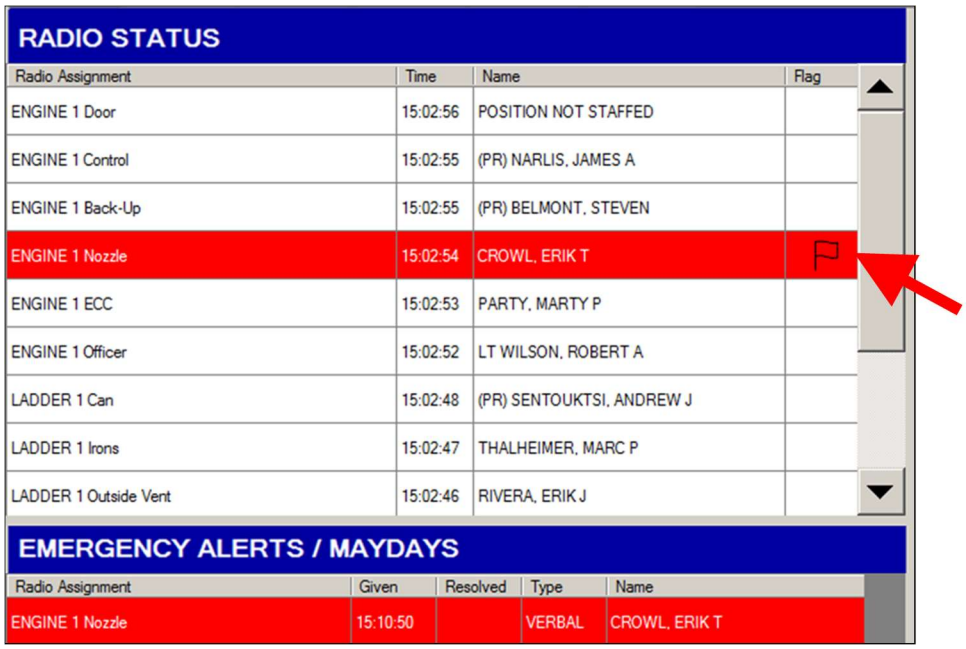

Figure 17 – Flag and Mayday

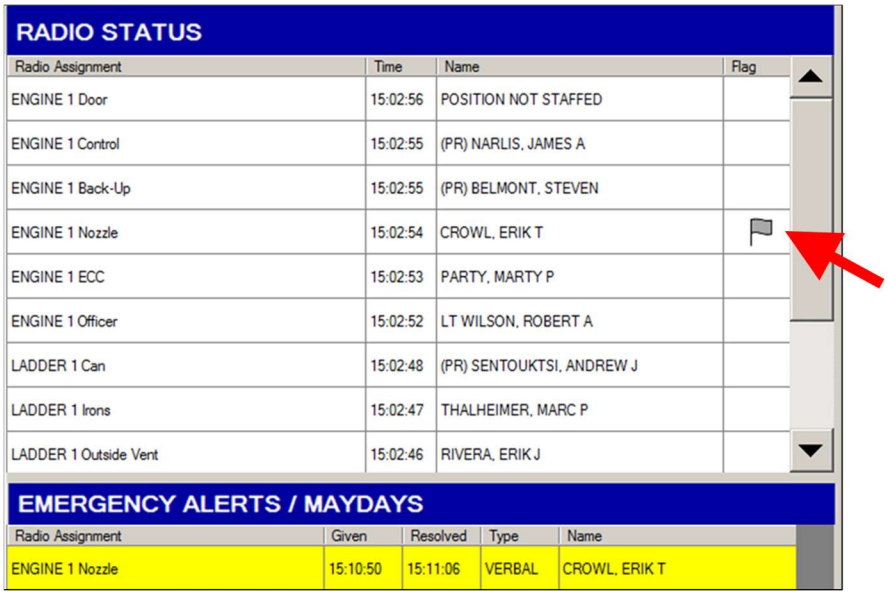

Figure 18 – Flag and Resolved Mayday

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5.6 "PRINT TXs" Feature

5.5.1 A snapshot of currently displayed transmissions can be manually printed by selecting the "PRINT TXs" button. The first transmission printed will be the first visible transmission in the "RADIO STATUS" area. Scroll to the desired transmissions before selecting "PRINT TXs." (Figure 19)

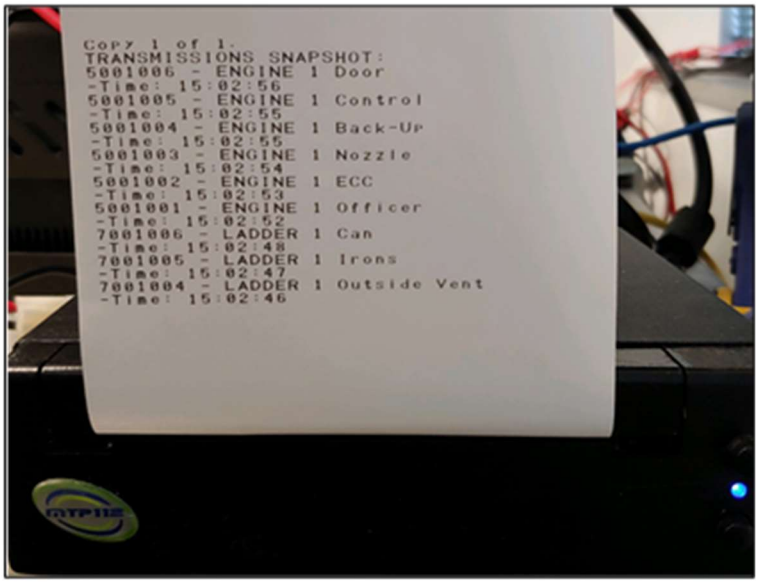

Figure 19 – Print TX

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6. CHANNEL SELECT

6.1 EFAS defaults to HT-1/TAC-1. It has the capability of monitoring any of the programmed radio channels, including FDNY-specific channels, UTAC, and repeater channels. **However, it can only monitor one channel at a time,** therefore, a separate Battalion/Division/EFAS-equipped vehicle in conjunction with an EFAS-trained member is required for each channel in use (e.g., primary tactical, secondary tactical, primary command).

6.1.1 To monitor a different channel, select the "CHANNEL SELECT" button at the top of the EFAS screen. A dialog box will appear.

6.1.2 Select the HT channel you want to monitor from the drop-down list. (Figure 20)

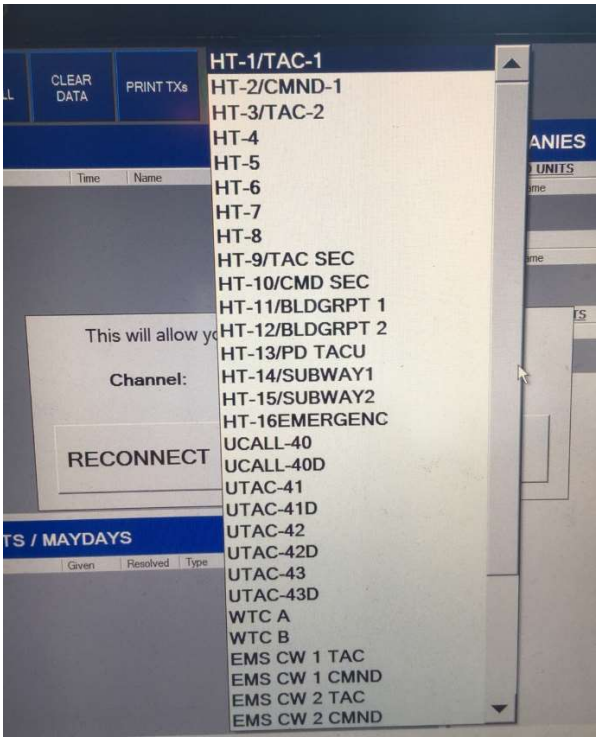

Figure 20 – Channel Select

6.1.3 Click "Reconnect" to monitor the selected channel. (Figure 21)

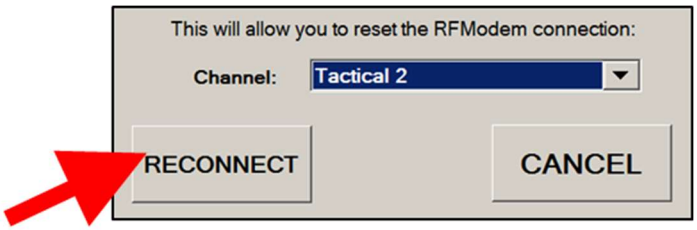

Figure 21 – Reconnect

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7. CONDUCTING ROLLCALL UTILIZING EFAS (2 OPTIONS)

7.1 Prepare for Electronic or Manual Rollcall using EFAS

7.1.1 The Chief or company officer conducting the Rollcall shall instruct all units to prepare for an electronic or manual Rollcall.

7.1.2 Select "BEGIN ROLLCALL" located at the top of the EFAS screen. (Figure 22)

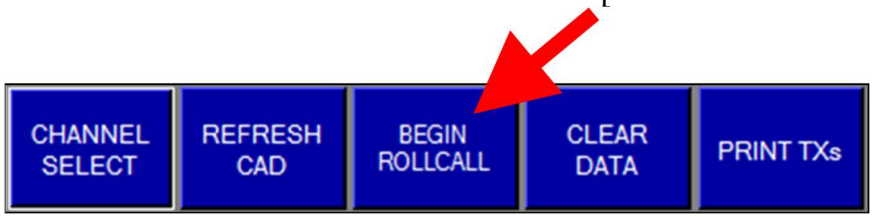

Figure 22 – Begin Rollcall Button

A. After selecting "BEGIN ROLLCALL," EFAS shows a pop-up before proceeding to Rollcall where the user must decide between starting an Automatic or a Manual Rollcall. During an Automatic Rollcall, members give confirmation by keying their HT radios, or the EFAS operator can manually account members and assign Maydays. During a Manual Rollcall, members cannot give confirmation by keying their HT radios, only the EFAS operator can account for members. (Figure 23)

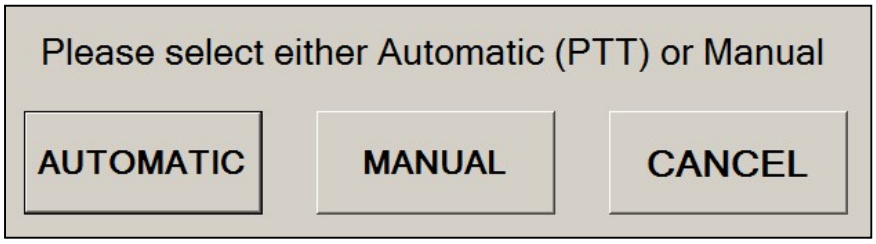

Figure 23 – Automatic or Manual Rollcall

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7.1.3 Starting a Rollcall causes EFAS to automatically send a request to CAD (Starfire) to refresh the Assigned Units. The EFAS operator can also manually refresh Assigned Units by pushing the "REFRESH CAD" button. The Assigned Units List is the Starfire information that enables EFAS Rollcall to show only those Units assigned to the incident. Three timestamp/color-coded status outcomes are possible. (Figure 24 through Figure 26)

A. This time stamp, displayed in green text, indicates an accurate update of units assigned by Starfire.

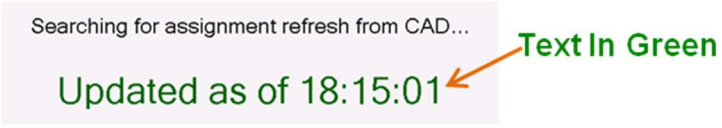

Figure 24 – Accurate CAD Updated

B. This time stamp, displayed in red text, indicates the assignment has not changed since the previous request.

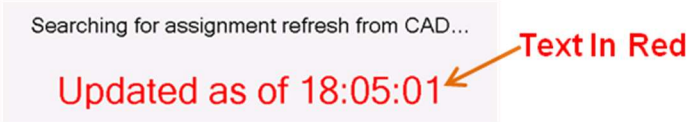

Figure 25 – Assignment Has Not Changed Since Previous Request

C. EFAS unable to refresh the Assigned Units over the entire course of the incident will display in red text as "Unable to retrieve assignment refresh from CAD" **without a time stamp**. This pop up is an extremely rare and unusual occurrence, and the IC should be immediately notified. When performing a Rollcall in this scenario, Units will **NOT** be assigned by Starfire, but will be populated by HT transmissions. Prior to pressing begin Rollcall, IC must request the Officer of each Unit to individually key their HT mic once to check in. Units that have keyed their mic will be viewed in "Unassigned Units" section.

Note: If this text appears, the IC should strongly consider performing a verbal Rollcall according to Communications Manual Chapter 9 Addendum 2.

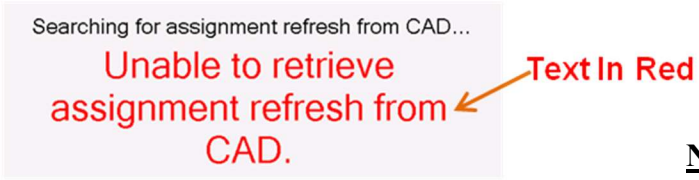

Figure 26 – Unable to Refresh

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7.1.4 Once "BEGIN ROLLCALL" is pressed, EFAS will display the most current unit assignment stored in Starfire. Only "Assigned Units" will appear in the Rollcall, units not assigned to the incident will appear on the lower half of the screen as "Unassigned Units". A tabular "ROLLCALL" screen will populate, showing unaccounted for positions in yellow. As members are accounted for during the Rollcall, their riding position color will change from yellow to green, and any members activating their Emergency Alert will be highlighted in red. (Figure 27)

Note: Unstaffed positions are represented in grey, and do not need to be accounted for.

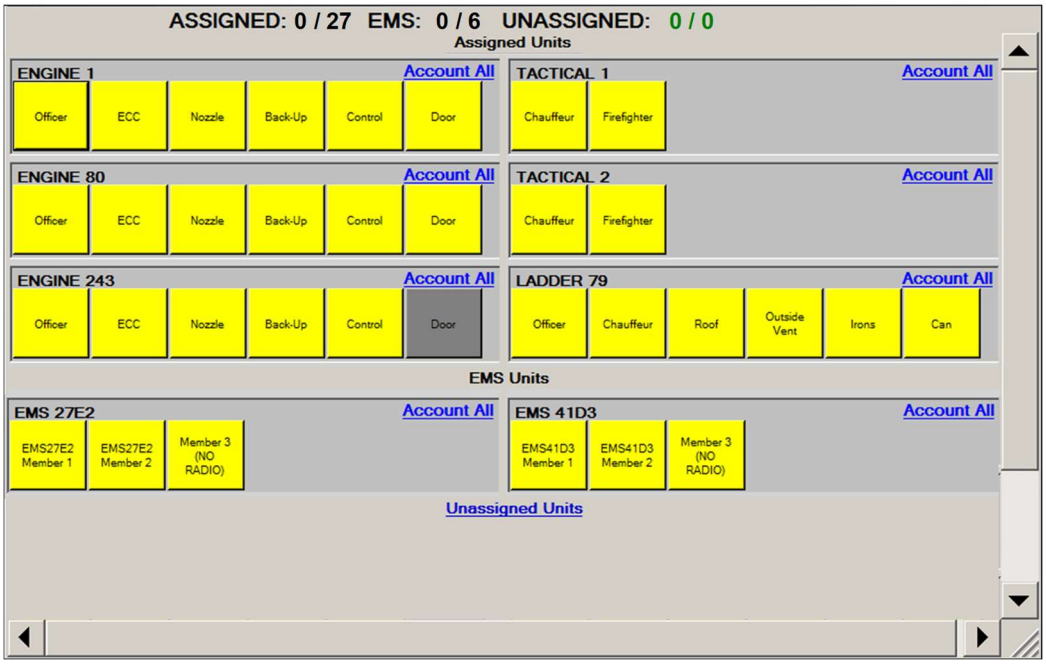

Figure 27 – Rollcall Screen

7.2 Automatic Roll Call Using EFAS

7.2.1 The Chief or company officer conducting the Automatic Rollcall shall begin by contacting the most severely exposed unit, sector, or group, e.g., "All members of Engine 1 fully depress and release your HT remote microphone 3 times." If a unit-by-unit Rollcall is not feasible, the IC can vary from this procedure.

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7.2.2 When remote microphone is keyed three times, the member's riding position will change from yellow to green. (Figure 28)

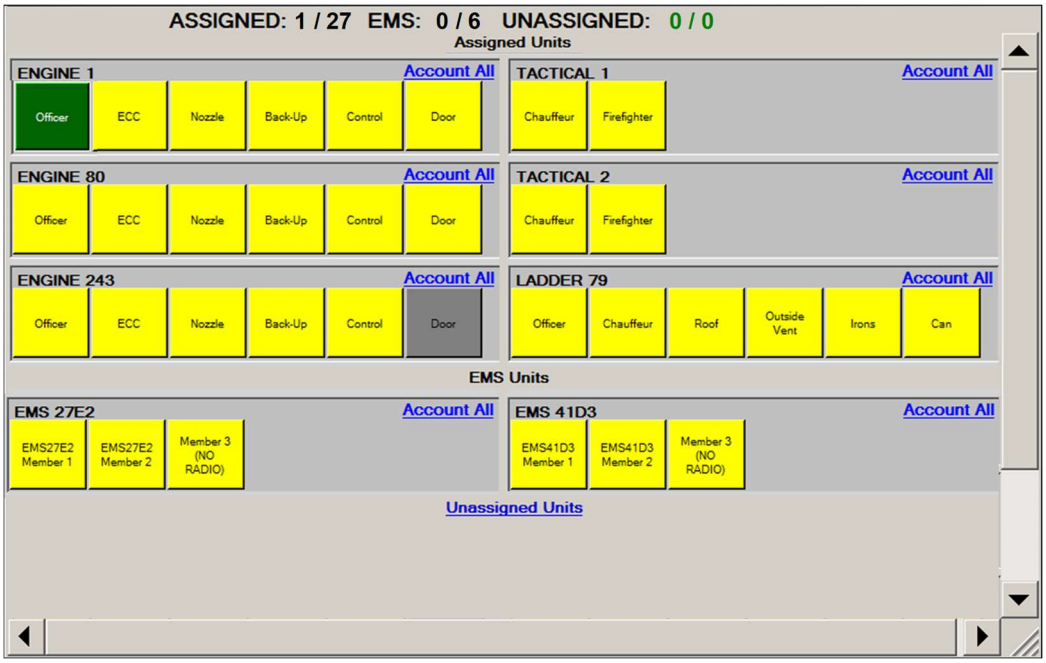

Figure 28 – Rollcall Screen Showing Accounted for Members highlighted in Green

7.2.3 Members who do not key their HT remote microphone will remain in yellow and will need to be contacted directly.

7.2.4 If a member is confirmed accounted for, but they do not have ability to key their HT remote microphone, you can manually account for the member. Select the member's riding position utilizing the MDT touch screen. A dialog box will appear for that member, select the "MANUALLY ACCOUNT" button. (Figure 29)

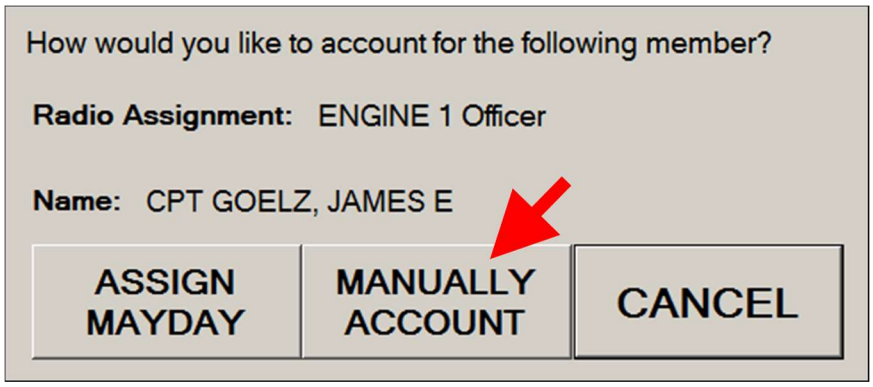

Figure 29 – Manually Account

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7.2.5 When the Rollcall is complete, select the "END ROLLCALL" button located at the top of the EFAS screen (the "BEGIN ROLLCALL" button is replaced by "END ROLLCALL" when you begin a Rollcall). A dialog box will appear, select the "END ROLLCALL" button. (Figure 30)

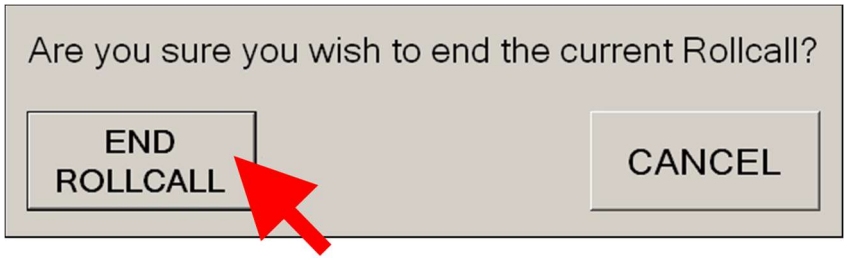

Figure 30 – End Rollcall

Note: All Emergency Alerts will still be recognized and highlighted during a Rollcall procedure. It is imperative that members utilize their Emergency Alert Button when transmitting a Mayday.

7.3 Unassigned Units within EFAS Range

7.3.1 EFAS will pick up all HT transmissions within range even if the company is not assigned to the incident. The units will show up in the "Rollcall" screen on the lower half as "Unassigned Units".

7.4 Manual Roll Call Using EFAS

7.4.1 The Chief or company officer conducting the Manual Roll Call shall begin by selecting the 'Manual' Roll Call from the popup menu (Figure 31) and then confirming that you want to proceed. (Figure 32)

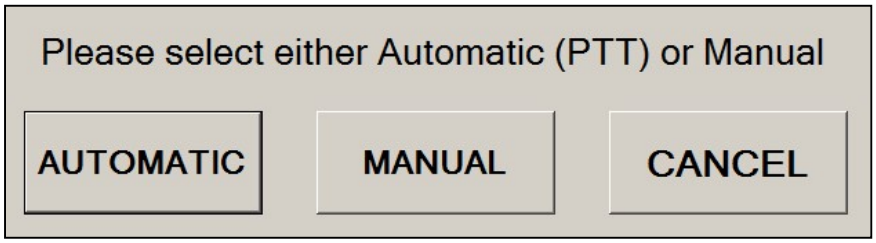

Figure 31 – Manual Roll Call

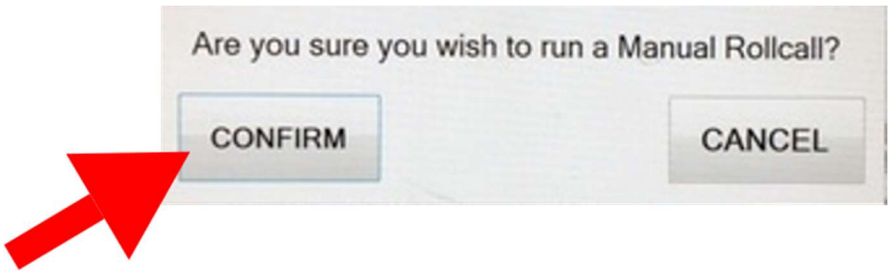

Figure 32 – Confirm Manual Roll Call

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7.4.2 A tabular "ROLLCALL" screen will populate showing unaccounted for positions in yellow. (Figure 33) The Chief or company officer conducting the Manual Rollcall shall begin by contacting the most severely exposed unit, sector, or group. If a unit-by-unit Rollcall is not feasible, the IC can vary from this procedure.

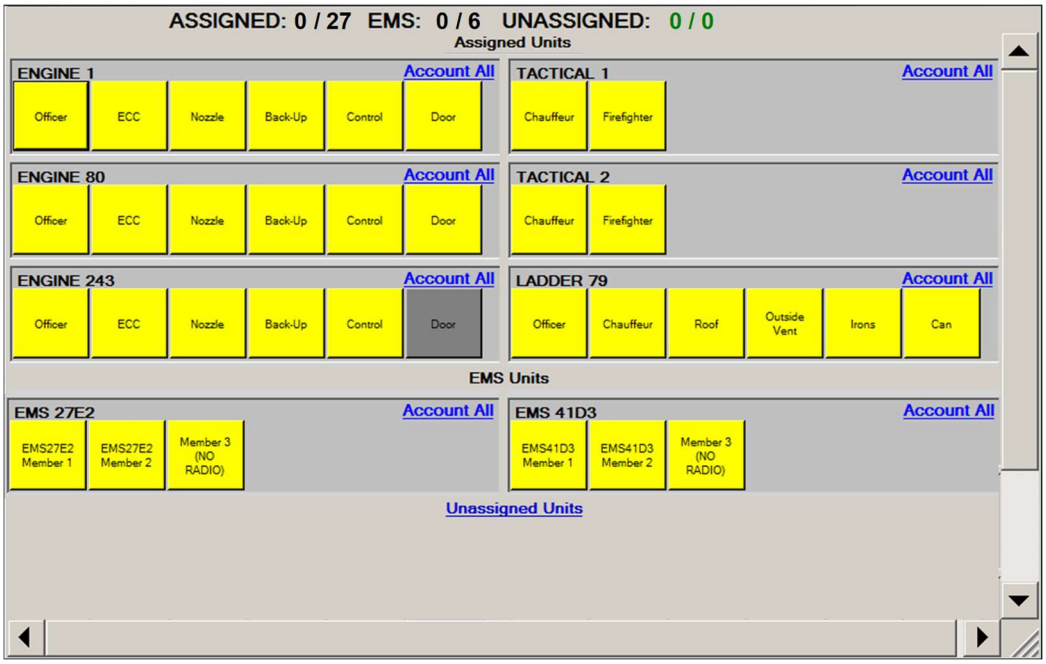

Figure 33 – Roll Call Screen

7.4.3 The 'Manual' Roll Call feature allows the EFAS Roll Call Officer to manually account for all members during the Roll Call. Keying the HT remote will not automatically turn a member's position green and the Roll Call Officer will be required to manually account for members by selecting the member's riding position utilizing the MDT touch screen. A dialog box will appear for that member, select the "MANUALLY ACCOUNT" button. (Figure 34)

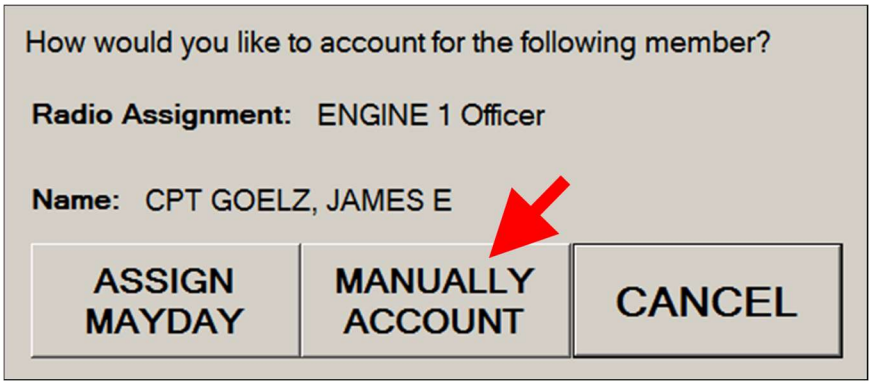

Figure 34 – Manually Account

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7.4.4 There is also an 'Account All' button for each Unit which allows the Roll Call Officer to account for the entire unit simultaneously if information received warrants. (Figure 35)

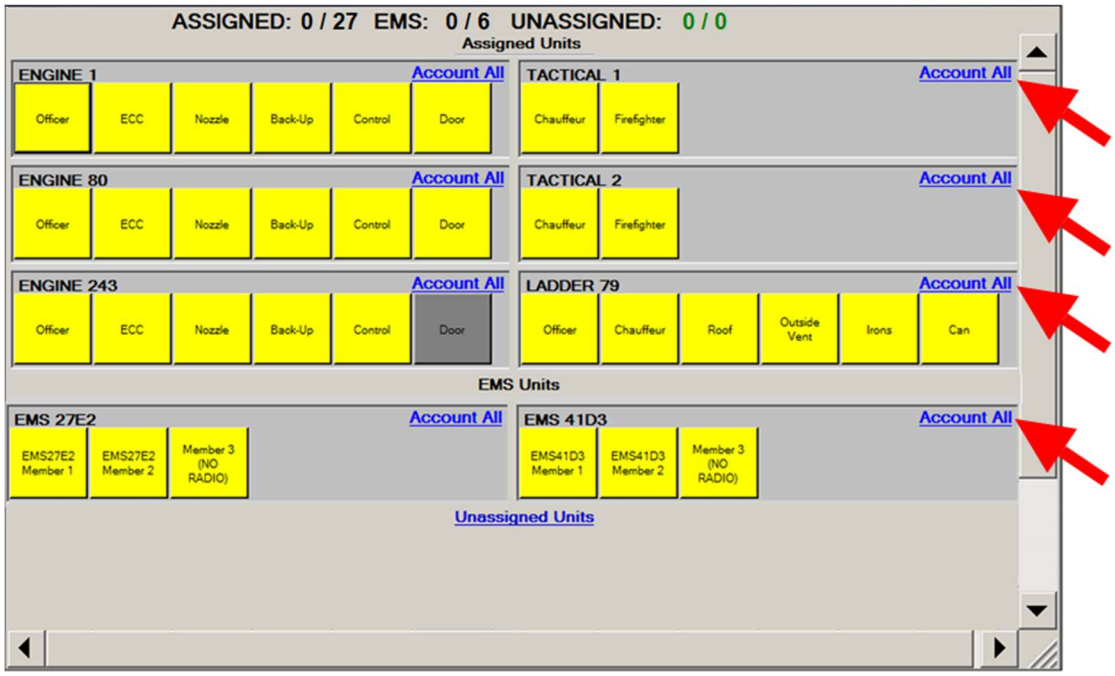

Figure 35 – "Account All" Feature

7.4.5 When the Manual Rollcall is complete, select the "END ROLLCALL" button located at the top of the EFAS screen (the "BEGIN ROLLCALL" button is replaced by "END ROLLCALL" when you begin a Rollcall). A dialog box will appear, select the "END ROLLCALL" button. (Figure 36)

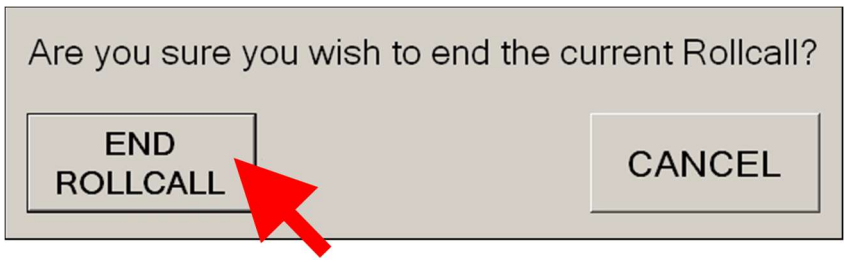

Figure 36 – End Rollcall

8-9. ***Redacted for PFS***

BY ORDER OF THE FIRE COMMISSIONER AND CHIEF OF DEPARTMENT

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1. The identification of buildings and subdivisions within buildings continues to be a problem for firefighting forces. The following outlines a system which will provide a simple and clear concept for building identification. This system uses a more practical approach, which will lead to improved on-scene communications

2. The system uses a series of numbers and letters to develop an identification code which is directly related to the building or occupancy the communicator is talking about. This system always uses as a reference point, the view as seen by a person standing in front of and looking at the fire building.

2.1 Buildings separated by more than thirty feet from the fire building, should not be identified as exposures unless the volume of fire or complexity of the incident causes an exposure problem.

3. Numbers indicate direction (front, left, rear and right).

4. Letters indicate distance from the main fire building or fire.

5. Explanation of numbers:

5.1 "0" - when used as the first digit, it indicates the FIRE BUILDING or FIRE AREA.

5.2 "0" - when used in any other position "0" refers to a subdivision of the building which is identified by the number following the "0" or the letters following the "0".

5.3 "1" - is used to indicate the street in front of the main fire building or the buildings opposite the front of the main fire building.

5.4 "2" - is used to indicate any building or area to the left of the main fire building.

5.5 "3" - is used to indicate any building or area to the rear of the main fire building.

5.6 "4" - is used to indicate any building or area to the right of the main fire building.

5.7 To enhance the description of a location within or around a building, and when viewed from the Exposure 1 perspective, the building corners can be further identified as follows:

- The front left corner is the “1-2” corner.
- The rear left corner is the “2-3” corner.
- The rear right corner is the “3-4” corner.
- The front right corner is the “1-4” corner.

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6. Explanation of letters:

6.1 "A" - is used to indicate the second building or subdivision from the main fire building or fire area.

6.2 "B" - is used to indicate the third building or subdivision.

6.3 "C" - is used to indicate the fourth building or subdivision.

6.4 "D" - is used to indicate the fifth building or subdivision.

6.5 "E" - is used to indicate the sixth, "F" is the seventh, and so on down the alphabet.

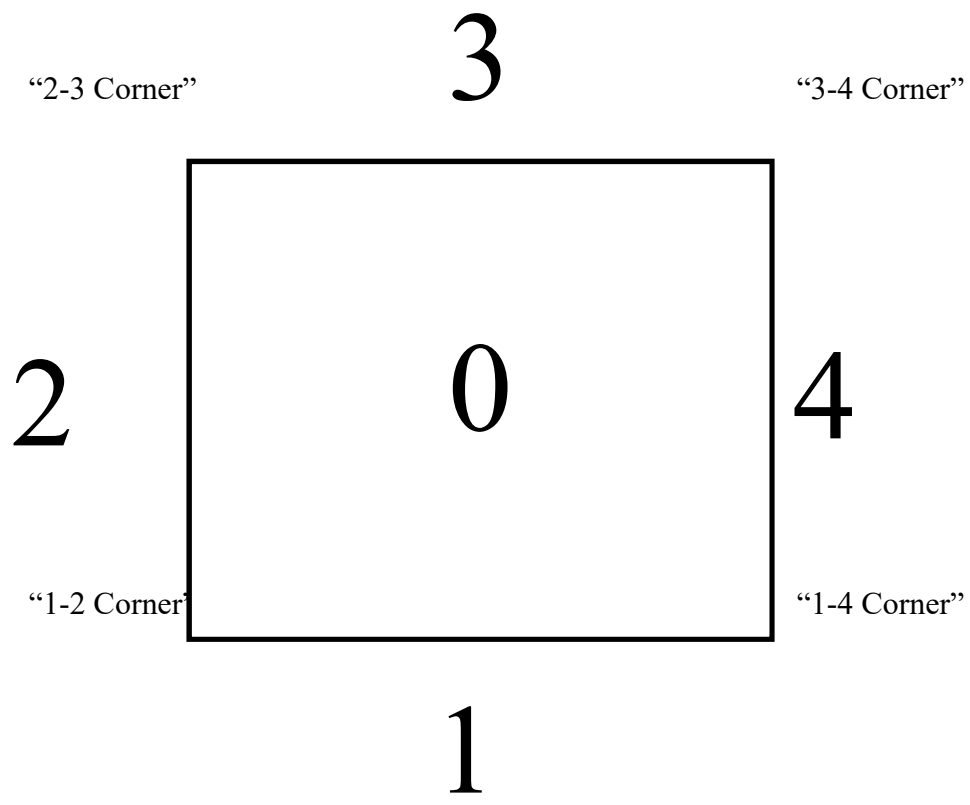

Illustration # 1

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7. The following illustrations show how the exposure system is used:

7.1 Illustration #1, depicts a single building. The building is identified as "O", "1" is a street, "2" is a lot "3" is a lot and "4" is a lot. This indicates that the building is isolated.

7.2 Illustration #2 depicts a taxpayer with nine (9) individual stores, or nine subdivisions. The fire is located in the center store. The store to the immediate left of the fire store is identified as exposure "O-2", the next store on the left (two stores from the fire store) is "0-2A", the third store on the left would be "O-2B" and the fourth store would be "02C". The first store on the immediate right of the fire store would be exposure "0-4", the second store on the right would be "0-4A", the third store would be "0-4B", and the fourth store would be "0-4C".

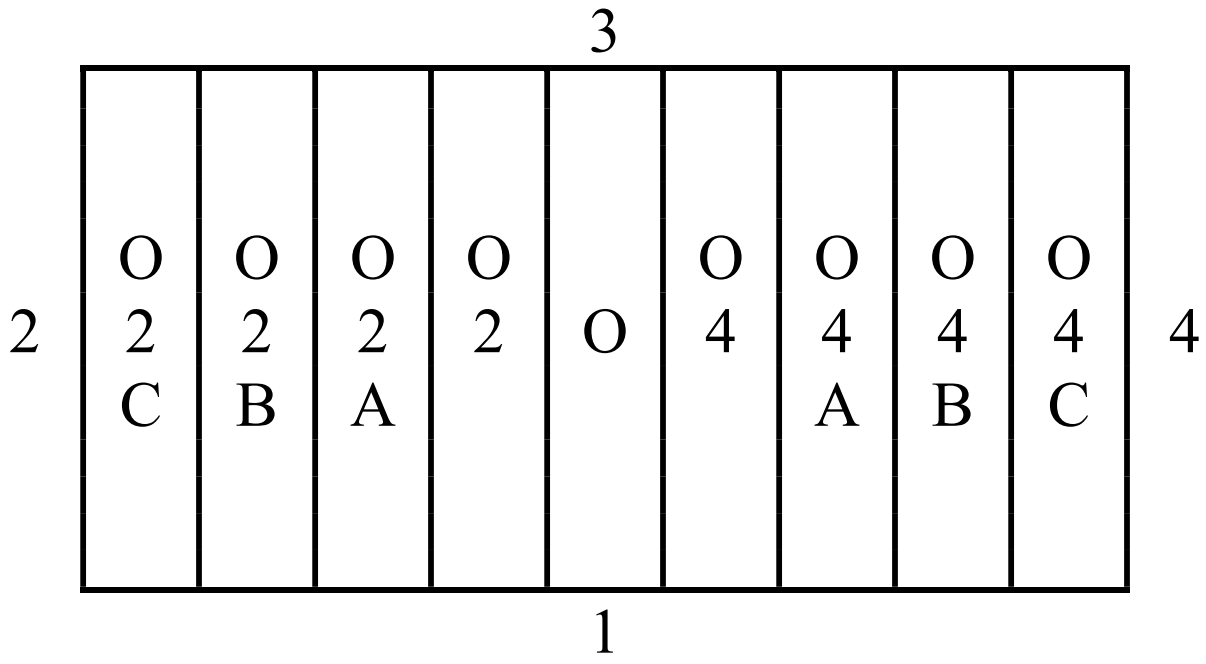

Illustration # 2

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7.3 Illustration #3 depicts a more complex problem. It uses as a foundation the taxpayer shown in Illustration #2. The fire building is identified as "0" and all subdivisions are identified by having their ID codes start with "0". The second character in the identification code is a number and indicates the direction; "2" indicates the left side and "4" indicates the right side. The third character is a letter and indicates how far away from the fire store the subdivision is located. Exposure "1", for this illustration is a street. The first building to the left of the fire building is exposure "2", the second is "2A". The buildings directly to the rear of the fire building are exposure "3". The building immediately to the right of the fire building is identified as exposure "4", the next building to the right is exposure "4A", than "4B", "4C", etc.

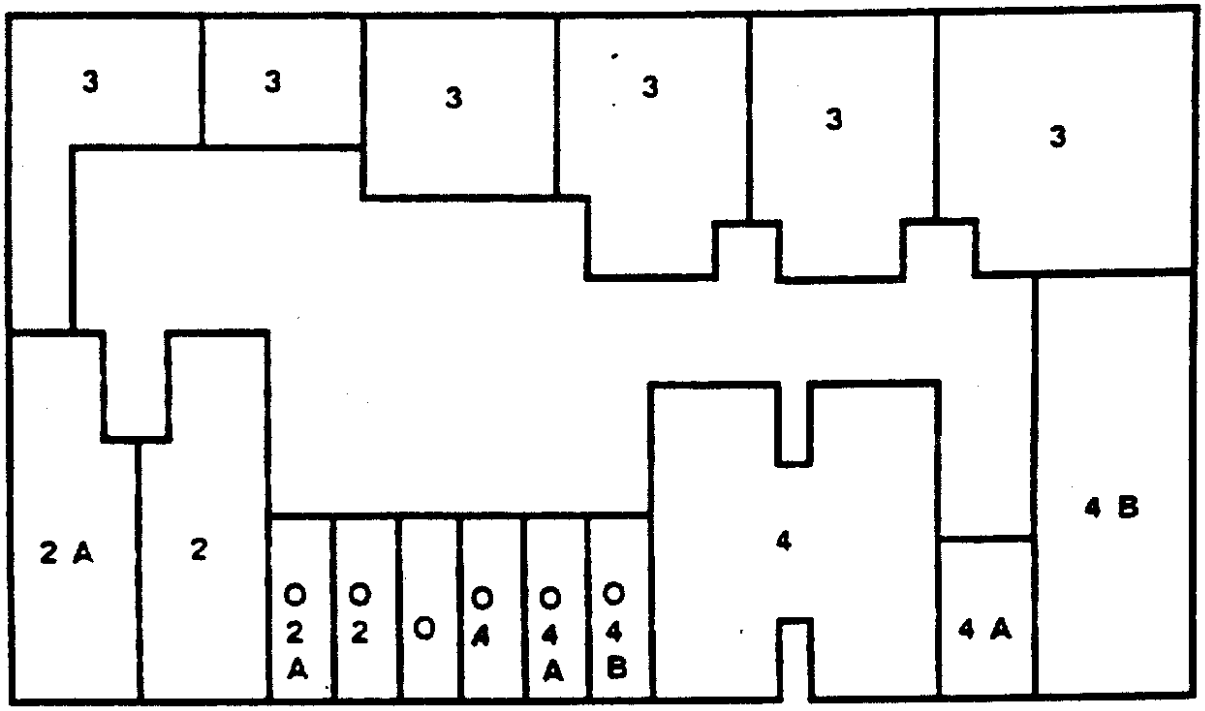

Illustration #3

Note: To eliminate any confusion in identifying rear exposures, all buildings in the rear shall be referred to as exposure "3". If operations on exposure "3" become too complex, the Incident Commander should create a sector/branch and assign a Sector Supervisor/Branch Director to manage this area.

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7.4 Illustration #4 shows how the system builds; it starts with a fire in the taxpayer, "O", that extends to the right and then out of the taxpayer and into the windows of the top floor of exposure "4". Exposure "4" is an "H-type" building and because of its size, we will mentally subdivide it into sections. Each of the arms of the "H" will be identified as WINGS. In this illustration, the wing closest to the fire building is wing "A", the next arm is wing "B" and if there is a third or fourth wing they would be identified as wing "C" and wing "D". Wings are identified from left to right looking from the front of the building: If necessary, each wing can be further subdivided from front to rear using the terms FRONT, CENTER, and REAR. The part of the building connecting each wing shall be designated the throat and shall be referred to as the throat between "A" wing and "B" wing etc.

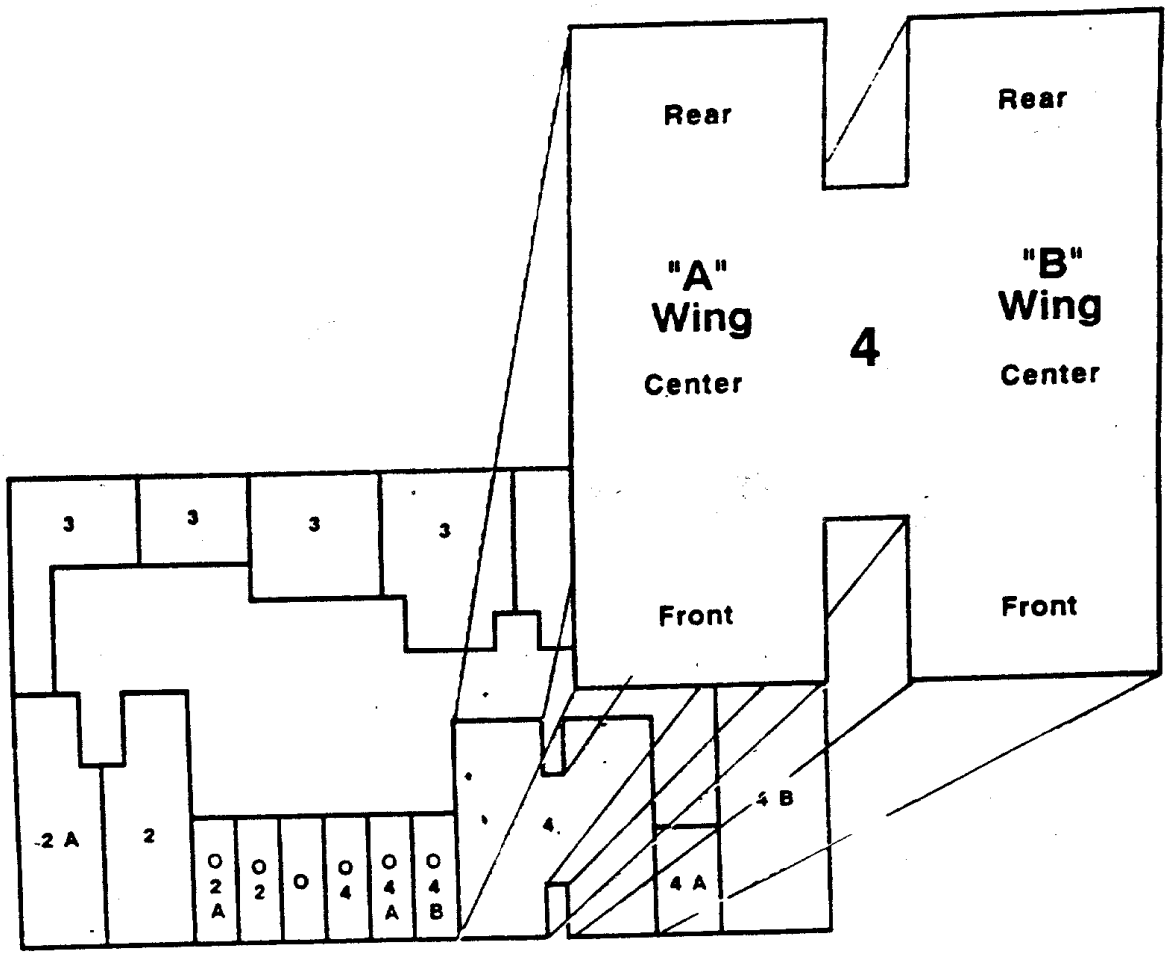

Illustration # 4

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8. Illustration #5 depicts a fire that originated in the "H" building and has extended to the left into the taxpayer. It has advanced down the row of stores to the third store and threatens the fourth store. The "H" type building is identified as "O", the taxpayer is exposure "2" and the first store or subdivision of the taxpayer is identified as "2-0". The "2" indicates the first building on the left; the "O" following a number indicates that we are now referring to a subdivision. The second store is "2-OA", the third store is "2-OB", the fourth is "2-OC", the fifth is "2-OD", the sixth is "2-OE". The next building is a separate building, not part of the taxpayer and is identified as exposure "2A", then "2B", etc. The buildings opposite the fire building represent exposure "1" because either the separation is thirty feet or less or the intense fire creates an exposure problem.

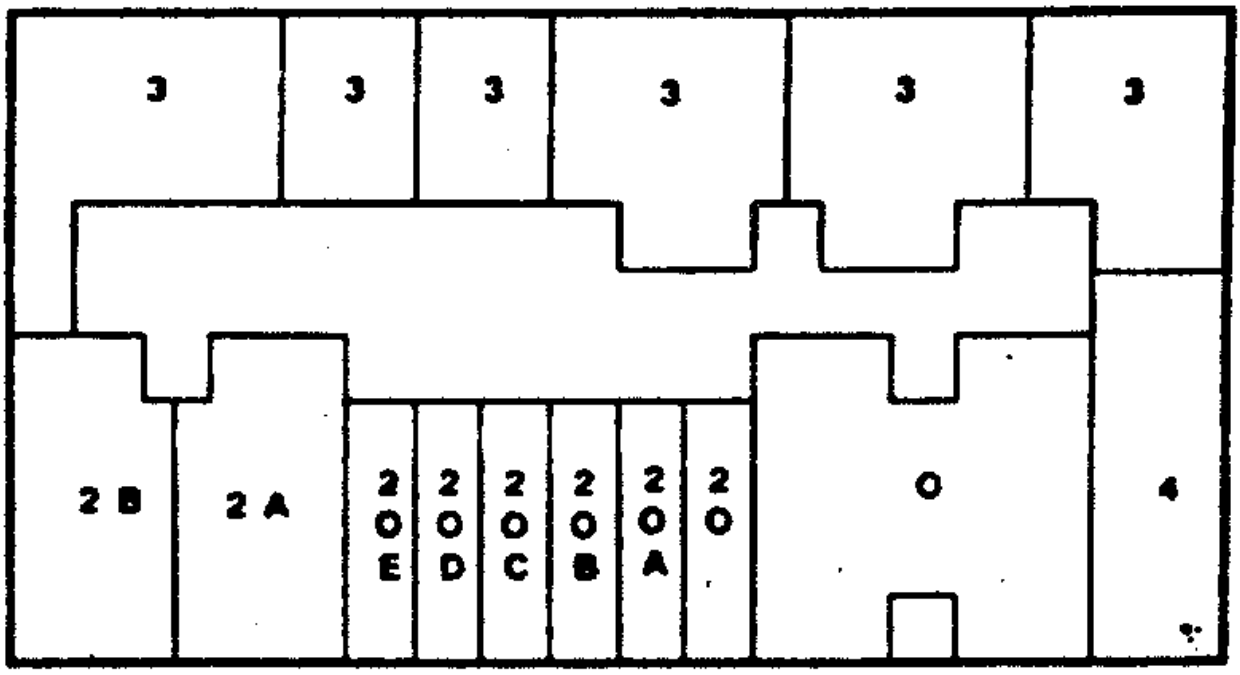

Illustration # 5

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9. Large buildings often need to be subdivided to gain better control of operational or problem areas. If necessary, subdivide the building into front, center and rear, or just front and rear. Starting from the left, designate sectors; Sector "A", Sector "B", Sector "C" etc.

9.1 Illustration #6 depicts an operation in a square building.

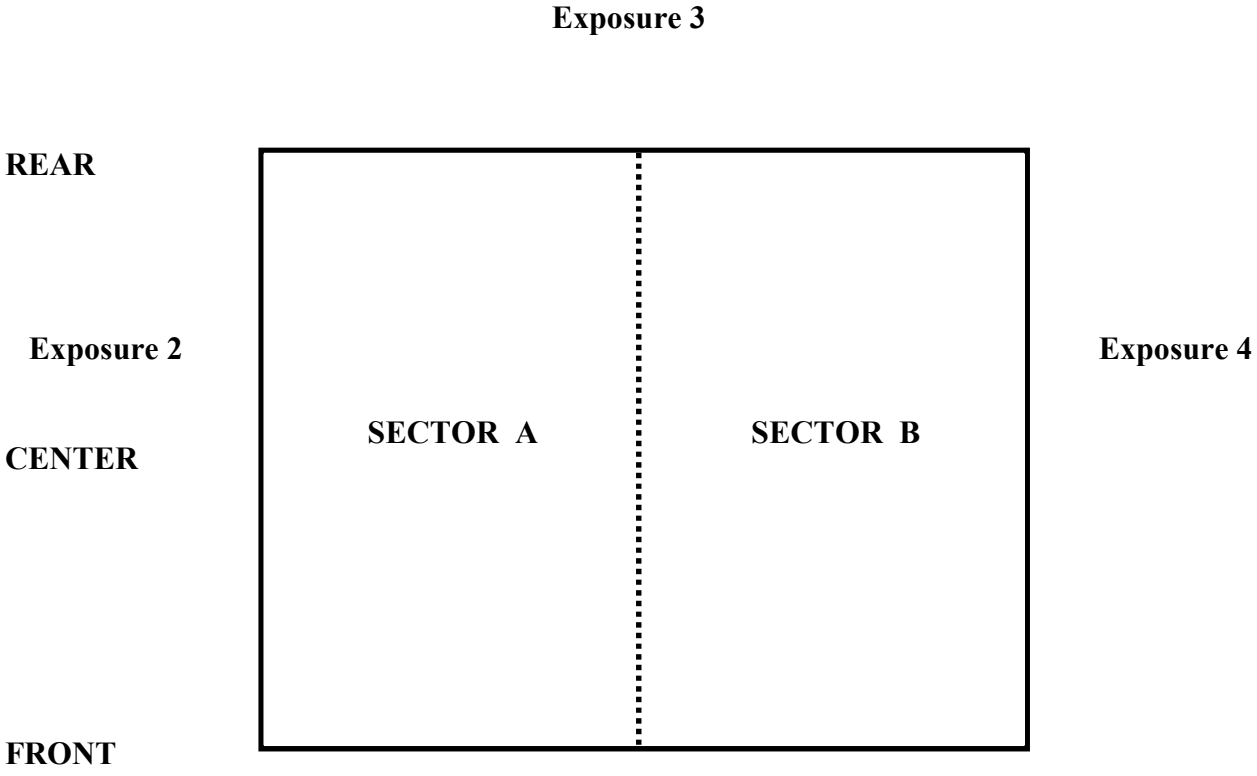

Illustration # 6

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9.2 Illustration #7 depicts an operation in a rectangular building.

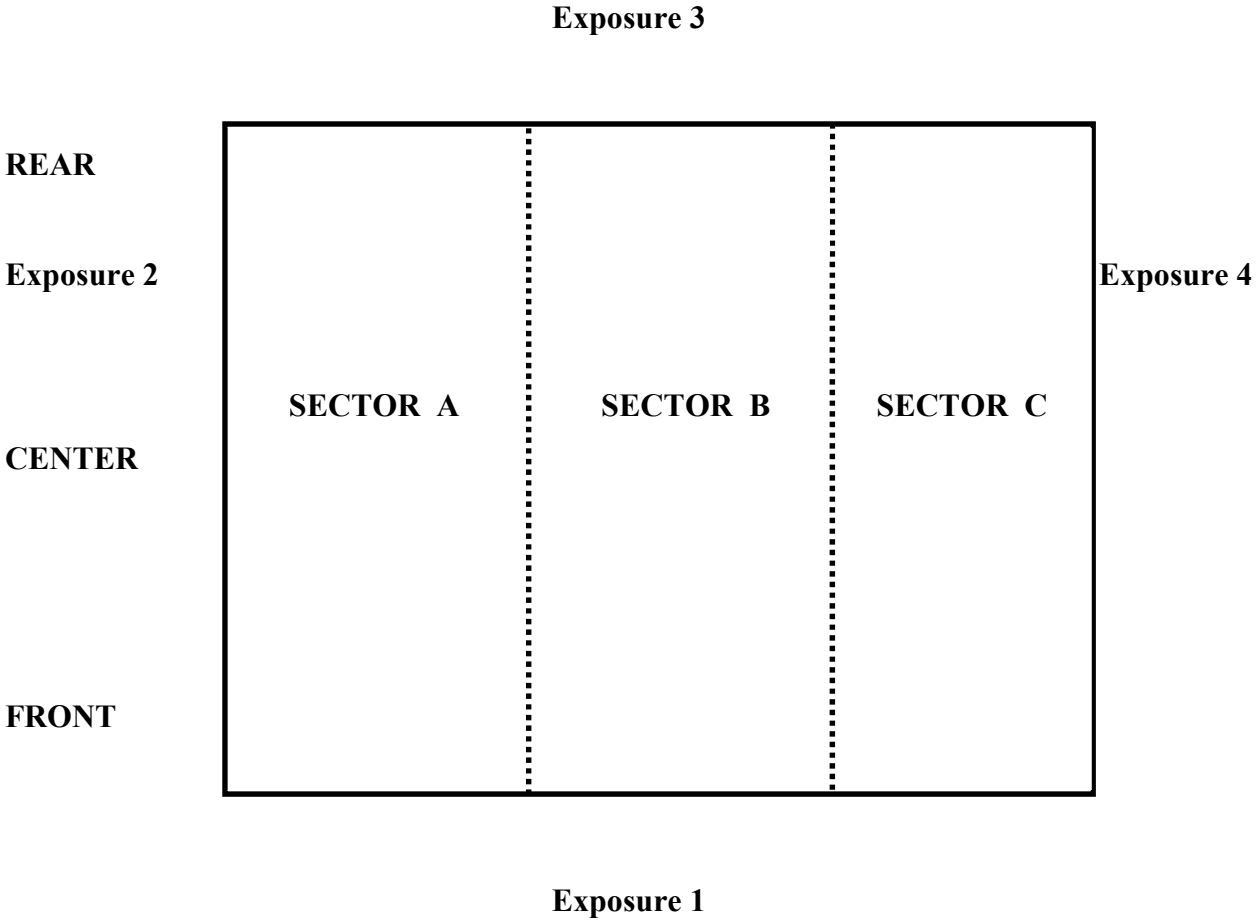

Illustration # 7

10. Use of Plain Speak for Fireground Communications

10.1 Plain speak exposure identification is the process of identifying building and/or occupancies by name, occupancy type, address or any other distinctive characteristic. It should be used on the fireground in situations when it would benefit fire operations. It can be used in combination with the standard alpha-numeric exposure identification system to clearly define operational locations. This can be particularly effective for operations involving taxpayer fires. These types of operations usually have separate occupancies with distinctive characteristics that can be used in conjunction with the alpha-numeric exposure system (O2A, 04B, 3, etc).

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Taxpayer Examples:

- "Conduct a primary search in exposure 04, the pizzeria sector"
- "Stretch a line into exposure 04, the bakery sector"
- "We have heavy fire showing from the rear of exposure 02, the hardware store sector"

The intent of plain speak is not to replace the standard exposure identification system. It should only be used when it enhances our ability to properly identify exposures. It should be noted, plain speak alone may not be an effective method of communicating with all members on the fireground. Members operating on the roof or at the rear of an operation may not be able to view occupancies and may have to communicate with the standard alpha-numeric exposure identification system. A combination of plain speak, and exposure numbering may be the most effective method.

Note: Plain speak shall only be used for fireground communications. Plain speak exposure identification shall not be used in preliminary and progress reports to the Borough Dispatcher.

11. By following this identification system, the IC can more effectively manage resources and improve incident communications.

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COMMUNICATIONS MANUAL
CHAPTER 11
July 17, 2019

UTILIZATION OF COMPANY HANDIE-TALKIE

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1. INTRODUCTION

After many years of use in the FDNY, the XTS3500 has reached its end of service life. Following an exhaustive evaluation process, a new radio with many additional features has been selected by the FDNY.

1.1 Portable Radios: (HT)

The Department has purchased the Motorola APX8000XE radio. This multi-band radio will provide access to every mode of voice radio communications currently used by the FDNY. The APX8000XE portable radio can communicate on VHF, UHF & 700/800 MHz. The multi-band capability greatly enhances the department's efficiency, increases intra and interoperability and overall safety of our members. This UL approved, non-incendive radio is being issued to both Fire and EMS.

1.2 New Features

1.2.1 **Voice Annunciation:** Announces zone and channel when powering up and changing channels.

1.2.2 **Multi-Screen View:** Top display and Main display for navigation of features.

1.2.3 **Recent/Mayday Retention:** Will hold the IDs of the last 15 transmissions.

1.2.4 **Multi-Zone Capabilities:** Enhanced communication capabilities by providing access to numerous channels.

1.2.5 **Multi-Band Radio:** Ability to communicate on VHF, UHF and 700/800 MHz.

1.2.6 **High Visibility LED on Remote Speaker Mic (RSM)**: Operates on EAB activation and manually.

1.2.7 **Alpha-Numeric ID:** Identification of transmitting members. i.e.: LAD 12-OV, ENG 3-NOZ

1.2.8 **Encryption:** Enables secure transmissions on selected channels.

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Figure 1

2. DESCRIPTION AND USE OF HT

2.1 Motorola APX8000XE comes equipped with the following:

- 2 Watt and 5 Watt output
- 7" multi-band antenna
- Lithium-ion rechargeable battery
- Carrying case with an adjustable shoulder strap
- Remote Speaker Mic (RSM)

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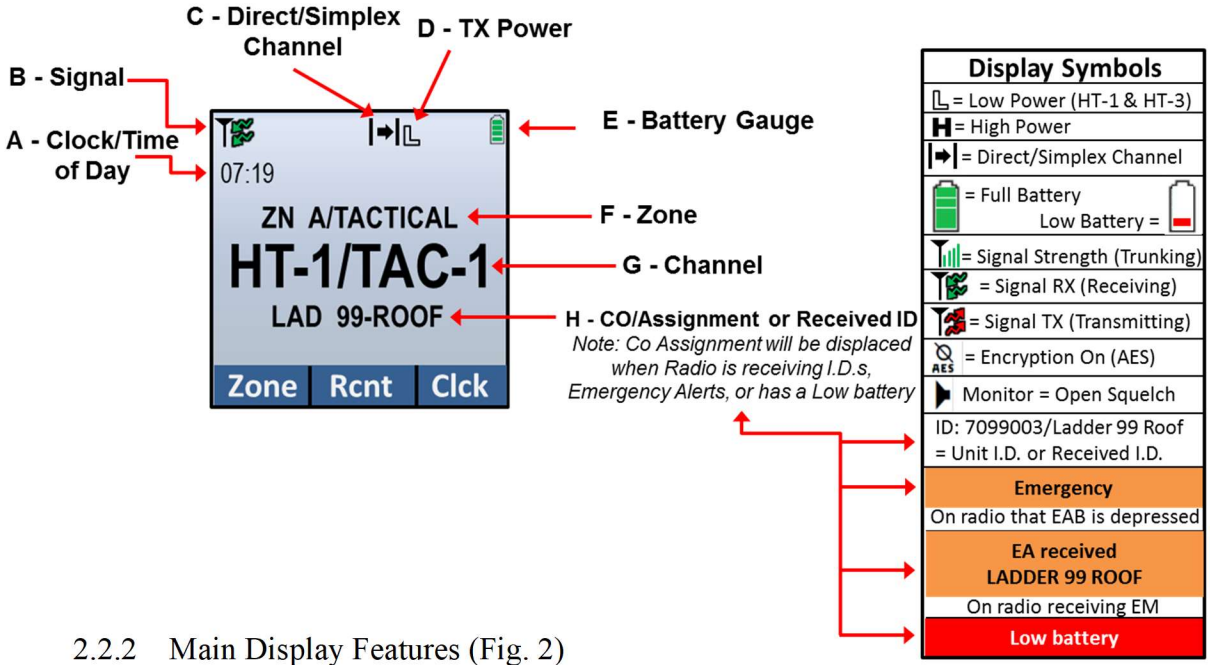
2.2 Two Displays

2.2.1 Main Display

Fig 2



2.2.2 Main Display Features (Fig. 2)

Full color display, 4 lines of text up to 14 characters per line.

A. Clock/Time of Day: Is only the time set on that HT and may not be accurate. (See Add. 6) Time of day is located in upper left-hand corner.

B. Signal: Indicates whether radio is Transmitting ,Receiving or signal strength for Trunking

C. Direct/Simplex Channel: An indicates a direct/point to point channel. No symbol (blank) indicates a Trunked/Repeated Channel.

D. TX Power: An **H** or **L** on the display indicates high (5 Watt) and low (2 Watt) power level.

E. Battery Gauge: Indicates level of battery. Battery indicator is located in the upper right corner of the display.

F. Zone: Indicates Zone member's HT is set to.

G. Channel: Indicates channel member's HT is set to.

H. Alpha-numeric Identification: By position i.e. LAD 99-Roof
Every portable radio has an assigned Internal Identification Code that is assigned to a specific unit and riding position. The assigned internal ID will be displaced when Radio is receiving IDs, Emergency Alerts or has a low battery. If an alphanumeric ID does not appear, then the numeric ID will be displayed. (See Addendum 4)

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2.2.3 Front Controls

Fig 3

A. Mic is located to the left above the main display.

B. Menu/Select buttons
   - Single Dot: Zone - Enables changing zones.
   - Double Dot: Rcnt - (Recent) allows access to list of last 15 IDs received.
   - Triple Dot: Clck - (Clock) Allows access to internal clock application, to reset time.

C. 4 Way Navigation Button: Allows navigation through different features on HT.

D. Home Button: Pressing and holding the Home button for long press (2 seconds) returns the radio to the Tactical Zone A, HT channel 1. (**Note:** No matter what channel the channel selector is on, you return to Channel 1). If you wish to use a different channel, use channel selector knob.

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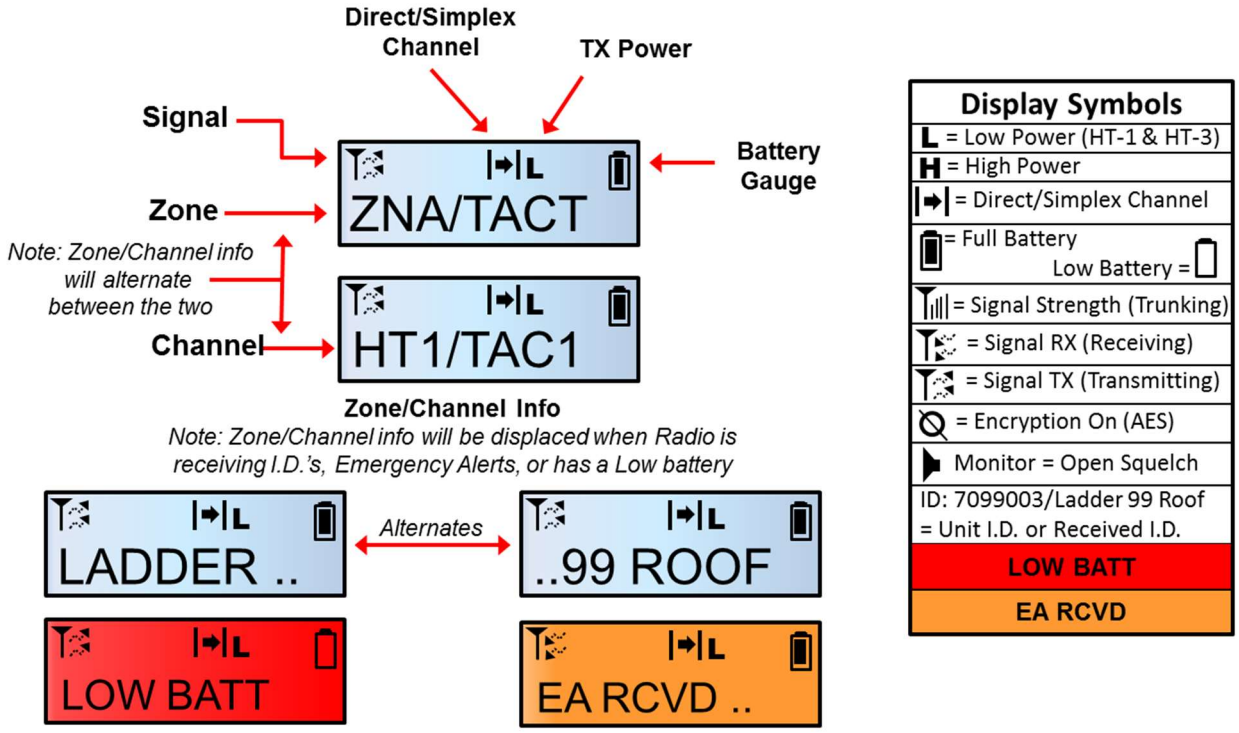
2.2.4 Top Display

Fig 4



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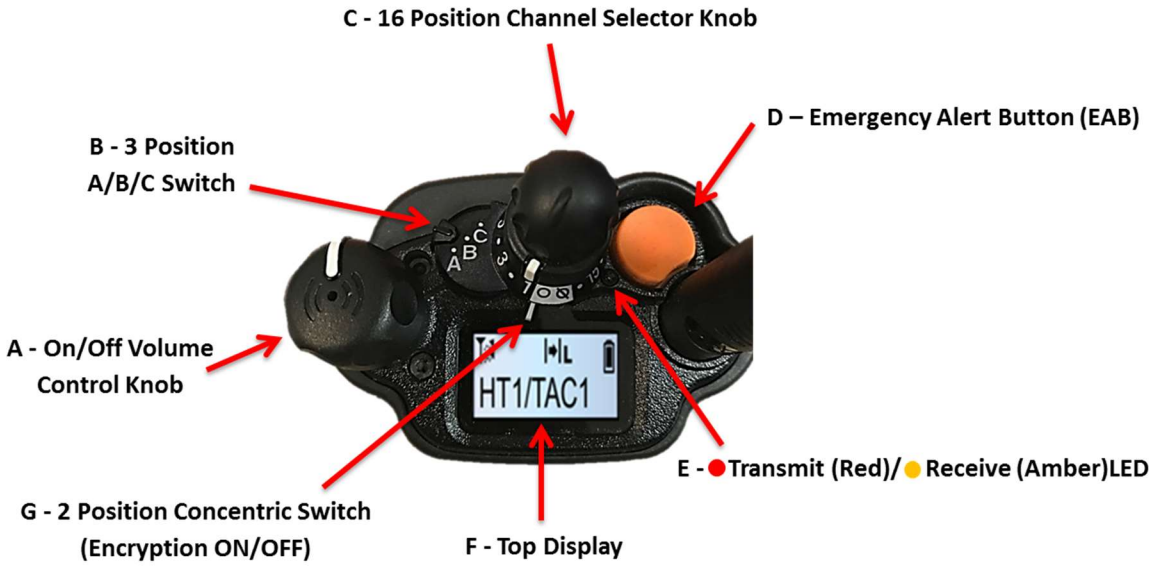
2.2.5 Top Controls

Fig 5



A. ON/OFF Volume Control Knob:

Radio ON: Rotate knob clockwise until a click is heard or felt. The radio will go through a power-up self-test.

If the power-up test is successful, a splash screen will appear on the radio display followed by the Home screen returning to last channel and zone selected when radio was on. The radio will return to the last channel that it was set to when it was powered off, no matter what position the channel selector knob is on. If the radio power-up test is unsuccessful an Error message will appear. Turn the radio off, check the battery, and turn the radio back on. If the radio still does not pass its self-test, it is defective. Follow procedure in Addendum 4 for placing radio OOS.

The Portable radio must be turned ON prior to donning the bunker coat. Volume must be adjusted for effective communications. The portable radio must be worn under the bunker coat to reduce damage and protect the unit from adverse weather conditions.

B. 3 Position Switch (A/B/C Zone Select):

Is used to toggle between Zone A, Zone B or Zone C. This also provides an easy method to return to tactical zone from any zone on the radio. Move A/B/C switch to any zone other than A and then return to A, and radio will return to Tactical zone.

C. 16 Position Channel Selector Knob: Used to select channel in selected Zone.

D. Emergency Alert Button (EAB):

The Emergency Alert Button (EAB) adjacent to the base of the antenna is used to activate the Emergency Alert.

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E. Transmit/Receive LED: Illuminates red light when transmitting and amber when receiving.

Solid Red - HT is transmitting.

Blinking Red (while transmitting) - HT transmitting at low battery condition.

Blinking Red (while not transmitting) - HT is in Emergency Mode.

Solid Amber - Receiving transmission.

Blinking Amber - HT is receiving a secured transmission.

F. Top Display: See Fig 4

G. 2 Position Concentric Switch: Used to activate encryption on designated channels.

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2.3 Side Buttons

Fig 6

A. Squelch Button: (Purple)

Depressing the squelch button momentarily opens the internal squelch of the radio for the duration of button actuation.

B. Push To Talk (PTT) Button:

Allows radio transmissions.

C. Side Button 1: (Single Square) has two modes.

- Short press (Momentary) - Illuminates both main and top displays for 20 seconds.
- Long Press (2 seconds) - Reverses orientation of top display.

D. Side button 2: (Double Square)

Depressing this button announces the Zone and Channel the radio is operating on and illuminates both displays.

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2.4 Zone Selection:

The HT is provided with various zones. Each zone is a grouping of 16 channels. To change zones, the following steps provide easy access to any channel/zone desired:

Fig 7

Note: The additional channels, zones and frequencies are an enhancement to FDNY communications. These additional channels afford broader communication capabilities at the Company level, as well as provide enhanced situational awareness.

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2.5 XE500 Remote Speaker Mic (RSM)

Fig 8

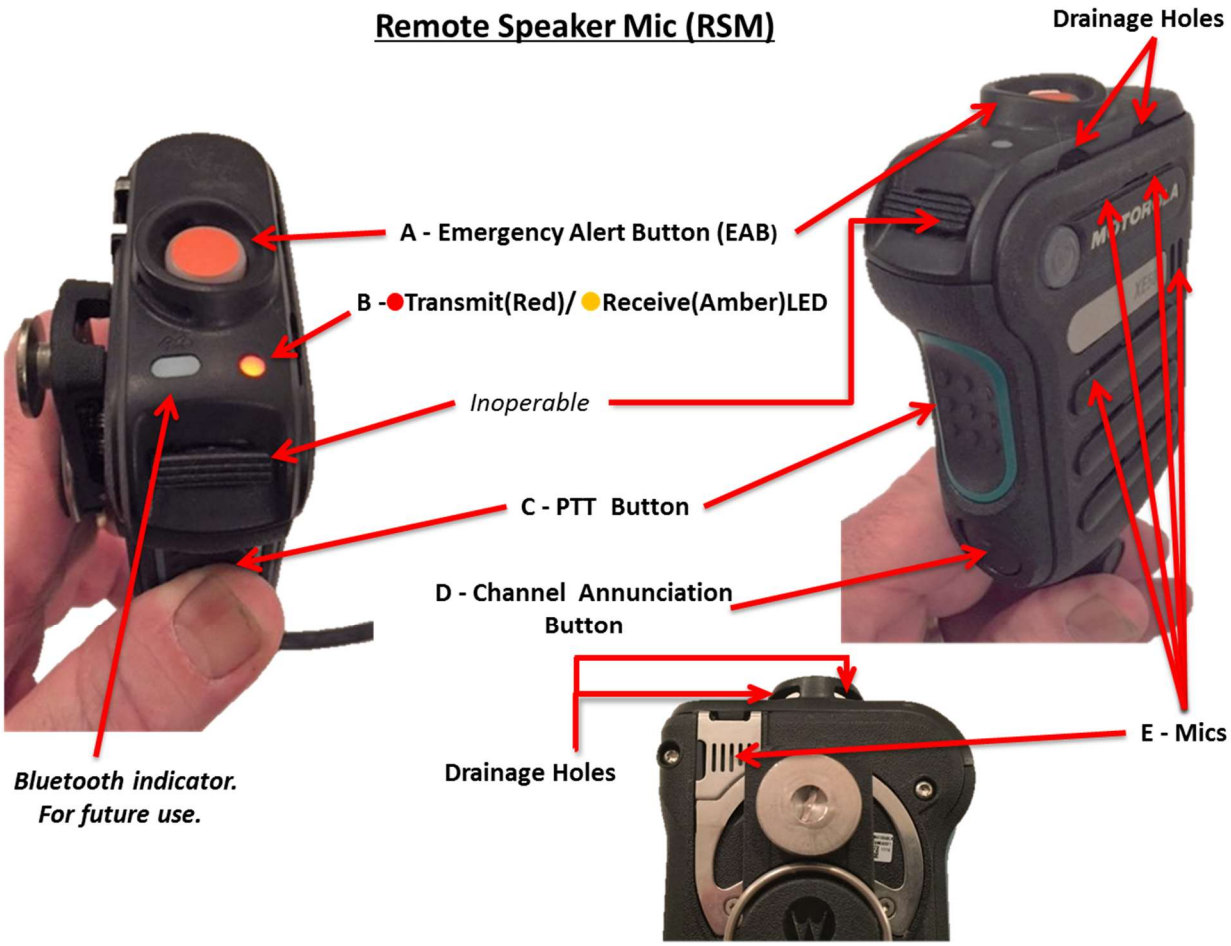
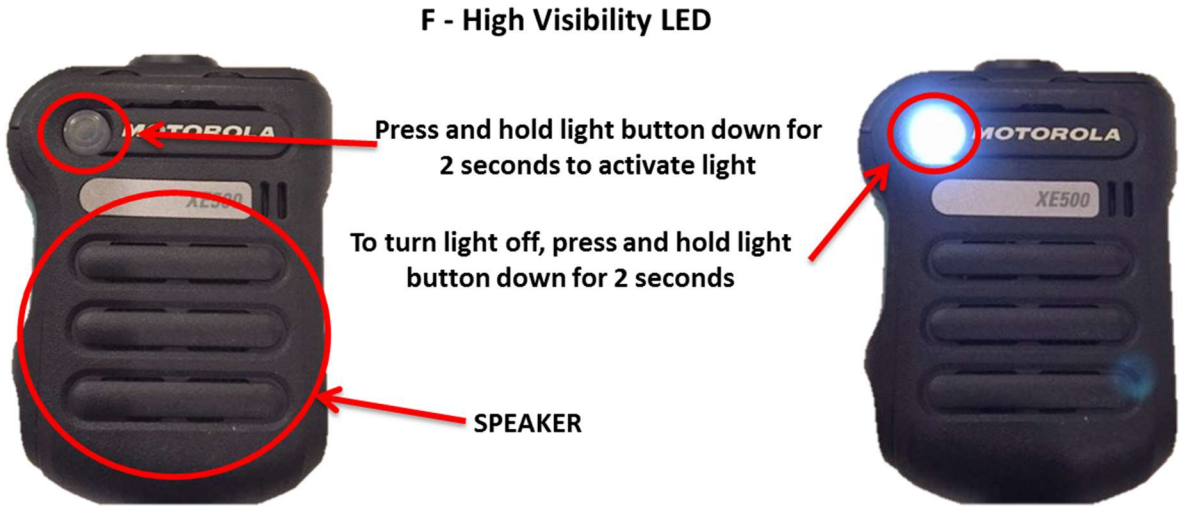


Fig 9



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A. Emergency Alert Button (EAB): Emergency alert button is used to activate emergency alert and has protective ring to reduce inadvertent Emergency alert activations.

B. LED light on top is transmit/receive indicator:

Solid Red - HT is transmitting.

Blinking Red (while transmitting) - HT transmitting at low battery condition.

Blinking Red (while not transmitting) - HT is in Emergency Mode.

Solid Amber - Receiving transmission.

Blinking Amber - HT is receiving a secured transmission.

C. Push-To-Talk (PTT) Button: The Remote Speaker Mic (RSM) includes a recessed PTT button located on the side.

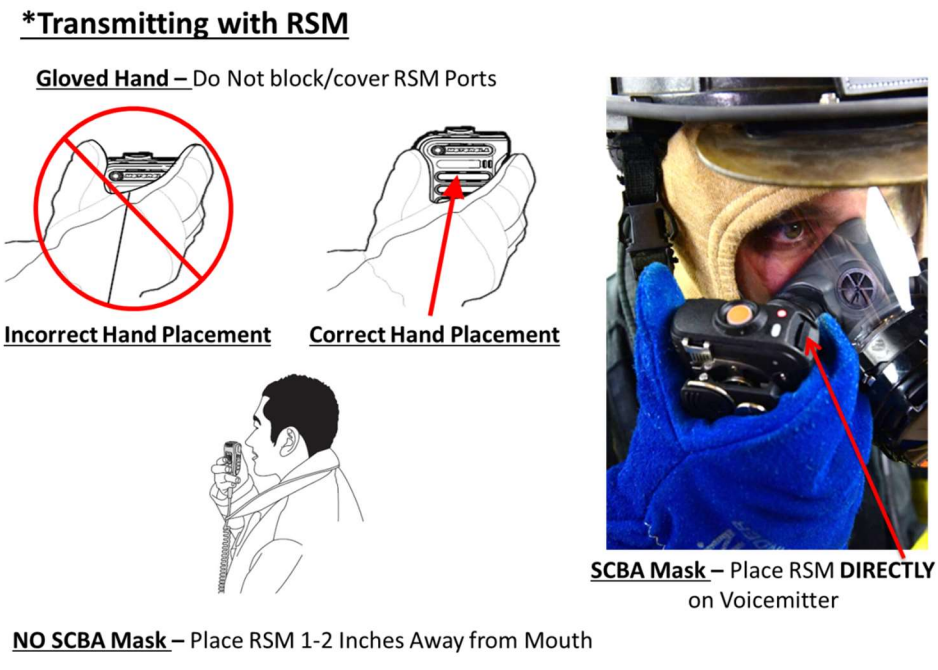
Depressing the PTT button puts HT in the Transmit Mode - When the PTT button is depressed member should pause ½ second, allowing HT ID to be transmitted. When the PTT button is released at the end of a transmission, a tone will be heard through the microphone speaker. The tone level is proportional to the volume setting.

D. Channel Annunciation Button: Depressing the button beneath the PTT button will announce the current selected channel.

E. Mics: The RSM has 5 mics - 4 on the front and 1 on the back.

F. High Visibility LED: A high visibility LED light is mounted in the front of the RSM for a visual indicator when the EA button is depressed. This LED light can also be used as a flashlight by depressing the light for 2 seconds. To turn off the light, depress the light for 2 seconds. The High Visibility LED illuminates 18.5 lumens at 120 degrees.

Fig 10



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3. SPECIAL FEATURES

3.1 Water Resistance

The radio and the RSM are designed to be water resistant. Water resistance is highly dependent on proper use/connection and condition of the radio seal elements. Therefore, the radio should not be subject to unwarranted or casual submersion outside the function of firefighting or routine maintenance. (If radio becomes submerged, refer to Sec. 5 for proper maintenance).

3.2 Audible Tone at End of Transmission (a.k.a. Voice End Tone)

At the end of each transmission, the radio emits an audible tone to:

1) Inform the operator of the volume setting.
2) Indicate that the radio is functioning properly.
3) Signal the end of the transmission.

3.3 30 Second Time-Out-Timer

This feature cuts off the transmitter after 30 seconds of continuous transmission and is especially useful to correct the "stuck-button" problem. At the RSM, the radio emits a short audible warning tone at approximately 26 seconds and a continuous tone at approximately 30 seconds. This indicates that the transmitter has been shut off. The operator can re-key the PTT again if a longer transmission is required. This resets the Time-Out-Timer.

3.4 Voice Recognition

The RSM voice recognition feature captures the member’s voice and reduces background noise, providing for clearer transmissions in noisy environments.

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3.5 Emergency Alerts (EA):
Depressing Emergency Alert Button (EAB) until the audible beacon tone is heard (approximately 1 second), will cause the following actions.

3.5.1 Emergency Alert Activation:
Activation of the EA will cause the following actions on the members HT who depressed EAB.

Fig 11

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3.5.1.1 **Audible Alerts**: When EAB is depressed, Audible Alerts are emitted.

Alert Tones: Alert tones are the audio signal transmitted to other HTs within range of the transmitting HT notifying others a member has activated his/her EA. This signal alerts members of a Mayday or Urgent situation. There are two types of alert tones; Impolite and Polite. The APX8000XE transmits One (1)-Impolite and Two (2)-Polite Alerts.

Impolite Alert - An impolite call is when the radio sends a transmission even when the channel is busy with other radio traffic, however it will NOT preempt any ongoing transmissions.

Note: Due to radio frequency (RF) anomalies, some radios may not receive the emergency alert. Proximity, concrete, steel, building construction, height, terrain and other factors can contribute to the individual member's radio ability to receive the transmitting member's EA.

Polite Alert - A polite call is when the radio sends a transmission when the channel is not busy with other radio traffic. Thereby, increasing the likelihood that other members will receive Emergency alert.

- Approximately 8 seconds after the impolite transmission, the Polite Alert is sent. Therefore, the Polite Alert may be more than 8 seconds after the Impolite Alert tone if other members are transmitting. The APX8000XE HT will transmit 2 Polite Alerts to attempt to reach as many members as possible.
- All 3 Alerts will be transmitted, regardless if members are transmitting or receiving messages. The Impolite Alert will go out first, followed by 2 Polite Alerts when the channel is clear.

Beacon Tone: Manual activation of a radio EA, will initiate an audible Beacon transmitted from that radio. This beacon is used to locate member that activated the EA. This audible beacon is emitted from members HT until it is reset by member.

Reset EA: The EA must be reset by depressing and holding the EAB until the reset tone is heard (approximately 2 seconds). Turning the radio off and on will not reset the EA on Electronic Fireground Accountability System (EFAS).

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3.5.2 Emergency Alerts Received

Activation of the EA will cause the following actions on the HTs that are receiving the EA.

Fig 12

Emergency Alert Activation - Receiving Radio

Main Display:

1. Displays EA received in Orange/Amber.
2. Displays identity of Radio Transmitting EA.
   Either Alpha Numeric of new HT, or 7 digit ID of older models.
3. Holds display for approximately 8 seconds.

Top Display:

1. Displays EA RCVD in Orange/Amber
2. Alternates between, EA RVCD and Alpha numeric ID of radio transmitting EA.
3. Holds display for approximately 8 seconds.

Note: Older model HT's will only show 7 digit ID on APX8000XE HT's.

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3.5.2.1 Transmissions received from member transmitting EA.

Emergency Call: Whenever a member who has transmitted an EA depresses the PTT button, members receiving such a transmission will observe Orange band with **Emergency call** appearing on Main display with Unit and Position. Similar information will scroll across the top display (Fig 12a). All transmissions from member will appear similarly until EA is cleared.

Fig 12a

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3.5.3 Recall Emergency Alert (EA) and Recent transmissions.

The IDs of the last 15 received transmissions (Recent Calls List) can be viewed in the following manner.

Fig 13

Recalling EA /Transmissions:

1. Depress double dot Menu button below Rcnt(Recent).
2. 'Recent Calls' screen appears.
3. The last 15 calls with radio ID will display from most recent to the previous 15 calls. Each call is time stamped. (Times not synced on radios)
4. Calls that display an Orange ⚠ were EA activated transmissions.
5. Use 4 Way Navigation button to scroll up or down to review the last 15 received transmissions.

NOTE: The Recent Calls (Rcnt) display is "static" it does not continue to populate PTT/transmissions/ID's or additional EA's while the Recent Calls(Rcnt) list is displayed. To view subsequent Recent Calls or EA's press triple dot button under Exit then go back to Recent Calls using the Rcnt double dot button

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3.6 Backlight:

Depressing any button will illuminate both displays for approximately 20 seconds.

3.7 Channel Annunciation:

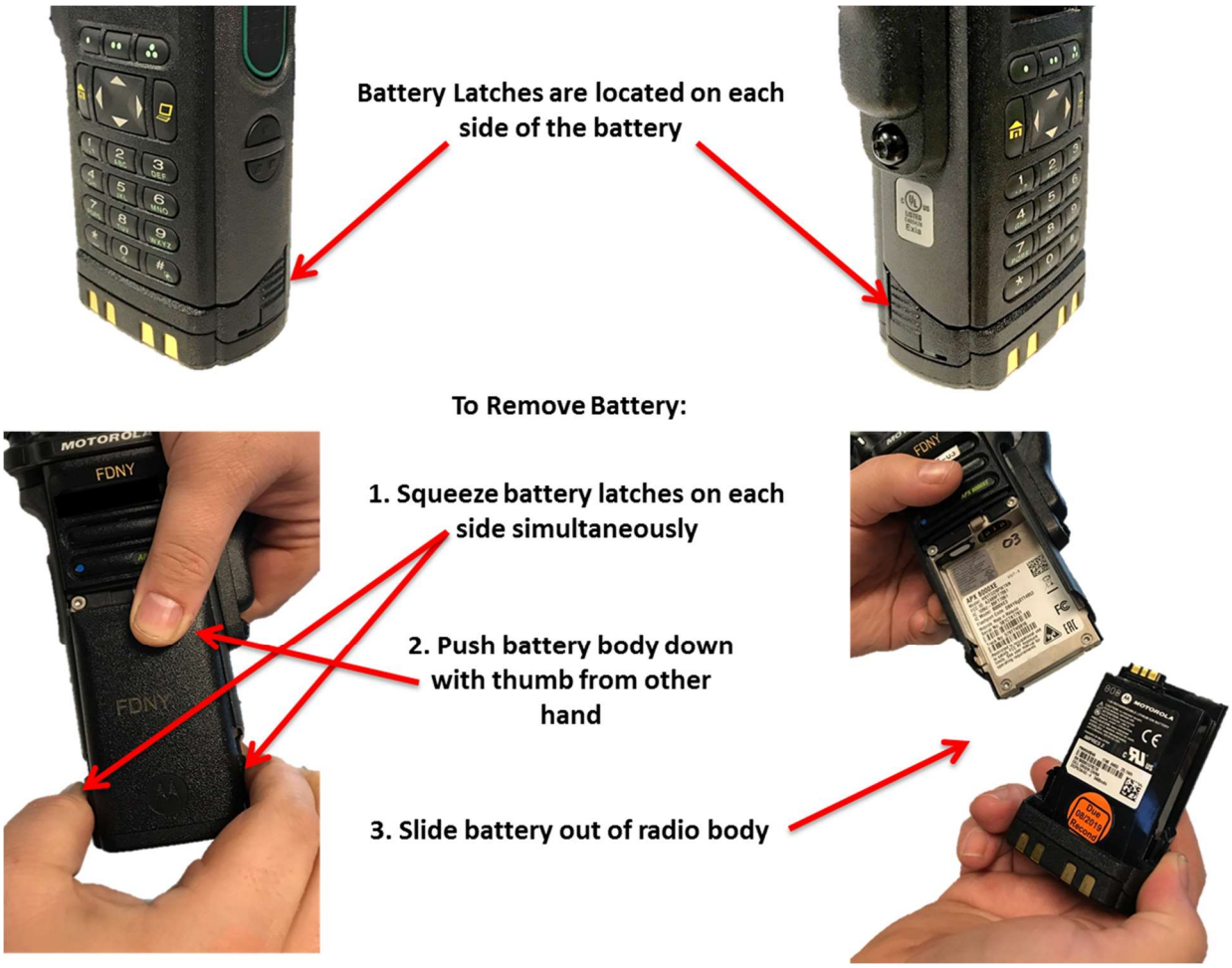
Channel annunciation will occur automatically when radio is turned on, and any time the zone or channel is changed. Member may confirm current channel they are on by depressing channel annunciation button on RSM just beneath the PTT button or the double square side button on the radio.

3.8 Batteries:

The APX 8000XE utilizes a Motorola Impres 2 lithium ion battery.

3.8.1 Removing battery:

Fig 14



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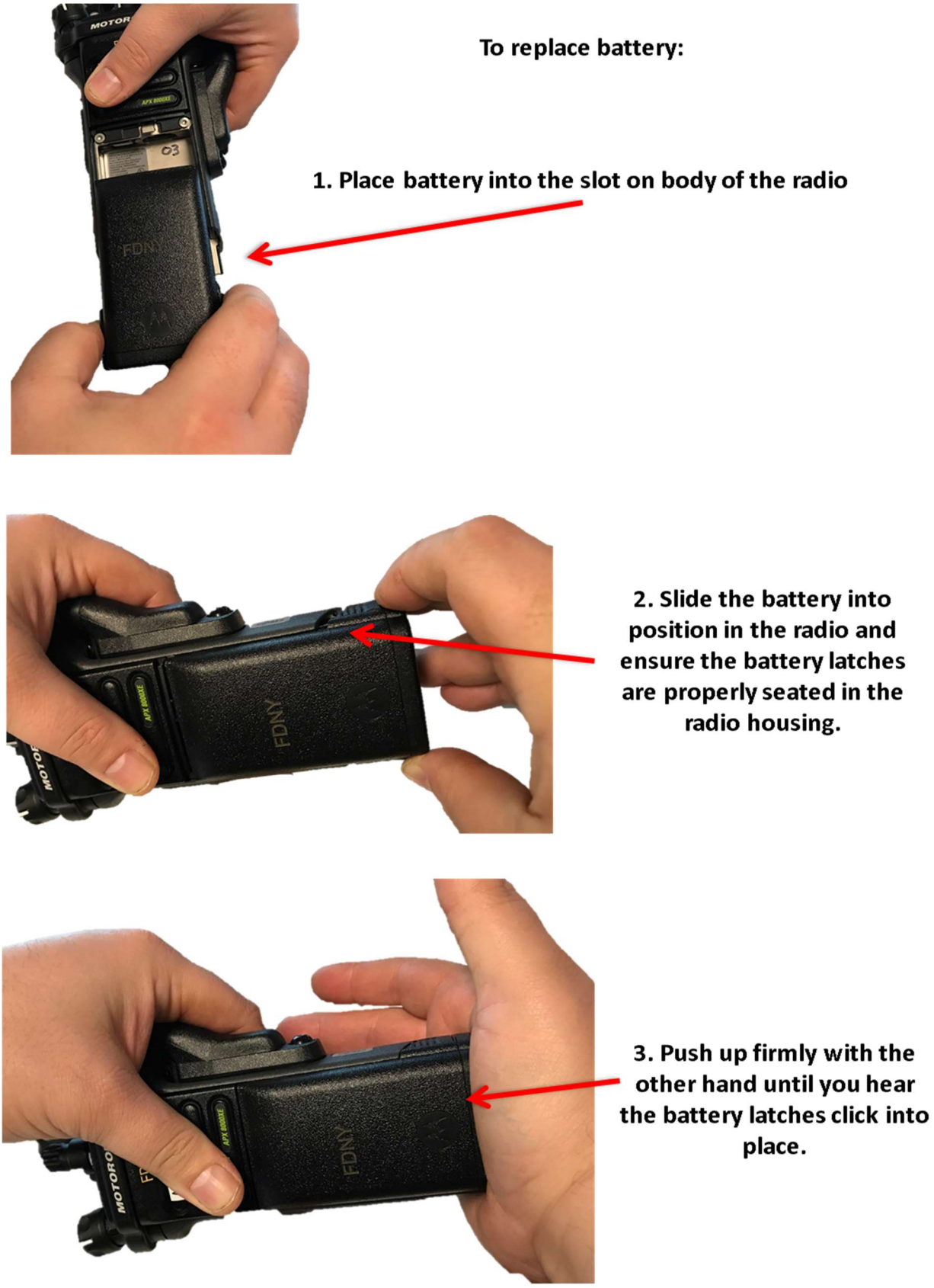
3.8.2 Replacing Battery:

Fig 15



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4. EQUIPMENT DISTRIBUTION AND ASSIGNMENTS

4.1 The following shows the Alphanumeric designation as well as the 7 digit numeric ID for typical Units and Positions. Alphanumeric ID of HT will appear on main/top display and will also be displayed on screen of member receiving transmissions.

Engines	Ladders	Rescues	Squads	Haz-Mat	BC Chiefs	DC Chiefs
ENG 81-OFF (5081001)	LAD 46-OFF (7046001)	RES 3-OFF (1003001)	SQ 288-OFF (8288001)	HM 1-OFF (9001001)	BC 7-Chief (2407001)	DC 1-Chief (2301001)
ENG 81-ECC (5081002)	LAD 46-LCC (7046002)	RES 3-CHAUF (1003002)	SQ 288-Chauf (8288002)	HM 1-CHAUF (9001002)	BC 7-Aide (2407002)	DC 1-Aide (2301002)
ENG 81-NOZ (5081003)	LAD 46-Roof (7046003)	RES 3-ROOF (1003003)	SQ 288-ROOF (8288003)	HM 1-ENT1 (9001003)	BC 7-FAST (2407003)	DC 1-2nd Aide (2301004)
ENG 81-BU (5081004)	LAD 46-OV (7046004)	RES 3-Hook (1003004)	SQ 288-Hook (8288004)	HM 1-ENT2 (9001004)	BC 7-DISPATCH (2407005)	DC 1-DISPATCH (2301005)
ENG 81-CONT (5081005)	LAD 46-FE (7046005)	RES 3-FE (1003005)	SQ 288-FE (8288005)	HM 1-BU1 (9001005)	BC 7-AUX (2407006)	DC 1-AUX (2301006)
ENG 81-DOOR (5081006)	LAD 46-CAN (7046006)	RES 3-CAN (1003006)	SQ 288-CAN (8288006)	HM 1-BU2 (9001006)		
		RES 3-OV (1003007)		HM 1-DCON1 (9001007)		
				HM 1-DCON2 (9001008)		

Note: Additional Unit ID #'s may be found in Addendum 4.

5. MAINTENANCE OF PORTABLE RADIOS

5.1 If the HT becomes wet at an operation, or has been submerged in water, remove the battery, dry HT and battery contacts before re-attaching battery to the HT.

5.2 If the remote speaker mic becomes wet, or submerged, water trapped inside the speaker grille and microphone can be removed by shaking the unit well.

5.3 ***Redacted for PFS*** .

5.4 Members should not remove or replace any accessories associated with the radio, including antenna and remote speaker microphone.

5.5 When HTs are sent for repair, they should be sent complete (radio, antenna, battery, and RSM) with defect and company number recorded on RT-2. Leather goods (cases and straps) should not be sent unless they need repair. (See addendum 4)

5.6 No items (keys, key fobs, etc.) shall be attached directly to the HT, case, antenna or RSM as this may cause interference with radio transmissions. Items may be attached to the HT strap; however, they must be secured in a manner that does not allow movement or contact with the HT, case, antenna or RSM.

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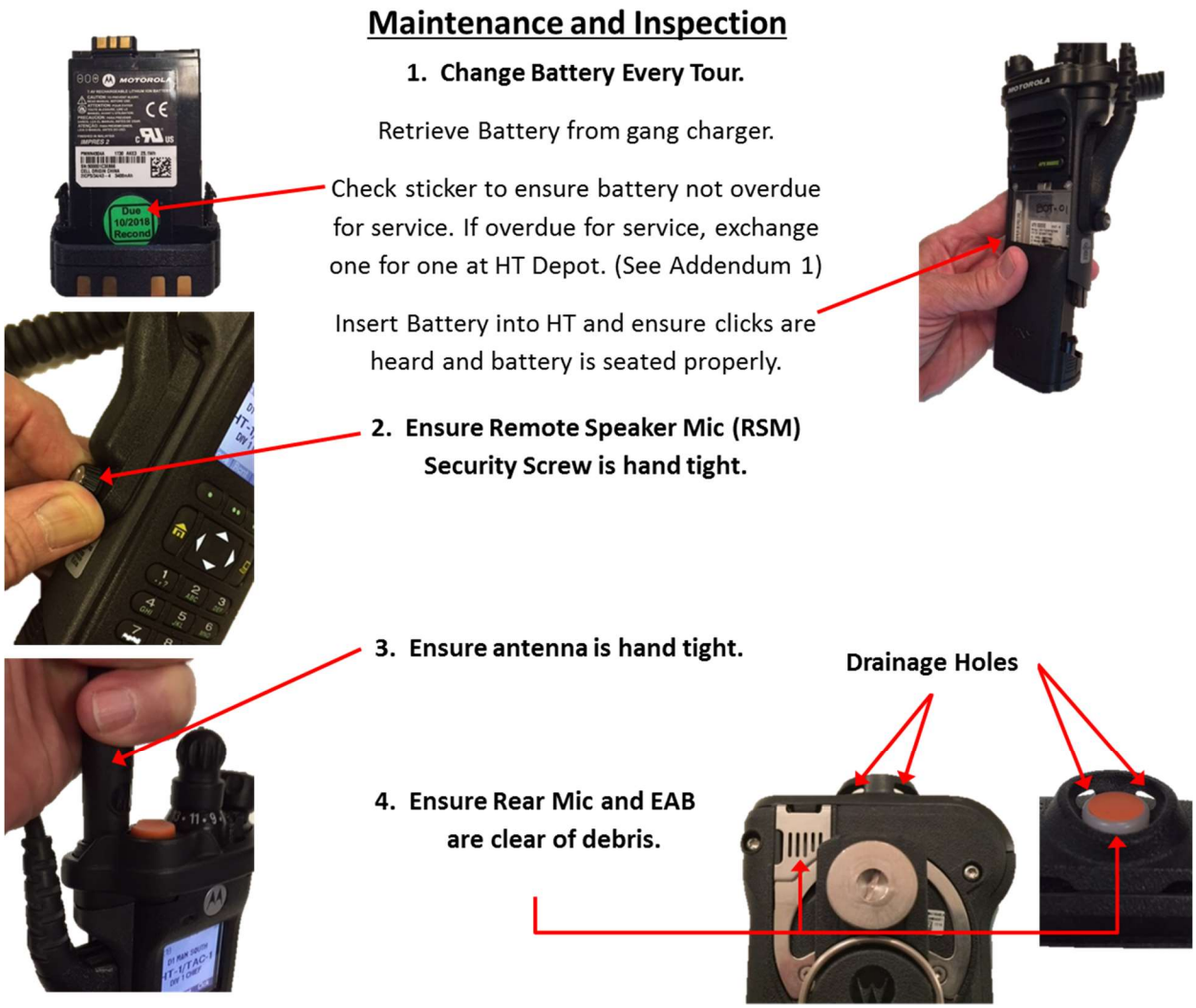
5.7 Decontamination: Adhere to CFR manual Chapter 3.

5.8 Functional Check, Inspection and Maintenance of the HT: including but not limited to radio, antenna, battery, RSM and cord shall be made (see Fig. 16):

- Immediately after the 0900 and 1800 hour roll calls.
- After each use.
- Members shall ensure that slots in radio charger are clear of dirt and debris prior to charging batteries. Wet batteries shall be wiped dry prior to charging.
- No batteries with any physical damage shall be placed in a charger. They shall be placed out of service.

Fig 16



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6. ***Redacted for PFS***

7. RADIO FREQUENCY (RF) CHALLENGES, INTERFERENCE AND DEADSPOTS

7.1 Throughout the city, members will encounter areas that are RF (radio frequency) challenged. These areas include but are not limited to hospitals, prisons, big box stores, shopping malls, high rises, large OMD's, sewage treatment plants, power plants, tunnels and any structure of unique construction. The use of radio relay or alternate communications strategies shall be considered.

7.2 Members are reminded that while operating at routine alarm assignments and BI, if any of these areas are identified as RF challenged, they should be noted in the CIDS for the respective address.

7.3 Communication transmissions and reception can sometimes be improved by moving a few feet or turning one's body.

7.4 Some buildings throughout the city have been equipped with proprietary repeaters and amplifiers for their in-house two way communication needs. The potential exists for these systems to interfere with FD HT communications.

7.5 As with the previous handie-talkie models, unforeseen and isolated incidents of radio frequency peculiarities continue to be experienced which interfere with communications. This occurs due to proximity of radios, radios out of range or poor radio discipline.

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NATURAL GAS EMERGENCIES AND FIRES

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1. PURPOSE

This guide describes gas system infrastructure to aid size-up and operational awareness, and to improve operational efficiency. Most importantly, the guide is intended to help assess the degree of risk present and take appropriate action at gas emergencies. As an operational guide it details how to investigate alarms for gas leaks and make decisions based on current best understanding and practices. While the tactics presented cannot eliminate risk, when adhered to they will help ensure decisions are based upon a rational approach. All members are encouraged to utilize this guide.

2. BACKGROUND

NYC is relying more and more on natural gas for its energy needs. The rate of households converting to gas in NYC is among the greatest in the Nation. Much of the gas system infrastructure in NYC is also some of the oldest in the Country. Construction, whether new, renovation, or maintenance-related, is also occurring at a tremendous rate and can damage gas systems if not properly planned and executed.

As first responders we are called to respond to leaks and fires involving natural gas. Gas leaks, minor and major, are occurring more frequently. Responses that resolve as gas leaks have doubled relative to a ten-year baseline in the last several years. Most gas emergencies are resolved by simple mitigation; rarely does the response involve complex, vital components of the gas delivery system. Some responses, however, involve situations that can put the public and our members at great risk, sometimes without the degree of risk being apparent.

3. PROPERTIES

Natural gas is a hazardous material classified as a "Flammable Gas" and exhibits the following properties:

- Comprised mainly of methane but also contains propane, ethane and nitrogen.
- Natural gas is a hazardous material classified as a Class 2, Division 1 substance. It contains high stored energy and is extremely flammable.
- Depending on the mixture, the explosive range is 5% - 15%.
- Colorless and odorless; however, to aid in detection, mercaptan is added to natural gas as an odorant, giving it a "rotting" smell. Mercaptan can be masked by other odors, stripped by chemicals or removed as natural gas passes through material such as soil. In addition, members operating in a gas environment can become desensitized to the smell, giving the false impression that the natural gas condition is no longer present.
- Significantly lighter than air.
- Non-toxic, but in sufficient quantity natural gas can displace oxygen in an enclosed space and cause asphyxiation.

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- When natural gas ignites, it undergoes a rapid increase in volume. If confined, the pressure, due to the volume change, will create an explosive force. A greater amount of gas indicates greater destructive potential. Two cubic feet of natural gas has the approximate energy potential of 1 pound of TNT.
- When unconfined (outdoors), natural gas will burn rapidly, without triggering explosive pressure.

4. GAS SYSTEM INFRASTRUCTURE

NYC uses over two billion cubic feet of natural gas every day, supplying two-thirds of our total energy needs. Natural gas is supplied to NYC by three interstate pipelines and several interconnections under the management of several distributers.

- Con Edison Gas distributes natural gas to Manhattan, the Bronx, and in Queens, generally north of the Grand Central Parkway.
- National Grid distributes gas to Brooklyn, Staten Island and in Queens, generally south of the Grand Central Parkway.

There are facilities in NYC used to store liquefied natural gas (LNG) by these Utility Companies for use during peak demand or when there are interruptions in supply.

4.1 GATE STATIONS

All of these facilities have moderate security protecting complex equipment (filters, heaters, regulators, meters, valves and relief vents) needed to regulate supply of natural gas to the City. The facilities have remote monitoring by the Utility Company's Gas Control Centers but generally have no permanent on-site personnel. Any event in these facilities should be considered an industrial facility emergency and actions should be limited to life saving and protecting exposures until the Utility Company has been consulted. CIDS and Pre-Incident Guidelines (PG) should be used appropriately to pre-plan for major events.

Hellgate Gate Station,
Bronx, Dec. 1989,
5th Alarm,
Transmission Main Fire

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4.2-4.3 ***Redacted for PFS***

4.4 GAS SERVICE & CURB VALVES/SERVICE VALVES

Gas service is the piping supplying individual buildings. Gas service pipe generally runs at right angles off of the Distribution Main, into the building. There is usually a curb valve/service valve (below grade) or an exterior gas service valve (above grade) between the Distribution Main and the building.

Curb valves/service valves are usually found on the sidewalk side of the curb and these valves shut the gas supply to the entire building. They are usually recessed in from the curb and are covered with a 4" X 4" square or round, brittle concrete or steel cover which may be sitting on top of a plastic or wooden plate.

Curb Valve/Service Valve Cover

Curb Valve/Service Valve

On the National Grid "Long Service" system, the curb valve/service valve is sometimes located across the street from the building it supplies, and may be found in the street. This type of curb valve/service valve can be identified by an arrow cast into the cover pointing to the building it supplies.

Some gas service piping supplies gas to the building without having a curb valve or service valve. A "NC" stamped on a tag near the service meter indicates there is no curb valve or service valve. An "EFV" stamped on a tag near the service meter indicates an "excess flow valve" exists in line on the service pipe. The EFV should limit or stop excess flow down pressure from it.

Care must be taken to differentiate between curb valves/service valves and main valves. The ramifications of closing, or damaging, a main valve are far greater than closing or damaging a curb valve/service valve which controls service to only one building.

National Grid Long Service Curb Valve/Service Valve Cover

4.4.1 HEAD OF SERVICE VALVES

Head of Service Valves are typically the first valve after the curb valve, they are always before the meter and are generally located either on the interior or exterior of the building near the Point of Entry (P.O.E.). The Point of Entry is the location on an exterior wall or building foundation where the gas service enters the building. Head of Service Valves control the gas supply from the street to the building meter(s).

Service Regulator

Head of Service Valves

Point of Entry

Head of Service Valve located on the exterior of the building will be found on the exterior riser before the meter.

Head of Service Valve located on the interior of the building in m be found at the Point of Entry.

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4.4.2 REGULATORS & PECK VENTS

Natural Gas Service

- Typical house appliance pressure is ¼ psi.
- A few commercial customers receive gas at 1 to 3 psi.
- There are a small number of large facilities that utilize full line pressure, especially for power generation.

Service Regulators are usually located before the gas meter on medium and high pressure systems to reduce gas to low pressure (¼ psi).

Peck Vents are installed on systems supplied by medium or high pressure to vent excess gas to the exterior if the service regulator fails. They may have a red cap. There should normally be no odor of natural gas at a peck vent. If an odor is detected, you must investigate to determine the source.

Multiple Peck Vents on a Building with Multiple Service Regulators

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4.4.3 METERS

Gas Meters can supply individual occupancies or entire buildings. Before the meter there should be a ¼ turn meter valve that controls the supply of natural gas to the meter.

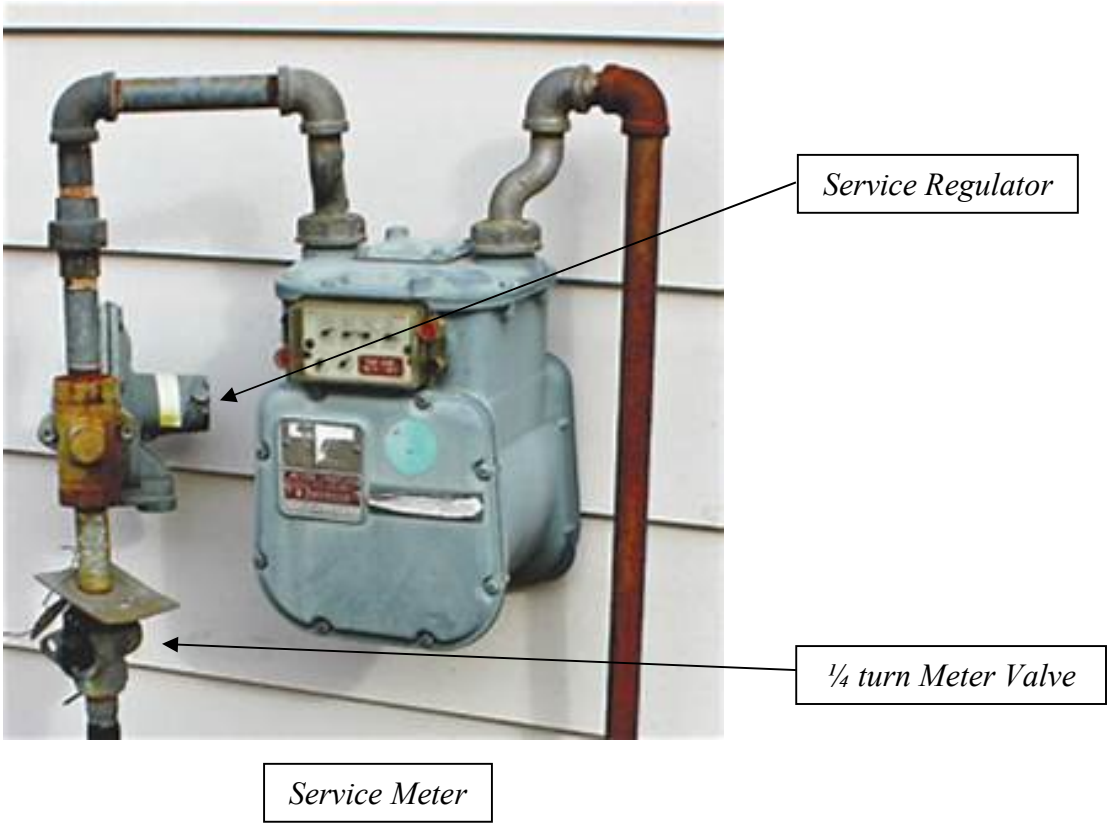
Single Master Meter

- Some multi-occupancy buildings have only a single master meter supplying natural gas to all occupancies. Shutting it down will shut gas to the entire building. Sometimes the Utility Company will have two master meters adjacent to one another so a master meter can be serviced or replaced without interrupting service to the building. The valves to both meters would need to be closed to shut supply to the building.

Multiple Meters

- Other buildings have multiple meters, each supplying natural gas to a different occupancy or tenant.

  Note: Some older apartment buildings may have individual gas meters located inside of each apartment served, and in some buildings, meters may be found in the public hallway. The presence of gas piping or meters in a public hallway requires appropriate enforcement action (**refer to the BISP Manual**).



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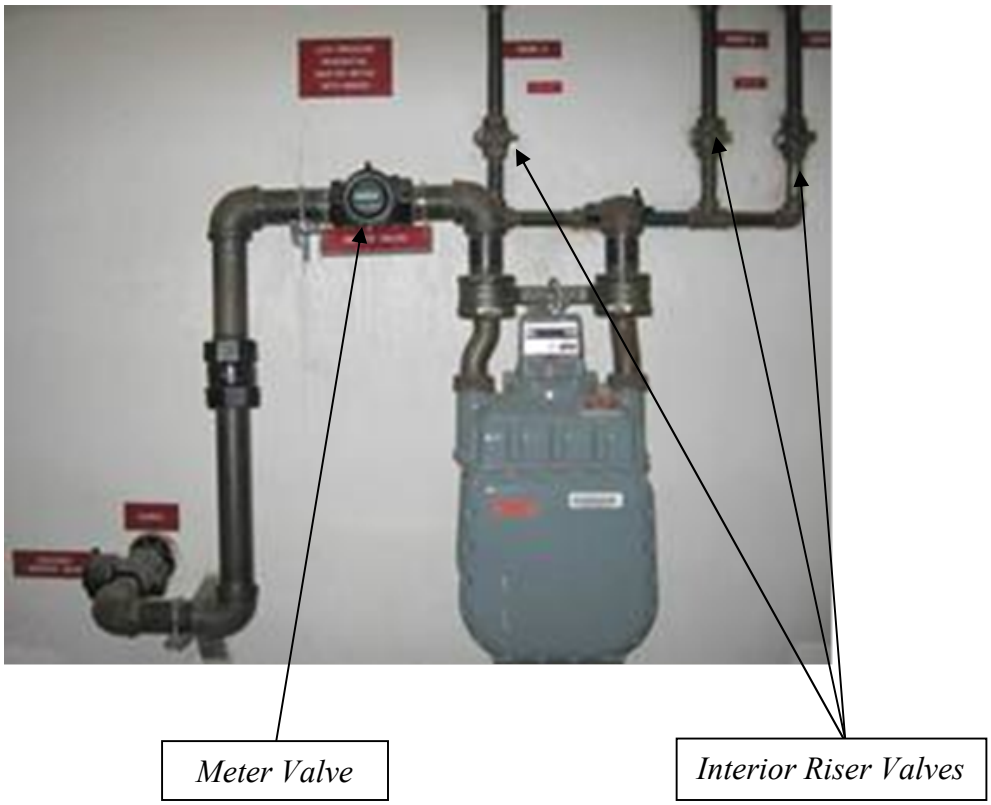
4.4.4 INTERIOR RISER VALVES

Often there are interior gas riser valves coming off of the master meter, typically near the ceiling of the cellar. These can be used to isolate a section of the building instead of shutting service to the entire building.



4.4.5 APPLIANCES & APPLIANCE VALVES

All natural gas appliances should have ¼ turn valves between them and the building/tenant natural gas supply pipe. The pipe connecting the appliance to the supply pipe may be rigid or flexible.

Commonly found natural gas appliances include:

Stoves/Ovens	Hot Water Heaters
Barbecues	Window/Wall-Mounted Gas Heaters
Refrigeration	Fireplaces
Dryers	Outside Decorative Lighting

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Furnaces and Boilers: Many large heating plants use a significant amount of natural gas. These systems may require assistance from building engineers and Utility Company personnel to mitigate emergencies.

Air Conditioners: Large, commercial units are often located on rooftops or setbacks. Some HVAC units are combination units, housing heating units using natural gas and conventional cooling units. Some large units may have chillers using natural gas as part of the condensation-evaporation cycle. Other, less common, units use natural gas in the heat exchange process. A failure in any part of these large, commercial air conditioning units can allow natural gas to leak and spread throughout the entire HVAC system.

Lighting: In the past, natural gas was used for illumination inside of certain buildings. These old gas lines were sealed with wax and, over time, this wax can deteriorate resulting in a gas leak. These types of leaks may be difficult to locate.

Old gas line for lighting run along the ceiling

Direct Vent Appliances: Direct vent boilers and hot water heaters have become prevalent throughout the city. They may be located anywhere within a structure and are vented by a short length of pipe through an exterior wall. Direct vent window and through-the-wall heaters may also be used to heat individual occupancies.

Direct Vent Through-the-Wall Heater

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5. STRATEGY

Most natural gas emergencies are resolved through investigation and simple mitigation. On occasion, a response can elevate to a **Major Gas Emergency,** at which point FDNY strategy should focus on securing life safety (evacuation).

The following conditions are indicative of a **Major Gas Emergency** and may require changing from a simple mitigation strategy to one that emphasizes all efforts on securing life safety (including utility personnel and first responders).

- **Serious damage to major components of the gas infrastructure (i.e., a Master Meter servicing many appliances, gas service pipe, Main Valves, Distribution Mains, etc.)**
- **10% LEL or greater detected outside or inside (see section 6.4 for best practices on metering tactics).**
- **Elevated natural gas reading (20% LEL or greater) in an unvented, subsurface structure (manhole, sewer, etc.)**
- **Gas present in two or more subsurface structures (manhole, sewer, etc.)**
- **Indications of gas migrating into a building from an outside source**
- **Gas leaking inside of a structure and the controlling valve cannot be located or is inoperable**
- **Gas leaking or present inside of a wall or void in a structure**

Atmospheric Monitoring:

Since natural gas readings will generally be more concentrated closer to the source/leak, members need to be aware of the location they are taking readings. When reporting results, members must also report the exact location and should state if they are in proximity to any natural gas appliance.

For example:

"Ladder 38 to Command, we have a reading of 7% LEL in the lobby."

"Ladder 4 to Command, I am in the cellar by the crack in the foundation and have 15% LEL."

Generally, the presence of natural gas in the lobby of a building would be more of a cause for concern than the same reading in the kitchen, at a stove with a defective natural gas connection. The further from the source/leak that natural gas has travelled, the more dangerous the situation.

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6. TACTICS

6.1- 6.2 ***Redacted for PFS***

6.3 ON-SCENE SIZE-UP

Structure: Upon arrival size-up the building, occupancy type and overall condition. The age and condition of the building may help indicate the condition of natural gas equipment inside. Vacant or untenanted buildings require a closer evaluation as slow leaks often go unnoticed over long periods of time. Buildings under construction or renovation require special attention as well, as damaged or faulty natural gas systems are often found in these structures.

Street: Be cognizant of signs of recent street work or on-going work (street excavation, plumbing truck in front of a building, etc.)

Note: Vent holes, otherwise known as prospecting "bar" holes, are a series of roughly 1" holes in the pavement and indicate recent Gas Utility Company work.

Serious gas leaks generally originate in the following ways:

- Excavation work: Pipes can be damaged from direct contact and/or tension on the pipe as a result of work. Failure can be some distance away from the excavation, (i.e., in a serviced building). This can occur some time after the excavation has been filled in.
- Mechanical failure (AKA human error): Mechanical failure resulting from work done by a local plumber.
- Subsurface leak: Pipe failure can be caused by undermining, corrosion **or arcing from adjacent electric feeder cables**. Many serious leaks originate from below grade and migrate into buildings along conduit and sewer lines.
- Undetected small leak: Leaks may go unnoticed in confined areas (plenum space, crawl space, etc.) or in vacant or untenanted buildings/building sections.

6.4 PERSONAL PROTECTIVE EQUIPMENT, GAS DETECTORS & METERS

The Department has provided all Ladder Companies with two types of natural gas investigative tools. One is a Natural Gas Detector (see Addendum 5); the other is a Natural Gas Meter (see Addendum 2). These two tools complement each other and both shall be utilized when investigating suspected natural gas leaks. Monitor continuously from the start. Natural gas detectors and meters require "warm-up" times in fresh air; it is good practice to power on these devices before arrival on scene.

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The Natural Gas Detector is used to determine the location of a natural gas leak. This device does not have an LCD nor can it quantify gas levels. It uses an audible tick that increases in frequency as it approaches the source of escaping gas. The Natural Gas Detector detects natural gas at low levels. For this reason, it is the superior tool for locating leaks in appliances (stoves), supply piping (joints) and points of entry into a building (cracks). In a hallway with multiple locked doors, it is an excellent tool for identifying which apartment is involved. Simply pass the detector's probe around a doorframe's upper area while listening for an increase in the detector's audile tick.

The Natural Gas Meter is used to determine the amount of gas present in an area. It visually displays the level of gas on an LCD in % LEL. The Natural Gas Meter is a superior tool for identifying areas in which it is no longer safe to operate. Tactically, this device should not be used at an appliance, pipe or crack as high levels of gas are expected at these locations. The best practice is to measure readings at a location high and in the middle of the room of the suspected leak; this is the % LEL to be reported to the IC.

Members shall wear their personal protective equipment (PPE). Even small amounts of natural gas can cause serious injuries to unprotected members from flash fires. Chief and Company Officers shall ensure strict compliance with the policy outlined in ***AUC 220 Self Contained Breathing Apparatus*** as it pertains to operating in an IDLH atmosphere.

6.5 ***Redacted for PFS***

6.6 DETECTION

The main mission is to ensure there is not a major leak. Secondary is mitigating minor leaks, which still have the potential for harm (mostly flash burns to nearby persons) or, if not stopped, can build up to become major leaks. A systematic approach is needed to avoid missing conditions that are unusual, complex or hidden.

Some responses are initiated from callers with knowledge of natural gas delivery/use systems and who know where the leak is, but are unable to stop it. Detection here involves making sure this is the leak and that there are no other leaks as well. Check all nearby natural gas appliances and piping. Use detectors and meters to confirm findings.

Most responses initiate from someone smelling mercaptan, the odorant added to natural gas just for that purpose. Some difficulties in investigating are:

- Members may become desensitized to the odorant over time and may no longer smell it, even if natural gas is still present. Other odors may mask the mercaptan. Migration through soil may lessen the mercaptan's effectiveness as an odorant. Use the Natural Gas Detector to lead you closer to the source of the odor. Call in other members to help search if becoming desensitized.

- Gas is invisible; use the detector to lead you closer to the source of the odor.

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Gas odors present in HVAC systems; examine rooftop and setback HVAC equipment for gas leaks, even if remote from the area. Shut down HVAC fans and wait to see if the odor dissipates; this may indicate a leak at HVAC equipment or near the air intake for the HVAC system.

6.7 MITIGATION

6.7.1 VENT

- Vent the immediate area and continue to monitor natural gas levels using the meter and detector.

6.7.2 ELIMINATE IGNITION SOURCES

- Remove ignition sources near the leak utilizing a remote shut off. Removing power will cause a spark at the switch, which should only be done outside of the area that is within the explosive range.

6.7.3 ISOLATE/CONTROL LEAK

- Once a leak is found control the leak by shutting the closest valve that controls supply to the leak. If a leak cannot be controlled by operating the appropriate valve consider:
  - A leak or break in **low pressure** gas piping may be stopped or greatly diminished by taping, or stuffing putty, rags, paper, etc., into the break. This tactic will not work on medium or high pressure piping before the service regulator.

    Note: Leaking plastic pipe (permissible by code for outside use) should not be touched or approached. Natural gas flowing out of a broken plastic pipe generates static electricity which builds up on the inside and outside surface of the pipe. Coming near to, or touching, a leaking plastic gas pipe could result in a spark that ignites the escaping gas. The Gas Utility Company has equipment to dissipate this static electricity.

Caution: Although easily folded, firefighters should not approach or attempt to fold a leaking plastic gas pipe

Priority Order of Valve Closure

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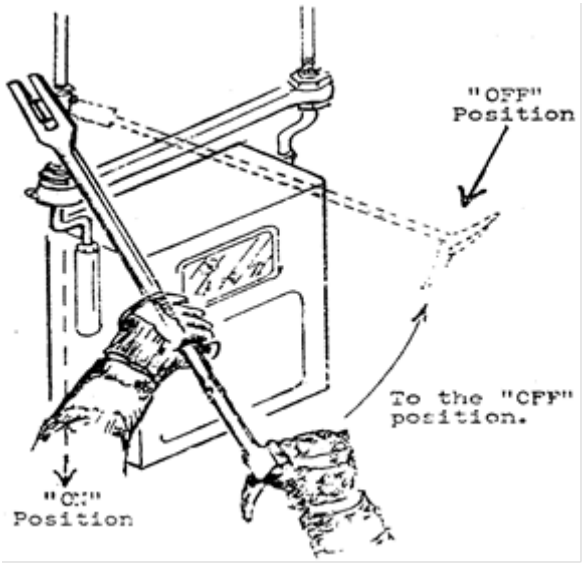
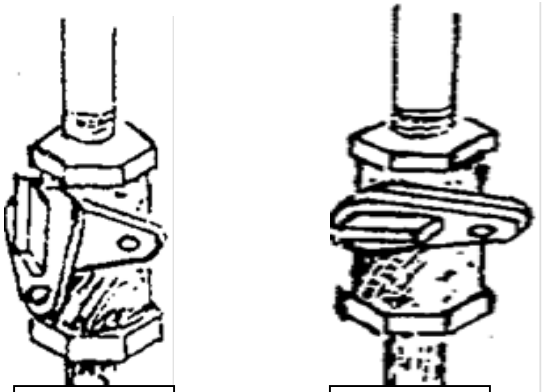
1. Appliance Valve

- Usually located behind or alongside the natural gas appliance and connected by hard piping or flexible metal tubing. The appliance may have to be moved to access it. Be careful not to damage plumbing on appliances connected with rigid pipe.
- Most natural gas shutoffs are of the ¼ turn variety and can easily be shut off using the fork end of a Halligan tool, vice grips or pliers to turn the wing cock valve ¼ turn counter-clockwise.
    - Exercise caution when using the Halligan tool to shut the valve as too much force could result in a new gas leak at the valve location.



    - When the key operating nut is parallel to the piping, it is in the open position. When it is perpendicular to the piping, it is in the closed position.



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2. Interior Gas Riser Valve

- If the appliance valve is defective or the leak is on the supply side of the appliance valve, check for the presence of an Interior Gas Riser Valve in the basement/cellar near the ceiling. This is a ¼ turn valve similar to the appliance valve and will disrupt less service than closing a Master Meter Valve would.

3. Individual Meter Valve

- Each occupancy may have its own meter and natural gas supply can be controlled using the ¼ turn valve at this meter. This will shut the gas supply to the affected occupancy.

4. Master Meter Valve

- A Master Meter Valve may control the flow of natural gas to just a few appliances (i.e., in a private dwelling), or to many appliances (i.e., in an apartment house). When possible, avoid shutting the Master Meter Valve if it supplies many occupancies/appliances. To restore service to a large building or complex, the Utility Company must access each affected apartment to pressure test the piping and relight all pilot lights. (This may take several weeks in larger buildings and is expensive for the Utility Company, as well inconvenient for the occupants).
- When possible, prior to shutting a Master Meter Valve notify the Utility Company and inquire as to possible alternatives (i.e., plugging/taping the leak, venting pending arrival of the Utility Company, etc.).

  Note: This does not preclude a unit from shutting a Master Meter Valve if natural gas levels are still rising despite other methods (i.e., venting, plugging/taping) and the Master Meter Valve is the closest valve controlling gas supply to the leak.
- A Master Meter may have a second Master Meter adjacent to it. This second meter is used in the event of a malfunction in the primary Master Meter in use. The Utility Company can switch service over to the second meter without disrupting service to the building. Consult with the Utility Company to correctly bypass an impaired meter without disrupting service, or for advice on shutting both Master Meter Valves, when necessary.

5. Head of Service Valve

- The Head of Service Valve can be found in either of two places. It is usually a ¼ turn valve and controls the supply of gas from the street to the building meter(s). Regardless if it is located on the interior or the exterior of the building, it will always be located before the building meter(s).
- If the Head of Service Valve is located on the interior, in most cases it will be found just inside of the building where the natural gas service enters (the point of entry/P.O.E.).
- If it is located on the exterior of the building, it will be found on an exterior gas riser near the location that the gas service enters the building (the point of entry/P.O.E.).
- Head of Service valves control all of the gas supplied from that gas service to the building. Shutting the Head of Service will shut gas to all of the meters supplied by that gas service.

6. Curb Valve/Service Valve

- Although the FDNY is authorized to shut curb valves/service valves, it should only be done as a **last resort** and in consultation with the Utility Company. Many valves are old and require skill to shut to avoid breaking the valve. Newer, plastic valves can also be easily broken if too much force is used. In addition, it is possible to turn the valve past the "shut" position, causing confusion as to whether or not the valve is closed. If the curb valve/service valve on a low pressure system becomes inoperative, mitigation of the leak will involve a Utility Company construction crew ripping up the street to isolate/repair the leak. If the curb valve/service valve of a medium or high pressure distribution system becomes inoperative, mitigation of the leak will involve shutting the Main Valve, possibly disrupting a large area which may include critical facilities (i.e., hospitals, nursing care facilities, etc.). **Contact the appropriate Utility Company Control Center when necessary to control a leak using the curb valve/service valve.**
- The curb valve/service valve is usually found on the sidewalk side of the curb and shuts the natural gas supply to the entire building. It is generally recessed in from the curb, but may be in the street. It is usually covered with a 4" X 4" square or round, brittle concrete or steel cover which may be sitting on top of a plastic or wooden plate. To shut the valve, remove or break the cover and plate.

  Note: The curb valve/service valve may have been covered with concrete or grass and not be visible.
- Gas Shut-Off Key – The gas shut-off key consists of a long shaft with a uniquely shaped wrench socket on either end that is placed onto the curb valve's/service valve's operating nut. Look into the valve box. Before using the key, determine which end is suitable for the valve that is being shut down. Attach the proper end of the gas key onto the valve. Before turning the key, place chalk or some other mark near the valve to indicate the start point. This will assist in noting when a ¼ turn is complete.
- A white valve is plastic and easily broken by excess force. National Grid supplies a white, plastic insert for shutting down plastic valves. For Con Edison plastic curb valves/service valves, use the gas key as is.

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Firefighters close a curb valve/service valve using a gas shutoff key and a Halligan tool for leverage.

- It may be difficult to discern between a curb valve/service valve and a Main Valve. FDNY is **not** permitted to shut a Main Valve. If a Main Valve fails, shutting the next valve up in the system may cause a major disruption in natural gas supply to an entire neighborhood and multiple, critical occupancies. In addition, shutting the Main Valve may not stop the leak as multiple Main Valves may need to be shut if the system is supplied from more than one direction.
  - **Con Edison Main Valves should have a tag inside of the valve housing with an I.D. number, indicating these are NOT curb valves/service valves.**
  - **National Grid Main Valves can be identified by an ID number stamped on the North side of the collar underneath the cover, indicating these are NOT curb valves/service valves.**
- **If a leak is serious enough to consider shutting down a Master Meter Valve, Head of Service Valve or curb valve/service valve, consider treating the incident as a Major Gas Emergency.**

7. Main Valve

- Main Valves are usually located on the street side of the curb and are used to isolate large sections of the natural gas main. They can look like curb valves/service valves but control distribution lines usually running under the street (these lines can also be found under sidewalks and unpaved areas).

  Note: FDNY is **not** permitted to shut a Main Valve.

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- The cover may be round or square and come in a variety of sizes (typically 9" or larger).
  - Con Edison Main Valves should have a tag inside of the valve housing with an ID number.
  - National Grid Main Valves can be identified by an ID number stamped on the North side of the collar, underneath the cover; however, these numbers may be difficult to see.
- Shutting a single Main Valve may not stop the flow of gas as distribution piping can be fed from more than one direction. The Utility Company will refer to maps to determine which valves to shut. It may be necessary to shut several Main Valves, some possibly remote from the building or area with the natural gas emergency, in order to isolate a section of piping.
- Shutting a Main Valve may disrupt natural gas service to a large area and/or critical locations. Gas service may not be restored to the area for several weeks.
- Main Valves are usually not present on low pressure gas systems. Stopping the flow of gas in a low pressure main will require the street mains to be excavated and stoppers installed, which may take several hours.

6.7.4 CONFIRM LEAK HAS STOPPED

- A distinct and continuous drop in natural gas levels must be present.
  - A spray bottle of soapy water can be used to test suspected leaking plumbing and confirm valve closure has stopped the leak.
  - A gas detector/meter may slow or stop, indicating the leak has slowed or stopped.

6.7.5-6.7.6 ***Redacted for PFS***

7. *Redacted for PFS*

8. MAJOR GAS EMERGENCY STRATEGY

1-2. *Redacted for PFS*

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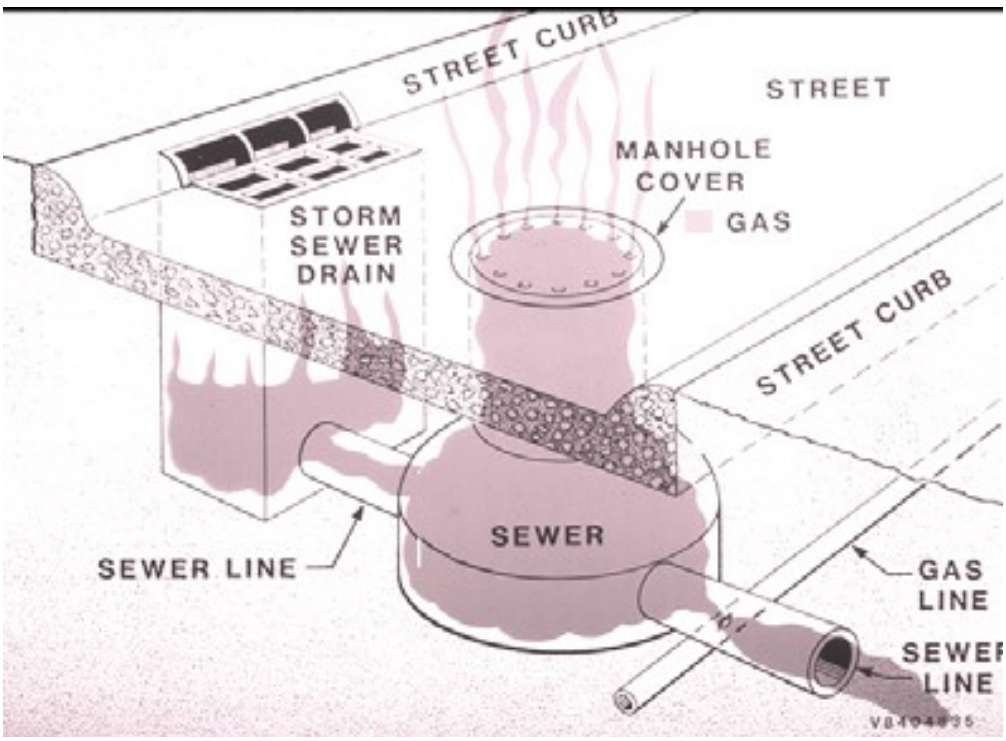
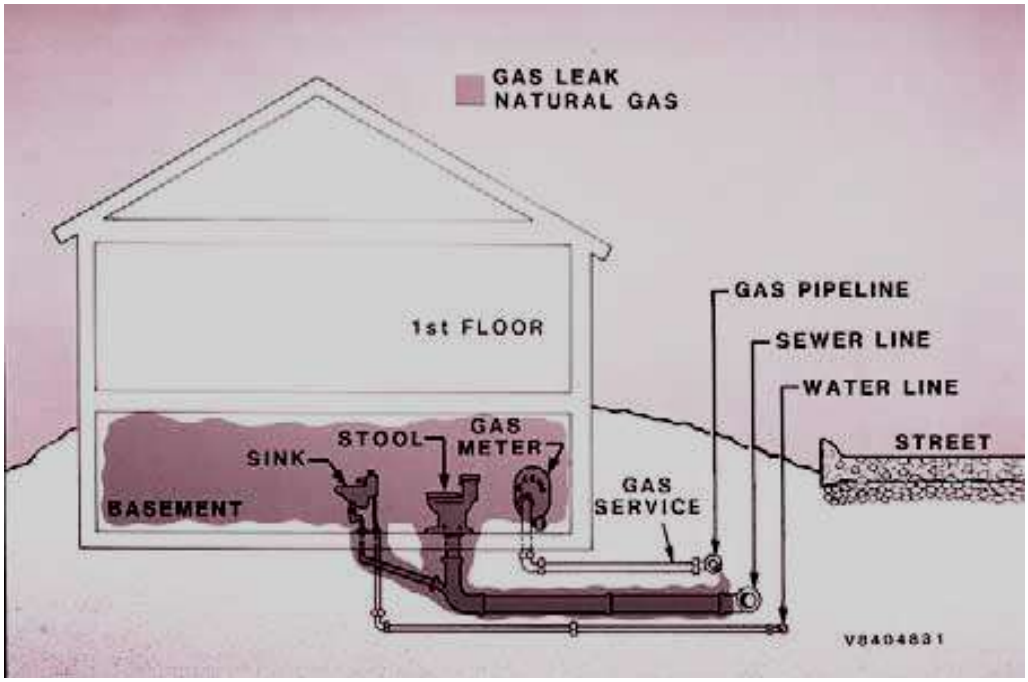


Pathways of gas leak from subsurface pipe into subsurface structures



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3. Inside Leak

If the Natural Gas Meter displays any readings at the building entrance/first floor, the Ladder Company Inside Team should go directly to the basement/cellar to investigate. Do not delay by going to a caller on an upper floor.

- **Leak found**
  - If the leak is found and can be controlled by a valve or, on low pressure service (or medium/high pressure service **after** the service regulator) by tapping/plugging, then do so.
  - If the leak is found and levels can be kept at less than 80% LEL by venting, you may continue to operate.
  - If levels can be kept at less than 80% LEL, remove ignition sources (shut breakers, pull fuses, shut off gas appliances, etc.) **ONLY IF this can be done from an area not within the explosive range.**
  - **If at any time gas levels reach 80% of the LEL or higher, treat the affected area as a "Potential Blast Zone."**
  - If the leak has allowed natural gas to flow into a wall or ceiling space, there may be a considerable amount of gas in that space. General atmosphere readings will not accurately reflect the amount of natural gas present in the concealed space. Consider how much gas has leaked and the likelihood of stopping the leak and venting the concealed space. **If it is suspected that natural gas has been leaking for a considerable amount of time and is likely trapped in a void space, treat the affected area as a "Potential Blast Zone."**

    Note: Utility Companies and FDNY Haz-Mat Company 1, Haz-Mat Technician Units (Engines 44, 165, 250, 274 and all Squad Companies) and SOC Support Ladder Companies are equipped with detectors designed for detecting natural gas in voids.

- **Leak not found**
  - If the leak is not found, investigate the structure's natural gas meters; if one is showing high gas flow, shut it using the Meter Valve, Head of Service Valve or curb valve/service valve. When possible, always shut the valve closest to the leak.
  - **Treat the affected area as a "Potential Blast Zone" if levels cannot be limited to less than 10% LEL by venting and:**
    - **The leak cannot be found.**
    - **There are indications the leak is coming from an outside, subsurface source**

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9. MAJOR GAS EMERGENCY TACTICS

To estimate an incident's explosive potential, consider how extensive the area is, as well as natural gas level readings and potential ignition sources present. Initial tactics should focus on determining how much gas has accumulated in a particular area. This will contribute to the "explosion profile" of the incident and will help determine the extent of the potential blast zone and evacuation required. The size of the potential blast zone shall include the area likely to be affected by structural collapse. This zone will be determined by the Incident Commander and identified by red, "DANGER DO NOT ENTER" tape.

- Apparatus should not be located within the potential blast zone; however, do not enter a potential blast zone to move apparatus.
- The number of members and time spent operating in the potential blast zone should be kept to a minimum and allow for rapid evacuation.
- The potential blast zone will include streets, yards or alleys on all sides of the involved building. Exposures may be included in the potential blast zone if likely to be affected by an explosion.
- Other agencies should be prevented from entering the potential blast zone unless they are involved in direct, life-saving procedures; this includes Utility Company personnel.
- Extreme care shall be exercised before re-entering a building that was in the potential blast zone. Natural gas levels in surrounding areas should be absent or low as the potential blast zone is redefined based upon all information gathered before allowing any members, including Utility Company personnel, back in.

At Major Gas Emergencies, the potential blast zone shall be considered an exclusion zone for all personnel and shall only be entered for direct, life-saving purposes.

9.1 OPERATIONS INSIDE OF THE POTENTIAL BLAST ZONE

Many tactics may be used at **Major Gas Emergencies** outside of the potential blast zone. Tactics used inside of the potential blast zone, however, should be limited. These tactics have as their objective:

- The quick evacuation of likely occupants.
- Minimum exposure of members.
- Minimum time spent in the potential blast zone to obtain the first objective.

Tactics inside of the potential blast zone should be limited to rapid evacuation as detailed below. Removing ignition sources and venting are not options within the potential blast zone. No amount of reconnaissance, venting or power removal is worth a first responder's life. Other than rapid evacuation no other actions inside of the potential blast zone should be warranted. All members should strive to GET OUT of the potential blast zone.

9.1.1-9.1.2 *Redacted for PFS*

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9.1.3 RAPID EVACUATION

- Rapid evacuation will allow members to locate and rescue civilians from an explosive environment, while limiting their exposure to potential extreme hazards. This is significantly different from primary searches conducted at fires and is accomplished with as few members in the potential blast zone as possible to cover the greatest area, and exit the potential blast zone in the shortest time possible. Evacuation should be via an available stairway; elevators should not be used.
- Rapid Evacuation is conducted by knocking on doors and moving from door to door to alert occupants. The intent is to alert occupants to self-evacuate. Assistance can be provided to people with special needs or those requiring assistance. If no one answers the door to an area or apartment, members should move on to the next door. Forcible entry should only be accomplished for a known life hazard and should not be attempted to access areas that show no signs of being occupied.
    - When forcible entry is required in an explosive environment it should be accomplished using equipment and techniques that will limit the chance of causing a spark.
    - Conventional forcible entry involving the use of an axe to strike the Halligan is not permitted. Entry should be conducted with the use of the adz end of the Halligan to gap and force the door and/or with the use of the hydraulic forcible entry tool (Hydra-Ram).
- Occupants should be notified there is potential for a natural gas explosion and they are not to turn on lights or use cell phones or any other electronic devices and must evacuate immediately by orders of the Fire Department.
- In structures with elevators, occupants should be instructed to use the stairs and not the elevators unless the situation makes it impractical (e.g., gas leak on an upper floor of a high-rise residential building where FDNY members utilize elevators to evacuate civilians). Elevators in the potential blast zone are **NOT** to be used by civilian or FDNY personnel. Elevators create electric arcs whenever they are activated by the call button or signaled to move.
- The IC should consider the evacuation of all buildings in proximity to the incident location when necessary. If these building are not located in the potential blast zone, operations such as routine forcible entry, searches, venting and power removal can be conducted as necessary. In addition to buildings, streets, sidewalks, public spaces, transit facilities, etc., may need to be evacuated as a precaution and to clear areas for Utility Company construction crews. It is recommended that members quickly meter sewers, manholes and cellars as they retreat from the original operating area after evacuating occupants.
- Use plain-speak in preliminary and progress reports concerning the extent of the evacuation required and the need for assistance from NYPD, NYCTA, MTA, etc. NYCEM may be contacted directly to initiate/coordinate additional non-Fire Department resources.

9.2 *Redacted for PFS*

10-11. *Redacted for PFS*

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EMERGENCY PROCEDURES
NATURAL GAS
ADDENDUM 2
December 11, 2014

MSA ALTAIR DIGITAL GAS METER

1. INTRODUCTION

1.1 The MSA Altair Digital Gas Meter has been issued to all Engine and Ladder Companies to increase their operational effectiveness in dealing with incidents involving natural gas. The meter does not replace existing SENSIT TKX Detectors, but must be used in conjunction with the SENSIT TKX Detector as each instrument possesses its own unique capabilities.

1.2 The MSA Altair Digital Gas Meter is equipped with two sensors, one for combustible gas and the other for oxygen. The meter is calibrated to methane, the major component of natural gas. Although the meter is capable of detecting other combustible gases, the displayed readings will not be accurate. For this reason, the meter should NOT be used to detect gases other than natural gas.

2. METER OPERATION

2.1 Before turning the meter on, the member must be an area free of contamination.

2.2 To turn the MSA Altair Digital Gas Meter on, press the power button located in the center of the meter above the LCD screen (Photo 2). When the meter is powered on it will run through a self-check test which takes approximately 40 seconds. During this test the meter will momentarily activate all three alarm types (audible, visual and vibrating) and the display will scroll through several LCD screens. One screen will display "FAS" prompting the user to perform a "Fresh Air Setup". Press the power button again to perform the FAS (ensure the meter is in an area free of contamination). The FAS is used to "zero" the LEL sensor to ambient air. Not performing FAS may affect the accuracy of meter readings.

Note: The FAS can be bypassed by either pressing the reset (right arrow or ^) button or waiting 10 seconds.

2.3 The meter is now ready to perform air monitoring. While air monitoring the meter will emit a vibrating pulse and flashing green LED light every 30 seconds to alert the user that the meter is operating.

2.4 In fresh air, the normal sensor readings on the LCD should read:

- LEL 0.0%
- O2 20.8%

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2.5 The meter will alarm at the following LCD readings:

- LEL 10.0%
- O2 23.5% (Oxygen enriched)
- O2 19.5% (Oxygen deficient)

Note: After alarm activation consider using an additional meter to verify readings.

2.6 To silence alarms press the Reset button (right arrow or ^).

2.7 Meters shall be stored on the apparatus and charged utilizing the charger adapter provided. Should the apparatus charger malfunction, the unit can be charged in quarters utilizing the 110 volt charging adapter.

3. ***Redacted for PFS***

4. THE COMBUSTIBLE GAS SENSOR

4.1 Normal air readings should display 0.0% LEL on the meter LCD. When the atmosphere is above 100% LEL, the LCD symbol will be displayed under the COMB/EX icon (Photo 1). This is an extremely dangerous atmosphere that is indicative of a potentially explosive environment. Refer to Emergency Procedures Natural Gas for operational guidelines.

4.2 When LEL readings exceed 100%, in addition to the LCD symbol being displayed, the meter will enter into a Lock Alarm State. The Lock Alarm State causes the meter to shut down the LEL sensor and no longer read natural gas levels. To reset the sensor, the meter must be removed to fresh air and turned off then turned back on.

5. OXYGEN SENSOR

5.1 The oxygen sensor was included on the meter since the LEL sensor requires oxygen to function properly. In an oxygen deficient atmosphere the LEL sensors will not be accurate.

5.2 Oxygen deficient atmospheres: The normal oxygen reading on the meter is 20.8%. The low oxygen level alarm is set at 19.5%. Upon activation of the oxygen sensor, members shall don their SCBA facepiece and notify the Incident Commander of abnormal oxygen readings on the Altair meter. Notify the dispatcher of conditions, and have the utility company respond and request an ETA. The oxygen in the atmosphere is being displaced and the LEL readings may not be accurate.

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5.3 Oxygen enriched atmospheres: The high oxygen sensor will alarm at 23.5%. Oxygen enriched atmospheres decrease flash points of combustibles and increases the chance of ignition of material not normally thought of as an ignition hazard. A series three large "+" along the screen under the O2 icon indicates the atmosphere is above 30% oxygen (Photo 1). This is an extremely dangerous condition since the actual readings are not known. Incident commanders shall take necessary action to address the abnormal condition and initiate a Haz Mat response.

6. ***Redacted for PFS***

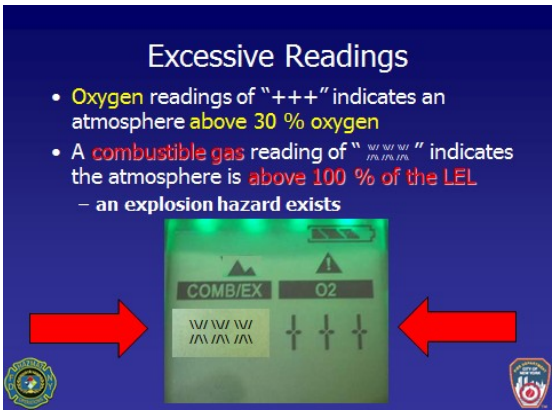

Photo 1

Photo 2

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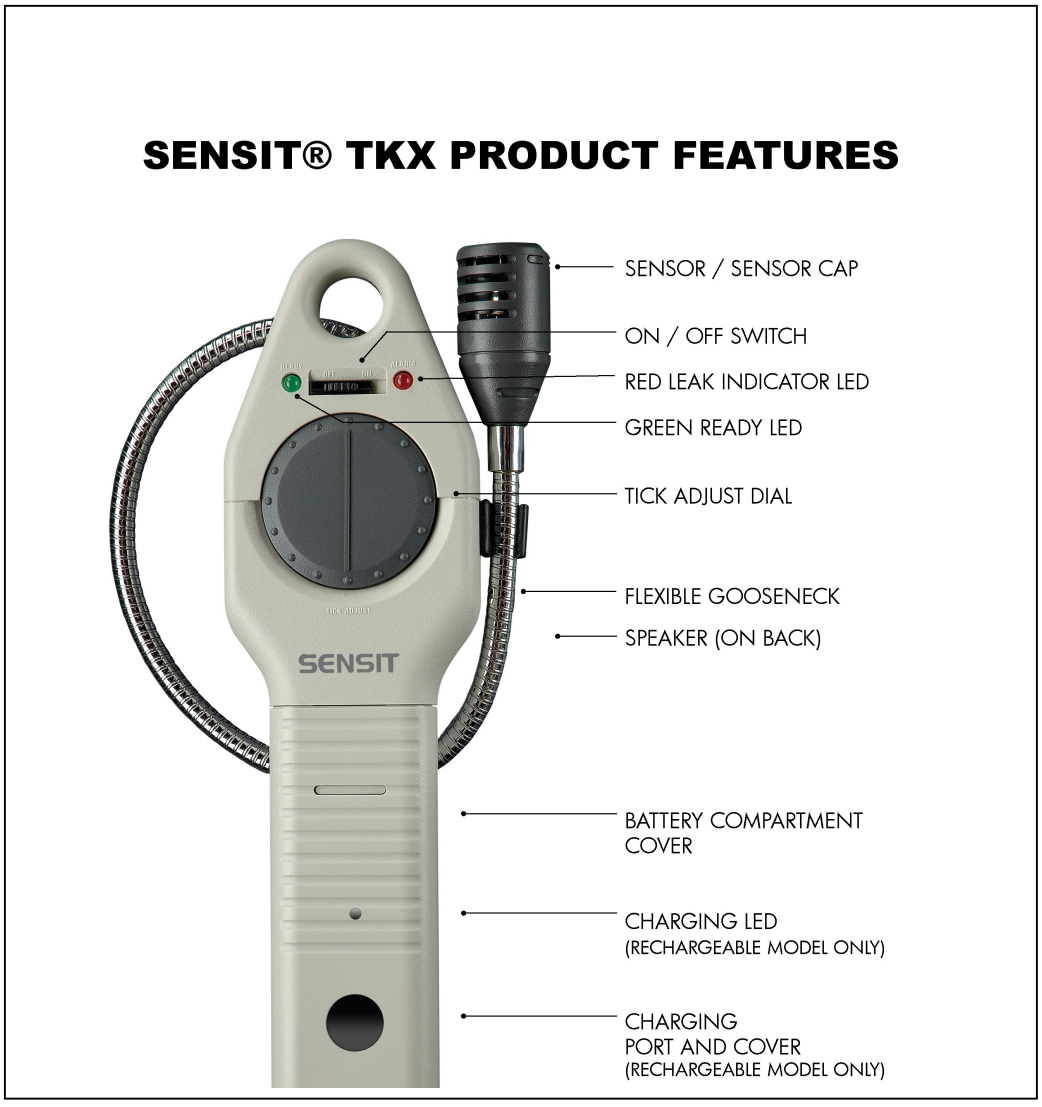
EMERGENCY PROCEDURES
NATURAL GAS
ADDENDUM 5
September 23, 2016

SENSIT TKX COMBUSTIBLE GAS DETECTOR

1. DESCRIPTION

The SENSIT TKX Combustible Gas Detector is a solid-state electronic, combustible gas detector carried by Battalions, Haz-Mat Co. 1, HMTU, Rescue and Ladder Companies. It provides a "Geiger Counter" like ticking sound that increases in frequency when a gas source as low as 20 ppm of Methane is detected. It comes with a carrying case, rechargeable Lithium Ion Battery Pack and a charger. It has UL intrinsic safety approvals for Class 1, Division 1, Groups C and D hazardous locations.



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2. APPLICATION

The SENSIT TKX Combustible Gas Detector may be used in almost any situation where combustible gas, vapor, or residues need to be located. Some examples are:

- Gas lines and pipes
- Fuel in marine bilges
- Exhaust and fuel leaks
- Manholes

Below is a partial list of gases that it will detect:

Acetone, Alcohol, Ammonia, Butane, Gasoline, Jet Fuel, Industrial Solvents, Methane, Lacquer Thinner, Naphtha, Propane and Natural Gas.

Note: The SENSIT TKX Combustible Gas Detector will **not** detect Carbon Monoxide.

3. SET UP

- With the detector turned off and in a non-hazardous area, plug charger into an electrical outlet. Remove the charging port cover in the front of the detector and insert the plug that was provide with the TKX, the LED above the charging port will illuminate red to indicate that that battery is charging (Note: The charging port cover is tethered and care should be taken not to pull the tether completely out of the charging port hole).
- A recharge takes 2 to 5 hours and the LED will illuminate green to indicate a fully charged battery.
- A fully charged battery supplies approximately 20 hours of continuous use.
- If the LED blinks green or does not illuminate, the battery needs to be recharged. If recharging does not produce a solid green LED after 5 hours notify Haz-Mat Operations.

4. OPERATING INSTRUCTIONS

- **THE ALTAIR METER MUST BE USED IN CONJUNCTION WITH THIS METER WHEN SURVEYING FOR LEAKS.**
- Turn the tick adjust dial fully counterclockwise.
- In a non-contaminated atmosphere, slide the power switch to the on position. The green LED will illuminate.
- The red LED may flash and a tick may sound during the warm up. To silence the tick, rotate the tick adjust dial wheel fully counterclockwise.

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- Rotate the tick adjust dial in a clockwise direction until a uniform ticking sound, which indicates a fully warmed up instrument, is heard,. The red LED will also begin to flash. Approach the area of the suspected leak with the sensor until the ticking sound begins to increase. When the ticking increases rotate the tick adjust dial counterclockwise to slow the ticking sound and continue to approach the suspected area of the leak. Continue in this manner until the location of the leak is pinpointed.
- An increase in the ticking sound and flashing of the red LED indicates that you are approaching a leak. A decrease in both the ticking sound and the flashing red LED indicates that you are moving away from the leak.

THE ALTAIR METER MUST ACCOMPANY THIS INSTRUMENT WHEN SURVEYING FOR LEAKS.

5. NOTES

- ***Redacted for PFS***
- ***Redacted for PFS***
- Detectors must be stored in the carrying case when not in use to prevent damage. The probe is extremely susceptible to damage when improperly stored.

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VEHICLE DISENTANGLEMENT AND PATIENT EXTRICATION

1. INTRODUCTION

1.1 Motor vehicle accidents (MVA) with victims pinned pose a unique challenge to our members. Medical authorities refer to the first hour from the beginning of an accident with critical injuries as the Golden Hour. A victim delivered to a surgical team within this first hour has the best chance of survival. Because of this, our operations must be well coordinated in order to achieve efficient victim removal without compromising member safety. Our knowledge of disentanglement procedures, new vehicle technology, tool capabilities, medical considerations and tactical procedures will aid us in achieving this goal. Each accident scene will be unique. Factors that will play a role in determining the appropriate actions taken and the order in which they are carried out will be the type and number of vehicles involved, their positions, number and condition of patients and any external hazards at the scene. This bulletin should serve as a source of information that will assist you in determining a proper course of action to be taken when you arrive at the scene of a MVA.

2. NEW CAR TECHNOLOGY

2.1 Today's cars save lives by wrapping occupants in reinforced alloys, impact absorbing crumple zones and as many as sixteen air bags. Safety features vary from year to year in their design and location amongst the different makes and models. It is paramount to know how these safety features could possibly affect our disentanglement and extrication operations. Listed below are some of the advancements made in the construction of new vehicles.

2.2 Reinforced wheel and engine deflection systems that upon impact, deflect the wheels and motor under the car away from the passenger compartment.

2.3 Crumple zones that absorb the energy of the impact, preventing it from being absorbed into the passenger compartment. While this has drastically increased the ability of occupants to survive the impact, it can complicate the disentanglement effort due to the strength of the deformed metal structures.

2.4 Reinforced dashboards have been developed to protect the occupants in case of a front or side impact. The transverse dash beam located behind the dashboard ties into the A posts and the floor pan making dashboard lifts more difficult.

2.5 High-Strength Low-Alloy and boron steel is used in vehicles for improved strength to weight ratio. The side door beam, when driven into the frame upon impact, will make door removal more difficult due to its strength. These lightweight, high strength materials are used to reinforce roof and post structures hindering our cutting operations.

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2.6 Airbags located in the steering wheel, dashboard, under the dashboard, and now any combination of the doors, seats, roof rails and even some seat belt systems present several challenges. Airbag systems are equipped with an energy storage feature that enables them to deploy even when the battery has been destroyed in an accident. Airbags can either be deployed electronically or mechanically. Disconnecting the battery will start the drain time, which varies, for an electronically activated device, but not a mechanically activated one. All airbag systems are not alike but do contain similar components. Exact location, volume and mechanism of deployment will vary. Newer systems include the use of dual stage inflators which basically means that just because an airbag has deployed it does not mean that there cannot be a second deployment. In the large majority of our responses the airbags will have already deployed. However, our members should always treat the area around the airbag as if they have not deployed. The rule of 5-10-20 should be observed; at least 5" from side airbags, 10" from driver airbags and 20" from passenger airbags.

2.7 Seatbelt pretensioners are designed to reduce blunt force trauma as well as impact with airbags. These devices are either mechanically or electrically activated using a spring mechanism or a pyrotechnic device to deploy. The mechanically activated pretensioner will remain live even after the battery is disconnected. Removal of the seatbelt from a patient as soon as practical is recommended. Accidental deployment during extrication can cause serious injury to both rescuers and occupants alike.

2.8 High impact plastic, carbon fiber, aluminum and other composite materials are replacing sheet metal in all or parts of the exterior bodies. Composite materials and carbon fiber can be difficult to cut. Plastic tends to crumple or shatter instead of bending making it hard to find a purchase point for leverage.

2.9 Tempered glass is being replaced on side and rear windows by laminated glass or rigid plastics due to it being highly resistant to breaking. This new type of glass presents a formidable barrier in gaining access to the occupants inside of the vehicle. Conventional methods used in the past will not work on these newer types of glass.

2.10 Unibody construction results in a vehicle that is made from many pieces welded together to make a lightweight but strong vehicle. This construction is such that the body and chassis is one unit. The outer surface of the vehicle adds to the overall strength of the vehicle.

2.11 Space frame construction usually does not depend on the exterior surface of the vehicle for strength. The body panels are attached to the frame to provide an outer surface many times consisting of plastic or a composite material.

2.12 The seats in vehicles today are generally stronger, some wrapping around the occupant, and are mounted more firmly to the floor pan making seat displacement more difficult. Many new design vehicles have airbag components mounted in the seats upholstery. Avoid cutting through airbag sensors, gas cylinders and the airbags themselves. Removing the upholstery prior to cutting might be a good practice.

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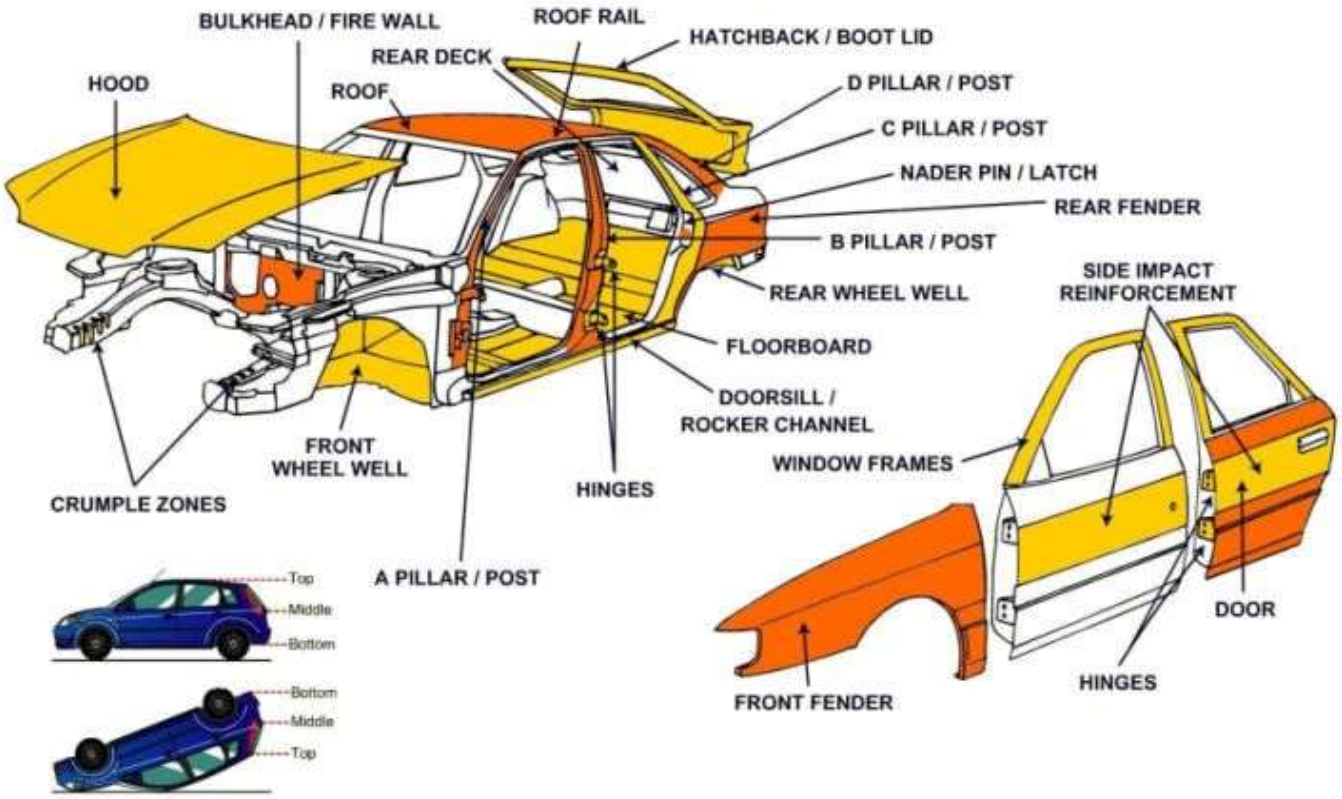
2.13 Automatic roll-over protection systems deploy as the vehicle begins to roll over. They are typically stowed behind the seats in convertibles in the rear deck area. This presents a risk to members operating when deployment accidentally occurs during the rescue operation. Disconnecting the battery and avoiding its deployment path are steps to follow. In some newer vehicles these systems can be manually deployed. When this is the case, manually deploying it would be a course of action.

2.14 The pillars and posts contain components that should be avoided. Reinforcement for the mounting of seatbelts, pretensioner systems and airbag inflators as well as the advances in construction presents more of a challenge during cutting operations. Exposing the posts rails and pillars prior to cutting will allow members to see where these components are located so that they can be avoided.

2.15 The batteries can be in many different locations. Under the hood, in the wheel well, under seats or in the trunk are some of the areas they may be found. Some vehicles may have more than one battery.



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3. TACTICAL PROCEDURES

3.1-3.2 ***Redacted for PFS***

3.3 Operations

3.3.1 **Disentanglement -** The removal of wreckage from around the victim.

A. There are so many variables at an accident with people trapped that no one procedure will work in all cases. The safest and most efficient method should be considered first. Protect victim with materials such as a blanket or sheet before disentanglement procedures start. Members working inside of vehicle shall be cognizant when operating tools close to victim. The least amount of movement of the victim will result in the fewest secondary injuries.

3.3.2 **Extrication -** The physical removal of the victim from the vehicle.

3.3.3 The power unit should be placed in the front or rear of the vehicle. This will allow flexibility to operate on both sides of vehicle without having to reposition. The spreaders and cutters are the tools of choice and should be used to complement each other at an operation. While one member is operating the spreaders, have other member holding cutters prepared to assist when needed. Always be in control of the tool and **never position any part of your body between the tool and the vehicle**. A coordinated team effort is key when operating the Hurst tool. Every member should be aware of its capabilities and limitations. This will be accomplished through continuous training and actual operations.

4. ASSIGNMENTS

4.1 **Engine Company Operations** - Officer should divide the company into two teams. The Officer and two CFR trained Firefighters (equipped with trauma bag and cervical collars) proceed to the scene of the accident. Firefighters shall gain access to the victim so that critical trauma assessment can be made and treatment initiated/augmented. Be prepared to allow ladder company members inside vehicle for disentanglement evaluation, if not already on scene. The remaining members shall stretch and charge a precautionary handline.

4.1.1 When fire or hazardous condition exists upon arrival, stretching and charging a hose line is paramount. Consider a foam handline.

4.2 **Ladder Company Operations** - These assignments are only a guide and should be evaluated by the company officer at roll call and distributed according to experience and staffing.

4.2.1 Officer and inside team proceed to scene of accident to initiate a perimeter survey, chock the vehicle and gain access to victim. Inside team will ensure car is in park, windows are opened, seats are moved back and seatbelts removed before shutting down ignition. If an engine or EMS is not on scene, members shall stabilize the

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patient. Once an engine or EMS arrives, the inside team can pass off patient stabilization and assist the outside team with disentanglement.

4.2.2 Roof and OV bring Hurst tool equipment to scene of accident and initiate operation.

4.2.3 Chauffeur initially uses the apparatus to block off traffic and can be used to bring additional equipment to scene.

4.2.4 The Officer should ensure the disconnection of the battery. When disconnecting the battery, remove the negative terminal first.

5. VEHICLE STABILIZATION

5.1 The goal of vehicle stabilization is to prevent rocking of the vehicle. Placing step chocks, shutting down the engine, engaging the parking brake, putting the transmission into park and disconnecting the battery are all part of the stabilization process. Before disconnecting the battery, open power windows and adjust power seats to assist with extrication. Stabilization options will vary depending on the available equipment. Ropes, chains, hooks, and Halligans, in addition to step chocks and wedges, can all be used for this purpose.

5.2 Two rules should always be considered:

- Vehicles are stabilized as they are found.
- **NEVER** right a vehicle with a victim inside.

5.3 Check under the vehicle for victims before any stabilization methods are taken.

5.4 Vehicles on all four wheels are best stabilized using step chocks and wedges. Place chocks just behind front wheels and in front of rear wheels, step side down. They should be positioned so as to not interfere with the door swing. Place the chocks so they make a snug contact with the rocker panel. A wedge may be required to fill the gap between the step chock and the rocker panel (Figures 1 and 2).

Figure 1

Figure 2

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5.5 When further stabilization is required deflate the tires so that the vehicle rests totally on the step chocks. Though this is not always necessary it will afford the best possible stabilization. Keep in mind that once this is done you will be unable to reposition the step chocks when necessary. When deflating tires use vise grips or pliers to remove the valve stems (Figure 3).

Figure 3

5.6 Vehicles encountered on their side or roof presents a unique stabilization challenge. Place step chocks and wedges under side of car and tires (Figures 4 and 5). Vehicle shall be secured to a substantial object (apparatus, tree etc.) with utility rope (Figures 5 to 7). Because of the potential for vehicle movement, no member should enter a vehicle until properly stabilized. A good initial choice for entry into these vehicles could be the front or rear window.

Figure 4

Figure 5

Figure 6

Figure 7

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6. DOOR REMOVAL

6.1 When removing a door, the first point of attack may vary. There are two options, Nader pin/staple or hinge side. Whatever method is chosen, the victim must be protected from any flying debris, and the window opened or the glass removed. While attacking the Nader pin/ staple first has been successful in the past, the hinge side may be an improved approach with new car construction. Both techniques should be mastered.

6.2 Hinge side

6.2.1 Fender Crush

A. Crush the wheel well section of the fender in between the spreader arms creating a purchase point between fender and door (Figure 8).

B. Insert tips of spreaders perpendicular to purchase point, pushing fender forward exposing hinges (Figure 9).

Figure 8

Figure 9

C. Cut top and bottom hinges using cutters in that order (Figure 10). When a hinge has a spring, it must be removed prior to cutting the hinge. Use a Halligan or Officers tool to remove it (Figure 11).

Figure 10

Figure 11

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D. Cut door stop when present (Figure 12).

Figure 12

E. Close spreaders on door and force door open, using spreaders for leverage exposing Nader pin/staple (Figure 13).

F. Cut Nader pin/staple with cutters and remove the door (Figure 14).

Figure 13

Figure 14

Note: Door may break free from Nader pin / staple when forcing it open. Keep the area clear beneath the door being removed.

6.2.2 Vertical Push

A. In order for this method to be successful the roof must be intact.

B. Insert tips of spreaders on an angle between A post and top of door (Figure 15).

C. After exposing hinges, follow the steps listed in Section 6.2.1 for cutting hinges and the Nader pin/staple.

Figure 15

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6.2.3 Halligan Tool

A. Place the adz end of the Halligan tool in the seam between the front fender and door in the vicinity of the top hinge.

B. Apply a vertical up and down motion creating a gap in the seam exposing the top hinge.

C. After exposing the top hinge, follow the steps listed in Section 6.2.1 for cutting hinges and the Nader pin/staple.

6.2.4 The spreaders may be used in place of the cutters when attacking the hinge side of the door for complete door removal. Use one of the above methods to establish a purchase (Figure 16).

Figure 16

6.3 Nader Pin/Staple Side

Nader Pin

Staple

6.3.1 Vertical Crush

A. When room permits, place one arm of the spreaders in the vehicle between the victim and the door and keep the other arm outside of the vehicle. **This method will not work when the victim is too close to the door.**

B. Keep spreaders in vertical position. The outer arm should fall over the outside door handle or close to it, with the tips about midway down the door.

C. Close the tool on the door, forcing the outer edge of the door to roll out exposing the Nader pin/staple.

D. Using the cutters cut the Nader pin/staple.

E. Push the door away from the car to expose the hinges. When necessary close the spreaders on the door using them for leverage (Figure 17).

F. Cut the top and bottom hinges, in that order, with the cutters. When a hinge has a spring it must be removed prior to cutting using a Halligan or Officers tool.

G. Cut door stop when present.

Figure 17

6.3.2 Halligan Tool

A. Place the adz end of the Halligan tool in the seam between the door and the post just above the midway point of the door (Figure 18).

B. Apply a vertical up and down motion, creating a gap in the seam exposing the Nader Pin/staple (Figures 19 and 20).

C. With the spreaders in the closed position, place the tips at a level just above the Nader pin/staple. Inch your way into position by opening and closing the spreaders to avoid tearing or shredding the door. This action may force the door.

D. When the above does not force the door use the cutters to cut the Nader pin/staple.

E. Follow steps E - G as listed in Section 6.3.1.

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Figure 18

Figure 19

Figure 20

6.3.3 Vertical Push

A. Using the vertical push to establish a purchase point may force the door from the Nader pin/staple. This method works best on older vehicles. On newer type vehicles (lightweight construction), the possibility exists of the door splitting, losing the integrity of the door. In order for this method to be successful, the roof must be intact.

B. Insert tips of the spreaders into the window opening close to the B post (Figure 21). Keep top arm of spreaders horizontal with tips inside of vehicle.

C. When the above does not force the door use the cutters to cut the Nader pin/staple.

D. Follow steps E - G as listed in Section 6.3.1.

6.3.4 The spreaders may be used in place of the cutters when attacking the Nader pin/staple side of the door for complete door removal. Use one of the above methods to establish a purchase.

6.4 When any of the methods listed in Section 6 do not provide enough of a gap to insert the tool additional space can be gained in the following manner. Open the spreader tips about one inch.

6.4.1 Place the edge of the door on the inside of the spreader tips.

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6.4.2 Close the spreaders pinching the edge of the door in between the tips (Figure 22).

6.4.3 Using the spreaders pry out and away from the vehicle enlarging the gap (Figure 23).

6.4.4 This will work on both the Nader pin/staple or the hinge side of the door.

Figure 22

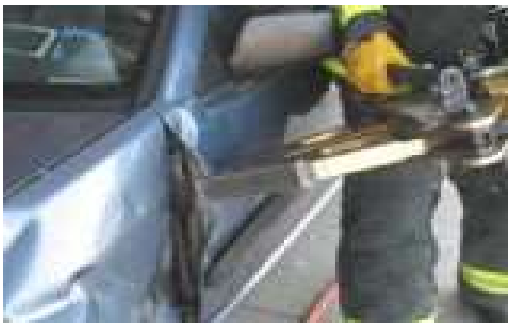

Figure 23

7. THIRD DOOR REMOVAL

7.1 This procedure is used when a victim is pinned in the back seat of a two-door vehicle. The third door will provide better access to remove the victim(s).

7.2 Make four cuts at the following locations (Figure 24).

7.2.1 Top of B post.

7.2.2 Bottom of B post.

7.2.3 Vertical cut rear of quarter panel.

7.2.4 Horizontal cut rear quarter panel at the rocker panel.

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7.2.5 Once the four cuts are made, insert the spreaders on an angle, midway on the door and make a crease (Figure 25).

7.2.6 Readjust the jaws to grasp the top right corner (Figure 26).

Figure 25

Figure 26

Figure 27

Figure 28

7.2.7 Once the jaws are secured onto the top right corner, pry outward and down (Figures 27 and 28).

8. ROOF REMOVAL

8.1 The large majority of the time victims are removed via the doors. Roof removal may be necessary for victim access or possibly even victim removal. The first step in removing the roof of a car is to decide which method of removal to employ.

8.2 Total Roof Removal

8.2.1 Cut low on the A Post and high on the B, C and D Posts with cutters (Figures 29 - 30). When cutting the A and D Posts, cut a portion of the windshield and rear window to allow access to cut the glass, if necessary. Cut all posts on one side before passing the tool to cut the posts on the opposite side of the vehicle.

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Figure 29

Figure 30

8.2.2 Cut across the bottom of the windshield using the sawzall with wood cutting blade (Figure 31) or the Beluga Auto Glass Knife. End the cut at the A Post on both sides of the vehicle. The windshield hand saw or axe can also be used to cut windshield.

8.2.3 After completing cuts, slowly carry the roof toward the front of the vehicle. This will prevent dragging the cut windshield over victims in vehicle (Figure 32).

Figure 31

Figure 32

8.3 Roof Removal - Hinged Forward

8.3.1 Make all of the cuts at the same locations as for the total roof removal Section 8.2.1.

8.3.2 The windshield does not have to be cut.

8.3.3 After cutting posts, have members on both sides of vehicle lift roof and walk towards front of vehicle folding roof onto hood of car (Figure 33).

Figure 33

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8.4 Roof Removal - Hinged Backward

8.4.1 Cut low on the A Post and high on the B Post with cutters. When cutting the A Post, cut a portion of the windshield to allow access to cut the glass, if necessary.

8.4.2 Make a hinge cut on both sides of the roof at a point just before the last post and place a hook in between the cuts (Figure 34).

8.4.3 With members on each sides of the roof, **slowly** lift it back over the hook placing over trunk of vehicle (Figure 35). Always secure a partially removed roof (Figure 36). Before cutting the roof posts, be sure the support of the roof in not needed to force the doors.

Figure 34

Figure 35

Figure 36

9. DASHBOARD DISPLACEMENT

9.1 In the past rams were the tools of choice for dashboard displacement. Today using cutters and spreaders which are already in operation will usually suffice. The rams are another option.

9.2 Spreaders

9.2.1 Make sure that the vehicle is properly stabilized with a chock under the rocker panel where the cuts are made.

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9.2.2 Make two cuts in the bottom portion of the A Post. The lower cut is made below the hinge, parallel to rocker panel. The second cut is made approximately 6-8 inches above first cut (Figure 37). A metal hook should be positioned between the cutters and the rocker panel to prevent the tool from moving in towards the passenger compartment (Figure 38).

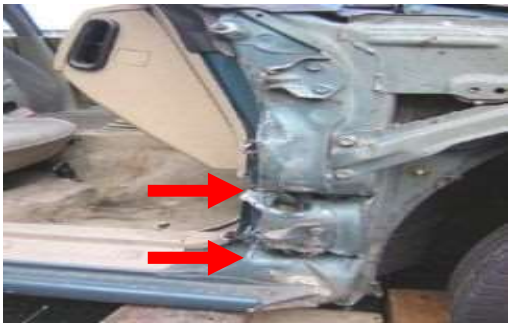

Figure 37

9.2.3 Make a third cut, low on the upper portion of the A Post (Figure 39).

Figure 38

Figure 39

9.2.4 Grip the section of the A post between the two cuts with the inside of the spreader arms and peel away (Figures 40 - 41).

Figure 40

Figure 41

9.2.5 Insert tips of spreaders into void created in A Post ensuring tips rest just inside of rocker panel (Figure 41). Open spreaders and lift dashboard (Figure 42).

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Figure 41

Figure 42

9.2.6 A relief cut in the front fender may assist the dashboard displacement by relieving front end resistance. When making this cut, avoid cutting through front shock assemblies (Figure 43).

Figure 43

9.3 Rams

9.3.1 Make one cut on the bottom portion of the A post.

9.3.2 With the ram in the closed position, place the butt end on the rocker panel and the tip of the extending end on an upper portion of the A post.

9.3.3 Tightly close the spreaders on the rocker panel just behind the ram. The spreaders will act as a substantial object for the ram. Place a chock under the spreader tips.

9.3.4 Open the ram to lift the dash (Figure 44).

Figure 44

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9.3.5 An alternate method in using the rams for a dashboard displacement would be to follow the same steps as listed above except instead of butting the ram against the jaws of the spreaders use the base of the B Post (Figure 45). Use of one of the tip attachments may assist the operation.

Figure 45

9.3.6 The ram may be removed to allow full access to the displaced dash area. To do this a second step chock should be placed under the rocker panel below the A post (Figure 46). A wooden wedge should also be placed in the gap that has been formed at the relief cut on the bottom portion of the A post (Figure 47). Exercise care when retracting the ram so the displaced dash does not come down on the victim.

Figure 46

Figure 47

9.4 Bucket Seats

9.4.1 In order for a dashboard displacement to be effective in a vehicle that has bucket seats with a center console, the metal straps that are located on each side of the console behind the plastic covering should be cut (Figures 48 and 49).

Figure 48

Figure 49

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9.4.2 The metal straps are bolted to the hump in the floor pan and the underside of the dash and will vary in size and shape.

9.4.3 These straps can be accessed from the opposite side of the trapped occupant by breaking the plastic covering the side of the center console.

9.4.4 Even cutting one of the straps will assist in the operation. When starting to lift the dash the other strap may break free from the force.

10. SEAT DISPLACEMENT

10.1 Although this procedure is an accepted way to displace a seat backwards, it must be used with caution. Always try to move the seat backwards by normal methods (e.g. manual lever, electric buttons) before committing to hydraulics. To avoid potential problems, seat displacement procedures should only be used for short distances.

10.2 Ram

10.2.1 Place the butt end of the ram on the base of the "A" post.

10.2.2 Place the extending end of the ram on the sliding portion of the seat track (Figure 50). Make certain the extending end is not placed on the fixed base of the seat track or on the cushion portion of the seat. The part of the tool that is placed against the “A” post should be slightly higher than the opposite end.

10.2.3 Extend the ram to displace the seat (Figure 51).

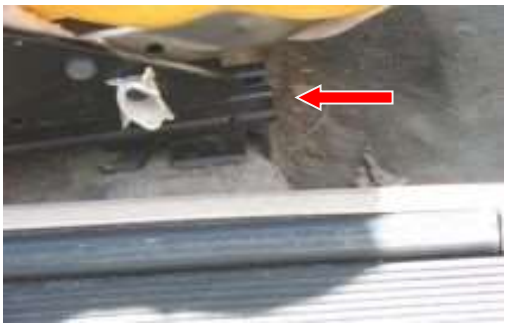

Figure 50

Figure 51

10.3 Spreaders

10.3.1 Place one tip of the spreaders on the base of the "A" post.

10.3.2 Place the opposite tip of the spreader on the sliding portion of the seat track (Figure 50). Make certain the spreader tip is not placed on the fixed base of the seat track or on the cushion portion of the seat. The part of the tool that is placed against the “A” post should be slightly higher than the opposite end.

10.3.3 Open the spreaders to displace the seat (Figure 52).

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Figure 52

11. GLASS REMOVAL

11.1 There are two predominate types of glass used for vehicle windows; laminated safety glass which is used for the windshields, and tempered glass which is found on the sides and rear of a vehicle. Tempered glass is being replaced on side and rear windows by laminated glass or rigid plastics due to it being highly resistant to breaking. This new type of glass presents a formidable barrier in gaining access to the occupants inside of the vehicle. As a rule, only the glass necessary to be removed for a certain procedure should be removed. Eyes and hands should be properly protected any time glass removal procedures are being used. Avoid inhaling glass dust and/or particles.

11.2 Before any glass removal procedures are started, victims and/or rescuers should be protected from airborne glass debris. Salvage plastic or yellow exposure blankets are a good choice of protection. Fabric blankets are not a good choice as they tend to keep pieces of glass in the fabric which could cause injury later to a victim or rescuer. Also, when they are contaminated with bodily fluids, they must be placed out of service.

11.3 **Windshields**: One of four tools may be used when removing a windshield; a windshield saw, sawzall, Beluga auto glass knife or an axe. Before using the windshield saw, make sure that the blade is installed correctly (the teeth facing the handle of the tool). The axe should be considered as a last resort for this procedure. When using an axe, take firm but not full strokes and strike the windshield with the corner of the axe blade. A cut windshield should always be supported to prevent it from falling in on a victim.

11.4 **Side/Rear Windows**: The center-punch or halligan can be used to break tempered glass. When using the halligan, insert the adz end between door frame (Figure 53) and glass exerting downward pressure (Figure 53). This will generally keep glass from shattering all over victim. Keep in mind that on the newer types of glass these methods may be ineffective.

Figure 53

Figure 54

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11.5 When encountering a vehicle that has side or rear windows that are laminated or rigid plastic, a sawzall may be used to gain access.

12. VEHICLE ON SIDE

12.1 Access to the passenger compartment for a vehicle on its side can usually be made from the front or rear windows when the roof is intact. When the roof is crushed, access and extrication can be achieved by cutting the roof posts and hinging the roof down. The above methods of gaining access to the passenger compartment can only be attempted after the vehicle is firmly stabilized.

12.2 An alternate method of gaining access to the passenger compartment would be to cut an opening in the roof of the vehicle. The air chisel would be the tool of choice (Figures 55 and 56).

12.2.1 Prior to cutting remove the interior headliner.

12.2.2 Make sure victims are not against the interior of the roof in vicinity of cutting operation.

Figure 55

Figure 56

13. VEHICLE ON ROOF

13.1 Access to the passenger compartment for a vehicle on its roof can usually be made from the front or rear windows when the roof is intact. Door removal can be accomplished when the vehicle is in this position. Attacking the hinge side would be the preferred method of removing the door.

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13.2 Fender Crush

13.2.1 Crush the wheel well section of the fender in between the spreader arms creating a purchase point (Figure 57).

13.2.2 Insert tips of spreaders perpendicular to purchase point, pushing fender forward exposing hinges (Figure 58).

Figure 57

Figure 58

13.2.3 Cut top and bottom hinges using cutters in that order. Be advised the lower hinge would now be the top hinge. When a door spring is present it must be removed prior to cutting using a Halligan or Officers tool (Figure 59).

13.2.4 Cut door stop when present.

13.2.5 Close spreaders on door and force door open using spreaders for leverage exposing the Nader pin/staple (Figure 60).

Figure 59

Figure 60

13.2.6 Cut Nader pin/staple using the cutters.

13.2.7 Once the front door is removed the rear door hinges, when present, will be exposed for rear door removal when necessary.

13.3 Halligan Tool

13.3.1 Place the adz end of the Halligan tool in the seam between the front fender and door in the vicinity of the bottom hinge.

13.3.2 Apply a vertical up and down motion creating a gap in the seam exposing the bottom hinge.

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13.3.3 After exposing the bottom hinge follow steps 13.2.2 – 13.2.6 as listed.

13.4 An alternate method of establishing a purchase point would be to attack the seam between the bottom of the door and the rocker panel of the vehicle using either the spreaders or Halligan tool to expose the bottom hinge (Figures 61 and 62).

Figure 61

Figure 62

14. SAFETY

14.1 The operator(s) must wear all required protective clothing. The operator(s) and any member working in close proximity to the operator(s) must wear eye protection (e.g., eye shields, safety glasses, or helmet-mounted eye shields).

14.2 An area of safety measuring the fully opened length and width of the jaws must be maintained. Do not place any portion of the body within this zone when opening or closing the jaws.

14.3 Avoid cutting through hydraulic pistons or rods on hatchback style vehicles. A sudden release of pressurized fluid could cause injury.

14.4 Always treat airbags as if they are live, observe the rule of 5–10–20. The rule of 5-10-20 is at least 5” from side airbags, 10” from driver airbags and 20” from passenger airbags.

14.5 When possible, cover cut post or sharp edges of the vehicle with a car mat or other suitable material to prevent injury.

14.6 Keep the working area around the vehicle free of loose tools.

14.7 Eye and hand protection should always be worn when connecting and disconnecting hose couplings. A good practice would be to point the couplings down when disconnecting.

14.8 Whether using the spreaders or cutters always remove the top hinge first.

14.9 Rear end collisions might not activate safety systems such as airbags and seatbelt pretensioners. This can even be the case in some side impact collisions due to smart systems that will only deploy/activate due to a persons weight. These systems that have not deployed will still remain live and could possibly activate once the rescuers weight is sensed.

14.10 Avoid crushing/cutting areas that might contain live airbags, cylinders and sensors that will activate any of the safety systems. The cylinders may contain up to 9,500 psi of stored gas pressure. Removing the interior trim inside of a vehicle might help in determining the locations of these devices.

14.11 Always be aware of the unsupported end when using the cutters.

14.12 Never position any part of your body between the tool and the vehicle.

14.13 The hydraulic hose lines may be coupled or uncoupled with the power unit running, provided the bypass valve is in the backward or dump position. On the low pressure hose, align the slot with the pin before you connect or disconnect the coupling. These couplings are provided with seals and rings compatible with hydraulic fluid. Because there is a ball check, they can be disconnected under pressure, but caution must be exercised since some fluid may spray out.

14.14 Prolonged and repeated contact with the hydraulic fluid may be irritating to the skin. If a member gets hydraulic fluid in their eyes, the member should flush their eyes with clean water for at least 20 minutes and immediately seek medical attention.

BY ORDER OF THE FIRE COMMISSIONER AND CHIEF OF DEPARTMENT

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WATER RESCUE OPERATIONS

1. INTRODUCTION

1.1 The FDNY is accustomed to responding to many types of unusual incidents on a daily basis. Ice, water and surf rescues can be among our most difficult and dangerous responses. The FDNY has been responding and operating at these incidents for years. This bulletin will help to standardize the use of Ice/Water/Surf rescue equipment and to explain the capabilities, limitations, and guidelines to follow when responding to, and operating at these types of incidents. The tools and procedures unique to Water/Ice/Surf rescue will be discussed in greater detail as individual procedures.

1.2 New York City has over 578 miles of coastline along the ocean, rivers and waterways. Each borough also has numerous lakes and ponds. The numerous bodies of water encountered throughout the city will ensure incidents where FDNY units are called to operate.

1.3 ***Redacted for PFS***

2. GENERAL SAFETY AT ICE/WATER/SURF INCIDENTS

2.1 It should be emphasized that any entry into the water or onto ice must be considered as a last resort. The safety of our members is paramount. An alarming fact is that 10% of all drowning victims started out as would be rescuers. All members must use extreme caution and good judgment with any ice or water rescue.

2.2 There will be times when FDNY members should not enter the water. This goes for drills as well as rescue situations. Some factors that would affect this decision are:

2.2.1 Water/Weather Conditions - Factors such as wave height, wind, presence of Rip Currents or Long Shore Currents, and lightning storms.

2.2.2 Location of Victim - How far out the victim is and if they can be reached safely (Ice/Water Tether Rope is 200’ and Surf Tether Rope is 600’).

2.2.3 Skill Level of Rescuer - Can the rescuer reach the victim under the above circumstances or will the rescuer eventually become a victim.

2.2.4 Night Operations - Members should not be allowed past the line of sight from the shore.

2.3 All members operating at or near a water emergency must wear a PFD. Bunker gear shall only be worn when operating in the immediate vicinity of water/ice operations when absolutely necessary.

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2.4 **Bunker gear does not float**. Tests have shown that members wearing Bunker Gear with or without an SCBA will **sink instantaneously**.

3. BODILY REACTION TO COLD WATER EXPOSURE

3.1 Cold water exposure symptoms include intense shivering, loss of coordination, mental confusion, cyanotic (cold/blue) skin, low pulse rate; irregular heart beat and fixed dilated pupils.

3.2 Cold water victims may appear dead. However, people have been submerged in cold water for long periods of time and made complete recoveries. ***Redacted for PFS***

3.3 ***Redacted for PFS***

3.4 Hypothermia

3.4.1 The loss of body heat occurs 25 times faster in cold water than in air. Hypothermia (subnormal body temperature) begins when the body's core (brain, spinal cord, lungs, and vital organs) temperature falls below the level of 98.6 degrees Fahrenheit. Cold water cools the body's skin and outer tissues very quickly. In approximately 7 to 15 minutes, core body temperature begins to drop significantly, affecting utilization of the arms and legs. Blood pressure, pulse and respiration rates all decrease. Muscles tense and shiver. Irrational behavior (resisting help) is a good indicator of hypothermia.

3.4.2 Early signs of hypothermia begin at approximately 95 degrees causing the body to uncontrollably shiver which is the body's first reaction to the cold. As the body temperature continues to drop to about 90 degrees the lips turn blue, speech begins to slur, and skins loses color becoming pale. If the body drops below 82 degrees severe hypothermia sets in and the person loses consciousness. If no intervention is performed the body's temperature will continue to drop decreasing the heart rate and leading to cardiac arrest and death.

3.5 Treatment

3.5.1 The medical community has learned that survival is possible with no brain damage even after an extended period of cardiac arrest in hypothermic patients. When a person's core temperature is low the brain requires less oxygen. This allows proper CPR to sustain life for hours as compared to minutes in warmer patients. Confirmed accounts of survival has led the medical community to adopt the slogan "You're not dead until you are warm and dead".

3.5.2 Exposure to cold water can lead to a life threatening medical emergency and immediate interventions must be taken to increase the victim's chance of survival. Some points to consider are as follow:

- Remove the victim to a warm shelter to prevent further body cooling.

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- Remove wet clothing and wrap the person in warm blankets.
- Perform a patient assessment and treat the patient according to CFR protocols.
- Do not massage or rub the victim because rough handling could cause cardiac arrest.
- The victim should be transported carefully to avoid heart fibrillation and stress.

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EMERGENCY PROCEDURES
WATER RESCUE 1
ADDENDUM 1
April 14, 2022

WATERFRONT OPERATIONS WHILE WEARING BUNKER GEAR

1. WATERFRONT OPERATIONS WHILE WEARING BUNKER GEAR

1.1 Tests were conducted to determine the amount of buoyancy a member (Fire or EMS) wearing bunker gear would have if the member accidentally fell into the water. The testing included falling from heights between 1 ft. and 10 ft.

1.2 Testing was done in fresh and salt water with and without an SCBA. Each test was started with a member wearing a full set of bunker gear, including personal harness, PSS kit, flashlight, and hand tools.

2. OBSERVATIONS

2.1 Results of the testing have shown that members wearing Bunker Gear, with or without an SCBA, **quickly become submersed**.

2.2 The higher the fall the less opportunity there may be to remain at the surface.

2.3 BUNKER GEAR DOES NOT FLOAT.

3. OPERATIONS

3.1 Prior to operating on or around water, Marine units must be notified.

3.2 Members operating at waterfront operations, piers or bulkheads should exercise extreme caution. Personal flotation devices, where available, should be used. Safety lines should be used, particularly if no flotation devices are available.

3.3 Each company's Water Safety Kit should be brought to the point of operation. Safety lines should be readied for use and attached to members operating in, over and around water. At least one 20 ft straight ladder should be dedicated for the purpose of member removal should the need arise.

4. CONCLUSION

4.1 In the event you fall into the water, do not attempt to swim - call for help, try to remain calm and slowly tread water. Thrashing about will reduce the amount of time you may be able to keep yourself at the surface.

4.3 REMEMBER - REMAIN CALM, DON'T PANIC, CALL FOR HELP!

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WATER RESCUE

1. GENERAL

1.1 Any FDNY unit can find themselves with the difficult task of a water rescue emergency. To prepare for these emergencies the FDNY has trained and/or equipped all companies to specific levels in order to address these water rescue emergencies.

1.2 Water Rescue Units are specific Engine and Ladder companies trained and equipped for surface Water/Ice rescues. These companies do not search for submerged victims. ***Redacted for PFS***

1.3 Water Safety Units are the remaining Engine and Ladder companies, as well as all Battalions. These units have been issued a Water Safety Kit to use when a water rescue trained company is not on the scene. When arriving first, these Companies may take action using this kit. Entry into the water should only be attempted when consistent with safety and after a proper size-up.

2. RESCUER SELECTION (WATER RESCUE UNITS AND WATER SAFETY UNITS)

2.1 Roll Call is the time to determine which member or members will enter the water if the emergency requires. FDNY members comfortable in the water, such as former lifeguards or trained scuba divers, would be the logical choice to select. It would not be a good practice to assign your primary water rescuer as a riding position, e.g., nozzle firefighter is always the primary rescuer. This member may not feel comfortable in the water and you may have someone with more training and water experience that would be better suited for that assignment.

2.2 The untrained and inexperienced potential rescuer could become a victim. Preplanning, proper equipment, and training will ensure the safest outcome in these types of incidents.

3. WATER SAFETY UNITS

3.1 All FDNY Companies and Battalions have been trained to operate as Water Safety Units. Water Safety Kits have been issued to these units as well as companies trained as Water Rescue Units and Surf Rescue Companies.

3.2 Water Safety Kits will ensure that all companies have the equipment and the ability to operate safely at water rescue incidents when a formally trained Water Rescue Unit is not on scene.

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3.3 The Water Safety Kit is primarily used for shore-based waterfront operations. Companies with Water Safety Kits can operate from the shore alone as well as assist Water Rescue and SCUBA trained companies when on scene.

3.4 Units should train and be familiar with the equipment to enable safe operations at waterfront incidents.

3.5 WATER SAFETY KIT

3.5.1 The Water Safety Kit consists of the following equipment:

ITEM	QUANTITY
Personal Flotation Device	2
Yellow Water Rescue Fittings	1 set
Spanner Wrenches	1 set
Fittings Carry Bag	1
Throw Rope in a Bag	1
Life Ring	1
Life Ring Tether Line	1
WSK Carry Bag	1

Photo 1

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3.6 EQUIPMENT DESCRIPTION

3.6.1 Personal Flotation Devices (PFD's)

Photo 2

- Two PFDs are included in each Water Safety Kit. (Photo 2)
- Built into the PFD is a quick release harness.
- On the front is the locking buckle with pull cord release. (Photo 3)
- On the rear of the harness is an O-ring which is designed to attach a tether line (Life Saving Rope). (Photo 4)

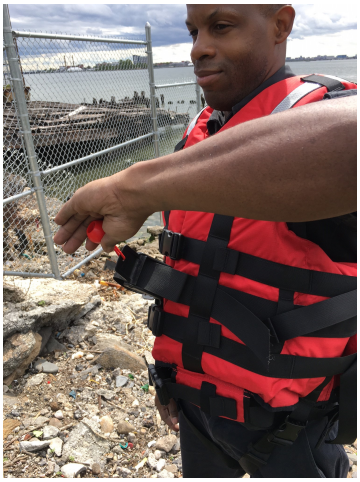

Photo 3

Photo 4

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3.6.2 Throw Rope (Photo 5)

- 75 feet of feet of buoyant nylon rope contained within a throw bag.
- One end of the rope has a pre-tied loop used to secure it to the throwing member's hand. (Photo 6)

Photo 5

Photo 6

3.6.3 Life Ring with Attached Tether Line (Photo 7)

- Life Ring is a flotation device that can be thrown to a victim.
- The Life Ring is attached to the yellow nylon buoyant tether rope prior to throwing.

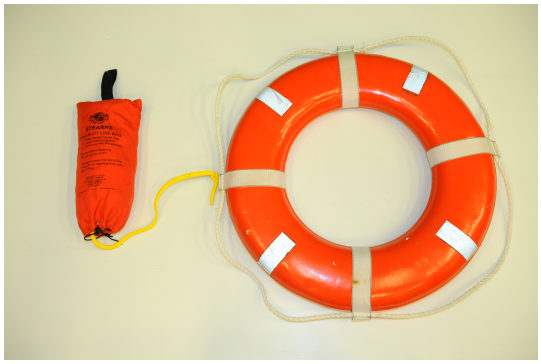

Photo 7

3.6.4 Yellow Water Rescue Fittings (Photo 8)

- 2 ½ inch hose caps with air chock and shackle and snap bolt.
- Pair of Spanners
- Carry Bag

Photo 8

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3.6.5 Red Carry Bag (Photo 9)

- To keep all the Water Safety Kit items together a carry bag has been provided. The gear should be kept in this bag to ensure uniformity through-out the Department.

Photo 9

3.7 POSITIONS **(WATER SAFETY UNITS)**

3.7.1 Rescue Coordinator - The company officer usually assumes this position and shall be located where they can observe and direct the whole operation. He/she will choose the point of operation and decide whether or not to attempt a rescue. When a rescue is attempted, he/she shall supervise operations and control members. In a 4-firefighter Engine Company, the officer will also assume the responsibilities of the Spotter until an additional unit arrives. Tools include HT, flashlight, and thermal imaging camera if available.

3.7.2 Spotter - A firefighter, designated by the company officer, (4-firefighter Engine Company) will assume this position and shall be positioned where they can keep sight of the victim. This may include using the apparatus as a vantage point. An aerial or tower ladder may be raised to facilitate spotter positioning and set up lights if needed. Tools include HT, flashlight, and binoculars.

3.7.3 Primary Rescue Team - Will consist of Primary Rescuer in a PFD tended by a member controlling the tether line. This team will operate as outlined below.

3.7.4 Secondary Rescue Team - Will consist of an additional Rescuer in a PFD also tended by a member controlling the tether line. The primary objective of this team is to ensure the safety of the Primary Rescue Team, although they are permitted to enter the water for a second victim.

3.8 PROCEDURE **(WATER SAFETY UNITS)**

3.8.1 Size-up begins with the receipt of an alarm. Members selected at roll call will don PFDs at quarters prior to boarding apparatus when responding to a possible water rescue emergency.

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3.8.2 Size-up will continue upon arrival at the scene. Once it has been confirmed that there is a victim to be rescued, notify the dispatcher and request additional resources. At this time risk vs. reward factors should be considered and the method of rescue, if feasible, determined. Generally, there are three methods companies have available to them for water rescues:

- Reach
- Throw
- Go

3.8.3 REACH: The rescuers shall consider using any long object on scene that can be passed to the victim. The victim will be instructed to grasp the object while the rescuers hoist victim to safety. If the victim is physically unable to assist in their removal the rescuer shall attempt to control victim with the tool or object. The reach method should not be abandoned even after a Water Rescue Unit is on scene and a rescuer is making their way out to the victim. Rescuers shall consider the use of the following items:

- Outstretched hand
- Ladders
- Hooks or pole
- Inflatable Water Rescue Hose(s) used in a straight line
- Any other object available on scene

Note: The rescuers reach may be increased by operating from a horizontally extended tower ladder or aerial ladder.

INFLATABLE WATER RESCUE HOSE

A. Attach fittings to a length of 2 ½ inch hose then fill with air and use as a flotation device.
B. Rescue Hose can be deployed in a straight line or a loop.
C. Each length of 2 ½ of hose can keep afloat approximately 10 people.
D. See Water Rescue 2, Addendum 1 for full description and procedure.

3.8.4 THROW: This method is used in conjunction with the reach method or when the reach method is not feasible and involves using the Throw bag and/or the Life Ring with attached tether line. These tools are used as follows:

THROW ROPE (Photo 5)

A. Remove the loop from the bag and place the loop onto the non-throwing hand.
B. The member's dominant hand will throw the bag while the other hand holds the rope.
C. Throw the bag over and past the victim.
D. Have the victim wrap the rope around their arm and hold the rope.
E. Pull the victim to safety.

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LIFE RING WITH ATTACHED TETHER LINE (Photo 7)

A. Attach the Tether Line to the Life Ring.
B. Hold the throw bag with the looped handle with the member's non-throwing hand.
C. The member's dominant hand throws the life ring while the other hand holds the looped handle of the throw bag.
D. Throw the Life Ring over and past the victim.
E. Have the victim hold the Life Ring.
F. Pull the victim to safety.

3.8.5 GO**:** This is the last method available to Water Safety Units. It is only under extreme life safety emergencies in which a member of a unit equipped with only a Water Safety Kit shall enter into the water. Generally, a Water Safety Unit will not enter the water if a Water Rescue Unit is on scene.

Note: Members entering water shall have their feet protected. Members may have no idea of the depth of the water or debris present until they enter it. Member can leave shoes on or if wearing bunker gear step out of pants remove boots from pants and put boots back on.

PERSONAL FLOTATION DEVICE WITH TETHER ROPE

A. Unit must notify Dispatcher that FDNY personnel are entering the water.
B. Place ladder if necessary for entry and egress.
C. Member must have a properly donned PFD.
D. Member must be properly tethered utilizing the Life Saving Rope or 75' Throw Rope attached to the "O" ring on the back of the PFD using the snap hook. (Photo 4)
E. Enter water bringing Life Ring.
F. Approach victim with caution.
G. If victim is ambulatory the rescuer shall pass the Life Ring to the victim while maintaining hold of it. If the victim is non-ambulatory grab hold of the victim from the rear and maintain his/her head above the water.
H. Rescuer signals to the Tether team when ready to be pulled to safety. (See Section 6 and photos 24 and 25.)
I. The Tether team must monitor both the rescuer and victim until pulled to safety.

Note: If the tether line becomes tangled the firefighter can pull the quick release which will release the tether line.

4. ***Redacted for PFS***

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5. REMOVAL PROCEDURE

5.1 When deciding on method of victim removal the rescuer should consider if head, neck, or spinal injuries could be present.

5.2 Utilize the quickest and safest means to remove the victim from the water. The point of exit does not have to be the same as the point of entry.

5.3 When the rescuer and the unconscious/non-ambulatory victim reach the point of exit from the water the victim may be placed in the stokes basket if necessary. This shall be accomplished as follows:

- The rescuer brings the victim to the stokes basket near the point of exit. The victim is then placed into the stokes basket. This may require more than one rescuer.

- When victim is placed in the stokes basket secure the top straps under the victims arms and the bottom straps will go over the victims ankles. The middle straps will be placed over one thigh and under the other, to stop the victim from sliding down when lifting vertically. (Photo 15)

5.4 Additional members shall ensure a portable ladder is in place if needed. When necessary a 2:1 mechanical advantage using this ladder and a LSR shall be set up. This can be accomplished as follows:

A. Secure the ladder and tether it in place.
B. The top rung of the ladder can be used as an anchor point for the 2:1.
C. The working end of the rope shall be passed through a small carabineer on the bottom of stokes generally 1/3 of the way down from the head. (Photo 22)
D. The stokes basket may be lowered feet first to the rescuers in water using this system. Make sure the flotation collar is at the head of the stokes basket.
E. After the victim is secured to the stokes basket the Primary Rescuer will guide the head of the stokes between the beams of the ladder as the members above begin to hoist. (Photo 23)
F. Pulling on the working end of the rope will give a 2-to-1 mechanical advantage.

Photo 22

Photo 23

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6. COMMUNICATIONS

6.1 Pre-determined hand signals have been established to allow the Rescuer and Tether to communicate. All FDNY members should familiarize themselves with these signals.

6.1.1 One hand placed on top of the rescuer's head indicates the rescuer is ready to be pulled to shore. (Photo 24)

6.1.2 One arm waving in the air indicates stop pulling. (Photo 25)

Photo 24 Photo 25

7. *REDACTED FOR PFS*

8. EQUIPMENT CARE AND MAINTENANCE

8.1 Rinse and air-dry all ropes suits and carabineers after each use or drill. The Lifesaving Rope shall be examined and maintained according to the procedures outlined in Training Bulletin, Rope 1.

8.2-8.3 ***Redacted for PFS***

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9. QUICK REFERENCE CHARTS

WATER SAFETY UNITS

Position		Tools	Procedure
Rescue Coordinator 4 FF Engine, also assume Victim Spotter position.	Choose point of operation. Decide whether or not to enter water.	Handi-talkie, flashlight, thermal imaging camera	Supervise operation and control members.
Victim Spotter: Keep sight of victim.	Serves as a spotter. Establishes an observation point.	Binoculars, handi-talkie, flashlight	Visually observe victim. Keep track of victim's condition and surroundings.
Primary Rescuer TEAM # 1	Dons PFD. Communicates with victim. Approach victim no closer than to effect rescue.	Water Safety Kit	Reach: Use hook and get victim to grab it. Throw: Throw rope over and past victim, get victim to wrap it around arm and hold on. Go: LAST RESORT, enter water.
Primary Tether TEAM # 1	Monitors Primary Rescuer and controls tether line (LSR).	LSR, PFD, Handi-talkie	Ensure Rescuer PDF is attached to tether line (LSR).
Secondary Rescuer TEAM # 2	Dons second PFD. Ready to assist Primary Rescuer or enter for additional victims.	Water Safety Kit	Standby unless needed to assist Primary Rescuer/Second victim.
Secondary Tether TEAM # 2	Monitors Secondary Rescuer and controls tether line(LSR).	LSR, PFD, Handi-talkie	Ensure Secondary Rescuer PDF is attached to tether line (LSR).

Note: In rare instances when the officer is the only capable swimmer these positions can be interchanged. This should be discussed at roll call.

WATER RESCUE UNITS

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INFLATABLE WATER RESCUE HOSE

1. INTRODUCTION

1.1 Inflatable Water Rescue Hose may be used during Water/Ice rescue incidents involving one or more conscious victims. Every company, including Battalions, carry the Yellow Water Rescue Fittings.

2. EQUIPMENT

2.1 The following equipment shall be used to deploy inflatable hose for Water/Ice rescues:

- Yellow Water Rescue Fittings

  One 2 ½" Female Cap w/ Shackle & Snap Bolt (Photo 1)

  One 2 ½" Male Fitting w/ Shackle & Check Valve (Photo 2)

- Lengths of 2 ½" Hose

- Spanner Wrenches

- Supply air from either a SCBA or Fast-Pak using the Hansen fitting. Do not fill the hose directly from the cylinder. If close enough, the apparatus air outlet may be used.

Note: This equipment is found in the Water Safety Kit that is issued to all units.

Photo 1

Photo 2

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3. AIR FILL PROCEDURES

3.1 Members shall deploy the required lengths of hose near the point of operation. Attach the Water Rescue fittings and ensure that all connections are spanner tight prior to filling with air.

3.2 To fill the hose using a SCBA or Fast-Pak, members shall disconnect the low pressure hose at the Hansen fitting (Photo 3). Attach air hose to male connection of hose fitting (Photo 4). Inflate the hose until it is completely filled and possesses rigidity similar to a charged hoseline. One 45 minute cylinder can fill five lengths of 2 ½" hose in approximately 1 minute.

Photo 3

Photo 4

3.3 To fill the hose using the apparatus air outlet, members shall connect the male connection from hose directly to the air outlet on apparatus. The apparatus air outlet can fill five lengths of hose in approximately 1 minute (Photo 5).

Photo 5

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4. OPERATIONS

4.1 Inflatable Water Rescue Hose can be deployed in either a straight line or loop. Straight line deployment can be used at incidents from a pier or shore involving a few victims within close proximity (Photo 6). It can also be used to reach a victim on ice. When deployed as a loop it increases buoyancy and can be used for multiple victims. Each looped length is capable of supporting approximately 10 people.

Photo 6

Photo 7

4.2 More than two lengths of hose can be used for larger operations increasing the amount of people that can be supported.

4.3 Units should have air filled hose secured with utility rope.

4.4 Take note of the water current as it may be necessary to deploy the hose ahead of the anticipated path of water travel.

5. DEFLATION

5.1 Upon completion of operations, spanners should be used to loosen couplings of the Inflatable Hose Fittings to allow air to escape. Loosen the fitting until the sound of air escaping can be heard. Do not loosen completely at this time. When the hose softens, fittings can be removed completely.

6. CLEANING

6.1 Rinse all ropes and hose after each use.

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EMERGENCY PROCEDURES
WATER RESCUE 2, ADDENDUM 2
December 6, 2018

LOWERING MEMBER INTO WATER USING TETHER ROPE AND ATLAS LIFE BELT

1. INTRODUCTION

1.1 The varying topography of the NYC coastline can help or hamper rescue efforts. At times units may find themselves elevated above the surface of the water that they are trying to enter. This may be due to the height of the natural shoreline, or the effects of structures such as piers, dock, retaining walls, or other raised platforms. Tidal stages will also effect where the surface of the water is in relation to the unit's operating position.

2. OBJECTIVE

2.1 To lower a member wearing a Cold Water Rescue Suit from a pier, dock, retaining wall, or other raised platform into the water to perform a water rescue.

3. EQUIPMENT

3.1 200' Tether Rope.

3.2 Cold Water Rescue Suit with quick release harness.

3.3 Atlas Life Belt.

3.4 PFD for lowering member.

3.5 When used in conjunction, the entire system is rated for 5,500lbs.

4. PREPARATION FOR LOWERING

4.1 All members operating at or near a water emergency must wear a PFD. Bunker gear shall only be worn when operating in the immediate vicinity of water/Ice operations when absolutely necessary.

4.2 Place the Tether Rope bag on its side midway between the point of descent and the substantial object. (Photo 1)

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Photo 1

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Photo 2

4.3 Remove enough rope from the end of the bag with the single small carabineer to reach the substantial object. Secure rope to substantial object by wrapping the Tether rope around the object three times and clipping the small carabineer back onto the rope. (Photo 2)

Photo 3

4.4 Follow the rope that is now tied off to the substantial object back to the blue bag and tie a figure eight knot in the rope close to bag. It is critical that the figure eight knot is tied in the section of the rope between the substantial object and the bottom of the blue bag as close to the bag as possible for this evolution to safely work. (Photo 3)

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Photo 4

4.5 Feed the figure eight knot up through the ring on the life belt and around the rappel hook. Step forward to remove all slack. (Photo 4)

4.6 Remove sufficient rope from the blue bag with the small carabineer and large cinch carabineer attached.

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Photo 5

Photo 6

4.7 Attach small carabineer to the D-ring of the quick release harness on the rear of the Primary Rescuers Cold Water Suit. (Photo 5)

4.8 Next attach the Large Cinch carabineer to the front D-rings of the quick release harness of the Cold Water Suit. (Photo 6)

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5. LOWERING OPERATIONS

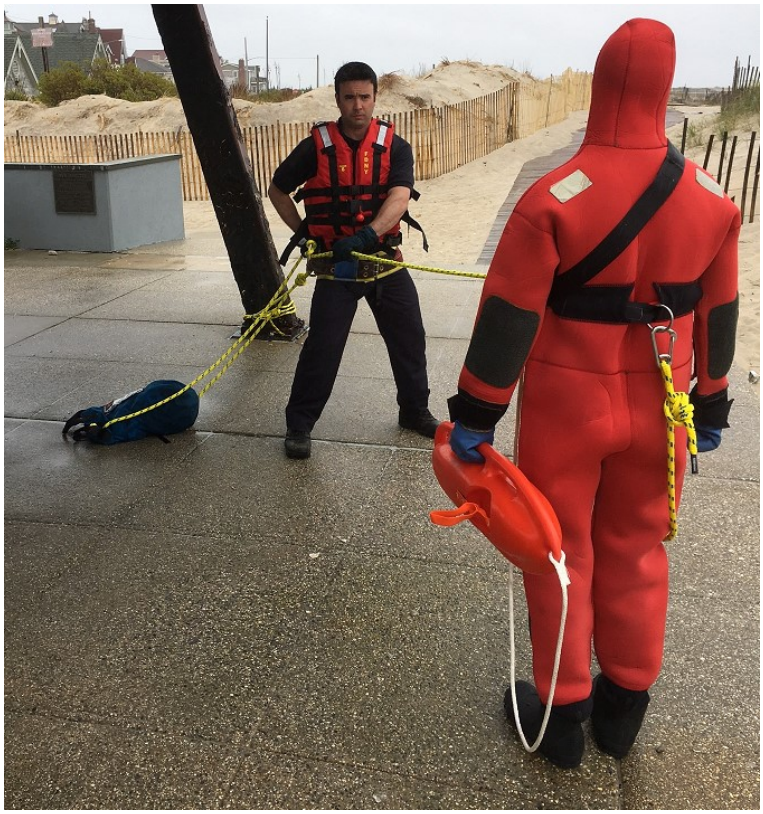

Photo 7

5.1 The Lowering member shall grasp the section of the rope that is now attached to the Primary Rescuer and properly attach it to the hook of the Atlas life belt as described in Evolution 26. (Photo 7)

5.2 To reduce redundancy, from this point, members shall proceed as outlined in Evolution 26 (Lower person using LSR and Life Belt) substituting the Tether rope for the Life Saving Rope.

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ICE RESCUE

1. GENERAL

1.1 New York City winters can complicate FDNY operations adding many challenges for the members to overcome. One extremely difficult and dangerous operation faced during the winter months is the rescue of victims who have been trapped on unstable ice or have fallen through the ice.

1.2 Many variables will affect the outcome of an ice rescue. As always, size-up is extremely important. Some points to consider at an ice rescue emergency are:

- Stability and thickness of the ice.
- How long has it been below freezing and the current temperature?
- Units on scene and availability of proper PPE (Cold Water Suit equipped or not).
- Physical/Mental condition of victim.
- Distance from shore.
- Number of victims.
- Access/Egress to and from the incident location.

1.3 When performing a shore-based ice rescue, members are reminded that there is no such thing as safe ice. The best tactics to employ are those that keep the members off the ice shelf.

2. RESCUER SELECTION (WATER RESCUE UNITS AND WATER SAFETY UNITS)

2.1 Roll Call is the time to determine which member or members will enter the water if the emergency requires. FDNY members comfortable in the water, such as former lifeguards or trained scuba divers, would be the logical choice to select. It would not be a good practice to assign your Primary Water Rescuer as a riding position, e.g., nozzle firefighter is always the Primary Rescuer. This member may not feel comfortable in the water, and you may have someone with more training and water experience that would be better suited for that assignment.

2.2 The untrained and inexperienced potential rescuer could become a victim. Preplanning, proper equipment, and training will ensure the safest outcome in these types of incidents.

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3. WATER SAFETY UNITS (OPERATING AT ICE EMERGENCIES)

3.1 EQUIPMENT (WATER SAFETY KITS)

3.1.1 WATER SAFETY UNITS will use the equipment provided in the Water Safety Kit in addition to any other equipment available to them that they deem useful (e.g., ladders, hooks). Inflatable Water Rescue Hose can be placed into operation as outlined in Chapter 2, Addendum 1.

3.2 POSITIONS **(WATER SAFETY UNITS)**

3.2.1 The same positions and nomenclature as outlined in Water Rescue shall also apply to Ice Rescue. Adaptations to these positions can be made by the Incident Commander as deemed necessary.

3.3 PROCEDURES **(WATER SAFETY UNITS)**

3.3.1 Size-up begins with the receipt of an alarm. Members selected at roll call will don PFDs at quarters prior to boarding apparatus when responding to a possible ice rescue emergency.

3.3.2 Size-up will continue upon arrival at the scene. Once it has been confirmed that there is a victim to be rescued, notify the dispatcher, and request additional resources. At this time risk vs. reward factors should be considered and the method of rescue, if feasible determined. Generally, there are two methods Water Safety Units have available to them for ice rescues:

- Reach
- Throw

3.3.3 REACH: Rescuer shall only use the reach method from a safe area. The rescuers shall consider using any long object on scene that can be passed to the victim. The victim will be instructed to grasp the object while the rescuer attempts to hoist the victim to safety. If the victim is physically unable to assist in their removal the rescuer shall attempt to control the victim with the tool or object. The reach method should not be abandoned even after a Water Rescue Unit is on scene and a rescuer is making their way out to the victim. Rescuers shall consider the use of the following items:

- Outstretched hand.
- Ladders (FDNY ladders or ladders which have been strategically placed by the NYC Parks Department around bodies of water for this purpose).
- Hooks or poles.
- Inflatable Water Rescue Hose used in a straight line.
- Any other object available on scene.

Note: The rescuers reach may be increased by operating from a horizontally extended Tower Ladder or Aerial Ladder.

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3.3.4 THROW: This method is used when a victim is ambulatory and can assist in their own rescue. The throw method does not necessarily follow the reach method, in fact, they should be employed simultaneously when conditions allow or when the victim is beyond reach.

THROW ROPE

A. Remove the loop from the bag and place the loop onto the non-throwing hand.

B. The member's dominant hand will throw the bag while the other hand holds the rope.

C. Throw the bag over and past the victim.

D. Have the victim wrap the rope around their arm and hold the rope.

E. Pull the victim to safety.

F. Verbal communication with the victim is paramount. Only one rescuer shall communicate with the victim to avoid confusion.

LIFE RING WITH ATTACHED TETHER LINE

A. Hold the throw bag with the loop handle in the member's non-throwing hand.

B. The member's dominant hand throws the life ring while the other hand maintains hold of the loop handle.

C. Throw the Life Ring over and past the victim.

D. Have the victim hold the Life Ring.

E. Pull the victim to safety.

3.3.5 GO: It is not recommended for any unit without a Cold-Water Suit to enter the water. Hypothermia can be life threatening to the rescuers.

4. *Redacted for PFS*

5. REMOVAL AND MEDICAL CONCERNS

5.1 Utilize the quickest and safest means to remove the victim from the water/ice.

5.2 Units shall have a stokes basket positioned at the point of exit from the ice. When the rescuer and the unconscious/non-ambulatory victim reach this point, the victim shall be placed in stokes basket if needed.

5.3 Ensure the path from the shoreline to the ambulance is unobstructed. Consider assigning a unit to this task.

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5.4 Exposure to cold water can lead to a life-threatening medical emergency. Placing the victim into a warm environment as quick as possible and removing all wet clothing will increase the victim's chance of survival. The victims should also be wrapped in warm blankets.

5.5 The same medical considerations shall be given to the rescuers who operated in the Cold-Water Suits.

6. Redacted for PFS

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SURF RESCUE

1. INTRODUCTION

1.1 Many New York residents are attracted to the shorelines found throughout the city. Ocean and bay beaches can be found in all five boroughs. These waters may prove to be more dangerous then they appear. Waves may look tranquil from the beach but can be incredibly powerful. For those who are unfamiliar with tidal waters the risk of drowning can be very real. Although lifeguards may be present at specified areas and times, much of the coastline remains unprotected. The areas with lifeguard coverage are limited to the season of the year and the time of day. In many instances the FDNY will be called upon to perform these surf rescues.

1.2 All FDNY units have some capability to operate at a water emergency however many are limited by the training and equipment provided. Water Rescue units have been given additional equipment and training increasing their capabilities. Certain companies whose response area includes waters where a surf rescue is likely have been issued additional Surf Rescue equipment (Section 3).

2. TIDES

2.1 Tidal conditions, wind conditions, and currents are just some additional size-up concerns that must be considered during a surf rescue. Rescuers should be familiar with tides and how they will impact the operation.

2.2 There are 4 tides in 24 hours: 2 tides are coming in (High) and 2 are going out (Low). Slack tide is 45 minutes between High and Low tides.

2.3 **Rip Currents** – are powerful, narrow channels of fast moving water and occur when the tide is going out. Rip Currents move at a speed of up to eight feet per second which is faster than an Olympic swimmer. They can occur at any beach where there are breaking waves and their location can be unpredictable. While some Rip Currents tend to recur in the same place, others can appear and disappear suddenly at various locations along the beach.

2.3.1 A Rip Current forms because breaking waves push water towards the land. Water that has been pushed up near the beach flows together (as Feeder Currents), and this water finds a place where it can flow back out to sea. The water then flows out at a right angle to the beach in a tight current called the "neck" of the rip, where the flow is most rapid. When the water in the Rip Current reaches outside of the lines of breaking waves, the flow loses power, and dissipates in what is known as the "head" of the rip. (Figure 1)

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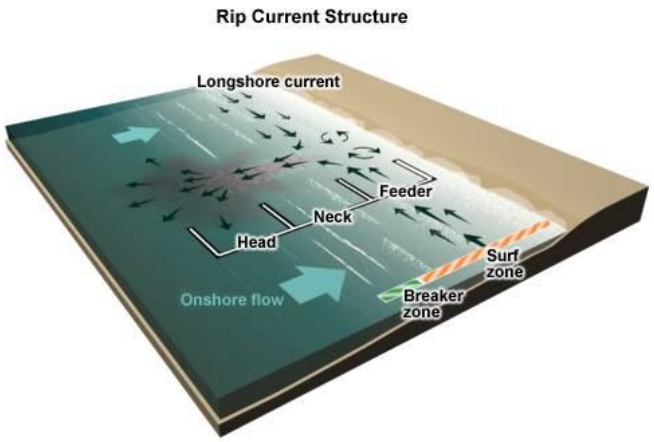

Figure 1

2.3.2 Rip Currents carry any floating objects, including people, to an area outside the zone of the breaking waves. These currents pull people into deep water very quickly and are the primary source of distress in drowning victims in oceans.

2.3.3 Panicked swimmers often try to counter a Rip Current by swimming straight back to shore causing fatigue which can lead to drowning. If caught in a Rip Current the correct action is to swim parallel to the shore until out of the head and then swim back to the land at an angle in the onshore flow.

2.3.4 Rip Currents can be used to the advantage of the rescuer in order to reach the victim quickly. Entering this current will help carry the rescuer out to the location of victim. After contact is made with the victim, the Primary rescuer will bring the victim out of the head of the current before signaling to be pulled to shore.

2.4 **Long-Shore Current (Sweep Tide) -** A Long-Shore Current is an ocean current that moves parallel to shore. It is caused by swells sweeping into the shoreline at an angle and pushing water down the length of the beach in one direction. They vary depending on the size, strength, and direction of the approaching swell. Long-Shore Currents are more pronounced at out-going tides and are common at any beach that is exposed to breaking surf. The longer and straighter the beach is, the more powerful and swift the Long-Shore Current will be (Figure 2).

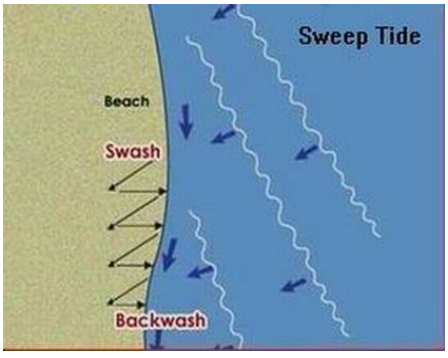

Figure 2

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2.4.1 Long-Shore Currents can be a factor in a rescue situation. Since Long Shore Currents run parallel or diagonal to the beach they can sweep swimmers and surfers into Rip Currents, piers, jetties, and other hazardous areas. In many cases, the Long-Shore Current is strong enough to prevent swimmers from being able to keep their feet on the bottom, making it difficult to return to shore.

2.4.2 Rescuers should enter the water upstream of the Long Shore Current (Sweep Tide) and swim with the current to reach the victim. Contact with the victim will be difficult if the rescuer takes a straight on approach because they will be swimming against the sweep to get to the victim (Figure 2).

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DIVE ASSIST

1. GENERAL

1.1 The FDNY has trained and equipped its Rescue companies in Dive Rescue operations. When a victim is submerged below the surface, the incident is now beyond the capability of a water rescue unit. Rescue divers will be deployed in order to recover the victim.

1.2 Rescue divers are trained and prepared to dive for life safety purposes. Many members of the Rescue units have completed the FDNY dive safety program and are certified municipal rescue divers.

2. SIZE-UP

2.1 ***Redacted for PFS***

2.2 If the victim is submerged, immediately search for a reliable witness. Once located, ensure the witness keeps their reference point and visually maintains the last location where they saw the victim prior to submerging. Do not allow the witness to be removed from this reference point. Keep the witness at this location throughout the operation.

2.3 Once the last location of victim is confirmed, units on the scene shall determine the best access point for the entry of the Rescue divers. This shall be relayed to the responding Rescue company officer. Upon arrival the Rescue Officer will determine if the selected site is suitable for dive operations and adjust if necessary. Available members shall remove any obstruction that would impede access and egress to this site.

3. OPERATIONS

3.1 ***Redacted for PFS***

3.2 In order to expedite the rescue effort, units should be prepared to assist the Rescue divers with transporting any needed equipment to the entry point. The assistance of at least one company will have to be dedicated to this task.

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3.3 In addition to the Rescue company's technical equipment, units should ensure the following equipment is brought to the scene.

- Ladders
- Hooks
- LSR
- Stokes basket/backboard
- Portable lights if needed

3.4 An Engine company on the scene shall be dedicated to CFR duties and members should be staged as near as practical to the exit point of the victim/rescuers. This company can also be utilized to help transport the patient from the shoreline to the awaiting ambulance. This could be a remote location depending upon the incident.

3.5 An Engine company on the scene shall hook up to a hydrant and have a hoseline stretched and charged. This hoseline can be used to:

- Cool back-up divers especially on very hot days.
- Decontaminate Divers.
- Decontaminate victims prior to transport when requested by EMS.

3.6 An available member can be used by the Rescue officer to assist in keeping track of his/her members' in-water times and on-air times.

3.7 Have a member utilize binoculars to lookout for maritime traffic and maintain visual contact of members in the water.

4. ***Redacted for PFS***

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STEAM SYSTEM EMERGENCIES

1. INTRODUCTION

1.1 Con Edison supplies high pressure steam to nearly 1,600 buildings from 96th Street to the Battery in Manhattan through more than 100 miles of buried high pressure steam pipe. It is generated in plants located in Manhattan, Brooklyn and Queens and is piped underground to the end users in Manhattan. (Table 1) Steam pipes run under streets and sidewalks with manholes providing access to the underground steam system. (Photo 1)

Photo 1
Concrete slabs typically cover steam vaults
with access manholes placed in pairs.

1.2 Con Edison is not the only entity generating high pressure steam in New York City. High pressure steam, generated for use in housing complexes, hospitals, college campuses and various commercial locations can be found in any borough. These District Steam systems will have the same hazards as the Con Edison system but will not be run or maintained by Con Edison. When discovered, district steam systems shall be entered into the CIDS Program.

Table 1 (*Redacted for PFS*)

2. HIGH PRESSURE STEAM

2.1 Steam is invisible. The white mist seen is the condensate that forms when steam cools.

2.2 Steam pressures in generating plants can be as high as 2,000 psi with temperatures reaching 900ºF. Steam pressures in the buried supply piping and in supplied buildings can be as high as 400 psi and temperatures as high as 450ºF.

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2.3 High Pressure steam is used in buildings for a number of purposes e.g., to provide heat and hot water, to heat food or to run air conditioners.

3. STEAM PIPE RUPTURE

3.1 When water comes into contact with the outside of a high pressure steam pipe, the water boils and steam is generated. This water may come from a heavy rain or a leaking water main. If enough water contacts the pipe, it can cool the steam inside the pipe, causing it to condense back into water condensate. Normally, this water is drained off by a series of drains called "Traps." If the condensate is not drained off and accumulates inside the steam pipe it can create a water slug. Water slugs can be pushed through the piping by the steam at speeds as high as 200 mph. If this water slug encounters a bend in the piping, the impact can cause the pipe to rupture, resulting in a release of high pressure steam.

3.2 Other possible causes for pipe rupture include street undermining, structural collapse, contractor damage or some other physical damage to the pipe. Con Edison workers refer to a steam pipe rupture as a High Energy Line Break (HELB).

4. HIGH ENERGY LINE BREAK

4.1 High Energy Line Break (HELB) in a Generating Plant

Hazards

- High temperature and high pressure steam.
- Leaking steam will condense quickly filling the plant, obscuring vision.
- Asbestos release. Asbestos pipe insulation can be found in the plant, on pipes buried under the street and in buildings supplied with steam.
- A high pressure steam leak will make verbal communications difficult.
- A pinhole leak in a high pressure steam pipe, though invisible near the source, is capable of instantly cutting through a steel bolt.

General Hazards (in Steam generating Plant)

- Heavy machinery and moving equipment.
- Sumps filled with near boiling water.
- High pressure natural gas lines, other flammable gases under pressure and compressed gas cylinders including oxygen, acetylene and hydrogen.
- High voltage electric, up to 345,000 volts.
- Fuel and lube oils.
- Acids and caustics.

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Tactics

- Never enter a Con Edison generating plant without Con Edison personnel. Instead, respond to the designated mustering site (white-hat location) outside of the plant.
- Plant personnel will mitigate the emergency. FDNY should only enter the plant to perform search and rescue for missing plant personnel.
  a) When entering the plant, stay close to the provided escort and be guided by their advice.
- Contact the Con Edison White Hat who can:
  a) Provide critical information and an escort if FD entry is necessary.
  b) Provide a personnel accountability report to see if anyone is missing.
  c) Remain at the Command Post as a Technical Specialist.

4.2 High Energy Line Break (HELB) in the Street

Hazards

- Underground steam pipes are most commonly wrapped with asbestos insulation and a HELB will likely result in an asbestos release that spreads over a large area. A steam main break is a haz-mat incident and should be treated as an airborne release of asbestos until confirmed otherwise.
  a) Asbestos has been removed from Con Edison steam manholes but remains in the underground piping.
  b) Asbestos may be drawn into structures by a building's ventilation system.
- The pressure released in a HELB is high enough to cause an intact street to collapse or explode outward as the high pressure steam escapes from the ruptured pipe.
  a) Escaping high pressure steam can hurl debris at 200 mph. Anyone in the vicinity of the break is in danger of being struck by flying, high velocity debris.
  b) Slugs of hot water released from the rupture and hot water on the pavement may cause burns to firefighters and civilians.
  c) Debris released from the HELB may break glass in surrounding buildings. This will allow asbestos to contaminate the interior of the building and its occupants.
  d) Debris in the street may make it difficult to move Department or civilian vehicles. (Photo 2)

Photo 2
Debris covers the street in the aftermath of a steam pipe rupture.

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- Anyone in the vicinity of the escaping steam will be exposed to high temperatures and may sustain serious burn injuries.
- Breathing superheated steam can result in respiratory burn injuries.
- A ruptured underground steam pipe can expose and damage underground high-voltage electric cables, natural gas piping and water mains.

  a) The escaping high pressure steam can impact a gas meter's ability to detect gas leaks in the area near the rupture

  b) The result may be a natural gas leak ignited by arcing from damaged electric lines.

  c) If water mains are damaged, the hydrants in the area may not be serviceable.
- The noise of escaping steam will make radio and verbal communications difficult in the immediate vicinity of the release.
- Condensing steam will obscure the vision of escaping civilians and responding firefighters.

  a) The force of escaping steam can project manhole covers into the air. Missing manhole covers and the crater and debris resulting from the HELB may not be visible.
- People may be trapped in vehicles, buildings and subways by the escaping steam.

Tactics

- Approach an outdoor HELB from upwind and stay clear of the vapor plume.
- Establish the Staging Area where units will not become contaminated by asbestos and where communications are effective.
- Consult with the Con Edison White Hat. They may be supervising the shutting of numerous steam valves.
- Limit the number of firefighters exposed to probable asbestos contamination.
- Isolate exposed responders, civilians and equipment in order to limit the spread of asbestos contamination.
- Prevent occupants from exiting buildings into the Exclusion Zone.
- Consider evacuating buildings from the rear or side entrances to avoid the Exclusion Zone.
- Prepare for decontamination of civilians, firefighters, bunker gear, tools, equipment and vehicles.
- Consider shutting the HVAC systems of nearby buildings.

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4.3 Steam Leak in the Street

The steam frequently seen rising from the ground and from steam manholes is usually not the result of a HELB. More often, it is the result of water from a heavy rain or a leaking sewer or water main, contacting the steam pipe and turning to steam vapor. Con Edison may place a **steam stack** over minor steam leaks, to direct the steam to vent up over the roadway. If a steam stack has a blue stripe on it, this indicates that the steam is the result of a water leak, not a leaking steam main. (Photo 3)

Photo 3
This steam stack over a steam manhole vents and directs steam up above the roadway.

- All steam vapor conditions not covered by a steam stack must be reported to Con Edison Steam via the FD dispatcher or by calling (212) 894-9540 and providing the severity of vapor. Minor vapor is a plume of less than 5 feet, Moderate vapor is a plume of about 5 to 9 feet and Severe vapor is a plume 10 feet or greater. (Photo 4)

Minor Vapor
< 5 foot plume

Moderate Vapor
5-9 foot plume

Severe Vapor
10 feet or higher plume

Photo 4
Steam vapor condition severity

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4.4 High Energy Line Break (HELB) in a Building

These incidents can range from a leaking radiator to a life threatening high pressure steam riser rupture.

Hazards

- High pressure steam risers can be found in the walls on all floors of supplied buildings. The failure of a high pressure steam pipe inside of a building can be deadly to anyone in the vicinity of the release. It can force sheetrock and plaster off of the wall, move furniture and fill rooms with superheated steam that scalds occupants and makes the atmosphere oxygen deficient.
- Occupants in the vicinity of a steam release may not have the opportunity to escape.
- High pressure steam pipe failure can also cause damage to electric and gas infrastructure in the building. Releasing steam can impact a gas meter's ability to detect leaks.
- High pressure steam pipes inside of buildings are typically insulated with asbestos and a HELB in a building will likely release asbestos inside the building.

Tactics

- The high heat may make it impossible to enter the affected area for search and rescue until the steam is shut and the area vented.
- Operating in live steam is debilitating and relief will be necessary to minimize member exposure time.
- Buildings supplied with Con Edison steam will have a steam control room filled with pipes. There will be a number of valves with different tags and seals to control the supply of steam. Do not randomly shut steam valves inside of a supplied building. Shutting the wrong valve can cause damage to the system creating other hazardous conditions and personal injury. (Photo 5)
  a) In an emergency, members may shut the Inside Service Valve. It will be labeled with a red caution tag and sealed. If possible, wait for Con Edison steam personnel to shut the necessary valves. (Photos 6 and Photo 7)
  b) Once a steam valve is shut, do not reopen it. The system will have to be drained before reopening the valve.
  c) Notify Con Edison Steam via the FD dispatcher if a valve is shut. Failure to do so can result in damage to the system and injury to Con Edison personnel working to restore the system.
  d) There is a building steam shutoff located outside the building. FD members should not attempt to shut this valve. This valve should **only** be shut by Con Edison steam personnel. Improperly operating the steam shutoff valve outside the building can result in a HELB in the streets and injury to Con Edison personnel, FD members and the public.
- Adjoining areas to the steam leak must be searched, as steam can infiltrate these areas.

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Photo 5
Do not randomly close valves

Photo 6
Inside Service Valve

Photo 7
The red caution tag identifies the Inside Service Valve which is to be closed only in an emergency and opened only by Con Edison steam employees.

5-6. ***Redacted for PFS***

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1-3. ***Redacted for PFS***

4. CONTROL ZONES

A hazardous materials incident generally involves the escape of the product from its container or containment system. Response to an incident requires actions to minimize or prevent these discharges. Scene security and control involves preventing or reducing the exposure to any civilian or responder, as well as preventing the transfer of hazardous substances by civilians, members and equipment from the Exclusion Zone to the Support Zone. Scene control involves:

4.1 Physical arrangements and control of work areas such as:

4.1.1-4.1.3 ***Redacted for PFS***

4.1.4 Establishing control zones based upon expected or known levels of contamination to reduce the potential for transfer of contamination. Three contiguous areas will be established:

Exclusion Zone (contaminated) - "Hot Zone"

Contamination Reduction Zone - "Warm Zone"

Support Zone (non-contaminated) - "Cold Zone"

4.2 Exclusion Zone—Hot Zone

4.2.1 The Exclusion Zone or Hot Zone is the innermost area of the scene and is considered contaminated or "hot."

4.2.2 All personnel entering the Exclusion Zone must wear appropriate personal protective equipment.

4.2.3-4.2.5 ***Redacted for PFS***

4.2.6 People, equipment and apparatus leaving the Exclusion Zone should be considered contaminated and must be decontaminated before leaving the scene.

4.3 Contamination Reduction Zone—Warm Zone

4.3.1 The Contamination Reduction Zone (CRZ) or Warm Zone lies between the Exclusion Zone and the Support Zone.

4.3.2 The Contamination Reduction Zone is an area provided to prevent or reduce the transfer of contaminants that may have been picked up by personnel or equipment exiting the Exclusion Zone.

4.3.3 All decontamination activities occur in the Contamination Reduction Zone.

4.3.4-4.3.6 ***Redacted for PFS***

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4.3.7 Exiting the Contamination Reduction Zone to the Support Zone requires the removal of any suspected or known contaminated protective clothing and/or equipment, following appropriate decontamination procedures.

4.3.8 Moving further away from the Exclusion Zone may allow for personnel to operate in a decreased level of PPE.

4.3.9 ***Redacted for PFS***

4.4 Support Zone—Cold Zone

4.4.1 The Support Zone is the outermost area of the site and is considered uncontaminated.

4.4.2 The Support Zone is designated as a controlled area for authorized support personnel and equipment.

4.4.3 No contaminated persons, equipment or apparatus are permitted in the Support Zone.

4.5 ***Redacted for PFS***

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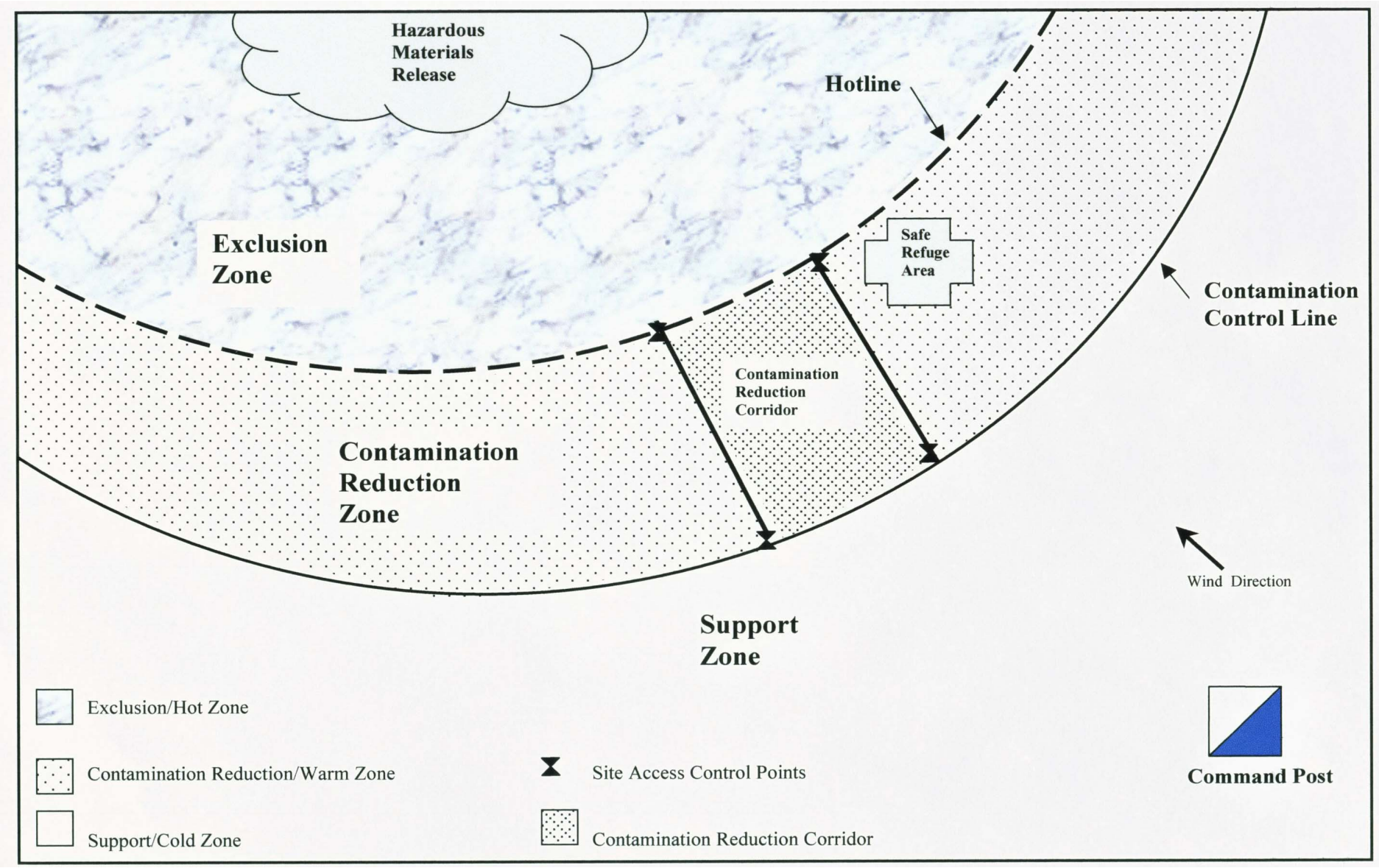
CONTROL ZONE DIAGRAM



5-8. ***Redacted for PFS***

9. INCIDENT COMMANDER

9.1-9.5. ***Redacted for PFS***

9.6 Establish the following facilities

9.6.1-9.6.2. ***Redacted for PFS***

9.6.3 Safe Refuge Area(s)

The Safe Refuge Area is established in the Contamination Reduction Zone for people removed from the hazardous area before decontamination.

9.6.4 Casualty Collection Point

The Casualty Collection Point is an area established in the Support Zone for Medical Branch personnel to triage and treat decontaminated victims.

10-21. ***REDACTED FOR PFS***

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CARBON MONOXIDE (CO)

1. INTRODUCTION

1.1 Due to increased public awareness and the availability of carbon monoxide (CO) detectors for the home, the Fire Department is being called to investigate activated CO detectors and other CO related emergencies.

2. PROPERTIES

2.1 CO is a colorless, odorless, tasteless, non-irritating, toxic gas.

2.2 CO is a natural by-product of incomplete combustion from fuels such as (gasoline, wood, coal, propane, oil and methane).

2.3 In the home, heating and cooking equipment are possible sources of CO. Vehicles running in an attached garage can also produce dangerous levels of CO. When a faulty appliance or unusual condition exists, CO may be vented into areas where people are present. CO has been known to vent into nearby buildings from manhole fires.

2.3 Virtually undetectable without special instruments.

2.4 It is a flammable gas with an auto ignition temperature of 1128 Degrees F., and a Lower Explosive Level (LEL) of 12.5% and an Upper Explosive Level (UEL) of 74%.

2.5 CO has a vapor density which makes it slightly lighter than air (.968). Since warm air rises, CO rises with it, e.g. air from a furnace, hot water heater, or a fire. Once this emitted air cools to room temperature, CO will disperse evenly through the room.

2.6 Two CO Meters have been issued to each Battalion, Ladder and Engine Company. One CO Meter shall be worn by the Battalion Chief / Company Officer affixed to the HT Radio strap above the remote mic.

It is recommended that Ladder Companies assign the second meter to the OV position. The Engine's second meter shall be carried with the CFR equipment, attached to the O2 bag. This will ensure a CO meter is present for members while initially responding to and operating at a Medical response (e.g. unconscious person, lock in with no response, confined or enclosed areas, etc.) Edited for PFS

2.7 ***Redacted for PFS***

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3. HEALTH HAZARDS

3.1 CO can kill before its presence is known.

3.2 Provides no early warning signs.

3.3 Displaces O_2 in bloodstream and asphyxiates victim.

3.4 Highly toxic.

3.5 CO is absorbed into the body through the lungs where it is transferred to your blood.

3.6 Once in the body it combines with hemoglobin and becomes a deadly compound called carboxyhemoglobin (COHb). Poisoning is measured by percentage of COHb in the blood.

3.7 COHb reduces blood's ability to transport O_2 to the body.

3.8 Reduced O_2 harms life support functions (brain, cardiac and respiratory activity).

3.9 CO has a greater affinity for hemoglobin than O_2. CO is about 210 more attracted to hemoglobin than O_2.

3.10 Final levels of COHb depend on the following factors:

a. Initial COHb concentration.

b. Concentration of CO inhaled.

c. Length of CO exposure.

d. Activity while inhaling CO.

e. Body size and other physiological factors.

3.11 To reverse the buildup of COHb in the body, over 200 parts of oxygen are required to replace one part of CO.

3.12 Symptoms of CO Poisoning:

a. Low Level CO Poisoning- can mimic flu symptoms, headache (mild/severe), fatigue, nausea, dizziness, confusion, irritability.

b. Medium Level CO Poisoning- vomiting, drowsiness, loss of consciousness.

c. High Level CO Poisoning- seizure, coma, permanent brain damage, death.

3.13-3.15 ***Redacted for PFS***

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4. OPERATIONAL GUIDELINES

4.1 ***Redacted for PFS***

4.2 CO investigation will determine if the response is an "Incident" or an "Emergency".

4.2.1 CO Incidents: No occupants are symptomatic and meter readings of 9PPM or less.

4.2.2 CO Emergencies: Occupants are symptomatic or meter readings greater than 9 PPM.

4.2.3-4.2.6 ***Redacted for PFS***

4.3-4.5 ***Redacted for PFS***

5. ***Redacted for PFS***

BY ORDER OF THE FIRE COMMISSIONER AND CHIEF OF DEPARTMENT

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DRAGER PAC 6500 CO METER

1. INTRODUCTION

1.1 The Drager PAC 6500 CO Meter is a pocket-sized measuring and warning device issued to all units for monitoring Carbon Monoxide (CO) gas in ambient air (Figure 1). Use of the instrument is intended to alert the user to CO presence in the environment. A visual display shows the amount of CO present in parts per million in the atmosphere.

Figure 1

1.2-1.5 ***Redacted for PFS***

2. OPERATIONAL USE

2.1 **The Drager PAC 6500 CO Meter is always to remain on**. The on/off function has been disabled. There are two buttons on the meter; units are only required to use the green (OK) button to silence the alarm.

2.2 Fire Officers and Firefighters assigned riding positions that have a CO meter are required to wear the meter whenever they are out of quarters (emergency and non-emergency operations). The CO meter shall be affixed to the handie-talkie strap above the remote mic.

2.3 Alarm threshold 1, (A1) is activated at 35 ppm. Alarm threshold 1, (A1) can be acknowledged and silenced by pressing the OK button.

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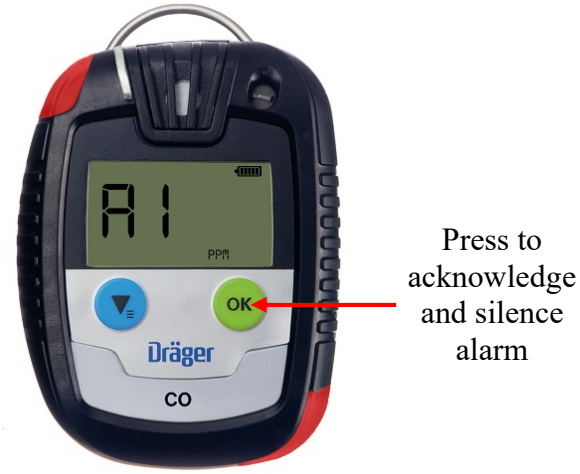

Figure 2

Figure 3

2.4 When the concentration of CO in the atmosphere is 35 PPM or greater, the meter will signal the following alarm:

- a slow modulating tone (every 1 second)
- with slow flashing red lights (every 1 second)
- and a slow vibration (every 1 second)

The display will alternate between A1 and the measured amount of CO in PPM. See Figures 2 and 3.

When the CO concentration falls below 35 PPM, the alarm will automatically turn off.2.5 Alarm threshold 2 (A2) is activated at 100 PPM. Alarm threshold 2 (A2) can be acknowledged and silenced by pressing the OK button.

Figure 4

Figure 5

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2.6 When the concentration of CO in the atmosphere is 100 PPM or greater the meter will signal the following alarm:

- a fast modulating tone (every ½ second)
- with fast flashing red lights (every ½ second)
- a fast vibration (every ½ second)

The display will alternate between A2 and the measured amount of CO in ppm. See Figures 4 and 5.

When the CO concentration falls below 100 PPM, the meter will go into Alarm threshold 1, (A1), and the alarm can be silenced, see Section 2.3.

2.7 The Drager CO Meter will retain the highest reading the meter has been subjected to. Due to the CO Meter remaining constantly on, this peak reading is not to be relied on or used during any operation or incident.

Note: CO meters will display readings up to 2000 PPM (Figure 6). When readings exceed 2000 PPM, the CO meter will display "rrr" (Figure 7), indicating concentration too high to measure.

Figure 6

Figure 7

3. MAINTENANCE

3.1 Instrument should be kept clean and dry.

3.2 ***Redacted for PFS***

3.3 Field units are not to perform any maintenance on, or open the device (opening the device will void the manufacturer's warranty). **The CO meter will always remain on**.

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3.4 Battery life is dependent on use, alarm activations and temperatures. The lithium ion battery has a maximum life of two years under ideal conditions (on 24/7 but no alarm activations). There are two low battery alarms.

- Pre-Alarm - A battery "pre-alarm" activates when there is 5% battery life left. The battery icon will flash, and a visual and audio warning is given similar to the A1 alarm without the vibration. The battery pre-alarm can be acknowledged and silenced by pressing the green OK button. However, there is limited battery life left, between 1 day and two weeks. The Officer on duty must contact the Meter Room at Haz-Mat Operations for a replacement.
- Main Alarm - A battery main alarm will display a rapid visual, audio and vibration alarm. This alarm cannot be acknowledged, and the meter will countdown from 10 to zero and shut down. The meter will be unusable and must be placed OOS. The Officer on duty must contact the Meter Room at Haz Mat Operations for a replacement.

3.5 When marking meter with company ID, do not etch or use marker (sticker/tape is acceptable).

3.6 ***Redacted for PFS***

BY ORDER OF THE FIRE COMMISSIONER AND CHIEF OF DEPARTMENT

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DECONTAMINATION PROCEDURES

1. PURPOSE

1.1 After a hazardous materials release, vapor or aerosol hazards can still exist on victims even after they have left the area of the release. Toxic levels of a material may be trapped inside clothing, which can vaporize (off-gas) and continue to harm people even after they have left the scene. Rapid physical removal of the material from the victims is the single most important action associated with effective decontamination. Reasons for decontaminating exposed victims are:

1. Removal of the agent from the victim's skin and clothing to prevent any additional exposure.
2. Protecting responders and medical personnel from cross contamination.
3. Providing psychological comfort to the victims by removing contamination.

2. EMERGENCY MASS DECONTAMINATION

2.1 In New York City, an incident may result in a large number of contaminated victims that need to be rapidly decontaminated. The Fire Department must have procedures in place to ensure that a simple and effective method of performing gross Decon can be set up and operational as quickly as possible. Our ability to deliver large volumes of water quickly is the key to reducing exposure times and saving lives by rapidly removing contamination.

2.2 ***Redacted for PFS***

2.3 All exposed people must be immediately removed from the area of the release to an area of safe refuge. This area of safe refuge is considered to be in the warm zone but is physically removed from any contamination and thus prevents any additional exposure to the released agent. The concept of the Mass Decontamination Procedure is to establish a "Gross Decontamination Corridor". Process the contaminated victims from the hot zone or area of safe refuge to the cold zone, where they can safely be released or transported to a medical facility for further care. The purpose of the corridor is to remove the contamination from the victim. This process is accomplished in two steps:

1. Have the victims remove their outer clothing

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2. Wash the victims down with water – soap can be added to the process if available. Ideally, removal of victims' outer clothing should be the first step in the Decon process after removing people from the contaminated area. Studies have shown that removing a victim's clothing removes up to ninety percent of the contamination. Street clothing will absorb liquids, which will continue to vaporize and further expose the wearer. Quickly removing outer clothing vastly reduces the exposure time, and thus the total dose received, of any contaminant. Also, a stream of water, even in a fog spray, will drive any liquid contaminant further inside clothing towards a victim's body, increasing the likelihood of skin absorption. Civilians must be informed of the benefits of removing their outer clothing and encouraged to do so. There will be some people who will not remove their clothing, regardless of the circumstances or the benefits. Such persons should be encouraged to remove what they will and continue through the Decon process. (For a firefighter wearing bunker gear, SCBA, gloves, and a hood, the percentage of contamination eliminated by removing outer clothing is even higher than ninety percent. The bunker gear should be removed while continuing to wear the SCBA with the facepiece to protect the respiratory tract. The SCBA is removed, with the facepiece remaining on, and the member holding the SCBA via the strap. Another member should then remove the bunker gear. After the bunker gear has been removed, the facepiece is then taken off and the firefighter sent to the gross Decon.)

2.4 Emergency Mass Decon Using Water Spray

2.4.1 Fire Department units should use resources that are immediately available and start gross decontamination as soon as possible. The most expedient approach is to use our standard firefighting equipment to provide emergency low-pressure streams supplying high volumes of water, allowing for large amounts of people to be deconned quickly.

2.4.2 After the removal of clothing, the victims should be moved through a "Gross Decontamination Corridor" which utilizes water spray to remove the remaining contamination. There are several options available to the decontamination officer for delivering this water spray. Several factors that will affect the choice of decontamination procedures include number of victims involved, type of material that has been released, impact of weather conditions on the use of water sprays for decontamination, and personal protective equipment (PPE) available to members performing the decontamination process.

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2.4.3 One option for setting up a mass Decon is to stretch a 2½" handline equipped with an Aquastream fog nozzle. The nozzle team should operate the nozzle in the fog position and the victims should be directed through the fog spray, rinsing any remaining contamination off them. The members should avoid contact with the victims until the proper PPE is in use. They must monitor the operating pressure of their line to ensure that it is not too forceful for the victims. The recommended operating pressure range is between 50 to 80 psi. Additional handlines can be deployed as necessary. Consideration can be given to the use of two handlines operating opposite each other, approximately 25' – 30' apart, to form a large shower area that multiple victims can move through at the same time. Care must taken to avoid pushing the contamination across to the opposing nozzle team. (See Figure 1 and Figure 2)

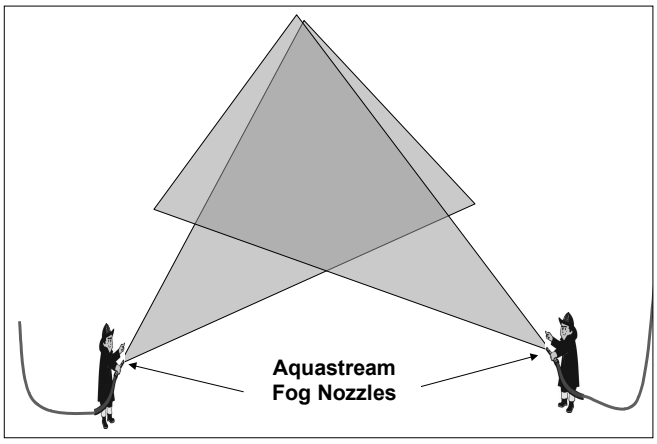

Figure 1

Figure 2

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2.4.4 A second option involves the use of two pumpers and greatly increases our decontamination capabilities (See Figure 3):

a. Position two pumpers parallel to each other approximately 25 feet apart with the control panels facing the outside.

b. Place an Aquastream fog nozzle on each pumper on a selected inside discharge gate. Additional discharges and nozzles can be used if available.

c. Operate the nozzles in the fog position.

d. Monitor the operating pressure to ensure the stream is not too forceful. The recommended operating pressure is 50 to 80 psi.

Figure 3

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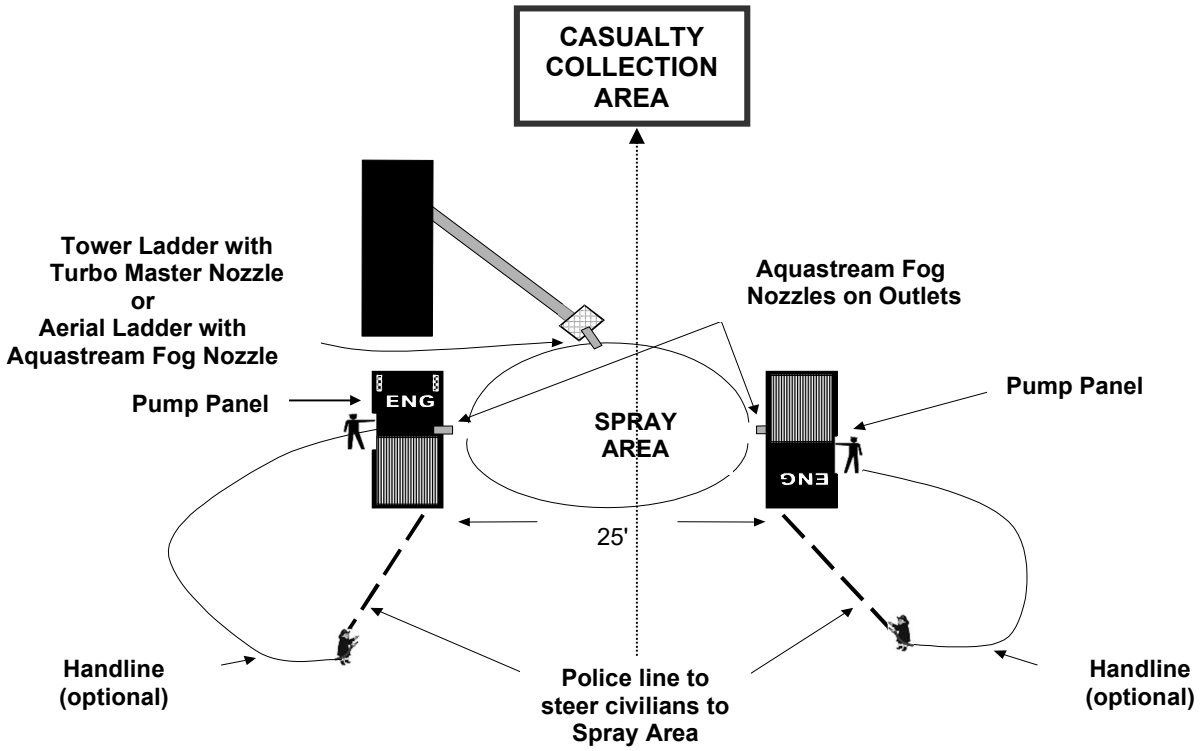
2.4.5 Other options include positioning a tower ladder with a Turbomaster fog nozzle or an aerial ladder with a ladder pipe and Aquastream fog nozzle at the edge of the water spray formed from the pumpers. If a tower ladder or aerial ladder is not available or will be delayed, a 3rd pumper with an Aquastream fog nozzle attached to the apparatus mounted multiversal nozzle can be positioned parallel to and in line with one of the first two pumpers as shown in figure 5. This configuration should produce a water spray shower area approximately 20 feet wide by 30 feet long, which the victims can now be directed to pass through. (See Figure 4 and Figure 5)

Figure 4

DIAGRAM FOR TWO ENGINES AND ONE LADDER CONFIGURATION

Figure 5



NOTE: *Pumpers will set up with control panels facing outside of the spray area, approximately 25' feet apart, and a tower ladder with a Turbomaster fog nozzle, or aerial ladder with Aquastream fog nozzle aimed down on the spray area.*

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2.4.6 In immediately life-threatening exposures where emergency decontamination is necessary, fog nozzles can be attached to the multiversal on an engine, or to a tower ladder outlet, for a very quick gross Decon setup. As time permits, the configuration shown in fig. #3 should be implemented and the tower ladder (as per figure #4) added, as the resources become available.

2.4.7 ***Redacted for PFS***

2.4.8 The SOC Decon Support Unit can supply disposable clothing, which can be issued as victims exit gross decontamination for matters of privacy and weather related exposures.

2.4.9 ***Redacted for PFS***

2.4.10 It is important to remember that in most cases the establishment of a mass decontamination procedure is viewed as a life saving operation. In this regard, the hazard to our members staffing the operation is from product that may be absorbed into victims' clothing. Thus, members initially staffing the Decon operation must wear their full protective equipment, including mask, gloves and hood. Using this ensemble will give adequate protection from cross-contamination in most instances. It must be emphasized that a SCBA will give adequate protection from inhaled contaminants, which is the primary route of exposure. However, bunker gear is not vapor tight, and members must still use care to avoid contact with the victims. As soon as resources become available these firefighters should be removed from the decontamination process and then go through decontamination themselves. If the Decon officer deems it necessary, the operation may be staffed by members wearing chemical protective clothing (CPC), as they become available. Incident Commanders and Decon officers shall be cognizant of these issues and be sure adequate Squad and Rescue personnel, who are qualified to wear CPC, are available.

2.4.11 The threat of a hazardous materials release, be it accidental or intentional, affecting large amounts of victims is real. The Hazardous Materials Emergency Response Plan is in place to deal with this occurrence. The Mass Decontamination Procedure is just one more tool for the Incident Commander to help control the situation. The basic rule of protection from hazardous materials is time, distance, and shielding. The Mass Decontamination Procedure is the key to reducing the amount of time that the victims are exposed to the hazard. The faster we can reduce their exposure to the harmful effects of the hazardous material, the better the chances they will not be injured as a result of their exposure.

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FIREFIGHTING GROOMING HEALTH AND SAFETY STANDARDS

1. STATEMENT OF POLICY

1.1 The grooming of individual members of this Department must be consistent with the conditions under which they are employed. Much of our work takes place in highly heated, toxic, poorly illuminated, and unsanitary conditions. Heat prostration, lacerations, burns, and falls are common consequences of firefighting. Exposure to airborne and blood-borne pathogens is a common consequence of providing pre-hospital emergency medical care. Hair of excessive length on the head, and hair on the face of any length will increase the probabilities of the indispositions mentioned above. With the mask facepiece designs currently in use, it has been reliably proven by NASA, the National Bureau of Standards, and others that it is impossible to obtain a satisfactory seal on a bearded individual.

1.2 It is evident that hair, excessive to any degree, acts as an insulator, retaining body heat and raising body temperatures at a time when eliminating body heat through exposed skin surface is highly desirable.

1.3 The health of the individual firefighter is also compromised when working in an unsanitary environment. Exposed hair is a breeding place for germs. Lacerations on hair-covered surfaces are subject to infection in direct proportion to the area and depth of the hair, thereby complicating the injury and extending the recuperation period.

1.4 ***Redacted for PFS***

1.5 Accordingly, safety standards for personal grooming and procedures for implementation are hereby established within the following guidelines. Responsibilities for compliance at all times shall be the individual responsibility of all members performing fire duty.

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2. STANDARDS

2.1 HAIR: There are many hairstyles which are acceptable in the Fire Department. The bulk or length of hair must not interfere with the normal wearing of a standard uniform cap or helmet. So long as a Firefighter's hair is kept in a neat manner, the acceptability of the style will be judged by the criteria described below:

2.1.1 Haircuts: The hair on the top and sides of the head will be neatly groomed and the back of the hair may extend to the mid-shirt collar, except as noted in 2.1.5. This shall be measured when standing at attention. Hair may cover to mid-ear level. Hair must never be of such bulk or length that it will jeopardize the personal safety of the Firefighter in the performance of firefighting or other emergency operations. For safety reasons, particular emphasis must be placed on a secure and snug fit for all Fire Department protective equipment so that maximum protection may be afforded by their use.

2.1.2 Members may wear their hair, not to exceed two inches in depth on both sides and top. Moderate "natural" type haircuts are permitted if they qualify within the limits described above; however the maximum extension from the scalp shall not exceed two inches. The length of the hair must not hinder the proper fit of Fire Department headgear.

2.1.3 Hairstyles that preclude the wearing of the uniform cap and safety helmet in the accepted manner are not permitted.

2.1.4 Hair may be dyed, tinted, or frosted any color which could naturally occur in human hair. Any stripes, spots, or color other than natural is prohibited.

2.1.5 If a member's hair extends beyond the mid-shirt collar, the hair must be secured up off the collar and off the ears in such a way that will not interfere with the fitting of the uniform cap, helmet, mask facepiece, or protective clothing. Members must ensure that hair is secured in such a way as to comply with Section 2.1.2 and remain secure and up throughout their tour of duty and whenever in uniform.

2.1.6 Hair shall not be worn in a "pony tail" or similar style.

2.1.7 No decoration(s) shall be worn in the hair. Pins, clips, combs, or fasteners shall never be exposed or visible through the hair or on the surface of the head. Hair clips or pins that match the color of the hair may be worn. No pins, combs, or other items (rubber, plastic, ribbons) may be used to secure wigs or hair which presents a safety hazard to members.

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2.1.8 Bangs: If bangs are worn they will be maintained no longer than mid-forehead level. At no time will the bangs be allowed to interfere with the seal of the mask facepiece or protective helmet. When wearing a helmet or Fire Department uniform cap, no hair shall be visible below the front of the helmet or cap.

2.2 FACIAL HAIR:

2.2.1 Mustaches are permitted but shall conform to the following:

A. They must be closely trimmed.

B. They must not extend beyond the corners of the mouth.

C. They must not extend below any portion of the upper lip.

2.2.2 Beards, goatees, or any form of facial hair beneath the lower lip are prohibited.

2.2.3 All members shall be otherwise freshly shaven when reporting for duty.

2.3 SIDEBURNS:

2.3.1 Shall be kept neatly trimmed and close to the face to avoid any possibility of an improper seal with the mask facepiece or N95 respirator.

2.3.2 They shall not extend below the lower extremity of the ear.

3. PROCEDURES

3.1 Company Officers at roll calls shall inspect members for compliance with these safety standards.

3.1.1 When the member's violation of safety standards might impair the full effectiveness of the mask facepiece, (Scott 4.5 for firefighters, N95 for firefighters when on appropriate CFR-D assignments) command discipline or formal charges shall be preferred against the violator. The member shall then be given a direct order to conform to the grooming standards set forth in this circular.

3.1.2 If the member refuses the direct order, additional charges shall be preferred against the violator, and the Officer shall relieve such member from duty. In all cases, entries shall be made in the Company Journal of all the facts, including the exact nature of the violation.

3.2-3.3 ***Redacted for PFS***

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ANTI-HAZING/ANTI-BULLYING POLICY

1. PURPOSE

1.1 The New York City Fire Department expects all of its employees to treat one another with dignity and respect. Consistent with that principle, this policy prohibits employees from engaging or participating in, or encouraging others to engage or participate in, any act of hazing or bullying.

1.2 The Department seeks to foster a professional, welcoming and safe work environment for all of its employees. Hazing and bullying are contrary to this goal, as well as to the FDNY's core values of honor, dedication and service. Such acts can impact an employee's ability to function at work and damage trust and confidence among co-workers, undermining the cohesiveness of the work unit. Every employee must be afforded the opportunity to be a productive and contributing member of their work unit, free of hazing or bullying.

1.3 Hazing and bullying have no place in any workplace or organization and will not be tolerated by the Department.

2. DEFINITION

2.1 Hazing is an act that, includes, but is not limited to, any form of initiation or a "rite of passage" into an employee group, unit, or work location that involves the potential for, or causes, physical injury, mental harm or personal humiliation. It includes but is not limited to conduct that is cruel, abusive, humiliating, intimidating, oppressive, demeaning or harmful. Soliciting, coercing, participating in, or condoning others to engage in any such activity is also considered hazing. Hazing need not involve any physical contact among or between employees; it can be, in part or wholly, verbal or psychological in nature.

2.2 Bullying is conduct that can be humiliating, intimidating, demeaning or cruel to a colleague in order to exclude or reject another member from the team.

2.3 Examples of hazing/bullying include, but are not limited to, the following types of conduct:

2.3.1 Requiring physical exercise for non-legitimate reasons;

2.3.2 Orchestrating exclusion or silent treatment;

2.3.3 Tampering with food or drink;

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2.3.4 Pouring a bucket of water or other substance over any part of an employee's body;

2.3.5 Using cruel, abusive or discriminatory language toward an employee;

2.3.6 Destroying or otherwise damaging an employee's personal property;

2.3.7 Singling out an employee to do tasks not given to others or multiplying tasks given to others in an effort to intimidate, undermine or harass that employee;

2.3.8 Requiring an employee to wear embarrassing or humiliating attire;

2.3.9 Performing degrading, crude or humiliating acts against an employee;

2.3.10 Tampering with an employee's uniform or bunker gear (e.g., cutting buckles, putting foreign objects in boots or pockets, poking holes in clothing);

2.3.11 Removing or defacing an employee's locker;

2.3.12 Creating or posting demeaning signs or photo-shopped faces;

2.3.13 Using social media to demean, intimidate, or otherwise harass an employee;

2.3.14 Playing abusive tricks or engaging in acts intended to ridicule;

2.3.15 Any inappropriate physical contact;

2.3.16 Requiring excessive physical exertion beyond what is required to meet established training and performance standards; and/or

2.3.17 Forcing or requiring the consumption of food, alcohol, drugs or any other substance.

2.4 Hazing/Bullying is not limited to superior-subordinate relationships. It may occur between peers or, under certain circumstances, may involve actions by junior personnel toward those more senior in rank.

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2.5 Hazing/Bullying does not include authorized activities such as required operational or training exercises/activities (but not including abuse of those activities as listed in Section 2.3); remedial training selected by the employee or as directed by Training Academy staff or other training or instruction authorized by the Chief of Training, Chief of Operations or Chief of Department; as well as daily work, *e.g.,* roll call, inspection of equipment, housewatch duties, committee work (maintaining the bunkroom, cleaning bathrooms, preparing meals, etc.).

3. POLICY

3.1 The FDNY prohibits hazing/bullying of any of its employees by another employee, while on and off duty. Aiding and abetting another person who is engaged in such conduct is prohibited. No FDNY employee may engage in hazing/bullying or consent to be a victim of hazing/bullying. Anyone who witnesses or is made aware of any act or allegation of hazing/bullying must immediately report such information (see Section 4.1). Actual or implied consent to acts of hazing/bullying is not a defense to a violation of this policy.

3.2 Hazing/Bullying is not an acceptable method of corrective training. Deficiencies in an employee's performance are appropriately addressed through instruction and the chain of command. Hazing/Bullying is not an effective way to instill discipline or develop skills.

3.3 It is the responsibility of the officer or supervisor to set the tone and maintain a safe and welcoming workplace environment. No officer or supervisor may condone or ignore hazing/bullying if the officer or supervisor knows, or reasonably should have known that the conduct has occurred. Once informed or made aware of any such incident or allegation, all officers and supervisors must report the incident through the chain of command and, where applicable, directly to the Equal Employment Opportunity (EEO) or to the Bureau of Investigations and Trials (BITs). Failure of an officer or supervisor to enforce this policy will result in disciplinary action against the officer or supervisor.

3.4 The FDNY strictly prohibits retaliation against any complainant of hazing/bullying, or any witness who reported such an incident. ***The Fire Department will not tolerate any such retaliation.*** Employees are prohibited from subjecting individuals to threats, reprimands, negative evaluations, harassment, or engaging in other adverse treatment that may have the effect of discouraging individuals from reporting or cooperating with investigations into any alleged violations of this policy. Offenders will be subject to discipline, up to and including termination of employment.

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4. REPORTING

4.1 Alleged violations of this policy will be handled confidentially. Information obtained will be disclosed only to those who need to know for purposes of investigation and/or remediation.

4.2 The ability to investigate reports and enforce this policy depends on the accuracy and specificity of the information provided. Employees are encouraged to provide as much specific detail as possible so that appropriate action can be taken to address the reported behavior. Employees have the option to submit a report anonymously to BITs or EEO. However, providing one's name and contact information is encouraged.

4.3 Reports may be made to any of the following:

4.3.1 Through the chain of command by notifying the employee's immediate supervisor; and or

4.3.2 BITs at 718-999-2646 or EEO Office at 718-999-1446 (Monday through Friday 9 a.m. to 5 p.m.) or 718-999-7900 (after hours).

4.4 Any incidents or allegations of hazing or bullying shall be reported by supervisory personnel, in writing, up the chain of command to the Chief of Department. The Chief of Department, in consultation with and working in conjunction with BITs, will determine what action is appropriate following a reported incident of hazing/bullying, and whether such action shall be taken within the chain of command or by BITs.

4.5 Hazing/Bullying allegations that may also implicate or violate the Department's EEO policy shall be reported directly to the EEO Office in accordance with the Department's EEO policy. BITs and/or the EEO Office will investigate reported hazing incidents as necessary.

4.6 Any reported hazing/bullying incident that would also be considered a crime will be reported by the FDNY directly to the Department of Investigation. Additionally, every officer and employee has an affirmative obligation to report, directly and without delay, to the Inspector General any and all information concerning conduct involving criminal activity. Notifications should be made directly to the Inspector General's Office at 212-825-2402.

4.7 Any FDNY employee who has been hazed or bullied, or whom a supervisor or officer believes may have been subjected to hazing or bullying, may be considered a victim and will be offered the assistance of the Bureau of Health Services (BHS) and Counseling Service Unit (CSU). An officer or supervisor who has been made aware of any acts of hazing must advise the victim of the services available to him or her that are provided by BHS and CSU.

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4.8 No person shall prevent, seek to prevent, interfere with, obstruct, or otherwise hinder any study or investigation being conducted pursuant to this policy. Full cooperation shall be afforded by every officer and member during the investigation.

5. GUIDELINES FOR VIOLATIONS OF THIS POLICY

5.1 The Department regards violations of this policy as serious offenses, and has established action guidelines for its violations. These guidelines are designed to cover the most common infractions, but there may be cases that do not fit precisely within them. The Department reserves the right to depart from these guidelines as the exacerbating or extenuating circumstances of each individual case requires. The following are guidelines only and are not meant to abrogate in any way the due process rights provided under the NYS Civil Service Law, the NYC Administrative Code or any applicable collective bargaining agreement. In addition, the Department's use of these guidelines will take into consideration any findings and recommendations made by an Administrative Law Judge after a NYC Office of Administrative Trials and Hearings trial or by a Hearing Officer after a disciplinary proceeding.

5.2 The Department may take the following actions, including but not limited to, pending the completion of an investigation:

5.2.1 Immediate detail of any member accused of violating this policy;

5.2.2 Immediate detail of the officer(s) on duty at time of alleged incident;

5.2.3 Immediate detail of the commanding officer(s) of the company, Battalion Chief, and/or Division Chief, where appropriate;

5.2.4 Suspension for up to thirty (30) days; and/or

5.2.5 Restriction of voluntary overtime and mutual privileges in accordance with operational needs.

5.3 Any employee found to be in violation of this policy will be subject to discipline, up to and including termination of employment.

BY ORDER OF THE FIRE COMMISSIONER AND CHIEF OF DEPARTMENT

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FDNY SOCIAL MEDIA POLICY

1. PURPOSE

1.1 The New York City Fire Department (FDNY or the Department) has established for all FDNY employees the guidelines below concerning the use of social media (Policy). This Policy is based on the New York City Social Media Policy (published by the Office of the Mayor in April 2010), which provides overall guidance for the use of social media by employees of City agencies.

1.2 The improper use of social media can undermine the confidence of the public in the integrity of the Fire Department and its employees, and can impact our ability to effectively deliver life-saving services. As such, this Policy applies to both official and personal use of social media by FDNY employees. All employees are reminded that they are accountable for their conduct while on duty and are accountable for off duty conduct when it could reasonably be expected to be disruptive of the workplace or agency operations, or bring the agency into disrepute.

1.3 All supervisors, including civilian managers, and Fire and EMS officers, must familiarize themselves with this policy and ensure that this policy is distributed to all employees within their bureaus, units, commands or companies.

1.4 Nothing in this policy is meant to interfere with or limit any rights of any employee organization or its members to engage in protected union activity as defined in the Taylor Law and the New York City Collective Bargaining Law (NYCCBL).

1.5 Violations of this Policy may subject employees to disciplinary action, up to and including termination from the Department.

2. DEFINITIONS

2.1 "Social media" is defined as virtual communities and networks used to exchange information that includes but is not limited to messaging and data transmission, blogging and/or photo and video-sharing. Social media include proprietary sites or applications such as Facebook, Instagram, Tumblr, YouTube and Twitter, websites and other content-rich sites, instant messaging, video conferencing and collaboration services such as Wikipedia or any emergent social media platform or service.

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2.2 Common social media outlets to which this Policy applies include, but are not limited to:

2.2.1 Social networking platforms: A social networking platform allows users to connect with other users and create profiles online with status updates, photos, videos, messaging and other features (e.g., Facebook).

2.2.2 Blogs: A blog is an online journal to which the host regularly posts material on which other users can comment; some blogs, such as microblogs, limit entries to short, text-message-like entries (e.g., Twitter).

2.2.3 Video or image-sharing outlets: A video or image-sharing outlet is an online platform on which users can upload, share and view video clips or digital images (e.g., YouTube or Instagram).

2.2.4 RSS feeds: An RSS (Really Simple Syndication) feed is an online alert system that notifies subscribers of new content on a website.

2.2.5 Podcasts: A podcast is an audio file that has been published on the internet and can be downloaded to a computer or a mobile-listening device.

2.2.6 Websites: A set of interconnected webpages, usually including a homepage, generally located on the same server, and prepared and maintained as a collection of information by a person, group, or organization.

3. ROLE OF OFFICE OF PUBLIC INFORMATION IN SOCIAL MEDIA

3.1 The Department's Office of Public Information (OPI) has been designated as the point of contact for the New York City Department of Information Technology and Telecommunications (DoITT) for operation of existing Department social media sites. OPI is required to register with DoITT any social media pages, sites or outlets related to the FDNY that are maintained by Department employees, as directed by the New York City Social Media Policy. OPI will be responsible for the registration of any social media pages, sites and outlets relating to the Department that are created in the future. Assigned managers of approved social media will be required to adhere to the New York City Social Media Policy and will be bound by the same rules and standards governing all New York City social media managers.

3.2 OPI is responsible for posting official content on the Department's official social media sites and will ensure that the Department's official social media usage comports with the New York City Social Media Policy.

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4. OFFICIAL FDNY USE OF SOCIAL MEDIA

4.1 All FDNY employees must be aware of and abide by the following:

4.1.1 No employee is authorized to post social media content on an official FDNY social media platform except those members specifically assigned to that task by OPI. All such social media usage will be clearly branded as official Department communication.

4.1.2 No Department-related social media site or application is to be created or maintained, except as authorized by the Fire Commissioner and OPI. This includes pages and sites dedicated to individual companies, EMS stations, civilian bureaus, affiliated organizations, photo sharing groups, etc. Requests for authorization are to be submitted to OPI via the Website/Social Media Registration Form attached to this policy.

5. PERSONAL USE OF SOCIAL MEDIA

5.1 FDNY employees are responsible for what they write or post on social media. Activities and statements made on social media sites are done in an online domain where users have no reasonable expectation of privacy. Even if an FDNY member has created "private" or "limited access" accounts or has customized "privacy settings", any statements, photographs, video clips or information that are sent over the internet may still be viewed and disseminated by third parties, even after the content has been edited or deleted by the user. Whether intended to be private or not, postings will be available on the web for a long time and may spread to large audiences by re-posting, sometimes without the knowledge or consent of the original poster. Before posting, consideration should be given to whether the post will disrupt operations or bring the Department or any of its members into disrepute if viewed by supervisors, co-workers, or members of the public.

5.2 Employees participating in social media are subject to all applicable Department and City policies even when using social media while off duty or not at work. Department and/or City policy prohibits engaging in conduct tending to bring the City or the FDNY into disrepute, including engaging in harassing or discriminatory conduct. Engaging in such behavior on-line, even in a personal capacity, may subject an employee to disciplinary action. In addition, all postings on social media must comply with all laws and FDNY policies regarding the confidentiality of information. Accordingly, FDNY members will comply with the following:

5.2.1 Employees should be mindful about disclosing or alluding to their status as a member of the FDNY. Divulging identifying information on social media sites may provide an opportunity for someone to use that information to undermine an employee's personal or professional credibility or that of the FDNY and/or affect the employee's employment status with the Department.

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5.2.2 Employees are prohibited from revealing Department affiliations of other individuals (e.g., co-workers, supervisors) without the express consent of that individual.

5.2.3 Employees may not use the FDNY's logo or name (e.g., FDNY) in any postings or feature the logo or name on any web page (e.g., a website/social media banner or profile photo) for commercial purposes.

5.2.4 Employees may not offer merchandise featuring the FDNY logo or name for sale on social media, except through licensed vendors and as authorized by the Fire Commissioner.

5.2.5 FDNY personnel shall not post photographs of themselves in uniform, unless the uniform was worn during an event for which a uniform is required. FDNY personnel are prohibited from posting a photograph of themselves if, at the time, the wearing of a uniform is prohibited. These prohibitions will not apply to photographs taken at official Department ceremonies (e.g., promotions, Medal Day). Employees must ensure that any photographs posted on social media sites pursuant to this exception must comply with the regulations set forth in Section 5.2.2 above.

5.2.6 Employees are prohibited from posting on the Internet nonpublic items (e.g., information about, or photos or videos of, patients or fire scenes) that were obtained as a result of their position with the Department. Members of the Department are prohibited from taking photographs, videotaping or recording audio while working unless authorized to do so by OPI.

5.2.7 Employees are prohibited from engaging in any type of social media contact with patients, fire victims or any members of the public with whom they interact in their capacity as FDNY employees, to the same extent contact is prohibited by other means of communication. Such communications may be deemed inappropriate, a breach of confidentiality or an invasion of privacy.

5.2.8 Employees are prohibited from engaging in any type of social media contact (e.g., "friending," or "following") with minors with whom they interact in the course of their FDNY employment, unless specifically authorized by a Department Assistant Commissioner (or higher rank) or Deputy Chief (or higher rank). Such unauthorized communications may be deemed inappropriate and create an appearance of impropriety.

5.2.9 Employees should never use their City e-mail addresses when participating in social media. Inasmuch as the FDNY monitors employee Internet use, employees have no right to privacy with respect to any information transmitted, received, created, accessed, obtained, viewed, stored or otherwise found at any time on the FDNY's computer system.

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5.2.10 Employees currently using social media must immediately ensure that all of their personal social media pages, sites and outlets are reviewed and in compliance with the regulations set forth in this Policy.

5.2.11 Employees who identify themselves as FDNY employees, or hold positions with the FDNY that are known to the general public, must make sure that their profile, comments and other postings are consistent with how they want to present themselves publicly. Employees should make a clear disclaimer that the statements and views expressed are theirs and do not reflect the views of the FDNY. Managers and others with leadership responsibilities, in particular, must consider whether their personal thoughts and views may be misconstrued by virtue of their position as expressing the FDNY's view.

5.2.12 Employees – including work units such as Fire companies and EMS stations -- are prohibited from posting their own web or other media sites, without prior authorization from the Fire Commissioner and OPI, if such site creates the appearance of being affiliated with or sponsored by the FDNY. Requests for authorization are to be submitted to OPI via the Website/Social Media Registration Form attached to this policy.

5.2.13 Guidelines set forth in this Policy will not apply to social media outlets used for investigative purposes.

6. INQUIRIES AND GUIDANCE

6.1 Employees are encouraged to seek guidance from the OPI (718-999-2056) or the Bureau of Legal Affairs (718-999-2040) if they have questions regarding compliance with this policy.

7. *Redacted for PFS*

BY ORDER OF THE FIRE COMMISSIONER AND CHIEF OF DEPARTMENT

Website/Social Media Registration Form

Redacted for PFS

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UNIFORM INSIGNIA

1. ***Redacted for PFS***

2. INSIGNIA SHALL BE WORN ON THE LEFT SIDE OF UNIFORM DRESS COAT.

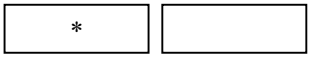
2.1 For Firefighters: Worn over the Badge. If no Badge is worn then insignia shall be worn over the Badge position.

2.2 ***Redacted for PFS***

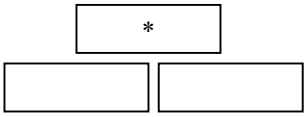
3. INSIGNIA TO BE WORN AS FOLLOWS WITH 1/4" SPACING BETWEEN ROWS AND COLUMNS.

1 Row - 1 Insignia

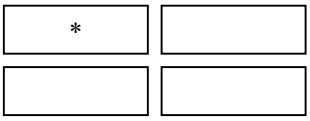
1 Row - 2 Insignia



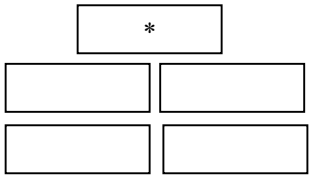
2 Rows - 3 Insignia



2 Rows - 4 Insignia



3 Rows - 5 Insignia



*** INDICATES POSITION FOR HIGHEST RATED AWARD.**

4-7. ***Redacted for PFS***

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ILLUSTRATION "A"

FIREFIGHTER

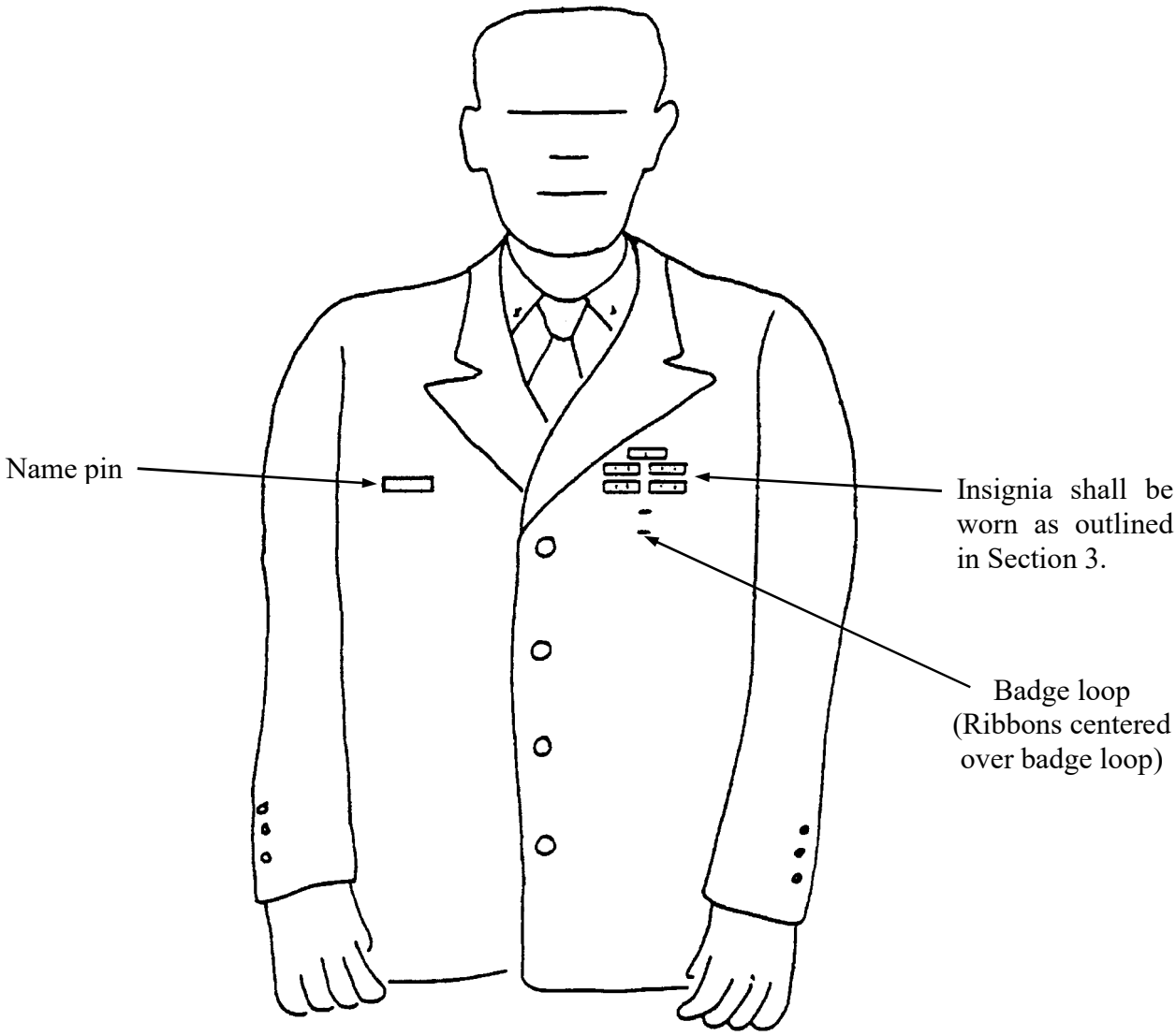

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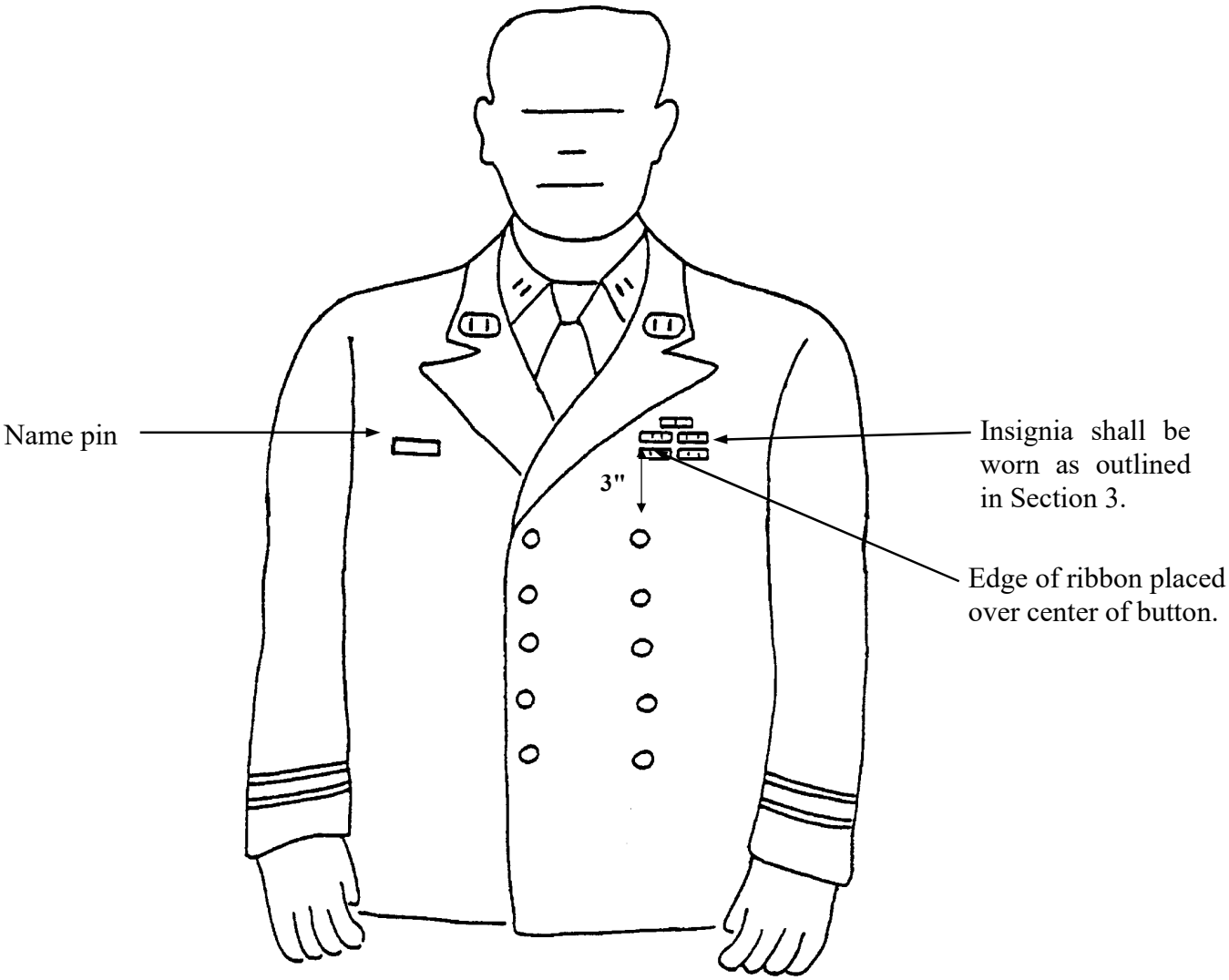
ILLUSTRATION "B"

OFFICER



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8. COLLAR INSIGNIA

EMT/Paramedic

Firefighter

Fire Marshal

Pilot

Marine Engineer/Wiper

Lieutenant

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EMS Officers
Left Collar Only

Captain

Battalion Chief
Battalion Commander = Silver

Deputy Chief

Division Commander

Deputy Assitant Chief

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Assistant Chief

Chief of Operations
Chief of Training
Chief of Fire Prevention

Chief of Department

8.1 These illustrations are for the information and guidance of members in the proper wearing of insignia on the uniform dress shirt and/or work duty shirt.

8.2 Vertical axis of insignia as indicated in illustrations shall be parallel to front edge of collar, with the exception for the rank of Chief of Operations, Chief of Training, Chief of Fire Prevention, Assistant Chief and Deputy Assistant Chief.

8.3 Chief of Operations, Chief of Training, Chief of Fire Prevention, Assistant Chief, and Deputy Assistant Chief - as indicated in illustration, the horizontal axis shall be parallel to the bottom edge of collar.

9. UNIT NUMBERS

9.1 Members may substitute an insignia indicating designation and number for one of the collar insignias.

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9.2 Such unit number shall be placed on left collar and shall be same color (gold or silver) as insignia indicating members rank. Numbers and letters shall be between 1/2" and 9/16" in height. Number of letters shall be limited to two, i.e.:

D - Division	SQ - Squad
B - Battalion	SU - Salvage Unit
E - Engine	TL - Tower Ladder
L - Ladder	MU - Marine Unit
R - Rescue	

9.3 Horizontal axis of unit insignia shall be parallel to the bottom edge of collar. See Illustration C.

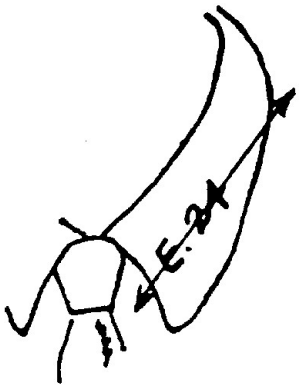

Illustration "C"

10. UNIT SHOULDER PATCHES

10.1 The maximum width is 3¾ inches and the maximum length is 4½ inches.

10.2 An appropriately sized drawing in the colors to be used must be submitted with the request.

10.3 After approval by the Borough Command, the patch may be worn on the right shoulder of articles of clothing listed in the Regulations Chapter 29. Copies of approvals and drawings shall remain on file in the Borough.

10.4 Placement of patch is as outlined in Regulations.

10.5 Patches must be of the same quality as the official patch and be professionally produced.

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10.6 In lieu of the unit shoulder patch, the American flag may be worn on the right shoulder. It shall be 3¾ inches in width by 2½ inches in height, trimmed in gold border, worn with the union (stars) forward.

11. NAME PIN

11.1 Uniformed personnel will wear the name pin to enhance the image of the Department and identify members to the public.

11.2 ISSUANCE

11.2.1 A name pin will be issued to all new members upon appointment to the Department. The name pin is silver polished with black lettering and shall be worn by all Firefighters, Lieutenants and Captains.

11.2.2 ***Redacted for PFS***

11.3 ARTICLES OF CLOTHING

11.3.1 The name pin shall be worn on the uniform dress coat or work/duty jacket. When the uniform dress coat or work/duty jacket is not worn, the name pin shall be worn on the Officer's or Firefighters dress shirt.

11.4 PLACEMENT

11.4.1 Uniform Dress Coat - Centered over right breast 3" above top button. Bottom of name pin shall be on same imaginary line as bottom of ribbons. (Refer to Illustration A and B).

11.4.2 Dress Shirt –Center name pin over the right pocket flap.

11.5 REPLACEMENT

11.5.1 Replacement name pins can be obtained from the quartermaster store.

12. CHEST INSIGNIA

12.2-12.11 ***Redacted for PFS***

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12.12 **MILITARY SERVICE RIBBON**

12.12.1 The purpose of this award is to give recognition to those members who currently serve or who have served in the Army, Navy, Marine Corps, Air Force, Coast Guard, National Guard or Armed Forces Reserves, and were honorably discharged.

Note: No promotional points are awarded for this ribbon.

12.13 ***Redacted for PFS***

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GENDER-NEUTRAL SINGLE-OCCUPANT RESTROOM POLICY AND POSTING

1. PURPOSE

1.1 To establish policy governing single-occupant restrooms in accordance with Local Law No. 871-A, which amended the administrative, plumbing, and building codes of New York City, and went into effect on June 28, 2016.

2. SCOPE

2.1 This policy applies to all Department facilities that contain single-occupant restroom(s).

3. DEFINITION

3.1 Single-occupant restroom: A restroom containing no more than one water closet and one urinal, *except where egress from it is through a male- or female-designated changing area*.

4. POLICY

4.1 To the extent that they exist at a given facility, all single-occupant restrooms must be made available for use by persons of any gender.

5. PROCEDURES

5.1 The sign shown in (Photo 1) must remain affixed on or near the entrance to the restroom if it is an Americans with Disabilities Act (ADA) accessible restroom.

(Photo 1)

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5.2 The sign shown in (Photo 2) must remain affixed on or near the entrance to the restroom if it is not an ADA accessible restroom.

(Photo 2)

5.3 Facilities may be subject to random inspection by the EEO Office.

Note: Any questions or concerns regarding this policy should be directed to the EEO Office: Phone: (718) 999-1446 (Monday through Friday 9 a.m. to 5 p.m.) or (718) 999-7900 (after hours); Fax: (718) 999-1289; Email: eeo@fdny.nyc.gov.

BY ORDER OF THE FIRE COMMISSIONER AND CHIEF OF DEPARTMENT

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SAFETY BULLETINS
TABLE OF CONTENTS

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SAFETY BULLETIN 7
CHAPTER 1
April 14, 2022

WINDOW BARS

1. INTRODUCTION

1.1 The installation of security bars has become prevalent in numerous areas of the city. These security installations are not common to a particular class of occupancy. However, a great majority of these security measures have been installed in one and two family dwellings in the form of window bars and security bar storm doors.

1.2 The location of window security bars will vary. However, it is not uncommon to find these installations on all floors and all sides. They have even been found attached to the inside of the window opening. Security bar storm doors found on door entrance ways have a double key lock assembly and tempered glass insert. In some dwellings, occupants have installed security bar gates on interior landings from floor to ceiling and wall to wall.

1.3 The construction of these bars will vary from thin aluminum child guards to heavy wrought iron and steel. The manner in which they are attached to the structure will vary. Some bars may be set in mortar or brick. Others may be bolted or screwed into the wooden frame of the window or door.

2. HAZARDS

The potential danger presented to both the occupants and firefighters during a fire in a building equipped with these security devices is clearly evident:

2.1 Civilians becoming trapped with no means of escape.

2.2 Firefighters becoming trapped when going above the fire for search and rescue, or, in any situation where a barred window would have provided an escape route.

2.3 Delay in gaining entrance to these occupancies.

2.4 Difficulty in effecting ventilation, particularly when energy efficient windows are present.

2.5 Window bars are heavy and difficult to remove.

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3. PLANNING

3.1 Preplanning is important to the success of operations at buildings equipped with these installations. The plan should identify the types of window bars and the operational problems encountered. The plan should outline the steps to deal with the problems and hazards encountered. The plan should be known and discussed by all company members.

3.2 Multi-Unit and Company drills afford units an excellent opportunity to critique and practice operational procedures. The drill discussion should include:

3.2.1 Identifying the different types of security bars and how to remove them using various tools.

3.2.2 Apparatus placement.

3.2.3 Handline placement.

3.2.4 Coordination of searches. No member should operate alone.

3.2.5 Rescue and removal operations.

3.2.6 Communications.

3.3 ***Redacted for PFS***

4. Operations

4.1-4.7 ***Redacted for PFS***

4.8 The unit assigned to remove the window bars should ensure at least one window on the fire floor and the floor above is cleared of bars. A portable ladder, aerial ladder or tower ladder shall be placed to the window. The location of windows that have been cleared should be communicated to all units.

4.9 When trapped occupants are discovered, their exact location should be immediately communicated. Both interior and exterior rescue operations can then be concentrated in that direction.

4.10 An engine on the scene or a special called engine could provide an exterior hoseline to protect civilians or members trapped inside a building behind window bars or members removing window bars.

5. ***Redacted for PFS***

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SAFETY BULLETIN 7
CHAPTER 2
April 14, 2022

GYPSUM ROOF DECKING

1. INTRODUCTION

1.1 Various types of roof decking are used to cover open web steel bar joists. A type of roof decking that will be discussed is called Gypsum Roof Decking.

2. GYPSUM ROOF DECKING

2.1 GYPSUM PLANK ROOF DECKING (Figure 1)

2.1.1 Gypsum planks are normally 2 inches thick, 2 feet wide and 8 feet long and are factory-laminated of two gypsum panels. Each plank weighs approximately 135 lbs.

Note: Gypsum planks also come in other sizes. Weights vary with the dimensions of the plank.

2.1.2 ***Redacted for PFS***.

2.2 GYPSUM CONCRETE ROOF DECKING (Figure 2)

2.2.1 Gypsum concrete is mill formulated and composed of calcined gypsum and wood chips or shavings. It is usually poured to a 2-inch thickness and weighs approximately 17.5 lbs. per square foot.

2.2.2 ***Redacted for PFS***

3. SAFETY OPERATING PRECAUTIONS REINFORCED

3.1 Gypsum plank and concrete decking is construction feature which spans large wide spaces. The main drawback, from a firefighting operational standpoint, is that this type of construction is extremely vulnerable to moisture causing a deterioration of the system.

3.2 The above characteristic, along with any supporting truss construction, are conducive to an early collapse under fire operations. Members shall not be committed to roof operations when this type of roof construction is found.

3.3 Interior firefighting operations shall be conducted from areas of safety due to the weight of such decking materials (gypsum plank - 135 lbs. each, gypsum concrete - 17.5 lbs. per sq. foot). Hose streams should be operated well in advance of members.

3.4 The presence of a Gypsum Roof Deck will be indicated by a white powdery residue during saw operations. Upon this observation, members shall make immediate notification to the Incident Commander and proceed to evacuate the roof.

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4. CONCLUSION

4.1 When operating on thin, flimsy roofs, members should always be aware of the possibilities of sudden failure.

4.2 When units are performing outside activities, all members shall note the building construction features within their response districts. Members should suspect truss construction on all new or renovated taxpayer/commercial structures as well as all large span building spaces. ***Edited for PFS***

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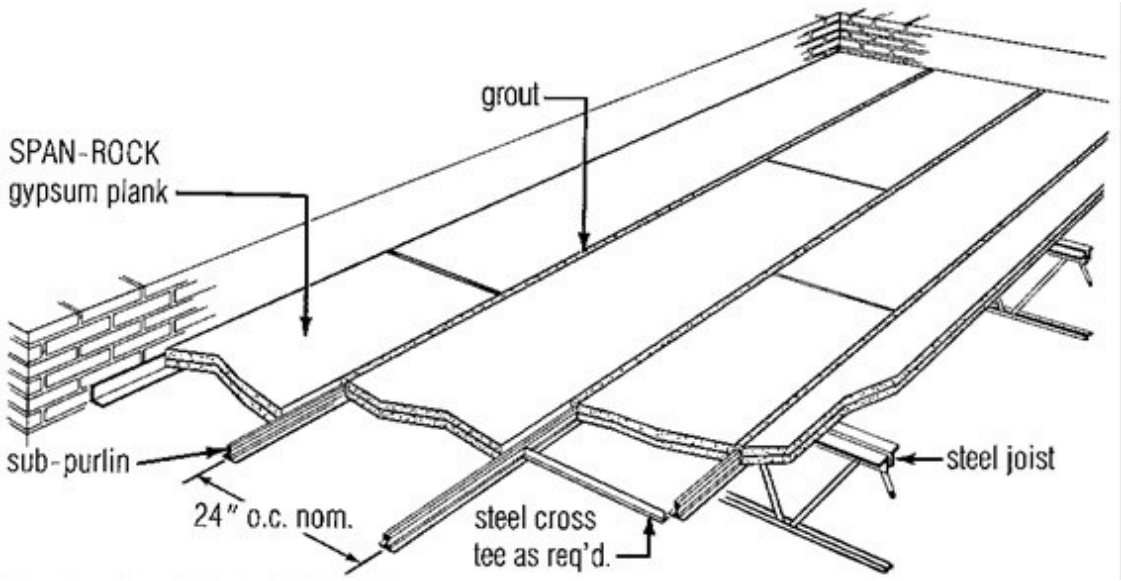
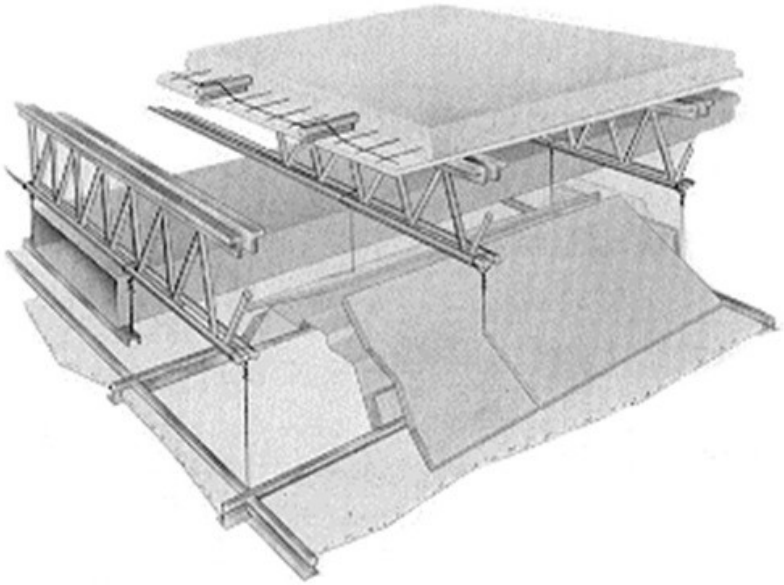
FIGURE 1 - GYPSUM PLANK DECKING SYSTEM



Construction Details/Flat Roofs

FIGURE 2 - GYPSUM CONCRETE ROOF SYSTEM



Deck With Ceiling

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SAFETY BULLETIN 7
CHAPTER 4
April 14, 2022

CLUTTER

1. INTRODUCTION

1.1 It has become commonplace to encounter apartments, homes and even the exterior areas of occupancies loaded with material well beyond what would normally be expected to be stored there. Whether the material is there as a result of the normal accumulation of possessions, collecting or hoarding, it is important to identify and communicate its anticipated impact on operations. Communicating a clear picture of the conditions to members will help assist in operations.

2. OPERATIONAL CONSIDERATIONS

2.1 Clutter conditions may adversely affect the following:

2.1.1 Access/Egress:

A. Public hallways and stairways

B. Interior passageways inside the occupancy

C. Delays in gaining entry to or exiting the space

2.1.2 Member Safety

A. Challenge to maintain unit cohesiveness

B. Potential injury from animals, vermin, pests

C. Risk of entrapment from falling material

D. Potential structural failure

E. Concern of unusual or rapid fire spread due to increased fire load

F. Need to walk, climb or crawl over and around items

G. Emergency evacuation or routine egress impeded

H. Storage of hazardous materials, e.g. gasoline, LPG, chlorine

I. Delayed ventilation

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2.1.3 Search

A. Ventilation for search hampered.

B. Delayed primary and/or secondary searches.

C. Impeded access to the occupancy from the exterior.

D. Blocked doors.

2.1.4 Suppression

A. Difficulty maneuvering charged hoselines.

B. Fire load beyond the capability of hoselines.

C. Decreased ability of water to penetrate to the seat of the fire.

2.1.5 ***Redacted for PFS***

2.2 It is important for members to communicate the presence of a clutter condition when it may impact operations. When discovered, members should communicate the degree of clutter (light, medium or heavy) and its impact on operations. The steps being taken to overcome the problem(s) and any additional resources that will be needed should be relayed to the IC. The IC will need to adjust strategy and tactics and/or request additional resources if necessary.

2.3 The term "Clutter" shall be used to describe an accumulation of material which may impact operations. The severity of the clutter shall be communicated by using one of the following:

2.3.1 "Light Clutter"

2.3.2 "Medium Clutter"

2.3.3 "Heavy Clutter"

Note: The term “Collyer’s Mansion” shall no longer be used.

3. ***Redacted for PFS***

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4. DEFINITIONS

	Light Clutter	Medium Clutter	Heavy Clutter
Access/Egress	Little or no effect	Entrances and interior pathways will be partially blocked hampering movement	Severe impact due to complete blockage of entrances and interior pathways. Rapid evacuation and relief of units severely impacted. Rescue of trapped members will be difficult and time consuming
Member Safety	Minimal concern for entrapment, structural issues or unusual fire spread. Unit cohesiveness not affected. Smoke detectors may be present and operating properly. Utilities are functioning	Increased concern of entanglement, structural damage and unusual fire spread. Advancement as a unit will be affected. Smoke/CO detectors may or may not be present or working properly. Possibility of gas or electric service disconnected, and candles used for light	Entanglement or entrapment due to avalanche is a real possibility. Unusual fire spread and structural damage due to contents absorbing water can also be expected. Smoke/CO detectors will likely not be present or operating properly. Likelihood of gas/electric services disconnected and alternate fuel sources for heat or cooking used. Storage of flammable or other hazardous materials likely
Search	Primary and secondary searches not affected	Primary searches possible but delayed. Secondary searches will be delayed	Primary and secondary searches will be severely delayed and may require extraordinary measures
Suppression	Little or no delays in line placement. Fuel load not beyond capability of handlines	Maneuvering handlines will be more difficult. Fuel load may exceed capability of handlines	Alternative strategies may be required. Maneuvering handlines may be impossible and fuel load may exceed capability of handlines
EMS	Adequate space to perform patient care in place	Patient care in place and removal will be affected.	Patient care in place and removal by normal means may be extremely challenging due to debris.

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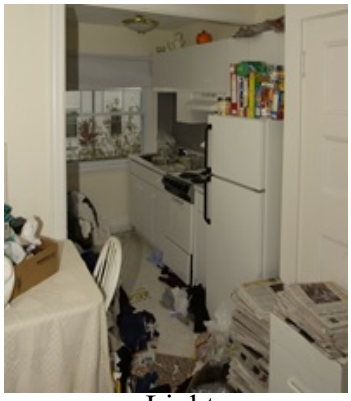
5. REFERENCE PHOTOS

Kitchen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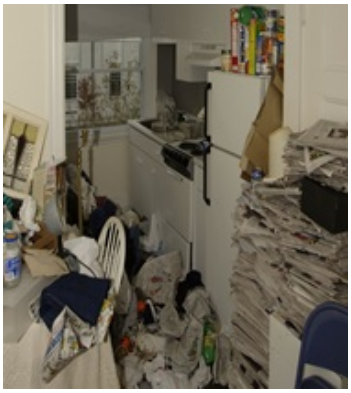
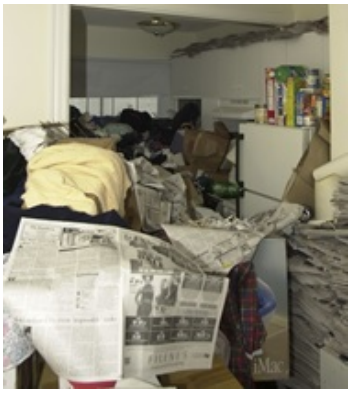
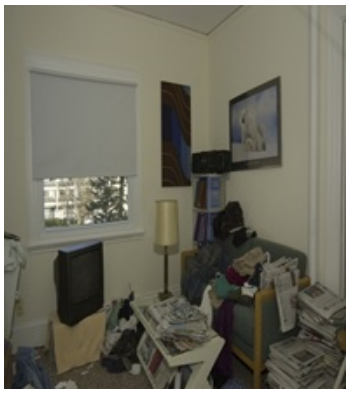

Medium


Heavy

Living Room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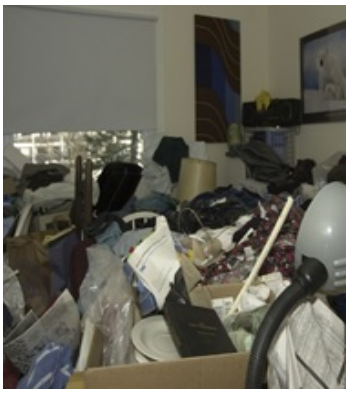
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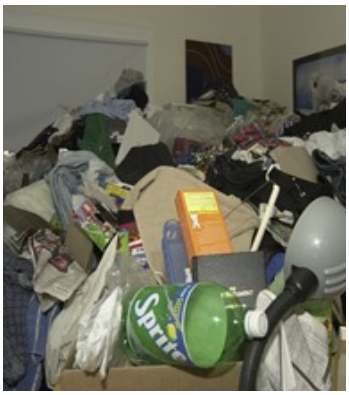
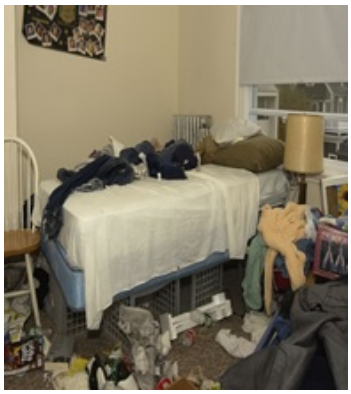

Heavy

Bedroom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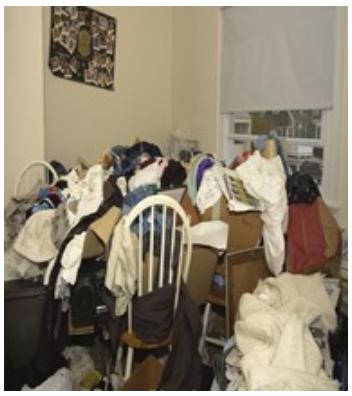
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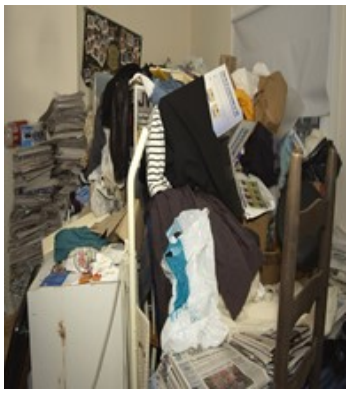
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BY ORDER OF THE FIRE COMMISSIONER AND CHIEF OF DEPARTMEN

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SAFETY BULLETIN 7
CHAPTER 6
April 14, 2022

OPERATIONS AT BUILDINGS WITH CORNICES

1. Cornices are commonly found on the front of Brownstones, Row Frames, Old Law Tenements, New Law Tenements, Apartment Houses, Taxpayers, Mixed Occupancies, Private Dwellings and other buildings in NYC. Many of these structures are over 100 years old, making those cornices even more susceptible to collapse.

2. A cornice is a cantilevered, horizontal, ornamental construction feature found along the entire front wall of a building which projects outward along the top wall of a building.

3. FDNY members responding to a fire in a building which has a cornice as part of its facade, must consider it a collapse danger. During firefighting operations, a cornice must be monitored for possible failure. The front of the building, including any stoop or entrance area to the building are in the potential collapse danger zone when a cornice is exposed to heat or involved in fire.

4. When a cornice is exposed to heat or involved in fire, even if the exposure is minor, a cornice may become weakened and can suddenly, without warning, collapse at one end, swinging down across the front of the building injuring or killing firefighters at the other end. It may also collapse straight downward in its entirety with catastrophic results.

5. A cornice is also a structure that can burn and spread fire. It may be constructed of wood, metal, or combustible plastic and it may have a wood framework inside, and/or wood shingles outside.

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6. FDNY members should be concerned about horizontal fire spread from one end of a building to the other via a cornice. Flames blowing out of a window below a cornice may spread fire to the cornice. Flames may then spread along the underside of the cornice or inside its framework, possibly to an adjoining building.

7. After flames involve a cornice, it can collapse off the façade of the building. When a cornice has been weakened by fire, it may also collapse due to a sudden impact like being struck by a powerful master stream.

8. When a cornice collapses suddenly, it will crash down causing severe and life-threatening injuries and cause damage to the area below. Firefighters operating at one end of a building can be crushed under a falling cornice that starts to collapse at the other end.

9. Depending on existing fire conditions, Incident Commanders should consider utilizing one or more of the following strategies when a cornice may be in danger of collapse:

9.1-9.2 ***Redacted for PFS***

9.3 Where fire conditions are seriously impacting a cornice, a collapse zone should be established.

9.4 When operating streams from the exterior of the building, utilize the reach of hose streams or master streams to operate from safe areas.

9.5 Engine and ladder company operations may need to be conducted by flanking the front wall of the building or by operating only from "Corner-Safe" areas.

10. Cornice collapses have occurred with little or no warning many times over the years at fires in NYC seriously injuring members, and in some instances, fatalities have occurred. By following these safety precautions, members can minimize the chance of being injured or killed by a cornice collapse.

BY ORDER OF THE FIRE COMMISSIONER AND CHIEF OF DEPARTMENT

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TRAINING BULLETIN
APPARATUS L-7
May 27, 2010

REARMOUNT AERIAL LADDER

1. OVERVIEW

1.1 This bulletin describes basic operations of the aerial ladder apparatus. Variations of model, year and make may result in differences of the control panels. In addition to this bulletin, chauffeurs should refer to the Operation and Maintenance manual for their particular apparatus.

1.2 The 100′ Aerial Ladder operates by utilizing two double acting hydraulic lift cylinders which provide smooth, precise elevation from 0-80 degrees above horizontal.

1.3 Two individually controlled stabilizers can be hydraulically extended out and down to provide a firm base for aerial ladder operation.

1.4 Load capacity varies from 250-750 lbs. at the tip depending on the degree of elevation.

1.5 The controls for aerial ladder operations are in three locations:

- Aerial Control Panel located in the Apparatus Cab - Permits the Ladder Company Chauffeur (LCC) to select the rating mode and engage the front brake lock.
- Stabilizer Controls located at the Rear of Apparatus - Two banks of levers control the extension and retraction of the stabilizers.
- Aerial Ladder Controls are located on the Apparatus Pedestal.

1.6 Description of 100′ Aerial Ladder Apparatus

Ladder: 4 sections; one stationary and 3 sliding sections. The aerial ladder is controlled from the rear operated pedestal.

Dimensions: Length: 36 feet

Width: 8' with stabilizers nested.

18' 4" with stabilizers down (5' 2" each side)

Height: 10' 8"

Weight: 60,000 lbs. unloaded.

Stabilizers: One on each side near rear wheels of apparatus, operated from controls in rear compartment.

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2. AERIAL CONTROL PANEL OPERATIONS

2.1 The power for operating the ground stabilizers, aerial ladder hoisting, extension and rotation is derived from the apparatus engine through a transmission mounted Power Take Off (PTO). Activation of the PTO sends power from the transmission to the hydraulic system instead of the apparatus drive train. (Photo 1)

Photo 1

ITEM	SWITCH/LIGHT	FUNCTION
1.	Stabilizer Not Nested Light	When lit, indicates stabilizers are not completely retracted into the body for road travel.
2.	Aerial Hourmeter	Indicates total hours aerial has been operated.
3.	Hydraulic System Indicator Light	Indicates when hydraulic filter should be changed.
4.	PTO Light	When lit indicates PTO is engaged.
5.	PTO Control Switch	Used to start/stop PTO for aerial hydraulics.
6.	Front Brake Light	When lit, indicates front brakes are engaged.
7.	Front Brake Lock Switch	Used to set front wheel brakes during aerial ladder operation (not to be used for parking).
8.	Auxiliary Pump Light	When lit, indicates auxiliary electric hydraulic pump is activated.
9.	Normal/Emergency Hydraulic Switch	Selects normal PTO pump or auxiliary electrically operated pump.
10.	Generator Switch and Run Light	Switch to activate generator. Light "ON" indicates generator has been turned on.

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2.2 Activating Power Take Off (PTO)

- Place automatic transmission in the NEUTRAL (N) position.
- Engage the MAXI-BRAKE.
- Move the FRONT BRAKE LOCK SWITCH to the ON position. The FRONT BRAKE LIGHT will illuminate.
- Open the red cover of the PTO CONTROL SWITCH and flip the switch to the UP position. The PTO LIGHT will illuminate.
- The apparatus is now in PTO.

2.3 Disengaging Power Take Off (PTO)

- The aerial ladder must be bedded and stabilizers fully nested.
- Store wheel chocks, stabilizer pads, and make sure all compartments doors are closed.
- Close the red cover of the PTO CONTROL SWITCH, this will toggle the switch DOWN and disengage the PTO.
- Move the FRONT BRAKE LOCK SWITCH to the OFF position.

3. STABILIZER OPERATIONS

3.1 **Stabilizer Controls** - Hydraulically operated "H" frame stabilizers are located behind the rear wheels. The controls for these stabilizers are located at the back of the apparatus in the Stabilizer Control Compartment, one control handle for each stabilizer. The stabilizers each require a clearance of 5′ 2″ for full horizontal extension. The operator can view the stabilizer in motion permitting a one firefighter operation. (Diagram 1)

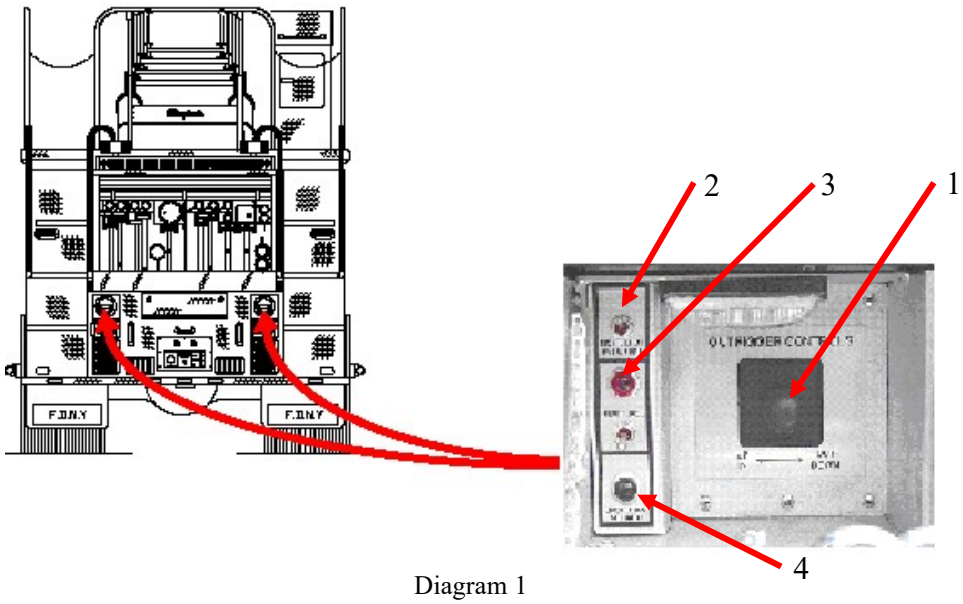

Diagram 1
Right Side Shown

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ITEM	DEVICE	FUNCTION
1.	Horizontal and Vertical Stabilizer Control	Controls IN/OUT and UP/DOWN movement of the stabilizer.
2.	High Idle/Emergency Pump Switch	Activates engine throttle system to increase speed of stabilizer operation when the dash switch is in the "NORMAL" hydraulic mode. Activates the emergency hydraulic pump for control of stabilizers when the dash selector switch is in the "EMERGENCY" mode.
3.	Short-Jack Switch	Overrides normal valve operation to allow for Short-Jack operation (horizontally) of the stabilizer.
4.	Stabilizer Down Indicator Light	When lit indicates stabilizer has been vertically loaded.

3.2 ***Redacted for PFS***

3.3 Extending and Lowering the Stabilizers

- Begin extending and lowering the inboard stabilizer (working side) first.
- Be sure the area is clear of members, civilians, hose or obstructions.
- Activate the HIGH IDLE switch to assist in faster operation.
- Move the STABILIZER CONTROL HANDLE toward the OUT/DOWN position until the stabilizer is **fully extended horizontally** and beginning to lower to the ground. A stabilizer that is not **fully extended horizontally** is considered Short-Jacked.
- Pause operation prior to contact with the ground in order to place Ground Stabilizer Pad. Ground stabilizer pads must be used at all times to help disperse the weight of the apparatus over a larger area.
- With pad in place, resume lowering the stabilizer until it reaches the end of its stroke.
- Ensure that the green STABILIZER DOWN INDICATOR LIGHT is illuminated. Both STABILIZER DOWN INDICATOR LIGHTS must be illuminated before the aerial can be operated.
- Deactivate the HIGH IDLE switch.
- Before operating the Aerial Ladder Controls, Manual Safety Pins must be placed in the highest hole possible in the stabilizers. This will prevent collapse of the stabilizers in the event of a hydraulic fluid leak. (Diagram 2)
- Repeat above procedure for the outboard stabilizer (non-working side).
- When the ground is not level and the apparatus is leaning, start with the stabilizer on the lowest side first (the direction the apparatus is leaning). The low side stabilizer shall be **fully extended horizontally** and lowered to its maximum. The high side stabilizer shall then be extended as necessary and then lowered to a point that levels the apparatus. Utilize the Inclinometer mounted at the rear of the apparatus to aid in leveling the apparatus (Diagram 3). If the inboard stabilizer (working side) is also the

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high side, it **must be fully extended horizontally** and then lowered the distance necessary to level the apparatus for a safe operation.

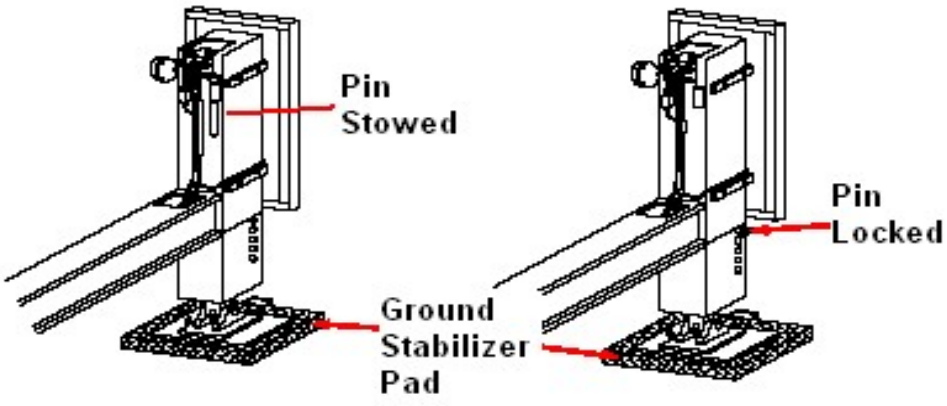

Diagram 2

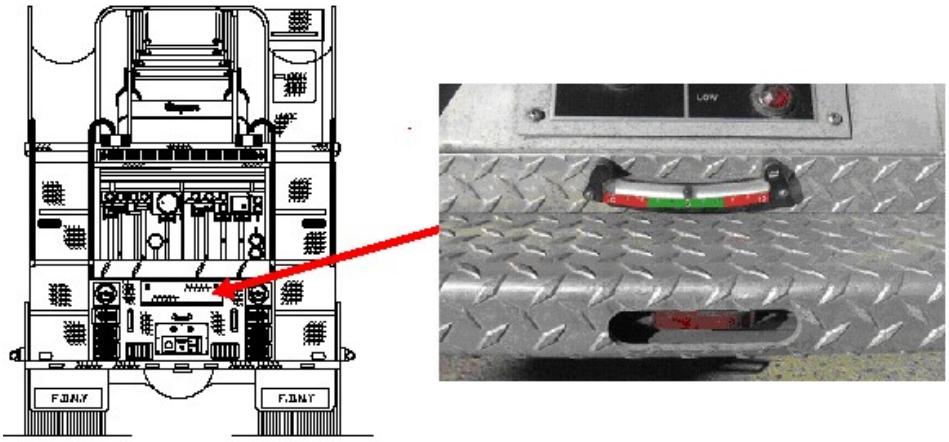

Diagram 3

3.4 Returning the Stabilizers to the Nested Position

- With aerial ladder bedded, remove and stow Stabilizer Manual Safety Pins.
- Activate the HIGH IDLE switch.
- Move the STABILIZER CONTROL HANDLE to the UP/IN position, until the stabilizer is fully nested.
- Deactivate the HIGH IDLE switch.
- Repeat operation on other side.

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4. PEDESTAL CONTROL OPERATIONS

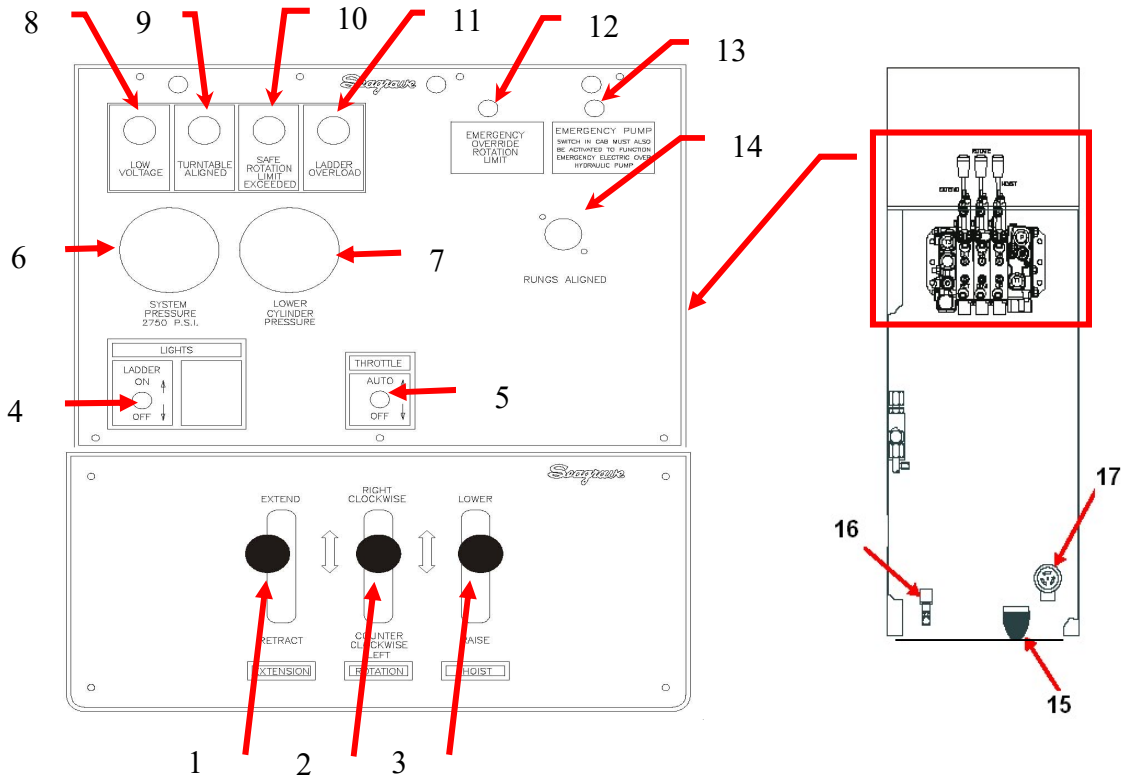

Diagram 4

ITEM	SWITCH	FUNCTION
1.	Extension/Retraction Lever	Controls ladder extension and retraction.
2.	Rotation Lever	Controls rotation of the turntable.
3.	Hoist/Lower Lever	Controls ladder hoisting and lowering.
4.	Ladder Light Switches	Provides current to the ladder lighting system.
5.	Throttle Control	Increases engine speed allowing for faster operation of aerial functions.
6.	System Pressure Gauge	Indicates operating pressure of the hydraulic system.
7.	Lower Cylinder Pressure Gauge	Indicates hydraulic pressure at the bottom of the hoisting cylinder. Provides indication of unsupported ladder load.
8.	Low Voltage Indicator Light	Light indicates a low voltage condition exists.
9.	Turntable Alignment light	Light indicates the turntable is aligned to the ladder cradle for bedding of the aerial ladder.

10.	Safe Rotation Limit Exceeded light	Light indicates when aerial ladder is rotated past its safe limit when operating on the Short-jacked side or during a mechanical malfunction
11.	Ladder Overload Light	Light indicates (and warning horn sounds) when ladder is subjected to an overload condition.
12.	Emergency Override Rotation Limit switch	When activated, overrides the rotation limit system.
13.	Emergency Pump Switch	Activates auxiliary electric hydraulic pump circuit.
14.	Rung Alignment Indicator	Light indicates when rungs are lined up between ladder sections when ladder is ready to climb.
15.	Aerial Enable Foot Switch	Allows operation of aerial control valve.
16.	Ladder Overload Actuator Switch	Controls aerial ladder tip-over alarm system.
17.	Ladder Overload Warning Horn	Horn sounds a warning (and the light comes on) when ladder is subjected to an overloaded condition.

Note: See Diagram 4 in reference to items 1-17 above.

4.1 Raising Bed Ladder

- Depress AERIAL ENABLE FOOT SWITCH at the base of the pedestal.
- Raise ladder by pulling back slowly on the HOIST/LOWER lever.
- Release HOIST/LOWER lever when sufficiently elevated.

4.2 Rotating Ladder

- Depress AERIAL ENABLE FOOT SWITCH at the base of the pedestal.
- Rotate ladder by moving ROTATION LEVER as required for proper direction.
- Release ROTATION LEVER when ladder has reached desired rotation.

4.3 Extending Fly Sections

- Depress AERIAL ENABLE FOOT SWITCH at the base of the pedestal.
- Push the EXTENSION/RETRACTION lever to extend to the desired length.
- Release EXTENSION/RETRACTION lever when ladder has reached desired length.
- If possible make sure RUNG ALIGNMENT INDICATOR light is ON before permitting personnel to climb ladder.

Note: Always move control levers at a slow deliberate speed to avoid jerky motions and consequent "whip" of the ladder which could cause personal injury or ladder damage. Turning off the THROTTLE CONTROL SWITCH on the Pedestal Control Panel will reduce pressure in the system and help with feathering the control lever.

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Photo 2

4.4 Extension Footage numbers are located on the base section vertical struts and the corresponding bright colored vertical strut of the second section. When the colored strut is lined up with a footage number, the ladder is extended to that respective length. (Photo 2)

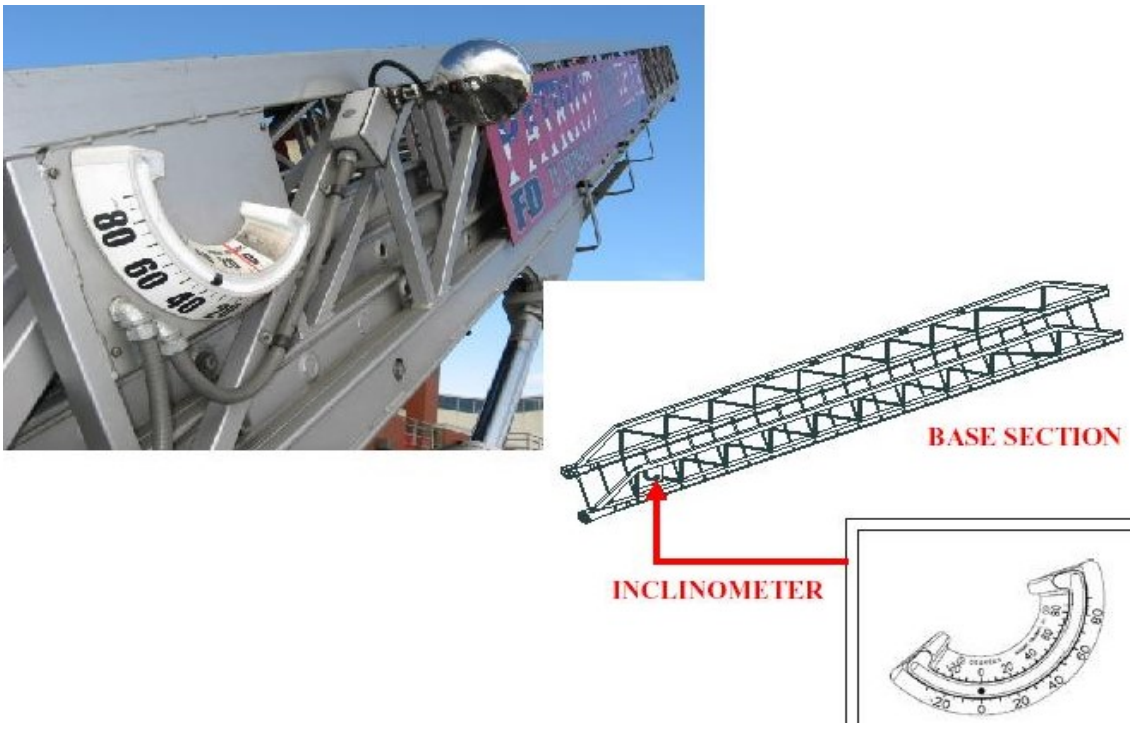

Photo 3

4.5 Refer to the Inclinometer, located on the inside of the Aerial Base section, to determine the hoisted degrees of the ladder above horizontal. Always match the Inclinometer and Extension Footage numbers for proper load capacity. (Photo 3)

4.6 Bedding Ladder (return to cradle)

- Depress AERIAL ENABLE FOOT SWITCH at the base of the pedestal.

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- Raise ladder from operating position by pulling back slowly on the HOIST/LOWER lever.
- Pull the EXTENSION/RETRACTION control lever and retract the ladder sections.
- Rotate the ladder with the ROTATION LEVER to line up with the cradle.
- Push the HOIST/LOWER lever away from you slowly and return ladder to cradle.

4.7 Apparatus Preparation Prior to Driving

- Aerial ladder bedded and stabilizers fully nested.
- Store wheel chocks, stabilizer pads, and make sure all compartments doors are closed.
- Close the red cover of the PTO CONTROL SWITCH, this will toggle the switch DOWN and disengage the power take off.
- Move the FRONT BRAKE LOCK SWITCH to the OFF position

5. ***Redacted for PFS***

BY ORDER OF THE FIRE COMMISSIONER AND CHIEF OF DEPARTMENT

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TRAINING BULLETIN
EMERGENCIES 1
August 1, 2019

ELEVATOR OPERATIONS

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1. INTRODUCTION

1.1 This bulletin will outline the following:

1.1.1 Operational procedures used at EMERGENCIES and INCIDENTS in which people are trapped in stuck elevators.

1.1.2 Guidelines for the utilization of elevators by this department during a fire situation.

1.1.3 Familiarization of members with elevator components and terminology which are essential in effective and safe operations.

1.2 The instructions and information presented here cannot be expected to cover all conditions that confront the department at elevator operations.

1.3 ***Redacted for PFS***

2. ELEVATOR INCIDENTS AND EMERGENCIES - DEPARTMENT POLICY

2.1 The function of the Fire Department at elevator operations is limited to the safe removal of persons trapped in the elevator car or hoistway. Repairs to and reactivation of elevators are not carried out by members of this department.

2.2 Contact shall be made with responsible building management personnel for any information and assistance that will aid the operation. However the first units at the scene should start operations at once without awaiting arrival of the management personnel.

2.3 ***Redacted for PFS***

2.4 Fire Department elevator operations are divided into two categories; INCIDENTS and EMERGENCIES.

2.4.1 INCIDENT:

A stuck elevator with trapped passengers not in immediate danger and no evidence of injury.

Note: Conditions must be constantly monitored; an INCIDENT may escalate to an EMERGENCY.

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2.4.2 EMERGENCY**:**

A situation where one or more of the following exist:

A. Fire endangering passengers in a stuck elevator.

B. Passenger of stuck elevator injured.

C. Passenger of stuck elevator in panic.

3. ELEVATOR INCIDENT AND EMERGENCY - PROCEDURES

3.1 Stuck Elevator Cars.

Problems arise from defective or non-functioning electrical or mechanical devices and equipment.

3.1.1 Electrical problems are the most frequent cause of elevator malfunction.

A. Common causes of electrical problems:

1. Car or hoistway door contacts open.

2. Blown fuses.

3. Shorting of electrical cables.

B. When an electrical problem occurs the following can be expected:

1. Elevator cars will be suspended on the hoistway cables.

2. Elevator brake will be applied in the hold position.

3.1.2 Mechanical problems, though not as common, may also be encountered.

3.2 Size-Up

3.2.1 Locate the car using the following.

A. Lobby control panel - check floor indicator.

B. If available use intercom or telephone system of the stuck car. Passengers may be able to give their approximate location.

C. Open the hoistway door at first floor with elevator key and look up shaft. Key devices are usually required at the lower levels and may be present at all levels.

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1. If the hoistway door has a glass panel check the shaft before opening the door. Using a flash light, look for the governor ropes and the counterweight. Movement of either one of these is an indication that the car is in motion, do not open the hoistway door. The governor rope is generally located on either side near one of the far corners of the shaft.

D. The location of the counterweight can be used to approximate the position of the car. For example, in a 6 story building where the elevator serves the basement, if the counterweight is on the 1st floor, the stalled car would be at the 5th. The counterweight can be located by viewing through the wire glass door panel or by opening a hoistway door.

E. Enter a car in the same bank and open top hatch if no damage will be done to the elevator car.

F. Use the floor selector in the machinery room, it indicates the exact location of elevator car.

3.2.2 Methods of communicating with passengers:

A. Elevator car telephone.

B. Elevator car intercom.

C. Call or yell up hoistway, or speak through car and hoistway doors.

Note: If emergency bell is ringing instruct the car passengers to deactivate the alarm and emergency stop button. A ringing bell can cause anxiety, confusion and hamper communications.

3.2.3 Methods of passenger removal:

A. Primary Removal Procedures, section 3.3.

B. Secondary Removal Procedures, section 3.6.

C. Emergency Removal Procedures, section 3.7.

3.3 Primary Removal Procedures

Primary removal procedures are simple approaches performed without turning off the elevator power.

There are two types of primary removal procedures. The order in which they are tried is not important. Try all if necessary.

3.3.1 Checking Electrical Contacts.

The first type of primary removal procedures checks whether simple electrical contacts might have been broken. However, if the passengers have activated the Emergency Stop Button, these methods will not work. The passengers must be instructed to deactivate the Emergency Stop Button.

A. Have a passenger press Door Open Button. If the car is level with the landing this may open both the car and hoistway door.

B. Press lobby call button.

C. Instruct passengers to insure the car door is fully closed. Have a person push the door towards the closed position.

D. Have members physically close all hoistway doors on the shaft. Air movement in shaft may have opened an interlock cutting power to the car. Check the hoistway doors in the vicinity of the stuck car first.

3.3.2 Fire Service.

The second type of primary removal procedure is activating Fire Service if available. Fire Service will over ride the Emergency Stop Button.

A. Activate Fire Service - Phase I. The stuck elevator may return to the main lobby or sky lobby and open its doors.

B. Fire Service should be deactivated when the car responds by returning to the lobby or if it's clear that the car isn't responding.

3.4 Summon an elevator mechanic if Primary Removal Procedures fail.

3.4.1 Telephone number of the mechanic is required to be posted in the machinery room near the elevator power switch.

3.4.2 Consider the possibility of an elevator mechanic on duty in a nearby building.

3.4.3 Secondary Removal Procedures may be initiated prior to the arrival of the mechanic.

3.5 Precautions during Secondary and Emergency Removal Procedures.

3.5.1 Power Removal

Whenever Secondary or Emergency Removal Procedures are used, power removal is essential. Dispatch two members to the elevator machinery room to shut off the power to the stalled car. The machinery room may be located at the top of the shaft, at the bottom of the shaft or two levels above the highest floor serviced by the elevator.

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A. Members should be equipped with a handie-talkie and forcible entry tools. Communication between members in machinery room and on landing is necessary.

B. Building maintenance personnel may be able to provide members with keys to the elevator machinery room.

C. Members assigned to the elevator machinery room will:

1. Determine which shaft the stalled car is in.

2. Shut off power to the stalled car when directed. Each elevator is controlled by its own power switch. Elevator power switch boxes and motors are required to be labeled in a manner which relates motor to switch. (Ex. Switch #1, Motor #1)

   a. If any doubt exists, open as many elevator power switches as required to insure a safe operation. Allow passengers to exit a serviceable car before removing power.

3. Remain at the power switch throughout the operation to insure the power is not restored.

4. Upon completion of the operation DO NOT restore power to the stalled car.

Note: When operating in elevator machinery rooms, located above the shaft, members should avoid stepping on the cover or grating over the elevator shaft ventilation opening. The grating may be improperly seated or removed and replaced with cardboard or other flimsy material. A member stepping on an unsafe grating or covering could fall the entire height of the shaft. The ventilation opening is also known as the smoke hole.

3.5.2 Other Precautions.

Once you move beyond the Primary Removal procedures there are several precautions you should be aware of.

A. Members are not to enter the shaft or remove passengers from the car until assured power has been removed.

B. When passengers are removed from a car between floors they should be taken up and out of the car if practical. This eliminates the possibility of a passenger falling down the shaft after exiting the elevator. If they are removed to the lower landing, the shaft opening must be protected.

C. Members operating in the shaft are to be secured by a life saving rope.

D. Members shall not normally be permitted to enter the shaft below the elevator car. During a rescue necessitating members entering the shaft below the car, the power switch must be turned off.

E. The elevator shall never be jacked up or moved in an upward direction. This action may free the car safeties causing the car to move either upward or downward depending on the live load in the car.

F. No adjustment to or prying of the elevator machinery brake shall be attempted. The brake will be in a safe position and should not be tampered with.

G. ***Redacted for PFS***

H. If conditions indicate that the elevator is unstable, additional precautions must be taken to prevent the movement of the car in either direction. Consider securing the car to structural members of the building using utility ropes, chains or shoring.

3.6 Secondary Removal Procedures

3.6.1 All efforts must be made to remove passengers via elevator car and hoistway door using an elevator tool or key or the procedures following in sections 3.6.3 & 3.6.4.

A. See addenda to this bulletin for a description of elevator keys and tools and instruction for their use.

3.6.2 Passengers of the stuck car can assist in their removal. Direct the passenger of the car to attempt to open the car door by physically exerting pressure toward the open position. If they succeed in opening the car door instruct them to lift the locking arm on sliding hoistway type doors, or to depress or lift the roller on hinge type hoistway doors.

3.6.3 If the elevator has a two speed system, commonly found in buildings over 10 stories, the following procedure may work:

A. If Emergency Stop Button has been activated have passengers deactivate it.

B. Have members in elevator machinery room shut power to the stuck car and turn it on again.

Note: This is the only circumstance in which the elevator power may be restored by members of this department. If this procedure fails, power must be shut off and members are not to restore power after completion of operations.

C. If the car is to restart it will do so within 10 seconds.

D. Communications must be maintained when attempting this procedure. Passengers and members must be prepared for the sudden movement of the car or car door.

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3.6.4 If stuck car is in a multi car hoistway "POLING" can be used to remove the passengers:

A. Have member work from an adjacent car which is nearest the leading edge side of hoistway door of the stuck car.

B. Adjacent car should be positioned to give access to upper portion of the hoistway door to be opened.

C. Have one member remain on the landing at the hoistway door of the stuck car.

D. Member in the adjacent car inserts pole or hook between the striking post and the hoistway door and trips the lock by either depressing the roller or pushing on the locking arm.

1. Hinge type door - Depress the roller.

2. Sliding type door - push up on locking arm.

E. Member on the landing near hoistway door of the stuck car opens hoistway door when the lock is disengaged.

F. If an elevator car door zone lock is encountered, follow procedures to disengage device as outlined in Addendum 8.

3.7 Emergency Removal Procedures

This section outlines procedures which may only be used during an EMERGENCY as defined in section 2.4.2, or when directly advised by an elevator mechanic. Primary and secondary procedures are usually quicker and more efficient than the methods outlined in this section. The decision of what method to use will be based on the size-up of the officer in command.

3.7.1 Power to the stuck elevator must be off when you use Emergency Removal Procedures. This should have been done before trying Secondary Removal Procedures.

3.7.2 An elevator car will have a top hatch or a side exit - sometimes both. One of these may provide a route by which you can remove trapped passengers.

A. Top Hatch Removal.
Although the law prohibits welding or bolting top hatches shut on elevators, it does happen and it can make this procedure very time consuming.

1. Open a hoistway door or access panel (required in single car blind hoistways) on floor above the stuck car.

2. Provide adequate lighting.

3. Lower a portable ladder to the elevator roof. Use straight ladder if possible. If an extension ladder is used tie the halyard around the rungs of both sections of the ladder. This will prevent the lower section from dropping on to the car roof.

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4. Climb down to the car roof. Maximum of two firefighters are to be permitted on the roof of the car at one time.

5. All members working in the shaft are to be secured with a life saving rope.

6. Open the top hatch.

   a. This may require the use of a wrench or screw driver.

   b. Forcible entry tools may be required.

7. A small portable ladder is lowered into the elevator.

8. One member equipped with a handie-talkie enters car. Member in the car must determine the order of removal. Secure each person with a life saving rope.

9. Members are to remain in physical contact with trapped persons while they are being removed.

B. Side Exit Removal.

Useful under conditions of partial power loss in multi-car hoistways. It may not be useful where a structural beam blocks a side exit or the rescue car can't be brought level with the stuck car.

1. Members must work from a car that is in the same bank and is adjacent to the stuck car. This will become the rescue car.

2. Bring rescue car even with stuck elevator.

   a. If mechanic is present, use their operating key to bring the car level with stuck car.

3. Remove power to rescue car. Power to the stuck car was previously removed.

4. Open side exit in rescue car.

   a. A key or forcible entry is required to open panel from inside the car.

5. Open side exit of stuck car. It is openable by hand from the shaft side.

6. Planks of sufficient lengths (6' or longer) should be used as a bridge between cars.

7. Member equipped with a handie talkie and secured with life saving rope crosses planks to the stuck car.

8. Member determines the order of removal. Secure each passenger with a life saving rope and assist them to the rescue car.

9. After passengers are removed restore power to the rescue car.

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3.7.3 Forcible Entry

Forcible entry of hoistway and elevator car doors should only be attempted under the direct advisement of an elevator mechanic or as a last resort during EMERGENCY REMOVAL PROCEDURES. The deformation of the doors and locks may add to the problem and delay the rescue. Upon completion of forcible entry operations have maintenance personnel secure the hoistway door or have police or security warn people of the danger.

Choose one of the following procedures based on the type of hoistway door.

A. Hinged door.

1. Knock out glass panel if present. If not, breach hoistway shaft above hoistway door
2. Push down roller, located near side opposite hinges, on shaft wall.
3. Open hoistway door.
4. Push open elevator car door.

B. Slide type door.

1. Maxi Force Air Bag System.

   This is the preferred forcible entry method. It is less likely than the others to push the door off its hangers or out of its track.

   a. Take a small purchase with a forcible entry tool.
   b. Place bag between the leading edge of the door and jamb as high as possible to apply a more direct force on the linkage and the locking mechanism.
   c. Position the bag to permit the center of the air bag to be as close as possible to the door edge. This increases the spreading capability of the air bag. It may be necessary to have a passenger in the car push open the car door to permit the air bag to obtain a good purchase.
   d. Inflate air bag until hoistway door opens.
   e. If necessary push open elevator car door.

2. Hydra-Ram ***(Edited for PFS)***

   a. Use forcible entry tool to gain a purchase for the jaws of the Hydra-Ram ***(Edited for PFS).***
   b. Insert the jaws of the Hydra-Ram ***(Edited for PFS)*** between the jamb and the leading edge of the hoistway door, as high as possible.
   c. Ensure that the tool is flush with the hoistway door.

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d. Operate tool to open door taking care not to cause the door to come off its track.

e. If necessary push open elevator car door.

3. Forcible entry tools

a. Go to landing directly above door to be opened.

b. Use a forcible entry tool to lift hoistway door out of its guide.

c. Tilt bottom of the hoistway door slightly into the shaft, just enough to allow the passing of a hook into the shaft.

Note: Care must be taken not to tilt the door too much. It may dislodge from hanger and drop into the shaft.

d. Use a hook to reach down to the lock arm mechanism and pull it up.

e. If necessary push open elevator car door.

C. Blind hoistway.

1. Determine the side of hoistway the car door faces.
2. Breach hoistway wall on that side.
3. Push open elevator door.

4. ELEVATOR PIT OPERATIONS

4.1 Elevator Pit Description.

The Elevator Pit is the lowest portion of the elevator shaft.

4.1.1 Types of Elevator Pits.

A. Jump Pits.

1. Usually 4' to 6' from lowest landing level to base of pit.

2. Elevator descends to within a couple of feet of the bottom of the shaft.

3. Pit is entered by opening the lowest hoistway door and using a portable ladder.

B. Walk In Pit.

1. Usually 6' to 10' from lowest landing to base of pit.

2. Car descends to the floor level above bottom of shaft.

a. A high buffer and lower limit switch prevent the car from entering the pit.

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3. Access to the pit is via a door located at the bottom of the shaft.

   a. Door is not required to have an interlock switch.

   b. Door is opened by a regular key. Emergency elevator keys are not usable.

4.2 Operations in Elevator Pits

4.2.1 Jump Pit.

A. Shut off elevator power switch.

B. Open the lowest hoistway door on shaft.

C. Use portable ladder to enter shaft.

D. For additional safety, trip lower limit switch and secure it in an open position.

4.2.2 Walk In Pit.

A. Shut off elevator power switch.

B. Enter via pit door.

C. If there is a fire in the pit, be cautious of the buffers (a device designed to stop a descending elevator beyond the normal limits of travel), they may be filled with combustible or inflammable liquid.

D. In an EXTREME EMERGENCY (immediate action necessary to save life) entry to a Walk in Pit before the elevator power switch is off may be made using the following precautions:

1. Open a hoistway door on shaft to be entered. The interlock will prevent car from moving.

2. Use caution around mechanical and electrical components.

3. Turn off power as soon as possible.

5. FIRE SERVICE

All Fire Department personnel should be familiar with the operating procedure and limitations of Fire Service. This section describes Fire Service components and operational procedures. Section 6.4 outlines use of Fire Service during fire operations.

Note: ***Redacted for PFS***

5.1 ***Redacted for PFS***

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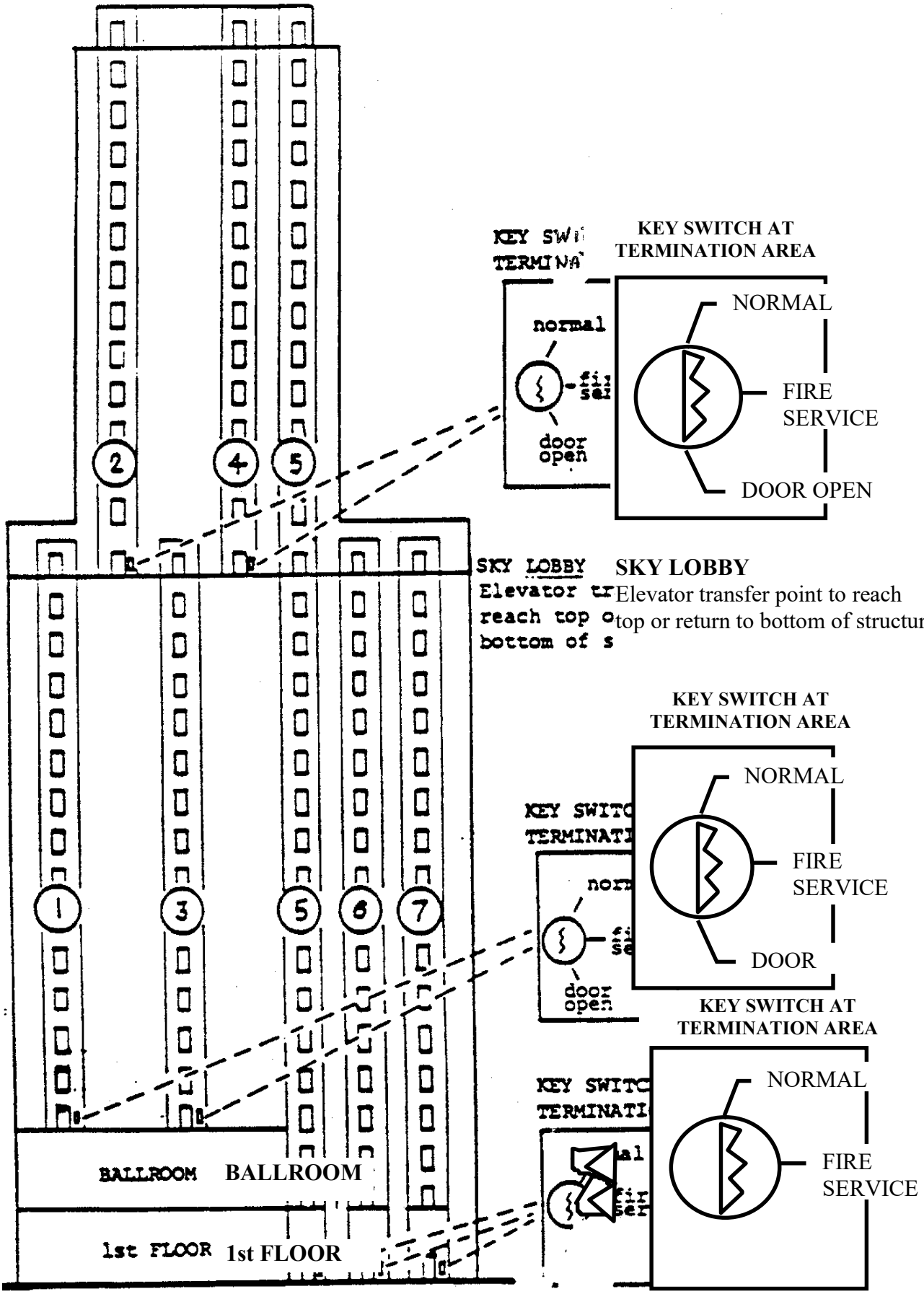

Fig. 1 Elevator Configuration

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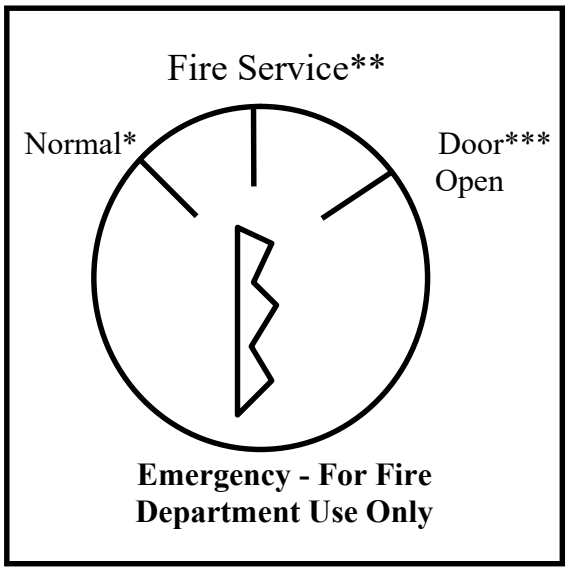
Fire Service Lobby Switch Plates



Often Abbreviated as
Off *
On **
DO ***

Fig. 2A

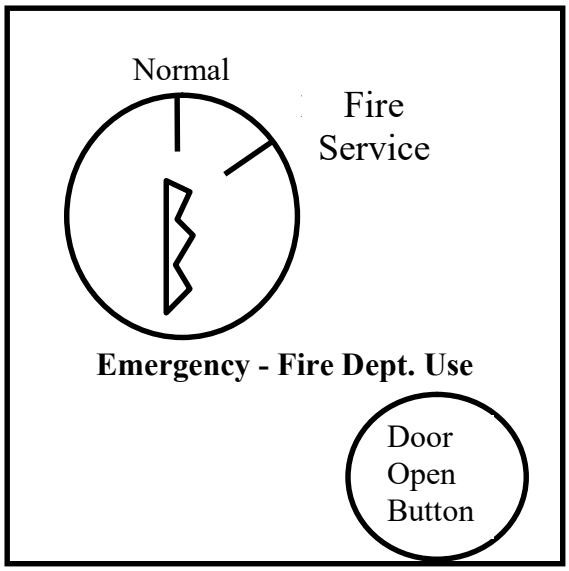


Fig. 2B

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5.2 Fire Service Controls.

5.2.1 Lobby Keyed Switch.

A. A switch at the street floor or terminal floor for each bank of elevators. Terminal floor is the lowest landing above the street floor of any elevator that does not serve the street lobby floor, also known as a Sky Lobby. (Fig. 1)

B. The key switch is required to be within 4 feet of the lobby call button.

C. The key switch is operated by use of the Fire Department 1620 key, or by city wide standard elevator 2642 key.

Note: Worn keys may not work.

D. Switch Configurations.

1. Three position key - Normal, Fire Service and door open. (Fig. 2A)

2. Two position key - Normal and Fire Service with a door open button. Door open button is required to be located in the same faceplate as the key switch. Button is only operable when key switch is in the Fire Service position. (Fig. 2B)

Note: In both situations the cylinder face is approximately 1 1/2" in diameter and colored red. Switch faceplate is required to be inscribed "for fire department use only" or similar terminology.

E. The Normal and Fire Service position in the keyed switch permit the removal of the key. The key is not removable in the door open position.

5.2.2 Elevator Car Keyed Switch.

A. Fire Service keyed switch is provided inside each Fire Service elevator car.

B. This switch is identified by red lettering "FOR FIRE DEPARTMENT USE ONLY" and has two positions. Normal and Fire Service.

Note: Elevators approved for installation after March 1991 are required to be equipped with a three position switch:

NORMAL HOLD FIRE SERVICE

The Hold Position has the following features:

1. Permits the firefighter to remove the 1620 key from the switch.

2. Allows the firefighter to leave the car without the danger of an individual, without a key, moving the car to another location.

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3. A firefighter with a 1620 key can move the car by changing the switch position from HOLD to FIRE SERVICE.

   THIS ACTION SHALL NOT BE TAKEN WITHOUT FIRST INFORMING THE FIREFIGHTERS OPERATING ON THAT FLOOR.

4. Elevator cars equipped with a two position switch are not required to be retro-fitted with a three position switch.

C. To operate the car, the switch must be placed in the Fire Service position while the car is at the landing where the lobby keyed switch is located.

D. The lobby keyed switch must be in the Fire Service position prior to placing the car keyed switch to Fire Service.

E. Once the car switch is in the Fire Service position it can not be overridden by the lobby keyed switch.

F. The 1620 key is not removable from the elevator car keyed switch when it is in the Fire Service position.

5.3 Operation of Fire Service.

5.3.1 Phase I - Recall Phase.

The recall of ALL elevators in the bank to the street or terminal floor either automatically or manually.

A. Manual Recall.

By the use of the 1620 key at the keyed switches located in the elevator lobby at the street floor or terminal floor.

Note: For elevators whose terminals are above the street floor (sky lobby), a two position keyed switch will be at the fire command station. The switch will allow the elevators to be brought down non-stop to their lowest floor landing. A three position keyed switch will also be at their terminal floor landing.

B. Automatic Recall.

1. Activation of elevator landing smoke detector.

2. Water flow from a sprinkler system.

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Note: If the Fire Service Phase I was initiated automatically by the activation of a lobby smoke detector or sprinkler water flow, the elevator cannot be returned to normal operation until the smoke detector or water flow alarm has been cleared.

C. Initiating Phase I Recall.

1. If Phase I (recall phase) has not been initiated upon arrival, Phase I shall be initiated and all cars accounted for and examined as they arrive at the street lobby floor.

2. If Phase I has been initiated before arrival and all elevator doors are closed, the following procedures are to be followed.

   a. Determine if Phase I was initiated manually or automatically.

   b. If Phase I was initiated manually the Fire Service lobby keyed switch will be found in the Fire Service position. Place the Fire Service lobby keyed switch momentarily in the "Normal" (OFF) position. Then return it to the Fire Service position. This will cause all elevator car doors in this bank to open.

   c. If Phase I was initiated automatically (by lobby smoke detectors or sprinkler water flow), place the lobby keyed switch in the "Door Open" position. The doors of the Fire Service cars will then open. In some older installations the doors of the non-Fire Service cars will not open and must be opened by use of the emergency hoistway door key.

D. Results of Initiating Phase I Recall.

1. By placing the keyed switch in the Fire Service position, all elevators in that bank will be returned to the street lobby or terminal floor.

2. An elevator traveling away from the street floor or from its lowest landing floor will reverse direction at the next landing without opening its doors, and return non-stop to the street lobby or terminal floor.

3. Doors opened at any floor will immediately close and the elevator shall return non-stop to the street or terminal floor.

4. Door reopening devices for power operated doors, which may be affected by smoke, heat or flame so as to prevent door closure, shall be rendered inoperative except for those mechanically activated by a safety edge.

5. "Emergency Stop" buttons will be rendered inoperative.

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6. When the elevator car reaches its terminal floor, one of the following will occur:

   a. All car and hoistway doors open. The doors remain open for at least 8 seconds and no more than one minute and then close.

   b. All car and hoistway doors open. The Fire Service elevator car and hoistway doors remain open with the car lights remaining on. Non Fire Service elevator car and hoistway doors close between 8 seconds and one minute after opening.

   c. All elevator car and hoistway doors open and remain open. The car lights in the Fire Service elevator cars remain on and the lights in the Non Fire Service cars go off.

Note: Option "c" is required for all installations for which plans were filed after 1980.

Caution: Do not return the switch to the "normal" position at this time.

5.3.2 Phase II - Operational Phase.

The actual operation of the elevator car by use of the controls located within the car.

A. Operations:

1. Place the 1620 key in the car Fire Service switch and turn to the Fire Service position.

2. Press the car "Door Close" button and select a floor. It is not important which floor button is pressed first.

   a. In some elevator cars there may be two floor selection panels. The one to use for Fire Service is the one nearest to or the one with the Fire Service keyed switch.

3. As soon as the car begins to move, press the "Call Cancel" button to verify the operation of the "Call Cancel" button.

   a. If the car stops at the next available landing in response to the "Call Cancel" button, select the desired floor on the "Floor Selection" panel.

   b. If the car does not stop at the next available floor in response to the "Call Cancel" button:

      1) Immediately select the next available safe floor. If the car stops at the next available floor, press the "Door Open" button and leave the car. Notify the officer in command that the car is out of service.

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2) If the car does not stop at the next available floor, attempt to stop the car by forcing the car doors open, thus interrupting the interlock relay switch. Notify the officer in command and initiate emergency evacuation procedures.

4. If more than one floor selection is made, the elevator car will stop at the nearest floor selection in the direction of travel.

5. If the car is operating normally when you reach the selected floor, press the "Door Open" button. You must keep your finger on this constant pressure button until the door is fully open, otherwise the door will close on its own. This is a built in safety feature.

6. If the doors open on heat and smoke, the simple removal of the finger from the "Door Open" button should enable the doors to close.

   a. If they fail to close automatically, press the "Door Close" button and manually assist the closing.

   b. If the car doors still fail to close, don Mask facepiece, evacuate the elevator and proceed to the nearest safe stairway.

7. When the elevator doors have fully opened, the elevator car will remain at the selected floor, with the doors open.

8. The elevator car shall not be returned to the lobby street floor until the officer has determined that the unit has arrived at the proper location.

   a. Due to internal building security, it is often necessary to force your way out of an elevator landing area on upper floors. Units may have to force their way from the elevator lobby to a fire stair or fire tower, either for reasons of safety or in order to operate. Someone should stay with the elevator, to see that it is not moved from the floor, until safe access to the fire stair or fire tower is assured.

9. To move from any floor, the "Door Close" button must be pushed, and another floor selected.

10. An elevator can be placed on Fire Service or taken off of Fire Service only when the car is at the landing where the lobby keyed switch is located.

11. Once a Fire Service car has been placed in Phase II operation, it will continue in Phase II operation, regardless of the Position of the lobby keyed switch. This feature may be utilized to restore other cars in the elevator bank to normal operation, while the Fire Department continues to use the Fire Service car or cars.

12. When an elevator car has been placed on Fire Service, it shall be operated by a member equipped with a handie talkie and forcible entry tools.

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5.3.3 Controls for Phase II.

A. Door Close Button.

1. It is a momentary touch type button.
2. Once fully opened the elevator car doors close only in response to the Door Close Button.

B. Floor Selection Button.

1. When the car is in Fire Service, the car responds only to the floor selected by the Floor Selection Button in the car.
2. All elevator landing call buttons are rendered inoperable on landings served by this elevator.

C. Call Cancel (reset) Button.

1. The Call Cancel Button allows the operator to change floor selection or direction of travel prior to reaching the original selected floor.
2. When the Call Cancel Button is operated, the elevator car stops at the next available floor landing (i.e., the first floor, in the direction of travel, that the elevator is electrically and mechanically capable of serving). The doors remain closed. A new floor selection must then be made.
3. It is recommended that the Call Cancel Button be pressed whenever a member enters a car on Fire Service to clear the floor selection panel of any previous floor selection that may have been made.

D. Door Open Button.

1. The elevator door opens only when the Door Open Button is pressed.
2. The Door Open Button must be held until the doors are fully opened.
3. If the Door Open Button is released before the doors are fully opened, the doors return to the closed position. This feature is provided so that the release of the Door Open Button will automatically close the doors in the event the car inadvertently stops at the fire floor.
4. Members leaving the elevator car must verify that the doors are fully opened. If a member leaves the car before the doors are fully opened, the door will close behind them, isolating the car and placing it out of service.

E. Emergency Stop Button.

1. The Emergency Stop Button is rendered inoperative during the Phase I operation.
2. The Emergency Stop Button should be operational during Phase II operation.
3. Activation of the Emergency Stop Button in Phase II will quickly stop the elevator car.

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6. ELEVATOR OPERATIONS DURING FIRE OPERATIONS

6.1 General Procedures.

6.1.1 ***Redacted for PFS***

6.1.2 When it is confirmed that the fire is on the 7th floor or below, units should avoid the use of elevators. It is safer to utilize the stairway to reach the fire floor.

6.1.3-6.1.15 ***Redacted for PFS***

6.2 ***Redacted for PFS***

6.3 Firefighters trapped in stalled elevator cars during fire operations.

6.3.1 Operations of Fire Department members in a stalled car.

A. If elevator car door opens on fire floor (heat, smoke), attempt to close the door.

1. Push Door Close Button.

2. Force door closed.

B. Select lower floor.

C. If car fails to move:

1. Check Emergency Stop Button, it may have accidentally been activated. Deactivate it by pulling it out, or if switch type, moving switch to off position.

2. Open Top Emergency Exit to relieve smoke in car.

3. Keep low in car.

4. If necessary don Mask facepiece. Remember it is important to conserve air.

5. Communicate situation to officer in command.

6. If necessary, use side emergency exit for rope slide to the safety of lower floor. Have power removed to the adjacent car if this is to be attempted.

7. In an EXTREME EMERGENCY, Fire Department hose can be used to slide down to the floor below. If more than one length of hose is used, first tie the lengths together, then couple them.

8. Members can be lowered to the hoistway door interlock and exit at the floor landing below the fire.

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9. Hose line on the floor below can be used to spray a fog stream between the car and the hoistway door. A 30 degree fog pattern should be used to cool and protect trapped persons during the rescue operation.

6.4 Fire Service during Fire Operations

6.4.1-6.4.6 ***Redacted for PFS***

6.4.7 Sabbath elevators are designed for religious purposes and operate automatically without the need to push any buttons. When in Sabbath mode, these elevators typically stop at every floor or every other floor automatically. These elevators are required to be operable in fire service mode in accordance with Building and Fire Code requirements. Most often a sign will be present indicating this type of elevator (Photo 1). There may also be a sabbath key switch plate (Photo 2).

Units shall verify the firefighter service feature is operational before electing to utilize any Sabbath Elevator. Sabbath elevators shall **not** be used if the firefighter service feature is missing or not operational. Buildings where Sabbath elevators exist, should be considered for inclusion in ECIDS.

Photo 1

Photo 2

6.5 ***Redacted for PFS***

7. ***Redacted for PFS***

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8. ELEVATOR TERMS AND DEFINITIONS

Alarm button (switch) - Button (switch) in elevator car which activates the alarm bell.

Car Door - Elevator car door.

Car Door Contact - An electrical device used to prevent the operation of the car unless the car door is in the closed position.

Car Safeties - Stop car in the event of an emergency. Controlled by car governor.

Counterweights - Used to counterbalance the weight of the elevator car.

Elevator Car Selector - Panel inside car containing emergency stop button, alarm button, door open button, floor selection buttons and Fire Service key switch if required.

Elevator Control Panel - A visual display unit located in the lobby which indicates the status and location of all elevator cars and the necessary controls for the operation of the cars. Common in High-Rise buildings.

Elevator Door Vane - The connection between the elevator car doors and the hoistway doors. It allows the elevator car door to drive the hoistway door.

Elevator Machinery Room - Area where the equipment that raises and lowers the elevator is located. Usually located at the top of the shaft, machinery room may also be found at shaft bottom or two floors above the highest floor serviced by the elevator.

Elevator Motor - Turns winding drum raising and lowering elevator car.

Emergency Stop Button - Elevator car button which when activated cuts power to car and sounds alarm bell. Note: Do not rely on this button; elevator power switch must be used to insure motor power is off.

Emergency Escape Ladder - On the top of some elevator cars used to assist in top hatch removal operations.

Emergency Exit - Side door of a car in multi car hoistways.

Final Lower Limit Switch - A switch located in the elevator pit which prevents the elevator from descending too low in the shaft. When tripped by elevator it cuts the power to elevator motor. Acts as a backup to lower limit switch.

Fire Service - A feature required in many elevators which enables the department to gain control of the elevators.

Floor Call Button - Located at elevator floor landing, used to call car to the floor when service is desired.

Floor Selector - Located in the machinery room can be used to determine the exact location of the elevator.

Governor - Regulates elevator car speed. Also engages car safeties and shuts off electrical power in the event of free fall or over speed.

Governor Rope - A wire rope or cable which travels with the car. If engaged by the governor it mechanically activates the car safeties.

Hoistway - The shaft the elevator moves in. Types: Single car (local service), multi car (local service), single car blind (express service), multi - car blind (express service).

Hoisting Cable - Cable (cables) used to raise and lower the elevator.

Hoistway Door - door leading from landing to elevator shaft.

Interlock - A switch on hoistway door, and some emergency exits that will prevent the elevator from moving when in open position.

Key 1620 - An official Fire Department alarm box key.

Key 2642 - Standard key used by elevator industry. This key is interchangeable with 1620 key for operation of Fire service elevators

Limit Switch - A mechanical electrical device which is located at the top or bottom of the shaft. Its purpose is to prevent over extension of elevator car in an upward or downward direction.

Lower Limit Switch - A switch which stops the car in pit area, below lowest landing.

Main Electrical Power Switch - Located in machinery room, each switch controls the operation of one elevator.

Terminal Landing - lowest landing for discharge of passengers, may be at ground floor or above in which case it is known as a Sky Lobby.

Traction Sheave - Free turning pulley for elevator cables.

Ventilation Opening - "Smoke hole" - opening providing for the movement of air in the shaft caused by the movement of the elevator.

BY ORDER OF THE FIRE COMMISSIONER AND CHIEF OF DEPARTMENT

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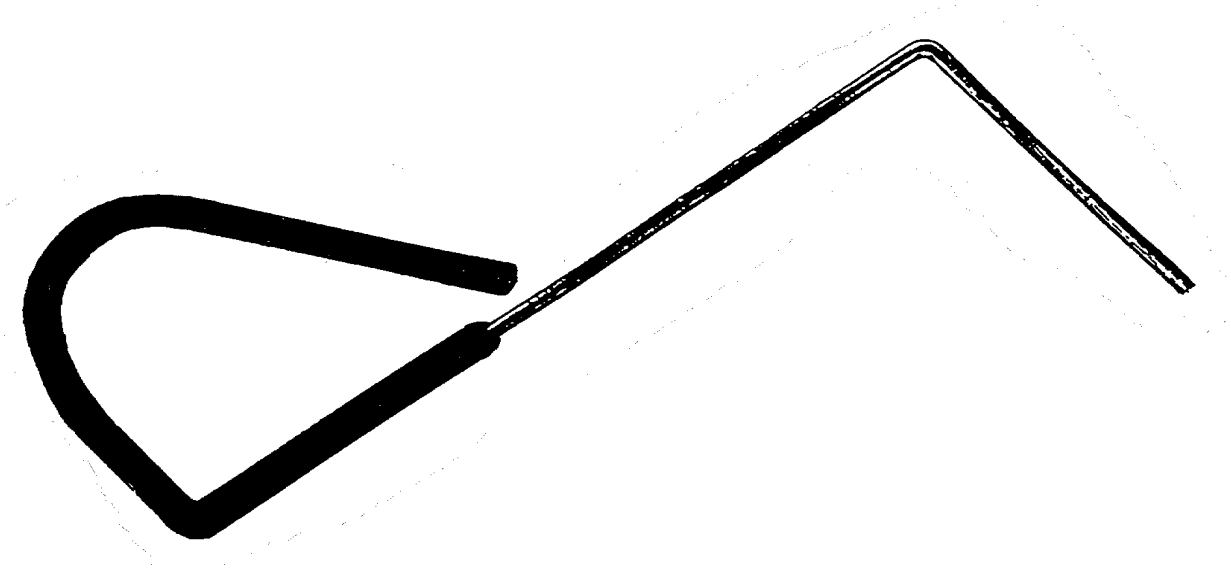
GAL ELEVATOR PICK TOOL



1. Description

1.1 A hand tool used to open Swing Type elevator hoistway doors to gain access to the elevator shaft or an inoperative elevator car.

1.2 Developed by Research and Development Unit of the Division of Safety and fabricated by the Maintenance Unit of the Bureau of Training.

1.3 Handle is Epoxy coated to reduce the electric shock hazard.

2. Use

2.1 Use of this tool is indicated when there is no emergency key provision and a brass tenon plate is visible on the upper part of the door on the opposite side of the hinges.

2.2 ASSURE THAT POWER IS OFF. There is danger of severe electrical shock if this tool is used on an energized hoistway door.

2.3 Hold tool with point up and handle toward the user.

2.4 Insert the point under the tenon plate parallel to, and as close to the door jamb as possible.

2.5 Push the point up between the door jamb and the latch spring located under the tenon plate.

2.6 Simultaneously rotate the handle toward the center of the door while pulling it upward, depressing the spring latch into the door jamb.

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2.7 Jiggling the hoistway door while depressing the spring latch may assist the procedure.

2.8 Open the hoistway door by pulling the handle.

2.9 Attempt to open a hoistway door with this tool before resorting to forcible entry.

3. Training

3.1 Due to the necessity to remove power, thereby stopping elevator service, drills on the use of this tool are not permitted.

BY ORDER OF THE FIRE COMMISSIONER AND THE CHIEF OF DEPARTMENT

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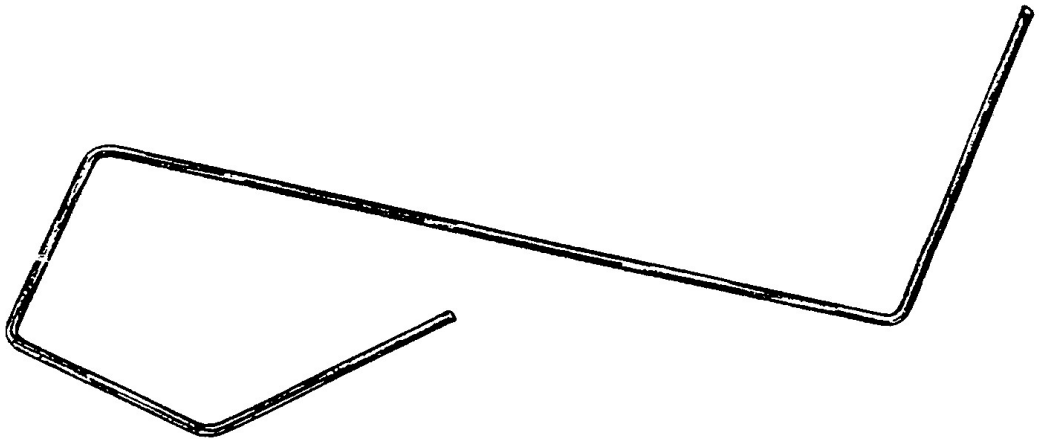
"Z" TOOL



1. Description

1.1 A hand tool used to open SLIDING TYPE elevator hoistway doors to gain access to the elevator shaft or to an inoperative car.

2. Use

2.1 With point of tool parallel to hoistway door, insert tool between door jamb and top of door.

2.2 Rotate the tool 90 degrees, so that the point of the tool is now perpendicular to the hoistway door.

2.3 Move the tool toward the leading edge of the hoistway door to locate the locking arm.

2.3.1 There are several items which may be encountered as the tool is moved along the top of the door. Trail and error will result in locating the locking arm.

2.3.2 Location of the emergency keyhole on a hoistway door in the same elevator shaft will aid in locating the locking arm.

2.4 While keeping the point of the tool perpendicular to the hoistway door, swing the handle of the tool so that the tool is at a 45 degree angle to the plane of the locking arm.

2.5 Push up the tool, raising the locking arm and disengaging the hoistway door lock.

2.6 Open the hoistway door by pushing it away from its leading edge.

2.7 Attempt to open a sliding hoistway door with this tool before resorting to forcible entry.

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T. B. EMERGENCIES 1
ADDENDUM 6
October 2, 2020

GAL DROP KEYS

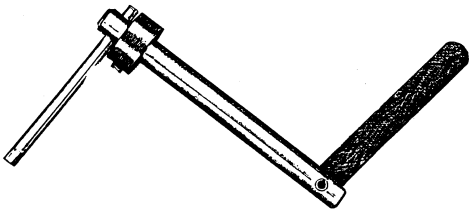

Figure 1

Figure 2

Figure 3

1. DESCRIPTION

1.1 A hand tool used to open SLIDING TYPE elevator hoistway doors to gain access to the elevator shaft or an inoperative elevator car.

1.2 Characterized by a hinged working end.

1.3 The key in Figure 2 is a smaller diameter than Figure 1 and has multiple hinged sections.

2. USE

2.1 The correct sized key that fits into the keyway (Figure 3) on the sliding door should be used. The smaller key can be used in larger keyways but the larger key cannot be used in smaller keyways.

2.2 Keeping the sections aligned, insert the tool until the hinged section(s) drop behind the hoistway door.

2.3 Turn the tool away from the leading edge of the hoistway door until resistance is met.

2.4 Apply pressure against the resistance to disengage the hoistway door lock.

2.5 Open the hoistway door by pushing it away from its leading edge.

2.6 On elevators equipped for use of the GAL Drop Key, attempt to open the hoistway door by use of the key before resorting to forcible entry.

BY ORDER OF THE FIRE COMMISSIONER AND CHIEF OF DEPARTMENT

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T. B. EMERGENCIES 1
ADDENDUM 8
June 11, 2009

ELEVATOR CAR DOOR ZONE LOCK

1. DESCRIPTION

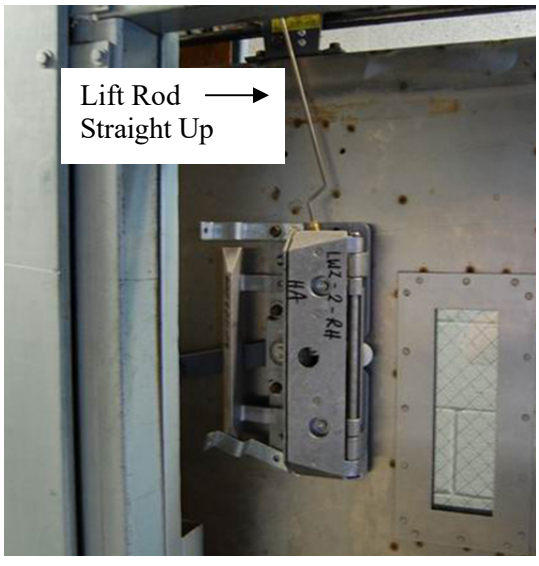
1.1 NYC Housing Authority is in the process of installing car door zone locks on all NYC Housing Authority elevator cars. The zone lock is a mechanical device which prevents the elevator car door from opening if the car does not stop level with the floor at the elevator landing. These devices are being installed on the outside of the elevator car doors on hinged type and sliding type doors. These locking devices can be easily disengaged without doing unnecessary damage to the elevator car door.

2. USE

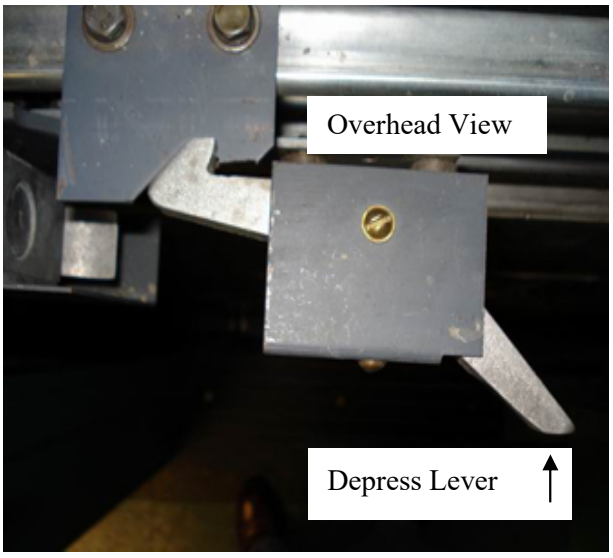
2.1 When operating at elevator emergencies, always ensure power is removed to the stalled elevator car before commencing operations. After opening the hoistway door, the zone lock will be visible on the front side of the elevator car towards the top of the door.

3. DISENGAGE ZONE LOCK DEVICE

- *Sliding Type Doors:* Lift rod straight up to release the zone lock device.
- *Hinged Type Doors:* Depress lever to release the zone lock device.



Sliding Door



Hinged Door

BY ORDER OF THE FIRE COMMISSIONER AND CHIEF OF DEPARTMENT

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TRAINING BULLETIN
EMERGENCIES 3
August 24, 2022

BASIC EMERGENCIES

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1. INTRODUCTION

1.1 Every day firefighters respond to different emergency situations that occur in N.Y.C. This bulletin will enable the firefighter to act on, control or eliminate the more common emergencies. The information contained in this bulletin is to be used as a guide for operations at basic emergencies.

2. OPENING OR CLOSING

2.1 In the Northern Hemisphere we are controlled by clockwise motion. Such phenomena as water draining out of a tub, smoke rising from a fire or chimney, vines growing up a pole all move in a clockwise direction. The Japanese Current, Gulf Stream, Jet Stream and prevailing winds also move in a clockwise direction. We mention clockwise in an attempt to save scraped knuckles, facilitate operations and to prevent serious injuries and damage to equipment. For this reason, it is beneficial to understand that clockwise is used by us in many ways at emergency operations.

2.1.1 CLOCKWISE DIRECTION is used to close, makeup or tighten the following (Figure 1):

A. Water valves in faucets (usually).

B. Screws.

C. Nuts.

D. Pressure cylinders such as oxygen and propane.

E. Sprinkler systems, water mains.

2.1.2. Equally important to know is the other way - COUNTER-CLOCKWISE (CCW). The Other Way (CCW) is used to close the following:

A. Hydrant operating nut.

B. Hydrant street shut off.

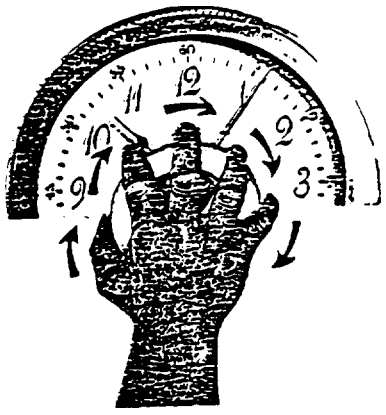

FIGURE 1
CLOCKWISE DIRECTION

The general rule for closing valves is to turn clockwise. For exceptions see Section 2.1.2

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3. WATER LEAKS

3.1 Toilet Bowl Leaking.

3.1.1 It is 3 a.m. and your unit is called to an apartment where water is leaking into a light fixture from the apartment above. We may have to disconnect the light fixture or pull the fuse as well as shutting off the water.

3.1.2 Possible action to stop leak:

A. Depends on type but generally if the ball in the water tank can be raised it will stop flow.

B. Sometimes under the tank a shut off handle is situated. Turn clockwise.

3.2 Leaking Sinks.

3.2.1 Possible actions.

A. Locate handle under sink.

B. Turn clockwise.

3.3 Broken Pipe or Leaking Pipe.

3.3.1 Possible actions.

A. If shut off handle is accessible turn clockwise.

B. If inaccessible and tubing used then simply crimp until flow stops. (Use pliers, tap with axe, etc.).

C. For non-malleable metal use tapered piece of wood (shaved chock, pencil, chair leg, golf tee, etc.

D. An emergency patch on a pipe can be made with a piece of rubber innertube and held with duct tape, rubber tape, clamp or coat hanger wire, etc.

E. A screw plug can be used with a rubber gasket on pipes or water tanks.

F. The packing nut may need tightening in a clockwise direction. Do not overturn.

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3.4. Flushometer.

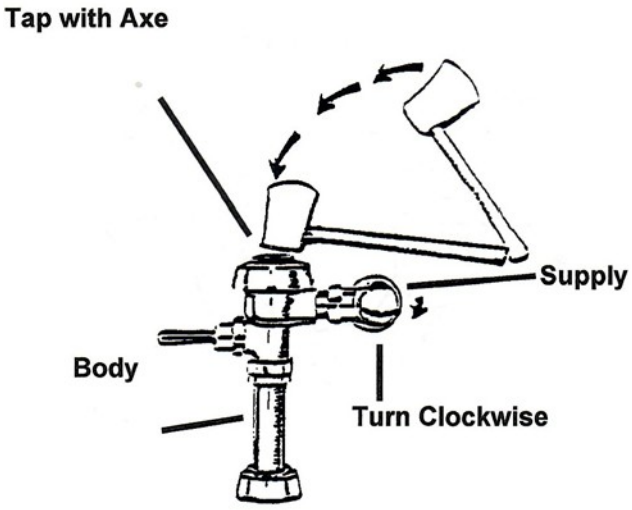
3.4.1 Possible action.

A. Shake handle.

B. Tighten large fitting which is either serrated on edge or hexagonal in shape. Often, they can be sufficiently tightened by hand to stop flow. This fitting is in supply elbow.

C. Tap with flat head of axe gently. This may reset valve in flushometer body.

FIGURE 2
FLUSHOMETER



3.5. Location of Shut Offs.

3.5.1 Sometimes shut off is located on the wall near the ceiling of the apartment directly below.

3.5.2 Shut offs are also located on riser line of apartments in basements.

3.5.3 Still no shut off; then locate where main enters building.

A. Usually near front building wall (often in a corner).

B. Pipe is coldest pipe in building and may also have condensation on outside.

C. Listen for sound of running water.

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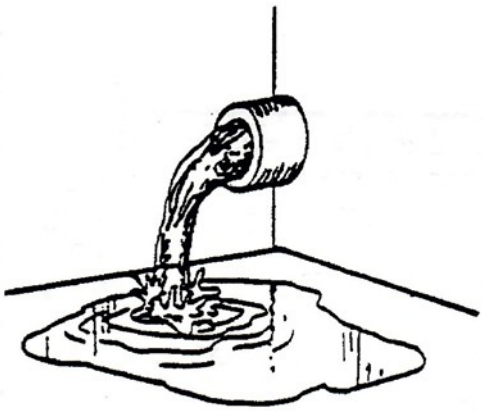
D. Feel vibration.

E. Look for armored ground cable which may be attached to main from electric meter.

3.5.4 Once valve is located shut off clockwise.

3.6 House Main (Figure 3)

FIGURE 3
BROKEN HOUSE WATER MAIN



3.6.1 Frequently broken by scavengers collecting mungo for resale.

3.6.2 Action to stop water flow.

A. Malleable pipe (copper, lead).

1. Strike with maul or flat head of axe until sufficiently closed to stop water flow (Figure 4).

2. Insert rounded end of stick, chock, pencil, chairleg, etc. to be used as a plug (Figure 5).

Note: It is sometimes helpful to use cloth on end of wood to aid in sealing.

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Figure 4
Flattened Water Main

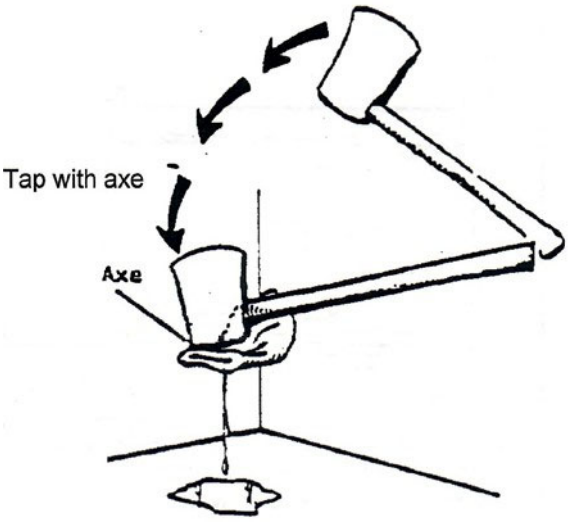
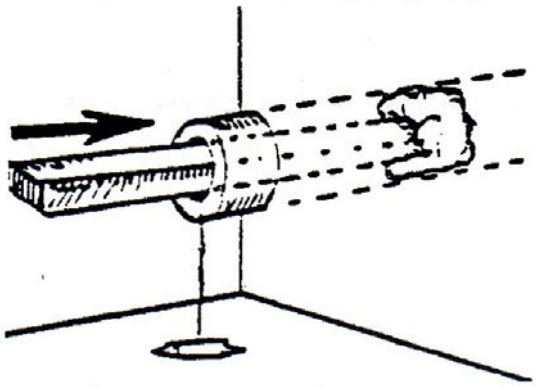


Figure 5
Plugged Water Main



To stop water leak, plug with chock and cloth.

4. FLOODED BASEMENTS

4.1 Occupied building.

4.1.1 May cause problems with oil burner in building or in an adjoining building. Children may be playing in area and could possibly be drowned.

4.1.2 Actions to be taken:

A. If location of drain is known then clear surrounding area of debris and if possible, channel flow towards drain. Look near shower or basement sink for drain if location of drain is unknown.

B. Remove the toilet bowl. This action will provide drainage. A screen or wire basket will keep out debris.

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4.2 Vacant building.

4.2.1 Actions to be taken:

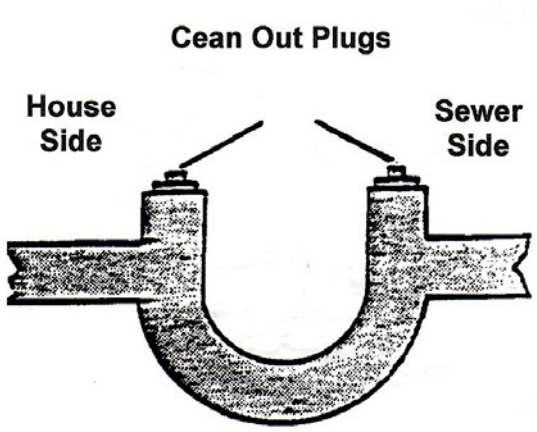
A. Same actions as occupied building

B. Break into cast iron waste pipe at most convenient location with Halligan and axe to permit water to escape. This location can be at ceiling level depending on water depth.

C. Remove clean - out plug of waste pipe.

D. Open the street trap on the sewer side.

Figure 6
Waste Pipe



CAUTION: Avoid areas of basements where electrical power may be on.

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5. FLOODED ROOFS

5.1 Actions to be taken.

5.1.1 DO NOT CLEAR ANY BLOCKAGE WITH HANDS!!! Member's arm can be drawn into drain. Deaths have resulted. Actual suction pressure can be quite high.

5.1.2 Clear blockage with 6' hook or applicable tool from drain or scupper.

A. ***Redacted for PFS***

B. ***Redacted for PFS***

CAUTION: NEVER CLEAR BLOCKAGE WITH HANDS!!

Each sq. ft. over 12" deep weighs 62 pounds. Use as few members as practical on the roof.

6. STEAM LEAK-RADIATOR

6.1 Safety valve blown off.

6.1.1 Action.

A. Shut down radiator flow at valve handle turning clockwise.

B. Replace safety valve or use tapered wooden plug wrapped in cloth. Tap in until secure.

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6.2 Flow valve blown off.

6.2.1 This is due to numerous operations of on and off flow. Generally, it will be nearby and undamaged.

6.2.2 Action.

A. Make certain flow handle is in open position (this is important).

Figure 10

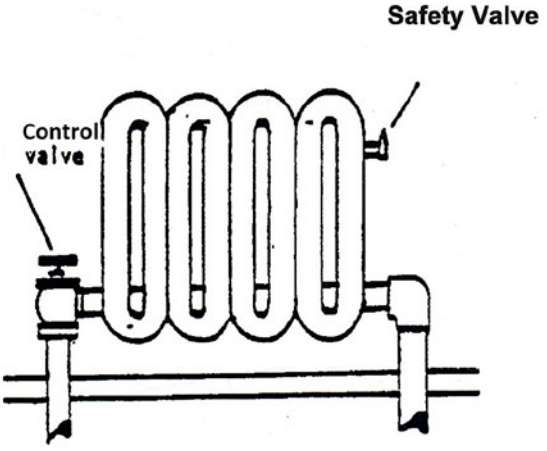
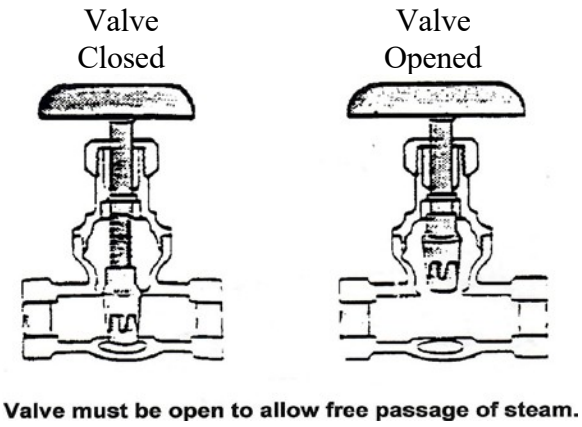


Figure 11



B. Replace fitting to open piping by turning nut on in clockwise direction.

Note: Wear gloves. Place towel over main valve to divert steam flow while resetting valve.

C. After restoration of flow valve, it may be turned off or on, as necessary.

D. The use of a compound or sealant on threads may be beneficial in obtaining a seal. Crayon, string, cotton thread or wax may be used.

Note: It may be necessary to shut steam off at boiler.

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7. OVERHEATED BALLAST

7.1 Fluorescents.

7.1.1 How to identify.

A. Smoke emanating from fixture.

B. Smell

C. Flickering light.

D. Partial or complete darkening of bulb.

E. Presence of heat.

7.1.2 Actions to be taken.

A. Shut off power.

B. Remove bulb.

C. Remove cover panel.

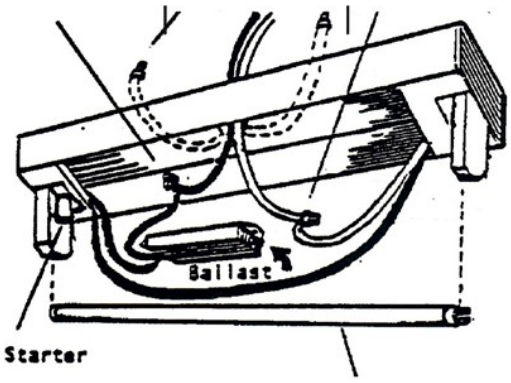
D. Disconnect wires to ballast (black box) and remove same.

E. Isolate black and white power wires and cover exposed ends with caps or tape. Keep apart.

F. Check for any fire or smoldering in ceiling.

G. Overheated fluorescent ballasts may leak PCB-contaminated oil. SCBA must be used while performing the above operations.

Figure 12



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8. OIL BURNER EMERGENCY

8.1 Heavy odor or visible smoke on scene that is usually caused by delayed ignition.

8.2 Actions to be taken.

8.2.1 Disconnect electric power.

A. Methods of disconnecting electric power.

1. Shut off electric power by use of oil burner remote control. Oil burner remote control is generally painted red and generally located at the following locations:

   a. In a private dwelling at the top of interior cellar stairs.

   b. In an old law tenement, brownstone or frame building at the top of the interior cellar stairs.

   Note: At above locations listen for sound of burner going off as switch may be for lights.

   c. In a new law tenement or apartment house outside of the oil burner room.

   Notes: 1. Be alert to other locations for switch especially if there is a commercial occupancy on street floor.

   2. It is helpful to turn on lights, if possible.

2. Fuse box.

   a. Remove fuse.

   b. Pull knife switch.

   c. Switch off circuit breaker.

   Note: Box is usually marked "oil burner." Power line can also be traced from oil burner or switch.

3. Ignition component at boiler.

   a. Remove cover from component and place non-conductor between contact points. (Small piece of wood, plastic, rubber, cardboard, etc.

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8.2.2 Fuel shut off.

A, At tank (all tanks have shut off).

B. At oil burner (with 275 gallon tanks).

C. On preheat or #6 oil, turn gas to preheater off (¼ turn) and also electric. (See "1" above).

CAUTION: There is a very real danger of the flexible, thin wall gas line tubing to the preheater melting or being disconnected. The gas/air mixture ignited by the heat of the oil burner results in an explosion Members have been injured.

D. On boilers with larger than 275 gallon tanks there may be a shut off on the feed line near the filter.

9. GASOLINE LEAK AUTOMOTIVE

CAUTION: No open lights or smoking, sparks, etc. Keep area clear of people.

9.1 Leaking fuel line.

9.1.1 Actions to be taken.

A. Wash down if necessary.

B. To stop leak.

1. Crimp fuel line.

2. Plug with pencil, golf tee, shaved stick or chock, etc.

9.2 Leaking gas tank.

9.2.1 Actions to be taken.

A. Plug hole with small piece of tapered wood.

B. Rub piece of chalk over pinhole leaks.

C. Use commercial product such as "Loctite".

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D. Use half of rubber ball (tennis, spalding) propped with stick forming airtight seal with suction side towards leak.

E. Cut straps of gas tank, lower to ground and prop so that leak is above fuel level.

Note: Often reason for hole is that someone found it easier to steal gas by punching hole with ice pick in preference to using siphon.

10. *Redacted for PFS*

11. RING REMOVAL

11.1 Actions to be taken.

11.1.1 Use a soapy water as lubricant for ring removal.

11.1.2 Finger may be cooled which will decrease swelling and allow removal.

11.1.3 Use or call for ring cutter which will safely cut ring off finger in short period of time - less than a minute.

Note: Sometimes it is preferable to use regular cutting pliers because ring cutter will not cut stainless steel.

12. BURGLAR ALARM RINGING

12.1 Many times due to a fire, a burglar alarm may be constantly ringing. This constant noise during overhaul could possibly make members tense and set up a situation where injuries occur.

12.2 Burglar alarms may be silenced by either of the below methods.

12.2.1 Locate alarm and insert wad of paper, chock, match book cover, etc. between clapper and bell.

12.2.2 Disconnect power.

A. Locate alarm.

B. Follow wire into occupancy.

C. Locate alarm box with batteries.

D. Use screwdriver or dime to remove cover.

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E. Disconnect wires from battery terminals.

F. Replace cover.

Note: If wires are connected to house electric pull plug, pull fuse, or turn off power.

13-15. *Redacted for PFS*

BY ORDER OF THE FIRE COMMISSIONER AND CHIEF OF DEPARTMENT

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REFERENCE # 1
(FORMERLY SAFETY MESSAGE # 42)

Fluorescent Light Ballast's and PCB.

Fluorescent light tubes require a high voltage to function. This is provided by an electrical device called a ballast. It is the rectangular metal box, with wires coming from each end, found inside the fixture. The size of the ballast will vary depending on the size of the light tubes. Simply stated the ballast is a sheet metal box containing a transformer and a capacitor. They are embedded in an asphalt and sand mixture which after being heated to 425° F, is poured into the container. This material, which is solid at ambient temperatures, serves as a heat transfer agent and a sound absorber. The asphalt mixture will soften at about the boiling point of water. This mixture DOES NOT CONTAIN PCB. If the ballast suffers burnout (overheats) this material can leak from it's container. Firefighters searching for the source of the odor given off by a ballast in burnout use this leaking to identify the defective ballast. If the ballast does not leak we must resort to our sense of smell and touch to find the overheated unit.

The capacitor which is in the ballast is a small sealed metal can that contains less than a fluid ounce of a dielectric fluid. 25 % of this quantity is in liquid form. The remaining 75 % is absorbed in paper used in the capacitor. In ballast's manufactured before 1979 this dielectric was a PCB liquid.

If fixtures are involved in a fire that results in the break down of the ballast and the rupture of the capacitor, PCB could be burned. The burning of PCB can produce chlorinated dioxins and dibenzofurans. This possibility is rare and the amount of PCB in a capacitor is less than a fluid ounce.

Presence of leaking asphalt material from a ballast is not necessarily an indication of a PCB leak. But if the liquid does not solidify after cooling it could be an indication that the capacitor fluid has leaked. This fluid could be the dielectric used in ballast's manufactured prior to 1979 and could be a PCB liquid.

BECAUSE OF THE HIGH TOXICITY OF THESE COMPOUNDS THE USE OF PROTECTIVE EQUIPMENT THAT WILL MINIMIZE THE INHALATION OF SMOKE FROM FIRES INVOLVING EVEN SMALL QUANTITIES OF PCB SHOULD BE A HIGH PRIORITY. THIS ADVICE IS FROM THE NEW YORK CITY DEPARTMENT OF ENVIRONMENTAL PROTECTION.

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TRAINING BULLETIN - FIRE DYNAMICS
CHAPTER 1
May 26, 2021

BASIC FIRE DYNAMICS

1. INTRODUCTION

1.1 Fire Behavior and Dynamics

The members of the FDNY not only need to know the dangers of fire, but need to truly understand what fire is, how it develops and how it reacts with our tactics. To carry out our mission of saving lives and property, we must have an in depth understanding of fire behavior and fire dynamics.

2. CHEMISTRY OF FIRE

2.1 Fire

The term "fire" refers to how something burns. Fire is a rapid oxidation process, which is a chemical reaction resulting in the evolution of light and heat in varying intensities.

2.2 Combustion

Combustion is a chemical process of oxidation that occurs at a rate fast enough to produce heat and *usually* light in the form of either a glow or flame.

2.3 Modes of Combustion

Fire and combustion are similar conditions; however, combustion can occur without fire. There are two modes of combustion, non-flaming and flaming.

2.3.1 **Non-Flaming Combustion:** Non-flaming combustion occurs more slowly and at a lower temperature producing a smoldering glow in the material's surface without flames.

2.3.2 **Flaming Combustion:** Flaming combustion is commonly referred to as fire because it produces a visible flame above the material's surface.

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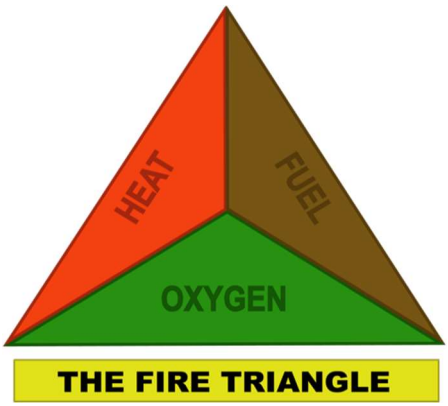
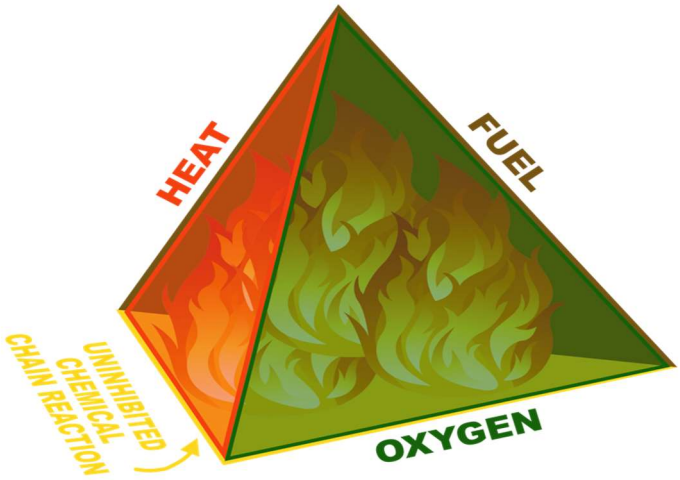
2.4 Fire Models

Two models, the fire triangle and fire tetrahedron are used to explain the elements of fire and how fires can be extinguished.



2.4.1 **Fire Triangle:** The oldest and simplest model, the fire triangle, illustrates the three elements necessary for combustion to occur: fuel, oxygen and heat. Remove any one of these elements and combustion will cease. The fire triangle best illustrates the elements required for ***non-flaming*** combustion; when burning is localized on or near the fuel's surface where it is in contact with oxygen. Examples of non-flaming combustion include burning charcoal briquettes or smoldering wood or fabric.

2.4.2 **Fire Tetrahedron:** Research into fire behavior has determined that an uninhibited chemical chain reaction must also be present in addition to the other elements of the fire triangle (fuel, oxygen & heat) in order for flames to occur. Therefore, the fire tetrahedron was created to explain ***flaming*** combustion. Each element of the fire tetrahedron; fuel, oxygen, heat & uninhibited chemical chain reaction must be present for flaming combustion. Removing any element of the tetrahedron interrupts the chemical chain reaction and stops flaming combustion.



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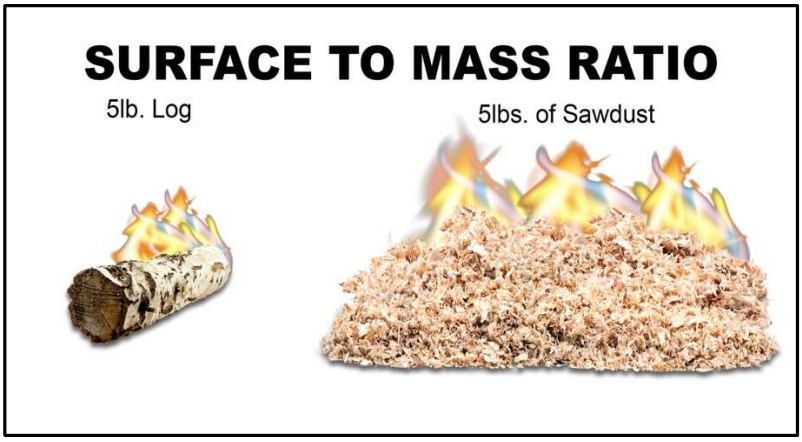
2.5 **Fuel**

2.5.1 Fuel may be found in any of three states of matter; solid, liquid, or gas. Only gases burn. In order for a solid or liquid to burn, they must be converted into a gas. Solids are converted into gas by **pyrolysis** and Liquids are converted to a gas by **vaporization.**

2.5.2 **Pyrolysis** is the chemical decomposition of a solid material that is caused by the absorption of heat. When pyrolysis of a material occurs, gas is released from the solid material. Pyrolysis often precedes combustion. **Surface to Mass Ratio** significantly affects the ease of ignition of solid fuels.

2.5.3 An example of this is 5 pounds of sawdust as compared to a 5-pound log of wood. The sawdust has a tremendously increased surface to mass ratio and thus more of the material is exposed to heat and generates more burnable gases. The sawdust will ignite significantly quicker than the log.



2.5.4 Liquids are converted into gas by **vaporization**. Examples of vaporization include boiling water or water in a container evaporating in sunlight. In both cases, heat causes the liquid to vaporize. **Surface to Volume Ratio** significantly affects the ease of ignition of liquid fuels. The greater the surface area compared to volume, the faster the liquid will vaporize. An example of this is a gallon of gasoline within a small steel container sitting on the floor in the middle of a room (smaller surface area) or a gallon of gasoline spilled out on a floor all over the room (larger surface area). The fire in the container will not produce the same volume of fire as the floor that is covered in gasoline.

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2.5.5 Gaseous fuels can be the most dangerous, because they are already in the natural state required for ignition. No pyrolysis or vaporization will be needed to ready the fuel. These fuels are also the most difficult to contain.

2.6 Oxygen

2.6.1 Oxygen in the air is the primary oxidizing agent in most fires. Normally, air consists of 20.8% oxygen. At normal ambient temperatures, materials can ignite and burn at oxygen concentrations as low as **15 percent**. When oxygen concentration is reduced below 15%, the flaming combustion will diminish, causing combustion to continue in the non-flaming mode. This means that below 15% there will not be visible flames, but because combustion continues in the non-flaming mode, heat and dense, fuel rich smoke will continue to be produced. If oxygen is introduced to this type of atmosphere, the fuel rich environment can ignite and be hazardous to firefighters.

2.6.2 Some fires involve fuels that contain chemical oxidizers (their own oxygen source) such as Ammonium Nitrate Fertilizer and Hydrogen Peroxide. These compounds can cause rapid burning rates, flame spread and explosions when they breakdown and do not depend on oxygen in the air to burn.

2.6.3 When oxygen concentration is higher than 20.8%, materials exhibit very different burning characteristics. Materials that burn at normal oxygen levels will burn more intensely in oxygen-enriched atmospheres. Many materials that do not burn at all in normal oxygen levels, may burn readily in oxygen-enriched atmospheres. Nomex, a fire-resistant fabric used in our PPE does not burn readily in normal oxygen concentrations. When placed in an oxygen enriched atmosphere, Nomex ignites and burns vigorously. Some petroleum-based materials may ignite spontaneously without an external heat source in oxygen-enriched atmospheres.

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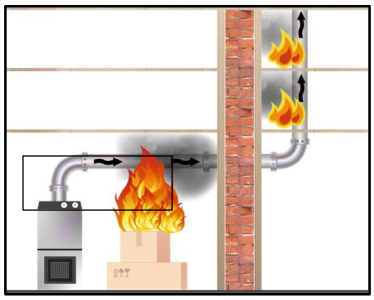
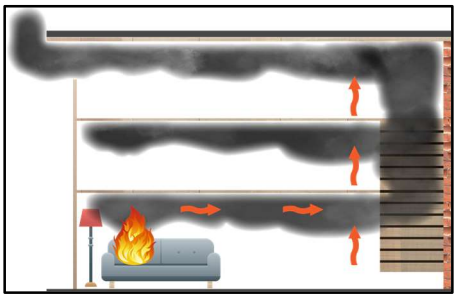
2.7 Heat

2.7.1 HEAT TRANSFER: A number of natural laws of physics are involved in the transmission of heat. One is called the **Law of Heat Flow**; it specifies that heat *always* flows from a hot substance to a cold substance. The colder of two objects in contact with each other will absorb heat until both objects are at the same temperature.

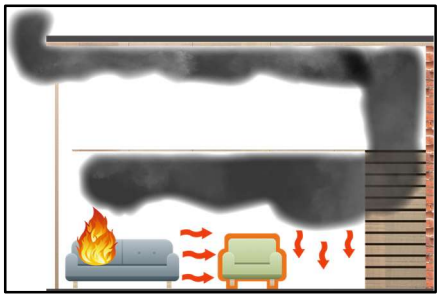
2.7.2 Heat can travel throughout a building by one or more of three methods: conduction, convection, and radiation. The following sections describe how this heat transfer takes place.



CONDUCTION



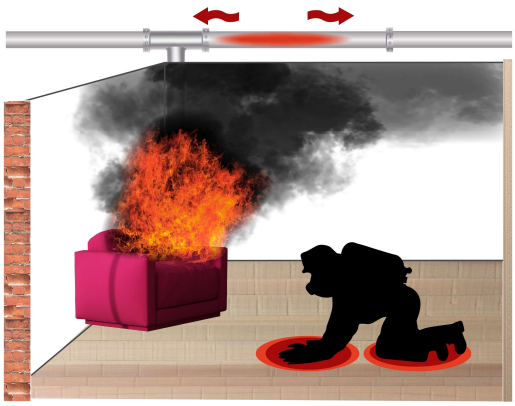
CONVECTION



RADIATION

2.7.3 **Conduction:** Heat may be conducted from one body to another by direct contact of two objects or by an intervening heat-conducting medium (material). An example of this type of heat transfer is a cellar fire that heats pipes enough that the pipes ignite the wood inside walls remote from the fire. Another example is firefighters crawling on a hot floor that burn their knees.

CONDUCTION



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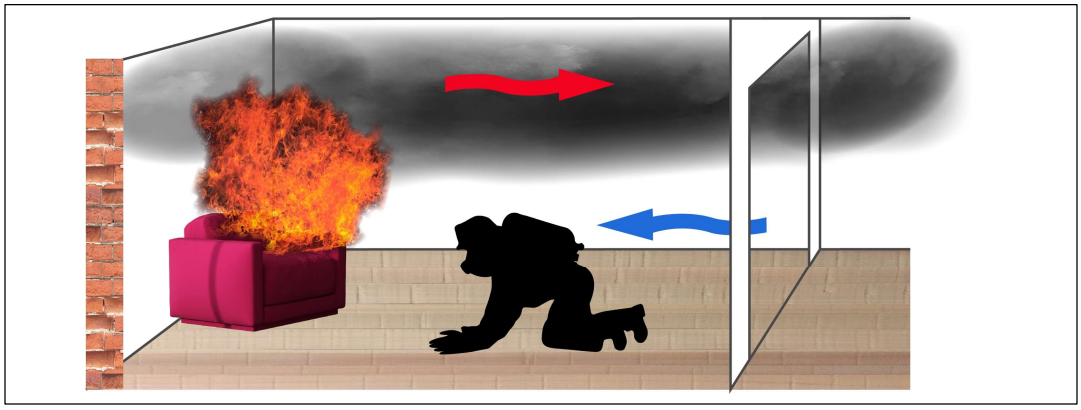
2.7.4 **Convection**: Convection is the transfer of heat by the movement of air or liquid. When water is heated in a container, it expands and grows lighter, hence, the upward movement.

Heated air in a building will expand (**creating pressure**) and rise. For this reason, fire spread by convection is mostly in an upward direction; however, air currents can carry heat in any direction. Convection currents are generally the cause of heat movement, from room to room, from floor to floor and from area to area. The spread of fire through corridors, up stairwells and elevator shafts; between walls, and through attics is caused mostly by the convection of heat currents.



CONVECTION

Convective heat transfer can be *exponentially increased* by wind. This is called **Forced Convection.** (An example of this is the use of a fan in a convection oven). Forced convection is a critical factor in wind-driven fires.

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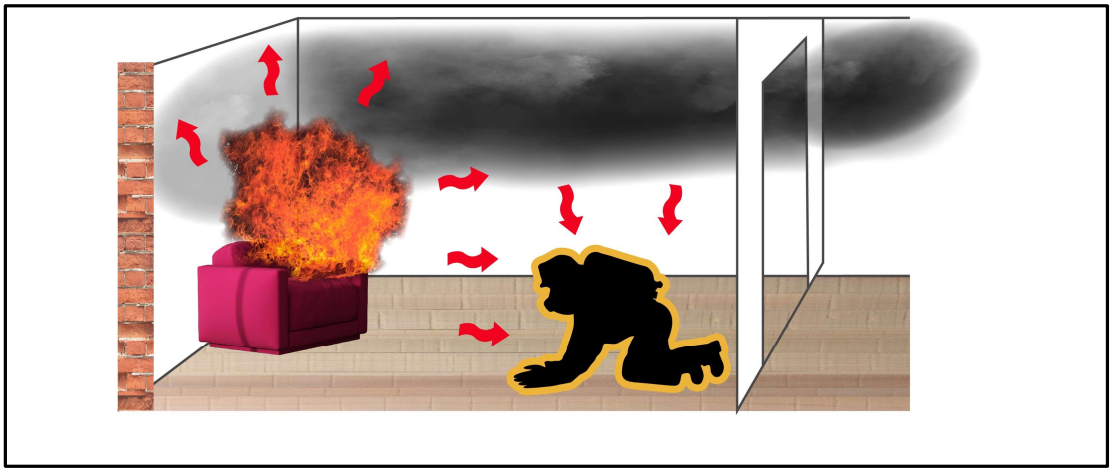
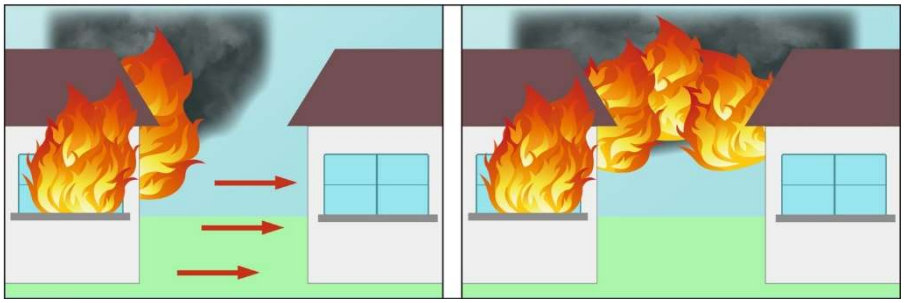
2.7.5 **Radiation**: Radiation describes heat transfer through the movement of heat waves. Heat and light waves will cause radiated heat to travel through a space until it reaches an object.



RADIATION

As the object is exposed to heat radiation, it will in return radiate heat from its surface. Radiated heat is one of the major sources of fire spread to exposures. Radiated heat is also one of the major causes of firefighter burn injuries and flashover in a compartment fire.



RADIATION

2.8 Uninhibited Chemical Chain Reaction

2.8.1 The last part of the Fire Tetrahedron is the self-sustained uninhibited chemical chain reaction involved in flaming combustion. It is very complex to explain. Understand that a chemical chain reaction occurs when fuels are broken down by heat and the reaction will cause the fire to continue to burn until the fuel or oxygen is exhausted, or an extinguishing agent is applied in sufficient quantity to interfere with the ongoing reaction.

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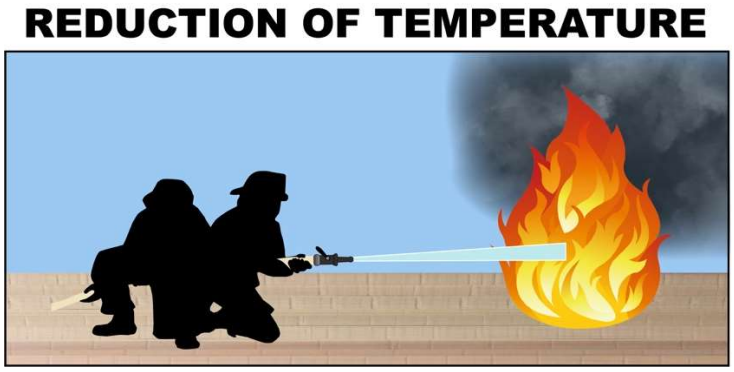
3. EXTINGUISHMENT THEORY

3.1 The extinguishment of fire is carried out by limiting or removing one or more of the essential elements in the combustion process (removing one of the sides of the fire triangle or tetrahedron). This is accomplished by one of four methods: heat reduction, fuel removal, oxygen removal or chemical flame inhibition.

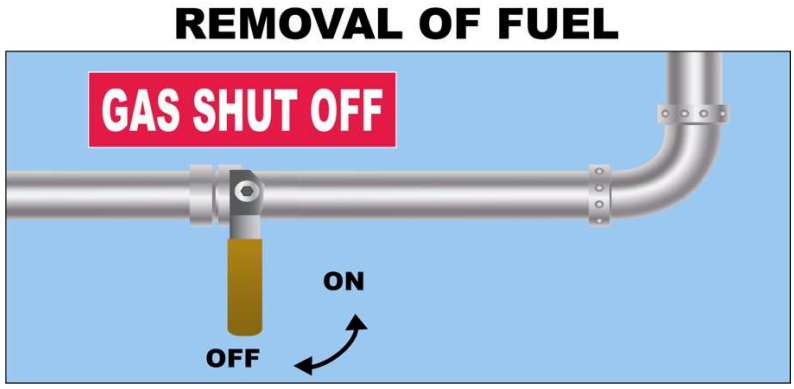
3.2 Heat Reduction

The most common method used to accomplish extinguishment is the application of water. This process of extinguishment is dependent on reducing the temperature of the fuel to a point where it does not produce sufficient vapor to burn.



3.3 Fuel Removal

In some cases, a fire is effectively extinguished by removing the fuel source. Removal of the fuel source may be accomplished by stopping the flow of liquid or gaseous fuel or by removing solid fuel in the path of the fire. Another method of fuel removal is to allow the fire to burn until the fuel is consumed.



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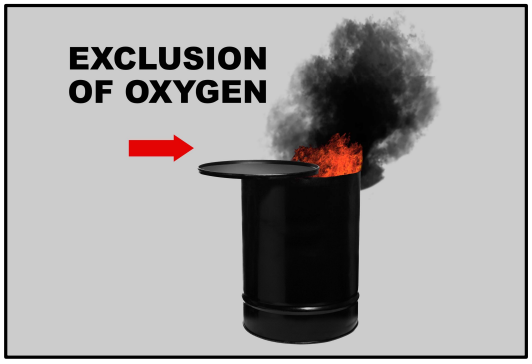
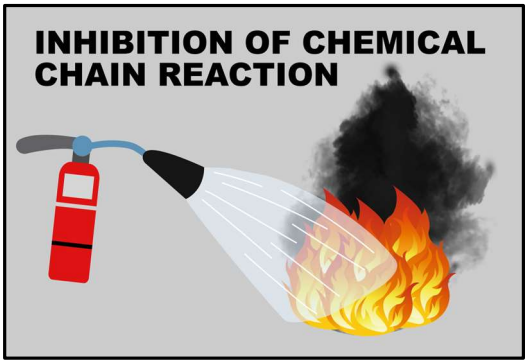
3.4 Extinguishment by Oxygen Reduction

Reducing the oxygen content in an area also extinguishes the fire. Reduction of the oxygen content can be accomplished by flooding an area with an inert gas, such as carbon dioxide, which displaces the oxygen; or the oxygen can be reduced by separating the fuel from the air such as by blanketing it with foam or placing a cover on a pot. None of these methods work on those rare fuels that are self-oxidizing.

3.5 Extinguishment by Chemical Flame Inhibition

Some extinguishing agents, such as dry chemical (sodium bicarbonate) and older systems such as Halon (halogenated hydrocarbons), interrupt the flame-producing chemical reaction and stop flaming. This method of extinguishment is effective on gas and liquid fuels, because they must flame to burn. Smoldering fires are not easily extinguished by this method because non-flaming combustion (represented by the fire triangle) does not require the presence of the chemical chain reaction present in flaming combustion (represented by the fire tetrahedron). Cooling is the preferred way to extinguish a smoldering fire.





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4. CLASSES OF FIRE

CLASS OF FIRE	TYPE OF FIRE	SUITABLE SUPPRESSION	NFPA CLASS	SYMBOL
A	**COMMON COMBUSTIBLES** wood, paper, cloth, rubber, and many plastics	Water Dry Chem Foam		
B	**FLAMMABLE LIQUIDS AND GASES** gasoline, oils, paint, lacquer, and tar	Dry Chem Carbon Dioxide Foam		
C	**ENERGIZED ELECTRICAL EQUIPMENT** computers, computers, servers, transformers, and appliances	Purple K Dry Chem Carbon Dioxide		
D	**COMBUSTIBLE METALS** magnesium, lithium, aluminum, titanium	Class D Powder		
K	**COOKING OILS AND FATS** vegetable or animal oils and fats	Wet Chemical Carbon Dioxide Foam		

5. SOLID FUEL COMBUSTION

5.1 As solid fuels are exposed to heat, they absorb energy and increase in temperature. As the temperature of the solid rises, the solid fuel begins to decompose and break down. When it breaks down, it releases gas. Solid fuel when exposed to enough heat, will transform into a gas. The gas ignites and produces fire during flaming combustion.

5.2 PYROLYSIS

The chemical decomposition of a solid material that is caused by the absorption of heat. When pyrolysis of a material occurs, gas is released from the solid material. Pyrolysis often precedes combustion.

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6. LIQUID FUEL COMBUSTION

6.1 For liquid fuels to burn, they must release vapors and those vapors must mix with air so that the concentration of fuel is within the explosive/flammable range. A liquid fuel with a higher vapor pressure generates more fuel vapor than a liquid fuel with a lower vapor pressure. If heat is added to a fuel vapor, once the fuel concentration is within the explosive/flammable range, it is possible for it to ignite. A fire may then begin and grow wherever a flammable mixture is present.

6.2 FLASH POINT

The lowest temperature of a liquid at which that liquid gives off sufficient vapors to ignite but will not continue to burn.

Liquid fuels are classified according to their fire hazard characteristics. The classifications are based on the flash point of the liquid. Depending on the flash point temperature, liquids are grouped as to whether they are flammable (more of a hazard) or combustible liquids (less of a hazard).

6.2.1 FLAMMABLE LIQUID

A flammable liquid is a liquid that has a flash point below 100’F

6.2.2 COMBUSTIBLE LIQUID

A combustible liquid is a liquid that has a flash point equal to or greater than 100’F.

6.3 FIRE POINT

Fire point is the lowest temperature at which a liquid will ignite and achieve sustained burning.

6.4 VAPOR PRESSURE

Vapor **pressure** is the ability of a liquid or solid fuel to vaporize. The higher the vapor pressure, the more vapors are released (the easier it is to off-gas).

6.5 VAPOR DENSITY

The **vapor density** of gas refers to its density compared to air. Gases that have a vapor density around 1 will mix evenly with air. A gas with a vapor density greater than 1 is heavier than air. It will sink and collect in low areas. Gases that have vapor densities less than 1 are lighter than air and will rise to the top of a compartment.

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7. GASEOUS FUEL COMBUSTION

7.1 In a fire, oxygen must chemically react with combustible fuel in a rapid oxidation process. For flaming combustion to begin and continue, the concentration of fuel vapor in the burning mixture (air and fuel) must be between the upper and lower explosive limits for that fuel. When the concentration of fuel in the air lies between the lower explosive limit (LEL) and the upper explosive limit (UEL), there is danger of the fuel igniting if a flame or other ignition source is present.

7.2 LOWER EXPLOSIVE LIMIT (LEL)

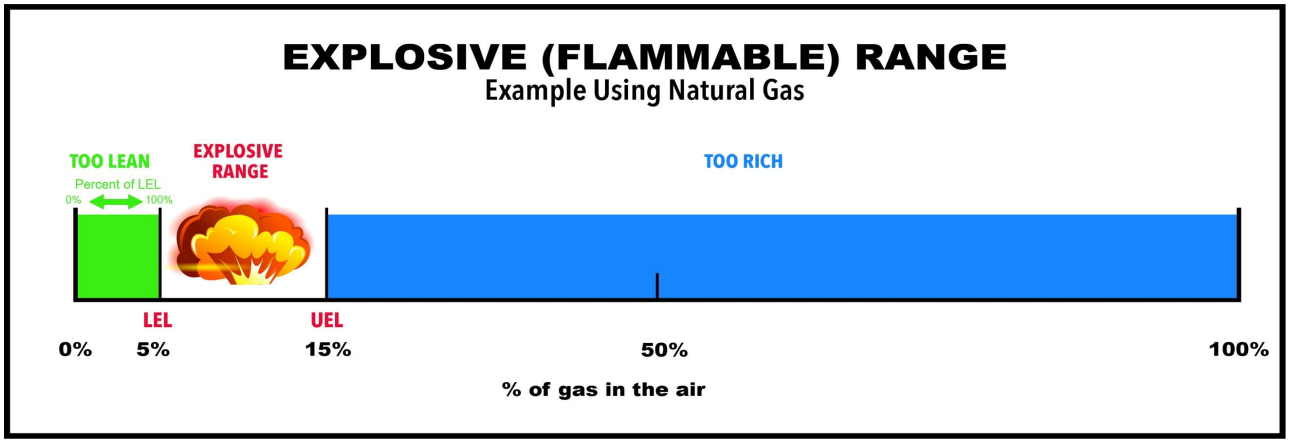
The lower explosive limit is the lowest concentration by volume of flammable gas in air that will support flame propagation. This is also known as lower flammability limit.

7.3 UPPER EXPLOSIVE LIMIT (UEL)

The upper explosive limit is the highest concentration by volume of flammable gas in air that will support flame propagation. This is also known as upper flammability limit.

7.4 EXPLOSIVE RANGE (aka Flammable Range)

The range of gas to air mixtures in which ignition can occur. It is the range of gas to air mixture that exists between the lower explosive limit and the upper explosive limit.



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FIRE DEVELOPMENT

1. COMPARTMENT FIRE DEVELOPMENT

To help understand fire behavior, the development of a fire in a compartment (room/enclosure etc.) has been broken down into 4 different stages:

- Incipient Stage
- Growth Stage
- Fully Developed Stage
- Decay Stage

In each of these stages, the fire will have discernable characteristics (different fire conditions) which are used to identify the stage the fire is in. Since certain fire phenomenon are likely to occur during certain stages of fire development, a firefighter's understanding and ability to identify these stages will help the firefighter better size up fire conditions and make better tactical decisions on the fireground. It is important to note that while most fires will pass through all 4 stages, some fires may not, e.g.: An arson fire may begin in the growth stage. In addition, some fires may pass through some stages more than one time. E.g.: A fire in the decay stage may redevelop into the growth stage following ventilation.

1.1 Incipient Stage

1.1.1 The incipient stage is the earliest stage of a fire and begins with the actual ignition. The fire is generally small during this stage and burning is usually limited to the original materials of ignition. During this stage of fire development, radiant heat warms the adjacent fuels and continues the process of pyrolysis, increasing the volume of fire. A plume of hot gasses and flame rise from the fire and mixes with the cooler air in the room. As this plume reaches the ceiling, hot gasses begin to spread horizontally across the ceiling.

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1.1.2 In the incipient stage, there is plenty of oxygen and fuel available to burn. Oxygen levels in the air have not been significantly reduced by the fire. Some heat is being generated but the temperature in the room may only slightly increase. **Incipient fires can be readily extinguished with the use of the proper fire extinguisher**. It is essential to recognize that the transition from an incipient fire into the growth stage can occur quickly (sometimes in seconds) depending on the type and configuration of fuel involved.

1.2 Growth Stage

1.2.1 The growth stage covers a wide spectrum of fire development. It is the period that usually begins when the original fire spreads to additional materials. As the fire grows, it may spread to other objects by any combination of heat transfer (conduction, convection or radiation), by direct flame impingement, or if foams or plastic materials are involved, they can melt, and drip liquid which is on fire. This burning liquid can pool on the floor while burning and ignite secondary items.

1.2.2 Similar to the incipient stage, during the growth stage there is plenty of oxygen and fuel available to burn. During the very beginning of this stage, oxygen levels in the room may not have been significantly reduced by the fire. Oxygen rich air will be drawn into the flame as convection carries the heat to the uppermost regions of the confined area.

1.2.3 The presence of this heated air will cause the temperature to begin to rise in the area and if left unchecked, may start a series of events that will lead to rapid fire development and flame spread. **Rollover** and **flashover** occur during the Growth Stage.

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1.3 Fully Developed Stage (Full Room Involvement)

1.3.1 After a compartment fire has flashed over, the fire ***that remains within the compartment*** which has flashed over is considered to be in the fully developed stage. The burning fuels in the compartment are releasing the maximum amount of heat possible for the available fuel and/or oxygen, producing large volumes of fire gases. These gases may travel throughout the building and into building voids while mixed into heavy smoke. The larger the volume of fire and larger the volume of smoke produced; the larger the impact on survivability will be, even in remote areas of the building.

1.3.2 Flammable products of combustion are likely to flow from the fire room into adjacent rooms or out through openings to the exterior of the building. Flames will extend out of the compartment openings because there is insufficient oxygen for complete combustion within the compartment itself.

Note: The fire is only fully developed within the compartment(s) that has flashed over. Fire spreading out of this compartment into other compartments or rooms may be in the growth stage and subject to additional rollover and flashover conditions.

1.4 Decay Stage (Fuel Limited or Ventilation Limited)

A fire enters the decay stage when all of the available fuel is consumed or when the oxygen concentration falls below 15% and flaming combustion is diminished. Both of these situations can result in the combustion reaction coming to a stop and the fire being completely extinguished if fuel or oxygen is never introduced. However, if a fire enters the decay stage due to reduced oxygen concentration, which is very common in the modern fire environment, any change in the ventilation of the compartment that adds oxygen before combustion has completely ceased, can cause the fire to rapidly redevelop. It is important to note that the cause for any fire to enter the decay stage is because the fire is either ***fuel limited*** or ***ventilation limited***.

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1.4.1 Fuel Limited

If there is adequate ventilation and the fire consumes the available fuel in the compartment to the point that the heat release rate begins to decline, the fire enters the decay stage. This is because whatever fuel was burning has been entirely consumed and there is no additional fuel to burn. The fire has become fuel controlled.

1.4.2 Ventilation Limited

If there is adequate fuel available and the fire consumes enough of the available oxygen in the compartment, the heat release rate will also begin to decline, and the fire will enter the decay stage because the flames do not have enough oxygen. There is still plenty of fuel that is available to burn, and the fuel, even while it is smoldering, is pyrolyzing and emitting a large volume of flammable gases into the compartment. In this situation, if no oxygen is introduced, after a lengthy time, combustion will cease and the fire will be completely extinguished. However, if oxygen is introduced before combustion has ceased, rapid fire development and/or backdraft may result.

2. THERMAL LAYERING

2.1 Thermal Layering

2.1.1 The thermal layering of gases is the tendency of gases to form into layers according to temperature. The hottest gases tend to be near the top of the layering, while the cooler ones make up the bottom. Other terms that are sometimes used to describe this layering of gases are “heat stratification” and “thermal balance”.

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2.1.2 Thermal layering inside a compartment fire, is further broken down into two separate categories: The **upper layer** which is composed of the hot fire gases and the **lower layer** which is the cooler air below the hot fire gases. It is important to understand these terms for tactical reasons e.g. a thermal imaging camera can identify the thermal interface if the camera itself is positioned in the lower layer (cooler layer) looking at the upper layer (hot layer). A camera held in the hot layer will not be able to see the thermal interface.

2.2 Upper Layer

2.2.1 Buoyant smoke and gases collected by the ceiling and walls of an enclosure that begin to form a relatively uniform layer of heated smoke and gases throughout the upper area of a compartment.

2.2.2 As a fire develops in a compartment, over time, the hot rising smoke and fire gases spread across the ceiling and mushroom down into the room as they collect in a thick, relatively uniformed layer of hot gases throughout the upper layers of the enclosure.

2.2.3 Once the upper hot layer is formed, the additional flow of gases from the fire continues to collect along the ceiling forcing the upper layer to descend downward into the room as the fire heat release rate and upper layer temperatures increase.

2.2.4 Decreasing the heat of the fire within the enclosure will decrease the temperature and formation of hot gases that collect in the upper layer. If the heat is reduced, it can result in the contraction of gases in the upper layer. The contraction of upper layer gas volume will cause the upper layer to lift.

2.2.5 Directly decreasing the temperature of the upper layer (i.e. through the application of water) will also result in a contraction of the upper layer gas volume as a result of the hot smoke cooling. This can delay or prevent flashover.

2.3 Lower Layer

2.3.1 Lower Layer

The lower layer is the zone beneath the upper layer which consists primarily of ambient air that is entrained into the fire.

2.3.2 The cooler lower layer consists of air, at temperature and humidity levels closer to ambient conditions, drawn in through ventilation openings in the enclosure. As the hot gases rise in the buoyant plume, the cooler air is pulled in towards the fire.

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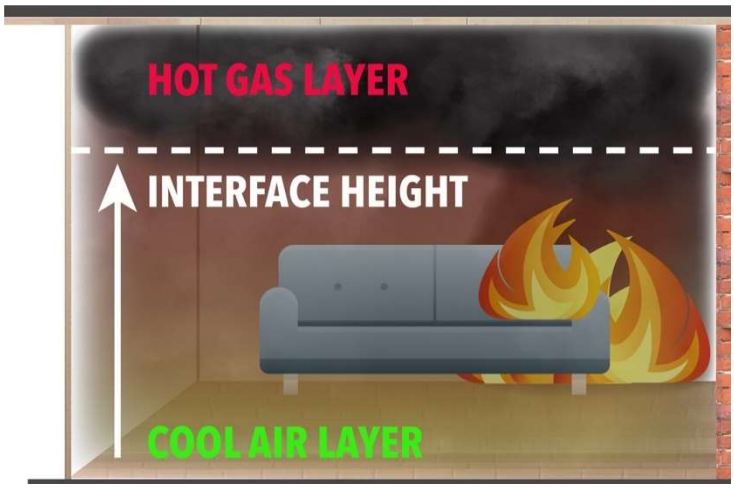
2.4 Thermal Interface and Interface Height

2.4.1 Thermal Interface

The boundary between the upper and lower layers which is represented by a sharp transition from the hot smoke in the upper layer to the cool ambient air of the lower layer is called the Thermal Interface.

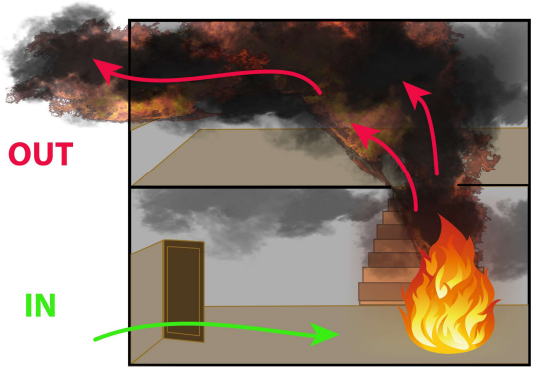
2.4.2 Interface Height

The vertical distance from the floor of the enclosure to the thermal interface.

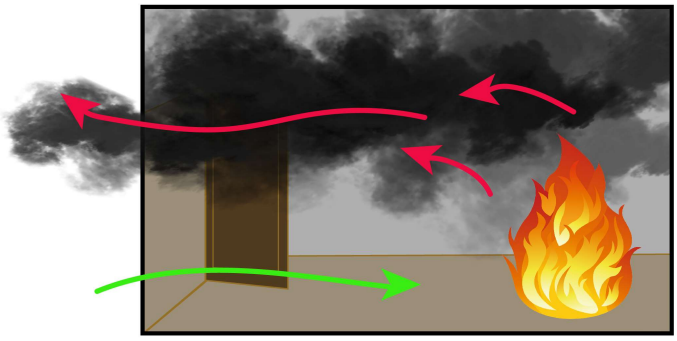


2.5 Neutral Plane

2.5.1 The flow of smoke and fire gases through an opening is described as either unidirectional or bidirectional. **Unidirectional flow** occurs when the flow through the opening flows in one direction only (either into or out of the opening). **Bidirectional flow** occurs when an opening acts as both an inlet and an outlet for flows at the same time.



UNI-DIRECTIONAL FLOWPATH



BI-DIRECTIONAL FLOWPATH

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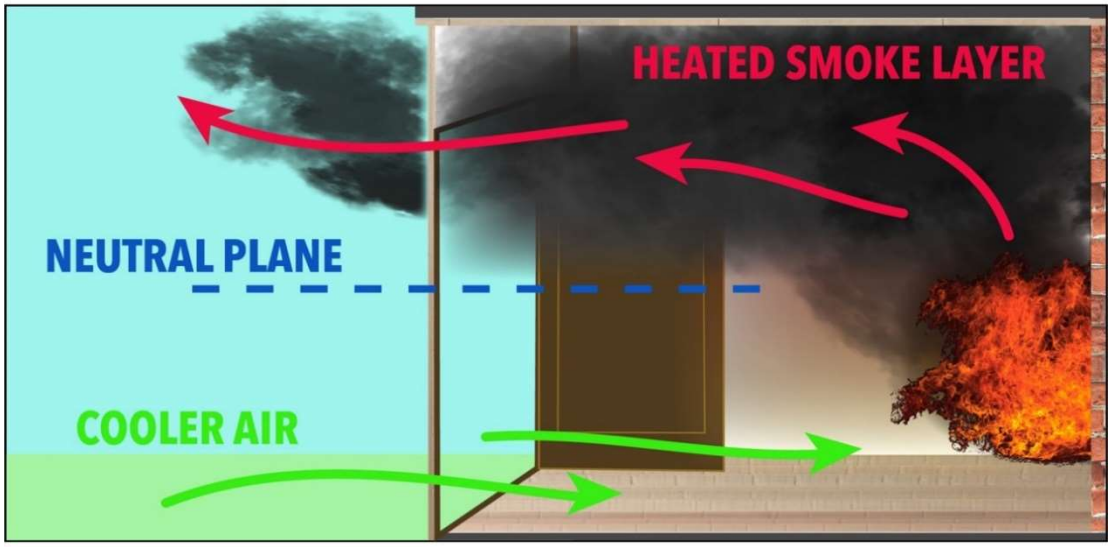
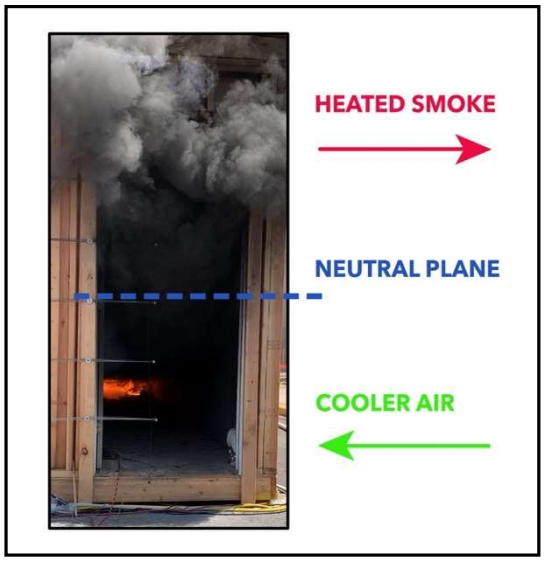
2.5.2 The neutral plane is the horizontal line along a window or door or other ventilation opening where no flow occurs due to the equality of internal and external pressures. Above the neutral plane the flow of smoke and gases will be outwards and below the neutral plane the flow of cool air will be inwards.



2.5.3 The volume of hot smoke generated by the fire largely determines the pressure distribution in the compartment under fire conditions. As the hot smoke rises and accumulates, the pressure at the ceiling will rise. Similarly, the pressure at the floor will be lower, as cool air is entrained. Above the neutral plane the pressure inside the enclosure will be higher than the exterior pressure and cause the direction of flow to be outward. Similarly, below the neutral plane the pressure inside the enclosure will be less than the exterior pressure, and the flow of cool air will be inward toward the fire.

2.5.4 The horizontal line between the inflow and outflow at a ventilation opening (i.e., at the plane where there is zero pressure difference and thus zero flow in or out of the opening) is known as the neutral plane. The position of the neutral plane can often be observed during a fire, given that the outflow often consists of visible smoke or fire.



Note: The neutral plane is different from the thermal interface because the neutral plane only occurs at a ventilation opening. Neutral plane indicates **pressure differences** at an opening and may be used by firefighters outside the building to help determine the fire location within a building.

2.5.5 Thermal Interface and interface height refer to the separation between the hot upper layer and the cool lower layer within a compartment. Thermal Interface and the interface height indicate **heat differences** (how much volume of a compartment is filled with heat). It can be used by firefighters to identify how far the hot upper layer has banked down and the possibility of flashover.

3. SMOKE

3.1 The smoke encountered at most fires consists of a mixture of oxygen, nitrogen, carbon dioxide, carbon monoxide, hydrogen cyanide, finely divided carbon particles (soot), and a miscellaneous assortment of products that have been released from the material involved.

3.2 Two of the most toxic gases are **carbon monoxide** and **hydrogen cyanide** which are both chemical asphyxiants and are responsible for many fire deaths. These gases are highly toxic and pose a significant threat to human life.

Note: FDNY paramedic ambulances and FDNY conditions cars (EMS Supervisors) carry an antidote medication to reverse the effects of hydrogen cyanide. This antidote is not available in most hospitals or on non-FDNY ambulances.

3.3 The combination of fire gases produced during combustion and present in smoke are flammable and contribute greatly to rapid fire development. For this reason, firefighters shall consider smoke to be additional fuel.

3.4 When air is heated it becomes more buoyant (hot air rises). In addition to buoyancy, more than three-quarters of air is made up of nitrogen. The energy released by the fire causes the nitrogen to expand which drives a significant increase in the volume of the air. The buoyancy of hot air and expansion of nitrogen can push significant volumes of smoke through openings to the exterior or to other parts of the structure. Because smoke is suspended in air, the smoke is a visible indicator of how much hot air is rising and how fast the nitrogen is expanding. The value of "reading smoke" is tremendous in performing a size up of the fire.

3.5 To accurately size up a fire by reading smoke, a firefighter must evaluate five characteristics of the smoke: Volume, Velocity, Density, Color and Stratification.

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3.5.1 Smoke Volume

In many instances, smoke may be the only visible indicator of a fire. The volume of smoke may indicate the size, location and stage of the fire within a structure. However, the volume of smoke may not always be visible and can be concealed by various building configurations.

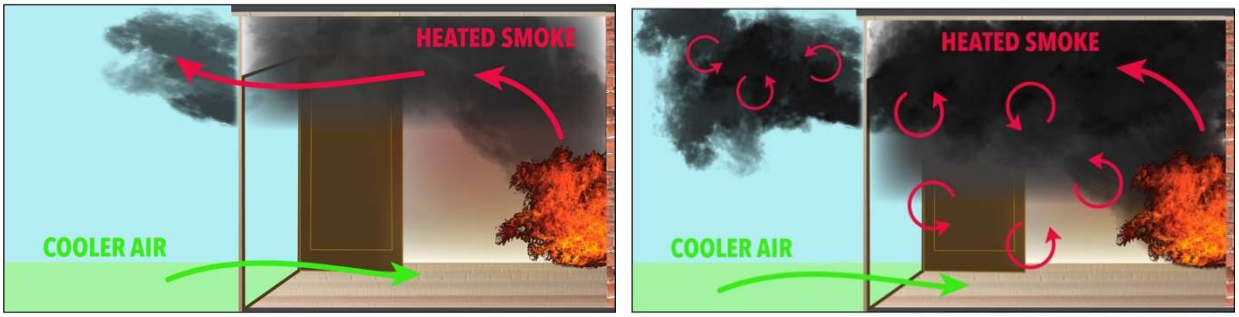
3.5.2 Smoke Velocity

Smoke velocity is an indicator of pressure that has built up within a structure. The pressure is developed by buoyancy and expansion due to the amount of heat released by the fire. Smoke flow can be either **laminar** (smooth) or **turbulent** based on the velocity and temperature. Cooler smoke appears to flow smoother. Hotter smoke will appear to boil and move quickly upwards in a turbulent fashion.

A. Turbulent Smoke indicates extreme heat (closer to the fire)

B. Laminar Smoke indicates low heat (either because it is a small fire, or the smoke is remote from the fire and has cooled)

LAMINAR SMOKE **TURBULENT SMOKE**



3.5.3 Smoke Density

The apparent density "thickness" of the smoke can be a good indicator of the efficiency of the combustion process. In the early fuel-limited stages where there is plenty of oxygen, the rate of smoke production is lower than in later stages when the fire is becoming ventilation-limited. A large fire which is severely ventilation limited, will produce large volumes of thick dense smoke.

A. Dense smoke can indicate the fire is a ventilation-limited fire.

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3.5.4 Smoke Color

A. **Black:**

Dark smoke often indicates fuel-rich conditions, due to restricted air supply (ventilation limited). Where flaming or smoldering combustion occurs, the carbon in the fuel is released as soot in the smoke, resulting in a very dark color. If the air supply is sufficient, more of the carbon will react and will produce a lighter colored smoke and brighter flame. If air supply is restricted, less carbon reacts and becomes suspended in the smoke producing a darker colored smoke.

Thick dark smoke indicates an abundance of fuel that was not burned in the fire and is now suspended in the smoke. Given the right conditions, this suspended fuel can ignite.

B. **Brown:**

Brown smoke can indicate the early stages of the pyrolysis of timber products. The brown color is caused by the process of wood breaking down. In a wood framed building, the presence of brown smoke may indicate that the structure is involved.

C. **Grey:**

Grey smoke indicates that at least some flaming combustion or smoldering combustion is present. Dark smoke that has travelled some distance can cool and large carbon particles suspended in the smoke can adhere to surfaces. The further the smoke travels, the more carbon it can lose, resulting in a grey smoke. In a building issuing dark smoke from some areas and grey smoke from other areas, usually the areas with grey smoke are remote from the fire.

D. **White:**

Application of water to a large fire will generate large amounts of steam which can mix with smoke and create condensation that gives the appearance of white smoke. In this situation, the white color can indicate water is on the fire. The more white condensation that is visible, combined with a reduction in the volume and velocity of dark smoke, indicates progress is being made in extinguishment.

White smoke (not steam) is produced when certain fuels are heated to their pyrolysis temperature and volatile components are released. If the heat continues to increase and there is insufficient oxygen even for smoldering combustion, then the production of white smoke will continue. White smoke can have a very high fuel content (white ghost), represents a significant danger, and should never be treated lightly. When white smoke mixes with oxygen and finds an ignition source, there is potential for a very sudden and powerful ignition.

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3.5.5 Smoke Stratification

A. Smoke usually stratifies in layers sometimes corresponding with the upper and lower layer. As a fire develops within an enclosure, the thermal interface will lower. The interface height can usually be observed by observing the smoke stratification or using the thermal imaging camera.

B. The location of the interface (its height in the room) and the neutral plane is important when assessing the potential for rapid fire development.

1. A high interface could indicate the fire is in early stages of development or that you are remote from the fire area.
2. A sudden rise in the interface could indicate that ventilation has occurred.
3. Gradual lowering of the interface often indicates a buildup of hot fire gases, a situation that could progress to rollover and flashover if left uncontrolled.
4. A sudden lowering of the interface could indicate a rapid intensification of the fire.
5. A neutral plane that is at or near floor level may indicate that the fire is on a floor below.

4. FLOW PATH & FIRE TRAVEL

4.1 The flow path of a fire describes the route that smoke and flame move away from the seat of the fire toward any outlet(s), as well as the corresponding flow of air into the fire from any inlet(s). Normal Air inside a compartment is made up of gases (such as oxygen and nitrogen). When this air is heated, the gases expand and the expansion of gases create pressure.

4.2 Flow Path

The area(s) within a structure fire where fire, heat, smoke and air flows from an area of higher pressure to an area of lower pressure.

4.3 Flow Path Management

It is possible to reduce the rate of fire growth if the inlet(s) and/or outlet(s) can be closed or restricted. In addition, the purposeful management of the flow path can increase firefighter safety during operations.

There may be several flow paths within a structure depending upon the building design and the available ventilation openings (i.e. doors, windows, shafts). The flow within the flow path may be characterized as being unidirectional, bidirectional or dynamic. The shape and position of the smoke/air track at a vent opening can be an important indicator of the intensity of the fire.

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4.4 Velocity and Direction

4.4.1 When an opening is created in a fire area, the heated gases will flow out of the top of the opening, and cool air will flow in through the bottom of the opening. A sudden inward movement of the air track could indicate the potential for rapid fire development. In these cases, the sudden inward rush of air will cause the fire to intensify and be followed by an outward rush of smoke and/or flame.

4.4.2 Smoke or flame being discharged from the entire ventilation opening (no neutral plane visible) usually indicates that it is an outlet and that there is at least one inlet located somewhere else in the structure.

4.4.3 An opening that is both a ventilation inlet and outlet will show signs of laminar (smooth) or turbulent flow at the neutral plane depending on the stage and intensity of the fire.

A. **Unidirectional Flow**

A unidirectional flow is a flow of smoke, flame or air moving in a single direction across the full area of the opening. A unidirectional flow path can exist as either an exhaust or an inlet.

B. **Bidirectional Flow**

Bidirectional flow describes a smoke/air flow moving in opposing directions within the same openings.

C. **Dynamic Flow**

A unidirectional or bidirectional flow of smoke/air that presents irregular stratification and shape, or alternates in direction (pulsates) is identified as dynamic flow.

4.4.4 Under normal fire conditions, there should be a clearly identified unidirectional flow or clearly delineated bidirectional flow of smoke/flame from a vent opening.

4.4.5 Under normal wind conditions, a room with only one opening will display a bidirectional smoke/air track with a visible neutral plane. In a wind-impacted scenario, the opening can aggressively alternate from a total inlet to a total exhaust outlet with a range of unique vent profiles. This would be an example of Dynamic Flow.

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TRAINING BULLETIN - FIRE DYNAMICS
CHAPTER 3
May 26, 2021

DANGEROUS FIRE EVENTS

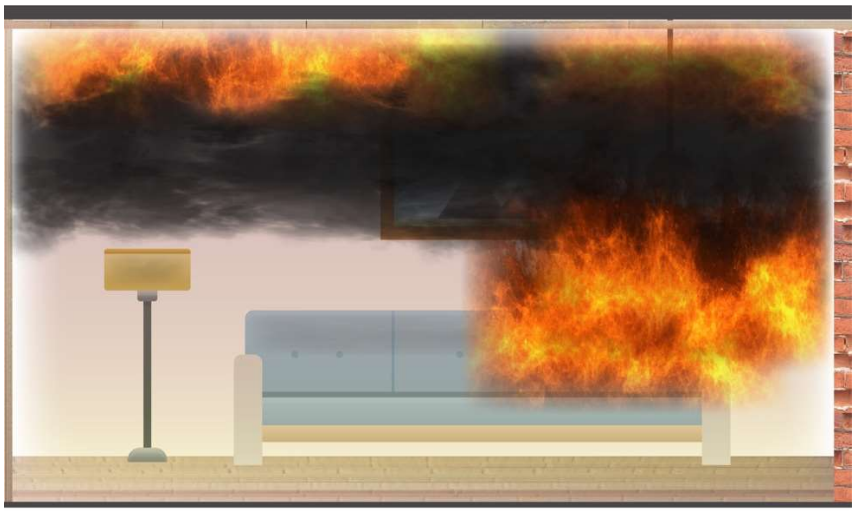
1. INTRODUCTION

1.1 Generally speaking, in a developing compartment fire, rollover occurs before flashover. Understanding and being able to recognize rollover and flashover conditions and being able to identify a ventilation-induced flashover environment and other dangerous fire events are key factors in Fire Dynamics Size-Up. The following section will describe dangerous fire events such as rollover, flashover, ventilation-induced flashover, backdraft, black fire, smoke explosion, flash fire, BLEVE and Boilover.

2. ROLLOVER

2.1 As the fire develops and the thermal layer has been formed, pockets of flame may begin to form in the upper layer as the first indication that unburned fuel in the hot smoke may be coming close to its auto-ignition temperature. If it does ignite, a rollover occurs.

2.2 **Rollover:** A condition where the unburned fire gases that have accumulated at the top of a compartment ignite and flames travel through the hot gas layer across the ceiling.



2.3 Rollover is when the heated gasses rising from the fire accumulate at the ceiling level. These heated gases are pushed, under pressure, and spread horizontally across the ceiling. While these gasses are banking down, they are forming the upper layer and are mixing with oxygen. The upper layer becomes a flammable mixture of heated gases. When their flammable range is reached, they ignite and a fire develops, with fire expanding very rapidly and rolling over the ceiling away from the main body of fire. Rollover occurs during the growth stage.

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2.4 Rollover is different from flashover because in rollover primarily the gasses are burning ***no***t the entire contents of the room. However, during a rollover event, such a significant amount of radiant heat (energy) is added to the room, that usually within seconds, flashover will occur. For this reason, the presence of rollover indicates that flashover is imminent.

3. FLASHOVER

3.1 Flashover is a transition phase in the development of a compartment fire in which surfaces exposed to thermal radiation reach ignition temperatures and ignite more or less simultaneously.

3.2 **Flashover:** The simultaneous ignition of all of the combustible materials in a compartment and all of the gases built up in the compartment produced by pyrolysis.

3.3 During flashover, the environment of the room is changing from a two-layer condition (Upper Layer and Lower Layer/ hot on top, cooler on the bottom) to a single well mixed, untenable hot gas condition from floor to ceiling. The temperature in the compartment typically exceeds 1100' F. In order for flashover to occur, there must be an enclosed space such as a single room. Virtually all combustible surfaces in the enclosed space become ignited during flashover.

3.4 The transition period between pre-flashover fire conditions to post-flashover can occur rapidly. During flashover, the volume of fire will increase to fill the entire volume of space in the room; with fire and burning gases likely extending out of any openings in the room (windows, doors, etc.) with substantial velocity.

3.5 Flashover occurs during the growth stage. Once flashover has occurred, the fire within the compartment is said to be in the Fully Developed Stage.

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Note: The Geometry (the size, shape and volume) of a room affects the formation of the upper layer and thus the heat transfer within a given fire compartment. A flashover may take longer to occur in compartments that have *peaked ceilings* or cathedral ceilings since these features make it difficult for the upper layer to form. Lack of upper layer formation limits the amount of radiant heat produced and radiated back towards the fire and other fuels in the compartment.

4. VENTILATION-INDUCED FLASHOVER

4.1 When a fire enters the decay stage before flashover occurs due to a reduction in oxygen, but then redevelops and flashover occurs when oxygen is admitted to the fire, is called a ventilation-induced flashover.

4.2 **Ventilation-Induced Flashover:** A flashover initiated by the introduction of oxygen into a pre-heated, fuel rich (smoke filled) oxygen deficient area.

4.3 Ventilation-Induced Flashover has become prevalent with modern content fires. Modern content fires rapidly consume more of the available oxygen within the fire compartment creating conditions favorable for a ventilation-induced flashover to occur.

4.4 Ventilation-Induced Flashover occurs when oxygen is introduced to a fire which has entered an early decay stage. Once ventilation-induced flashover occurs, the fire within the compartment is said to be in the Fully Developed Stage.

4.5 Ventilation-Induced Flashover is similar to a backdraft except a backdraft involves significantly more pressure, causing an explosion.

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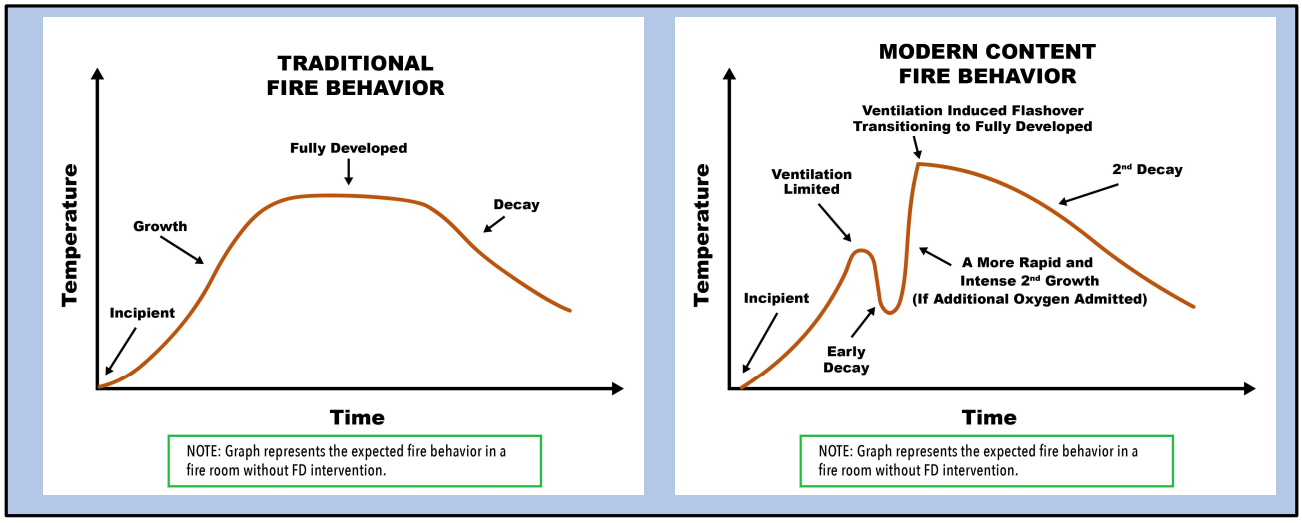
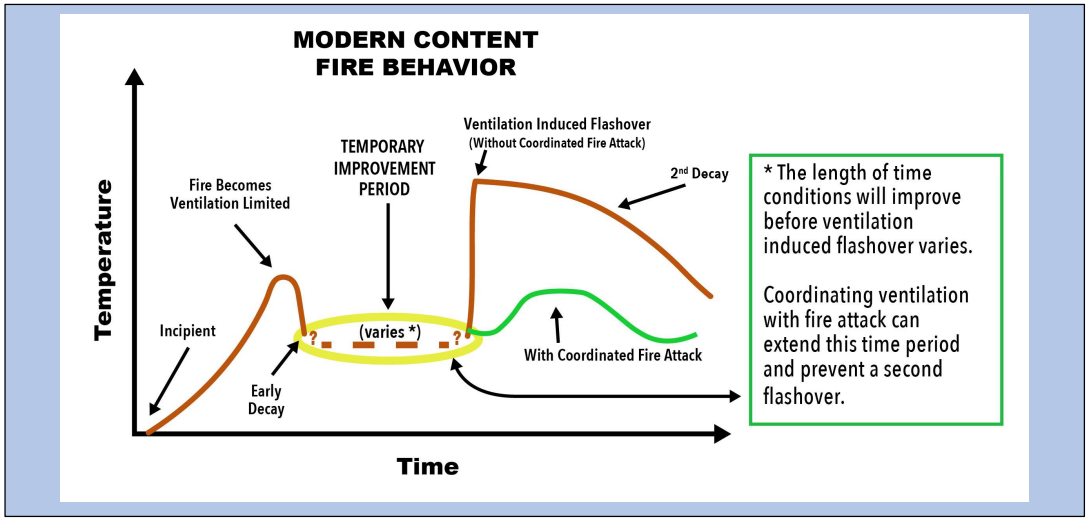


4.6 Ventilation will *initially* relieve built up heat and smoke even when conducted ahead of hoseline operations. While all ventilation openings may have an impact on the fire, a member taking a window of a fire room in the oxygen deficient early decay stage will have more immediate effect on fire regrowth than opening the fire apartment door down the hall. If water is not applied to the seat of the fire soon after ventilation occurs, this **temporary improvement period** may be followed by a rapid deterioration of conditions, potentially leading to flashover.



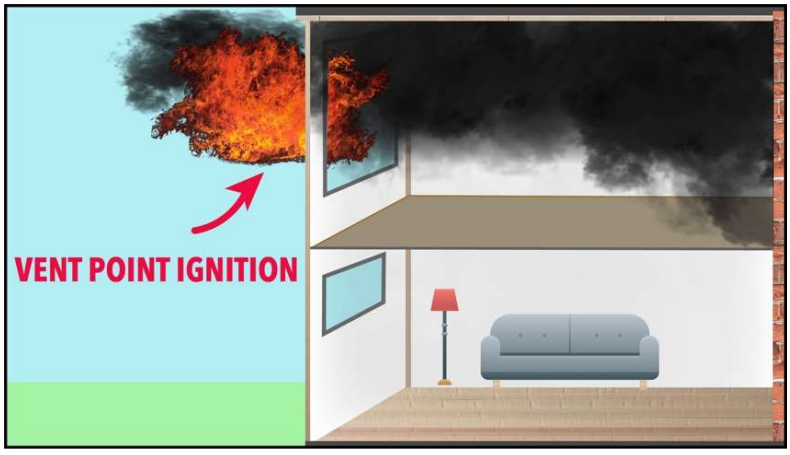
4.7 In oxygen depleted environments, this **temporary improvement period** can last for an unspecified amount of time; it can be seconds or several minutes. It is important to note that there is no way to accurately determine how long this temporary improvement period will last. Factors impacting fire rapid re-growth include: size and location of the fire, size and location of the ventilation opening, building dynamics and flow paths established between the fire and ventilation opening(s). Firefighters can extend the temporary improvement period by coordinating ventilation with fire attack.

5. BLACK FIRE

5.1 The occurrence of Black Fire is a condition when thick turbulent superheated fuel rich black smoke has been heated well beyond its ignition point but is so rich with gasses it is beyond its flammable range and is too rich to burn. Black Fire occurs in areas of the fire building which are said to be in the Growth Stage. This can and often does include areas ***above*** or ***adjacent*** to rooms of fire that are fully involved and in the fully developed stage.

5.2 It is called Black Fire because at the area affected there will be no visible flames, just dark black superheated turbulent smoke. The smoke will be so hot that it will act as if it were fire. This means that the heat from Black Fire will be searing and destructive and it will pyrolize and consume materials in its path. It can severely burn firefighters.

5.3 When Black Fire conditions are present, there is usually an area ahead of the Black Fire area where the main body of fire is free burning and heavily involved in flames. In the Black Fire Area itself, the smoke will be too rich to burn and there will be no visible flames. Behind the Black Fire area, as the smoke travels remote from the fire area and mixes with more air, there may be an area where the smoke ignites. This ignition can occur in a room behind firefighters who are operating in the black fire area causing them to become trapped. Ignition can also occur on the exterior of the building when the smoke ignites as it is released from a window or door and mixes with air in the atmosphere. This is known as **vent point ignition.**



5.4 Black Fire is an extremely dangerous condition to be operating in. Upon recognition of Black Fire Conditions, treat the Black Fire smoke as if it were flames. Immediately flow water into the smoke layer with a hoseline to aggressively cool the area. If you are unable to immediately cool the area, isolate our forces from the fire area by closing a door or some other means if possible, or retreat to an area of safety.

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6. SMOKE EXPLOSION

6.1 A smoke explosion can occur either inside or outside the fire compartment when an accumulation of fuel-rich smoke mixes with additional air and falls within its flammable/explosive range. A smoke explosion can occur without warning and occurs ***without*** a sudden change in ventilation.

6.2 **Smoke Explosion:** A rapid fire development that occurs when a smoke-air mixture falls within its flammable range, either internal or external to the fire compartment, and is ignited in a manner resulting in a significant pressure front. A smoke explosion occurs without an immediate ventilation triggering event.

6.2 One common example occurs when smoke migrates and accumulates in hidden areas such as rooms remote from the fire area or void spaces (including cocklofts, attics, or voids within walls). This smoke then mixes with air to fall within its flammable range and encounters an ignition source (or is at a temperature above its auto-ignition temperature), resulting in a flame front propagating through the mixture.

6.3 If ignition occurs in a relatively confined space (cockloft, small room, etc.), or if obstacles promote turbulence, the flame front may accelerate, leading to an over pressure situation that may result in structural damage and/or injury or death of nearby firefighters.

7. BACKDRAFT

7.1 Backdrafts are caused when there is an introduction of oxygen to a compartment that has been pressurized by the smoke and fire gases of an oxygen-deficient fire in the Decay Stage. Similar to smoke explosions, backdrafts are accompanied by a significant over-pressure.

7.2 **Backdraft:** A deflagration resulting from the sudden introduction of air into a confined space containing oxygen-deficient products of incomplete combustion.

7.2.1 During a backdraft, the ignition pushes unburned fuel-rich gases ahead of the burning smoke-air mixture as it expands. A large fire ball results as the burning flammable and smoke-air mixture is forced, under pressure, from the compartment. The over-pressurization and dramatic fireballs produced during backdraft can result in damage to the structure and extension of the fire beyond the compartment, and pose several risks to firefighters who are in its path.

7.2.2 A backdraft may lead to a heavy fire condition or may expel all of the fire gases, leaving only localized combustion in its path.

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7.3 **Backdraft Indicators**

7.3.1 No visible/active flaming within the compartment and

7.3.2 Extremely limited or no ventilation of the fire compartment

Sometimes but not always in conjunction with the following:

7.3.3 Pulsating smoke, usually pulsating in an in-and-out movement, giving the impression the "compartment is breathing".

7.3.3 Grey-Yellow smoke seeping out from around closed and intact doors and windows.

7.3.5 Doors and windows usually very hot and window glass discolored and/or cracked from the heat.

Note: It is important to note that while some or all of these indicators may be present to indicate the possibility of a backdraft, it is possible for a backdraft to occur without indications that the fire is in the decay stage being visible from the exterior of the compartment.

Note: Distinguishing between Smoke Ignitions

A. For FDNY purposes, Backdrafts and Smoke Explosions will be considered the same; except that Backdrafts will occur immediately following ventilation of the affected compartment.

B. An event will be considered a Smoke Explosion if it occurred without immediate and direct ventilation of the affected area.

8. FLASH FIRE (PROPAGATING FLAME FRONTS)

8.1 Flash fires involve a flame moving though a flammable mixture with considerable speed, without developing a significant over-pressure.

8.2 **Flash Fire:** A fire that spreads by means of a flame front rapidly through a diffuse fuel, such as dust, gas or the vapors of an ignitable liquid, without the production of damaging pressure.

8.3 Flash fires can happen within a fire compartment (such as during overhaul) when embers or sparks can act as an ignition source or external to the compartment in any remote location where a flammable mixture has collected. Flash fires usually self-extinguish, although sometimes may ignite secondary fires.

8.4 Examples of Flash Fires include ignition of dust in a wood shop, vapors from a roach bomb or vapors from a newly stained wood floor.

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Note: Flash fires which occur in a confined space can cause an over pressure condition and result in an explosion. This condition would be referred to as an explosion. (eg dust explosion)

9. BOILING LIQUID EXPANDING VAPOR EXPLOSION (BLEVE)

9.1 A BLEVE is an explosion caused by the rupture of a vessel containing a pressurized liquid that has reached temperatures at or above its boiling point.

9.2 Characteristics of the stored liquid, as well as the storage container, are important in determining whether there is potential for a BLEVE to occur. When a liquid is heated to a temperature which is at or above its boiling point, it will vaporize, causing an increase in pressure in the container. If the boiling liquid is in a sealed, rigid container, the pressure in the container will increase as more liquid boils. If the container is vented, the extra pressure will be released to equalize the pressure inside the container with that outside the container (atmosphere). If the container is not vented, or if the relief vent cannot release the building pressure fast enough, the pressure inside the storage container will increase.

9.3 A BLEVE occurs when (1) the liquid in a pressurized vessel is at or heated to a temperature that exceeds it boiling point and (2) the container ruptures, either due to excessive build-up in pressure, or due to tank failure caused by mechanical or thermal damage.

9.4 When the rupture is catastrophic, the contents of the vessel will boil almost immediately on release, causing a rapidly expanding vapor cloud. Depending on the temperature, pressure and type of liquid involved, this expansion may be so rapid that it is classified as an explosion and can cause significant damage to its surroundings. If the liquid involved is flammable, the expanding vapor cloud may also be flammable and ignite creating a fire.

10. BOILOVER

10.1 An event in the burning of certain combustible liquids in an open-top tank when, after a long period of quiescent burning, there is a sudden increase in fire intensity associated with the expulsion of burning oil from the tank. (NFPA)

10.2 When water is added to the fuel, it sinks to the bottom of the container and has little effect on extinguishing the flames which are on the surface of the fuel. Under certain conditions, the water vaporizes into steam causing it to expand more than 1700 times in volume. The rapidly expanding steam expels the fuel upward and out of the container, which ignites and results in a large plume of burning liquid outside of the container.

10.3 Boilover commonly occurs in residential kitchen fires when water is added to a grease/oil fire in an attempt to extinguish the fire. Boilover can be more catastrophic when occurring in a larger flammable liquid fire such as a transformer fire or tanker truck fire. In most cases, water (without a suppression additive) has little extinguishing effect on flaming liquid fires.

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STACK EFFECT AND WIND

1. STACK EFFECT

1.1 "Stack Effect" is a term used to describe the movement of air throughout a building that occurs when the temperature of the interior of a building is different than the temperature of the external environment. Stack Effect occurs in buildings of all sizes including private dwellings; although in hi-rise buildings it is significantly more prominent.

1.2 Stack Effect encompasses two distinct dynamics; it affects internal vertical air movement inside the building (up and down the shafts), as well as horizontal air movement (into or out of a floor within the building). Horizontal air movement occurs as air is exchanged between the building's interior and the external environment (in and out windows) or is exchanged within the building from a given floor into or out of a vertical shaft.

1.3 Impact of the Stack Effect

1.3.1 The Stack Effect impacts air movement in a building in two distinct ways:

A. It impacts the vertical direction and magnitude of air movement inside the building itself. Air inside the building can either move up or down the vertical shafts. This movement will affect the movement of smoke throughout the building.

B. It impacts the horizontal direction and magnitude of air being exchanged between (1) the interior of the building and the external environment and (2) the horizontal air movement on each individual floor to and from the vertical shafts. Air can either be pulled into the building through available openings (windows, doors), or it can be pushed out of the building. Likewise, air can be pulled into a particular floor from a vertical shaft or pushed out of a particular floor into the shaft. This horizontal movement can affect fire and/or smoke conditions depending on the direction of air movement.

1.4 Stack Effect Neutral Pressure Zone

1.4.1 Near the center of the building there will exist an area that experiences no horizontal air exchange at all (air will not be pulled into or pushed out of an opening or pulled into or pushed out of a floor due to stack effect). This area is called the "**Stack Effect Neutral Pressure Zone**".

1.4.2 The magnitude of horizontal air movement at other parts of the building depend on the distance from this central point; the further the opening is from the middle floor of the building, the stronger the Stack Effect will be. This means that lateral air movement will be strongest at openings (windows) or locations on the uppermost and bottommost floors.

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1.4.3 This condition can cause smoke and fire gasses to bypass several floors near the center of the building (near the stack effect neutral pressure zone), only to be pulled into floors somewhere above or below the center of the building depending on the direction of the stack effect.

1.5 Magnitude of the Stack Effect

1.5.1 The magnitude of the Stack Effect will be dictated by the size of the temperature differential between the interior of the building and the exterior environment and the height of the building.

A. Stack Effect will be more prominent in extreme weather; when air conditioning or heating systems make the temperature inside the building remarkably different from the outside temperature.

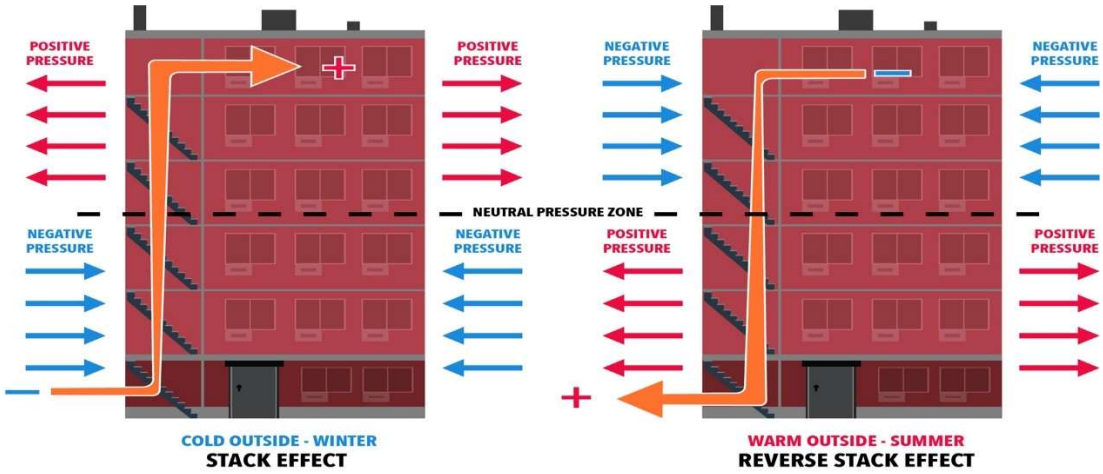
B. Taller buildings will experience a more powerful Stack Effect because more air will be moving over a longer distance inside the building. Also, the presence of large vertical shafts (stairways, elevators, compactors, etc.) will contribute to the strength of the Stack Effect.

1.6 Direction of the Stack Effect

1.6.1 The direction of the Stack effect will be dictated by whether the interior of the building is warmer or cooler than the external environment. There is a critical difference, as the air will move in opposite directions depending on this factor and will have the opposite impact on smoke movement and fire conditions in different parts of the building.

A. Positive Stack Effect (Winter) is when the interior of a building is warmer than the external environment.

B. Negative Stack Effect (Summer) is when the interior of a building is cooler than the external environment.



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1.7 Two Different Situations: *Positive Stack Effect (Winter) vs. Negative Stack Effect (Summer)*

1.7.1 Positive Stack Effect (Winter)

A. In cold weather, air inside occupied buildings is warmer than the air outside the building due to internal heating systems.

B. As a result, air and smoke movement inside the building will travel upwards via vertical shafts and attempt to exit the building via available openings near the top of the building. At the bottom of the shaft, a negative pressure will be generated, which will have the effect of pulling air into the shaft via available openings near the bottom of the building.

C. A fire on an upper floor will tend to want to **vent out** of the windows.

D. A fire on a lower floor will tend to **draw air into** the windows creating conditions similar to a wind impacted fire.

E. Smoke from a lower floor fire will be drawn up vertical shafts within the building and pulled back into floors with greater force as you go higher in the building and further away from the stack effect neutral pressure zone.

1.7.2 Negative Stack Effect (Summer)

A. In hot weather, air inside occupied buildings is cooler than the air outside the building due to internal air conditioning systems.

B. As a result, air inside the building will travel downwards via vertical shafts and attempt to exit the building via available openings near the bottom of the building. At the top of the shaft, a negative pressure will be generated, which will have the effect of pulling air into the shaft via available openings near the top of the building.

C. This is also known as “Reverse Stack Effect”.

D. A fire on an upper floor will tend to **draw air into** the windows creating conditions similar to a wind impacted fire.

E. A fire on an lower floor will tend to want to **vent out** of the windows

F. Smoke from an upper floor fire will be drawn toward the vertical shafts within the building and will typically travel downward. It can be pulled back into floors with greater force as you go lower in the building and further below the stack effect neutral pressure zone.

Note: In New York City, the difference between the temperatures inside a building compared to the temperature outside the building will be greater during the winter months than it will be during the summer months. For this reason, the positive stack effect which occurs during the winter will be more prominent than the negative stack effect which occurs during summer months.

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2. WIND

2.1 Of all the conditions that can affect fire behavior, wind has the most dramatic impact. Wind alone can override the effects of some or all of the other variables that define traditional fire behavior. Wind can overpower the Stack Effect, change flow paths, significantly change the volume and intensity of a fire, and the speed at which materials burn.

2.2 Wind introduces large amounts of oxygen and causes forced convection of the fire area and burning materials. The fresh air moving with wind currents at Wind-Impacted Fires cause significant changes to fire development, fire travel and smoke movement. "Blow Torching" is the appropriate description of what can occur when fire conditions are impacted by the wind. Wind can dramatically change a fire in seconds.

2.3 Although wind impacted fires are typically associated with fires in fireproof multiple dwellings, they can occur at any fire including those in private dwellings. Wind can also have significant impact on non- structural fires such as brush fires or large area rubbish fires.

3. FD OPERATIONS

3.1 It is important to understand that once the Fire Department arrives on the scene and begins operations, we will ALWAYS change the natural progression of Fire Dynamics. The intent of our operations is to change the dynamics of the fire in a positive way by extinguishing the fire and releasing the build-up of heat and smoke from the structure in an effort to save lives and reduce the damage to property.

3.2 However, an experienced firefighter must understand that many of the actions taken on the fireground will have irreversible effects on the fire that can be either positive or negative. The goal is that if these actions are selected correctly, coordinated with other FD operations and executed properly, the impact should be positive, conditions should improve and the fire diminish until extinguishment is achieved.

DCN: 3.02.14
TRAINING BULLETINS
FIRES 7
March 15, 1997

INCINERATOR / COMPACTOR FIRES

1. SIZE-UP: INCINERATORS AND COMPACTORS

1.1 New York City Regulations encourage the use of compactors rather than incinerators and require that incinerators be used only with safeguards. This policy reduces the risk of fire or smoke emergencies occurring but does not eliminate them. New incinerators can be installed in hospitals and in municipal buildings. In existing buildings, an incinerator must either be converted to a compactor or be updated by adding a scrubber, an auxiliary gas or fuel burning mechanism and oversized fans. New buildings (except hospitals and municipal buildings) are permitted to install only compactors.

1.2 Typical problems.

A. Heavy smoke conditions, in which people may be overcome by smoke or may panic.

NOTE: Some hallways do not have windows that can be ventilated.

B. Extension is unlikely but is much more probable in the case of a compactor than in the case of an incinerator, since compactor chutes are not designed for burning. Therefore, the operational priorities are different, viz:

1) Compactor - Put the fire out.

2) Incinerator - Clear the blockage.

1.3 An important factor is to determine if it is a compactor or an incinerator. A compactor fire is a structural fire while an incinerator fire which does not extend or communicate from the shaft is an emergency. If the fire extends from the incinerator shaft it is a structural fire. Some ways of determining what we are dealing with are:

A. You may know ahead of time, perhaps through BISP whether the building has an incinerator or a compactor.

B. A large number of plastic bags on the sidewalk may indicate a compactor.

C. Steel cans filled with ashes may indicate an incinerator.

D. In City Housing Projects, the chute door on the first floor may be color coded: RED for incinerator, GRAY for compactor.

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2. INCINERATOR OPERATIONS

2.1 Officer, FE team, and OV of the ladder company will generally operate inside the building to ventilate, search, and to locate the blockage.

A. Examples of ventilation.

1) Vent windows in halls, if there are windows.

2) Chock open doors to stairwells on floors with smoke conditions to allow vertical ventilation up stairwells.

NOTE: The roof firefighter (see below) can vent stairways by opening the door of the bulkhead and securing it.

B. Search floors above and below the source of the smoke where heavy smoke conditions call for this.

2.2 Locating the blockage.

A. If you open a chute door on a floor and smoke comes out, the blockage is generally above that floor. Refer to Reference #2

B. If instead, when you open it, a draft goes inward or there is little smoke, the blockage is generally below that floor or the blockage has freed itself. Refer to Reference #2

NOTE: If smoke is present on the uppermost floor, there may be a clogged or blocked spark arrester or fly ash collector. (See roof firefighter, below)

2.3 Possible ways to free the blockage once it is located.

A. Bent reinforcing rod that is about 10 feet long, and bent into an L shape, can be used to push down the blockage from above.

B. The blockage can be pushed down with a hook.

NOTE: Some hopper frames can be removed to provide easier access to the chute.

C. Tie a heavy weight to a rope and drop it from above.

NOTE: Don't drop anything which is not secured with a rope, whether it is a brick, a cinder block, or a cement block.

1) It may damage the chute or compound the problem if the blockage is not cleared.

2) More important, it is possible to injure members operating below.

D. If the blockage cannot be freed by use of the above methods, consider burning it off. (This is used only on incinerators).

NOTE: Caution must be taken to avoid any extension.

E. If all else fails, a hoseline can be used from the floor above to extinguish the fire.

NOTE: ***Redacted for PFS***

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F. The roof firefighter of the ladder company proceeds to roof to ventilate stairways and to check spark arrester for blockage. As stated above, the bulkhead door can be opened and secured in order to vent stairways.

NOTE: It is very important that, before the roof firefighter leaves the lobby he/she chocks open the stairwell door at the ground floor level. This will provide for maximum draft and vertical ventilation when the roof bulkhead door is opened.

G. If there is a spark arrester, it should be checked for blockage. If there is blockage, the roof firefighter should notify the officer and attempt to clear it. Be cautious of fly ash collector. Refer to Reference #1.

H. If there is a fly ash collector, there may be blockage inside the incinerator chute, at the top. If there is, the roof firefighter should notify their officer for assistance and start to force entry into the collector and clear the blockage. Refer to Reference #1.

NOTE: A fly ash collector is an area near top of the incinerator vent shaft for collecting fly ash that results from incomplete combustion of the waste material. It can be as small as an enlarged area in the shaft or as large as a small room. It is always equipped with a means of access cleaning (generally a steel door). Use caution in the larger collectors because there may be an open hole in the floor large enough to fall into. Also, if the area is small, hot ash may come down on member when opening door.

2.4 ***Redacted for PFS***

3. INCINERATOR SAFETY

3.1. Pay special attention to safety whenever you open a chute door. When chute doors are opened, dust explosions, exploding aerosol cans, and the eruption of fire are real possibilities.

3.2 Take the following precautions when opening a chute door:

A. Be sure you are wearing full firefighting gear, including gloves and eye shields down. Consider using a mask if necessary.

B. Stand to the side of the hopper door. If the door is hinged, stand on the hinged side.

C. Eyes should be below the opening, and face turned away.

D. Always stay clear of the opening, in case there should be an explosion or an eruption of fire.

E. Shining a flashlight up or down the chute may aid in locating the blockage or observing smoke movement. Refer to Reference #2

3.3 Members attempting to clear a blockage from the base of the incinerator should shut off the auxiliary burner before commencing operations. Gas explosions of some consequence involving the auxiliary gas burners, while infrequent events, have occurred.

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4. ENGINE COMPANY OPERATIONS

4.1. Engine companies shall be guided by the following:

A. Generally, the engine company will stand-fast in the lobby with masks, rolled ups and standpipe kit.

1) Some members may be used to assist the ladder company in search, vent, etc. However, generally the officer and at least 2 members shall remain in the lobby.

B. If it is determined that the chute is to be flooded, a line is stretched to the floor above the fire and operated into the chute.

4.2 Additional considerations:

A. There are buildings with incinerators and compactors that do not have standpipes. This will necessitate a hand stretch if a line is needed.

B. If after investigation, it is determined that the fire is in the basement incinerator room, entry may have to be made via an outside entrance.

5. COMPACTOR OPERATIONS

5.1 The air quality standards for New York City were revised by Local Laws 14 of 1966 and 49 of 1971 to improve the air pollution situation. In compliance with these laws, new buildings were equipped with compactors and many existing incinerators were converted to compactors.

6. COMPACTOR DESCRIPTION

6.1 There are several shapes, sizes and manufacturers of compactors.

6.2 A compactor is designed to reduce the volume of raw refuse. The refuse is dropped down a chute from the floors above, and guided by a shaped hopper into the compactor chamber. When the chamber is full, a photo electric beam is broken, initiating a ram that forces the refuse through a nozzle leading to a bag or container. This photo electric mechanism operates on a delayed time principle. An object must block the beam for four seconds before the compactor starts. The time factor may be either consecutive or accumulative.

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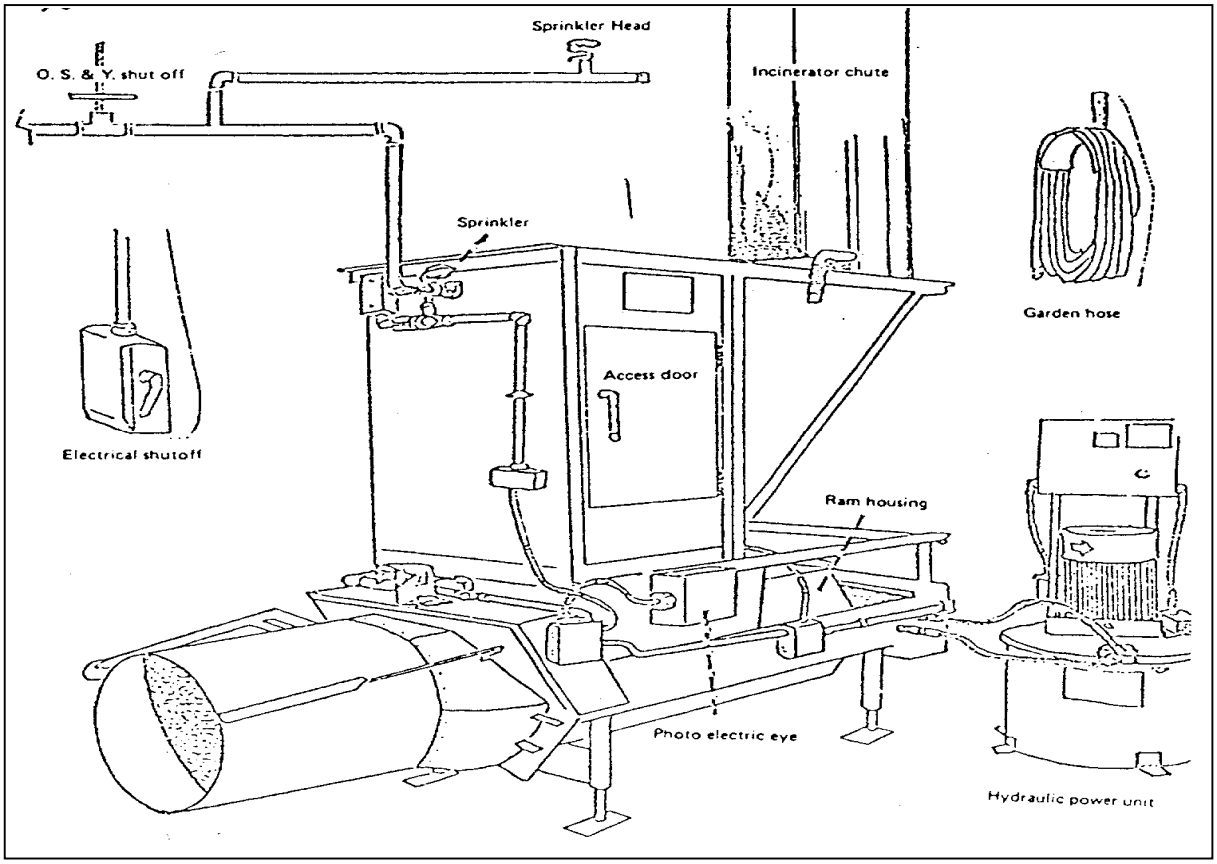
6.3 Diagram of Typical Compactor



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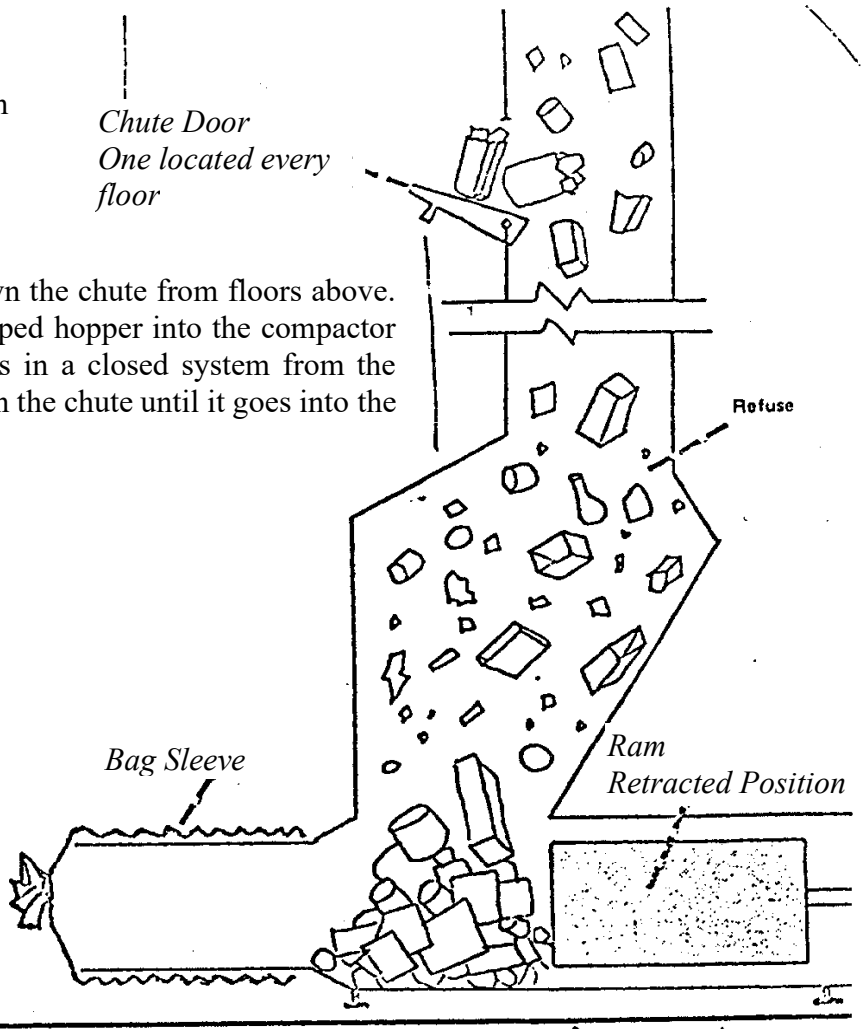
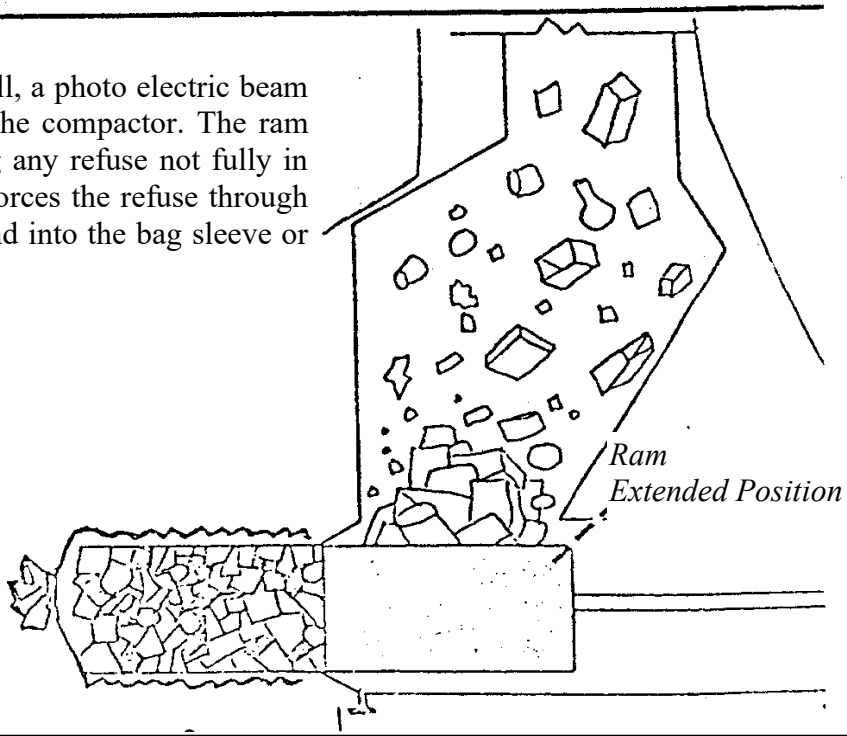
6.4 Cutaway view of operation cycle of a compactor



No. 1 Refuse is dropped down the chute from floors above. It is guided by the shaped hopper into the compactor chamber. The refuse is in a closed system from the time it is dropped down the chute until it goes into the bag.



No. 2 When the chamber is full, a photo electric beam is broken which starts the compactor. The ram moves forward shearing any refuse not fully in the chamber. The ram forces the refuse through the compactor nozzle and into the bag sleeve or container.

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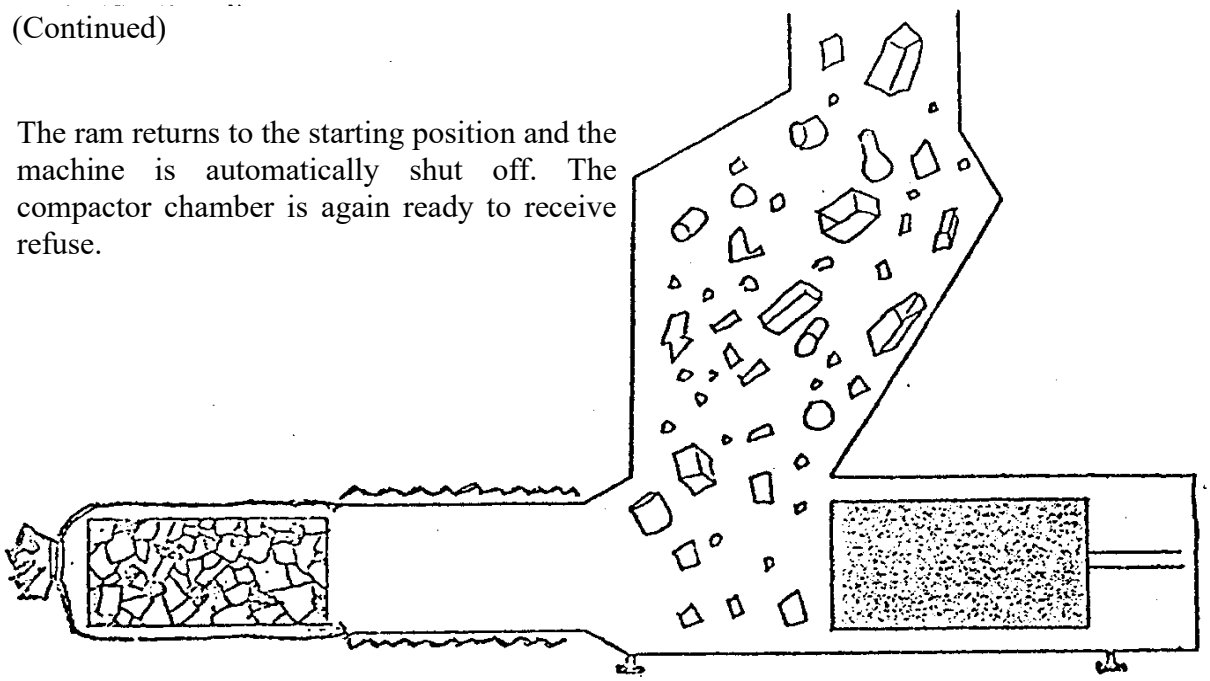
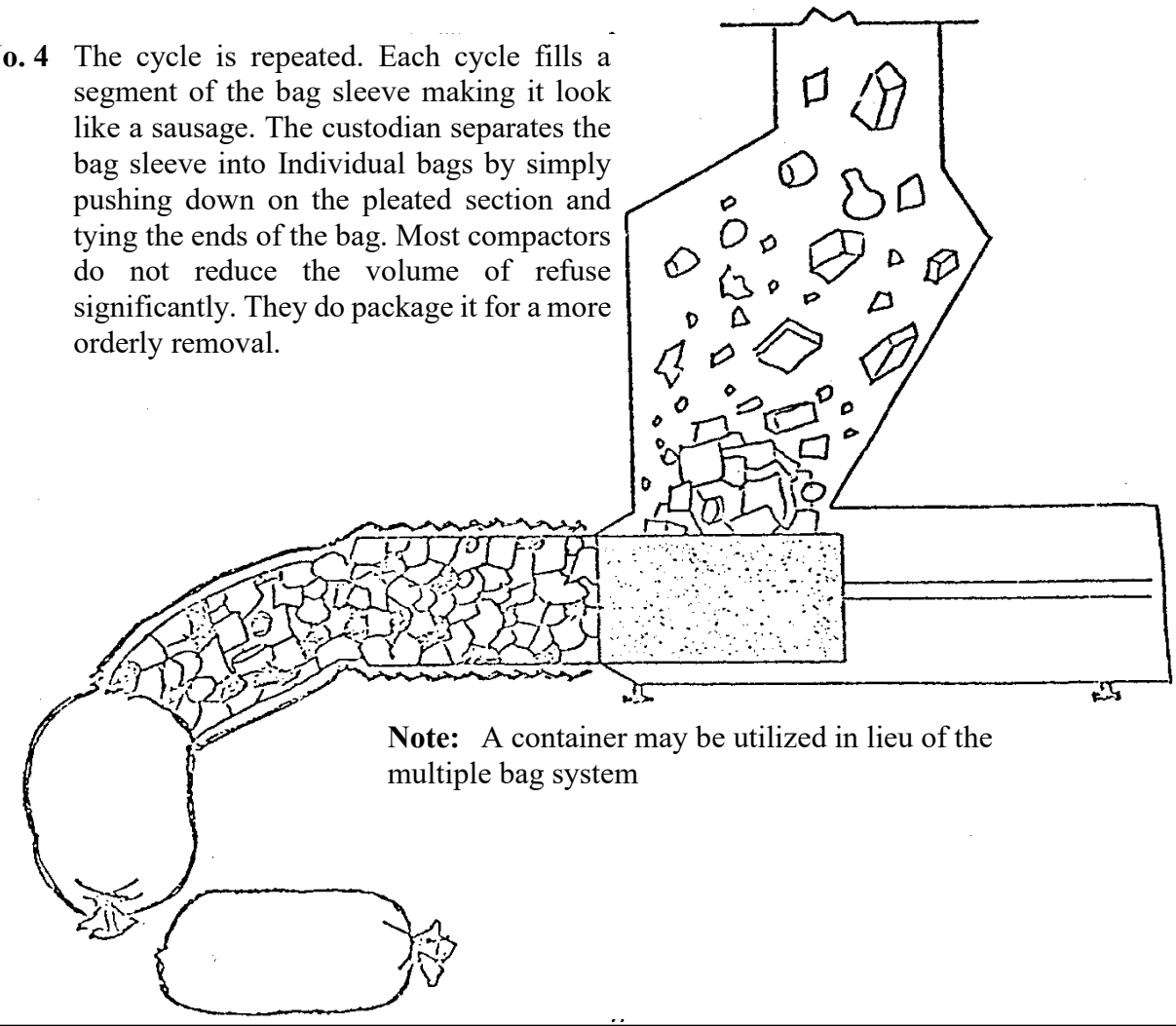
6.4 (Continued)

No. 3 The ram returns to the starting position and the machine is automatically shut off. The compactor chamber is again ready to receive refuse.



No. 4 The cycle is repeated. Each cycle fills a segment of the bag sleeve making it look like a sausage. The custodian separates the bag sleeve into Individual bags by simply pushing down on the pleated section and tying the ends of the bag. Most compactors do not reduce the volume of refuse significantly. They do package it for a more orderly removal.



Note: A container may be utilized in lieu of the multiple bag system

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6.5 The type of compactor that FDNY units most frequently encounter is the incinerator conversion, installed at the base of the original incinerator chute. It is usually located in a separate room, accessible from the rear of the building.

7. FIRE PROTECTION

7.1 The compactor room should be fire resistive, protected by a fire door and supplied with an automatic sprinkler.

7.2 A water outlet and a hose are required in the compactor room

7.3-7.5 ***Redacted for PFS***

8. COMPACTOR FIRE OPERATIONS

8.1 The operations at compactor fires will be governed by the location of the fire. There are three categories of compactor fires: in the chute, in the unit, or in the compactor room.

8.2 Chute fire (operations).

A. The first engine company to arrive will proceed to one level above the burning material, stretch a line and operate into the chute to extinguish the fire. Freeing the blockage, as you would in an incinerator fire, could result in a more serious situation in the compactor unit, because it is not designed for burning refuse. The possibility of extension is greater in the unit than in the chute.

1) OV of the ladder company operates with engine company to provide access to the chute and check for extension.

B. The officer and forcible entry team of the ladder company will operate in the compactor room.

1) The officer and forcible entry team must first, locate the electrical shut off and shut power to the unit before operations commence.

NOTE: The shut off will generally be on the wall in the compactor room. The compactor unit can be operated if there is a need, to help clear the unit; however, extreme caution must be exercised. Refer to Reference #3.

2) After the engine company has extinguished the fire, the ladder company may begin overhauling. Before opening the compactor unit access door be sure the hoseline is shut down and sprinkler OS&Y is closed. If the engine is still using the line or the sprinkler is still operating, glass and other debris may be driven out of the compactor unit.

3) Open door to unit and pull garbage to reach fire.

4) Most rooms have a hook up for a garden hose. Use it to wet down debris as it is pulled from chute.

5) Check for extension.

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C. The roof firefighter of the ladder company will generally proceed to the roof to vent.

1) After venting roof, this member will search and vent stairways floors, etc., as needed.

D. ***Redacted for PFS***

8.3 Fire in Compactor Unit (no extension to the chute).

A. If the fire has not extended into the room, the engine company stretches a line to first floor, and operates into chute to extinguish the fire.

B. OV operates with engine to provide access to the chute and to check for extension.

C. The roof firefighter of the ladder company will generally proceed to the roof to vent.

1) After venting roof, this member will search and vent stairways floors, etc., as needed.

D. ***Redacted for PFS***

E. The officer and forcible entry team of the ladder company will operate in the compactor room.

1) The officer and forcible entry team must first locate the electrical shut off and shut power to the unit before operations commence.

NOTE: The shut off will generally be on the wall in the compactor room. The compactor unit can be operated if there is a need, to help clear the unit; however, extreme caution must be exercised. Refer to Reference #3.

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3) Open door to unit and pull garbage to reach fire.

4) Most rooms have a hook up for a garden hose. Use it to wet down debris as it is pulled from chute.

5) Check for extension.

8.4 Fire Extended from Compactor into Room.

A. Firefighting tactics same as a cellar fire.

9. SAFETY PRECAUTIONS

9.1 Members working in area of compactor unit should make sure they have gloves on, eye shields down, and keep arms and hands out of unit. Bottles, spray cans and other potentially dangerous debris may be falling down chute.

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9.2 Electrical
Compactors are powered by high voltage electrical lines (approximately 210 Volts). To eliminate the potential hazard, disconnect power at electrical shut off.

9.3 Mechanical
Compactor ram has a packing force of approximately 50,000 pounds, depending on size of the unit and the manufacturer. It is triggered by a photo electric circuit. When the electric power is shut off, the hydraulic ram is also deactivated, eliminating the danger of injury from the ram.

9.4 Hydraulic
If the hydraulic lines rupture, the escaping flammable fluid adds to the potential of the fire. This would also create a slippery condition for members operating in the area.

BY ORDERS OF THE FIRE COMMISSIONER AND CHIEF OF DEPARTMENT

REFERENCE #1
Redacted for PFS

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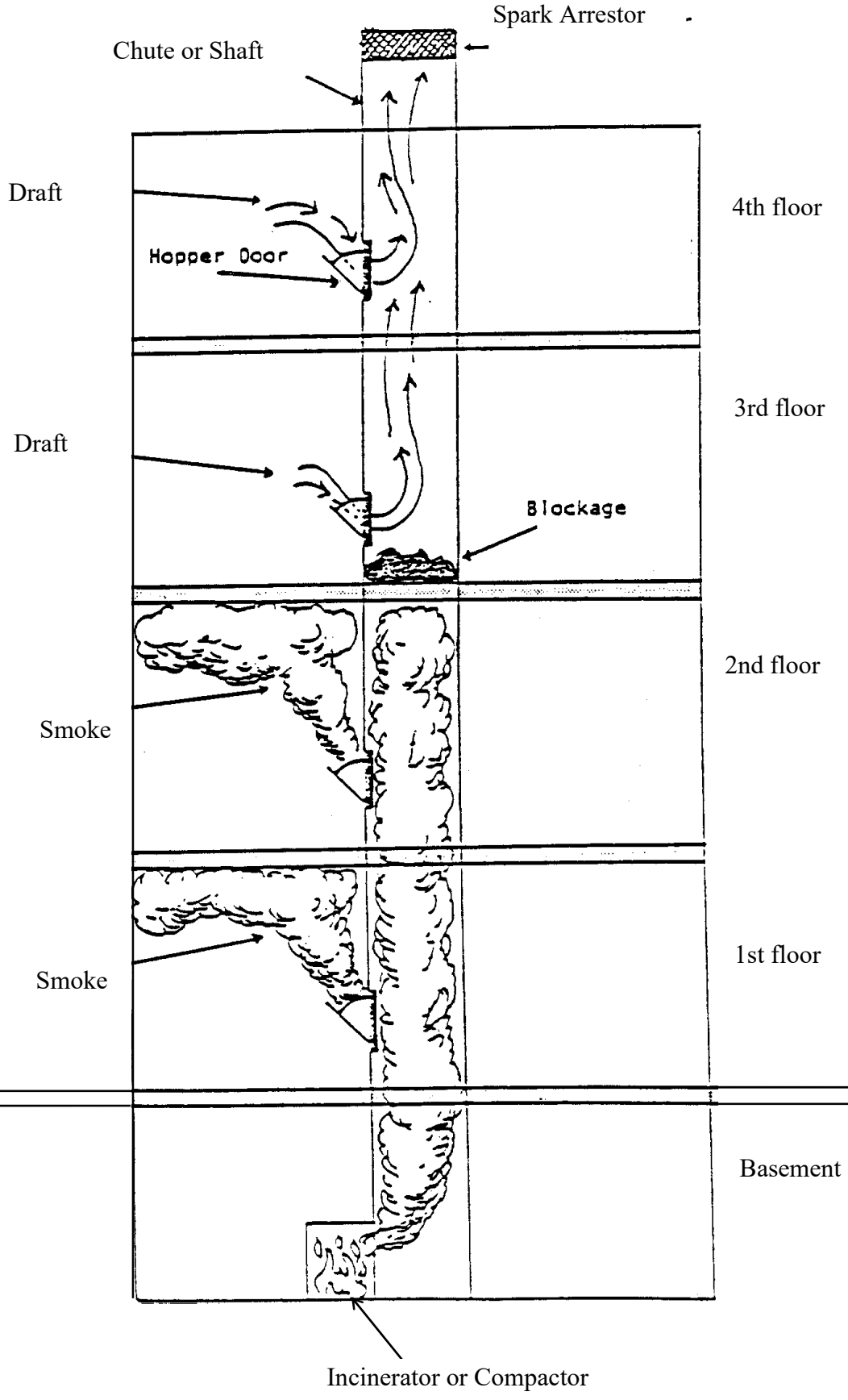
REFERENCE # 2



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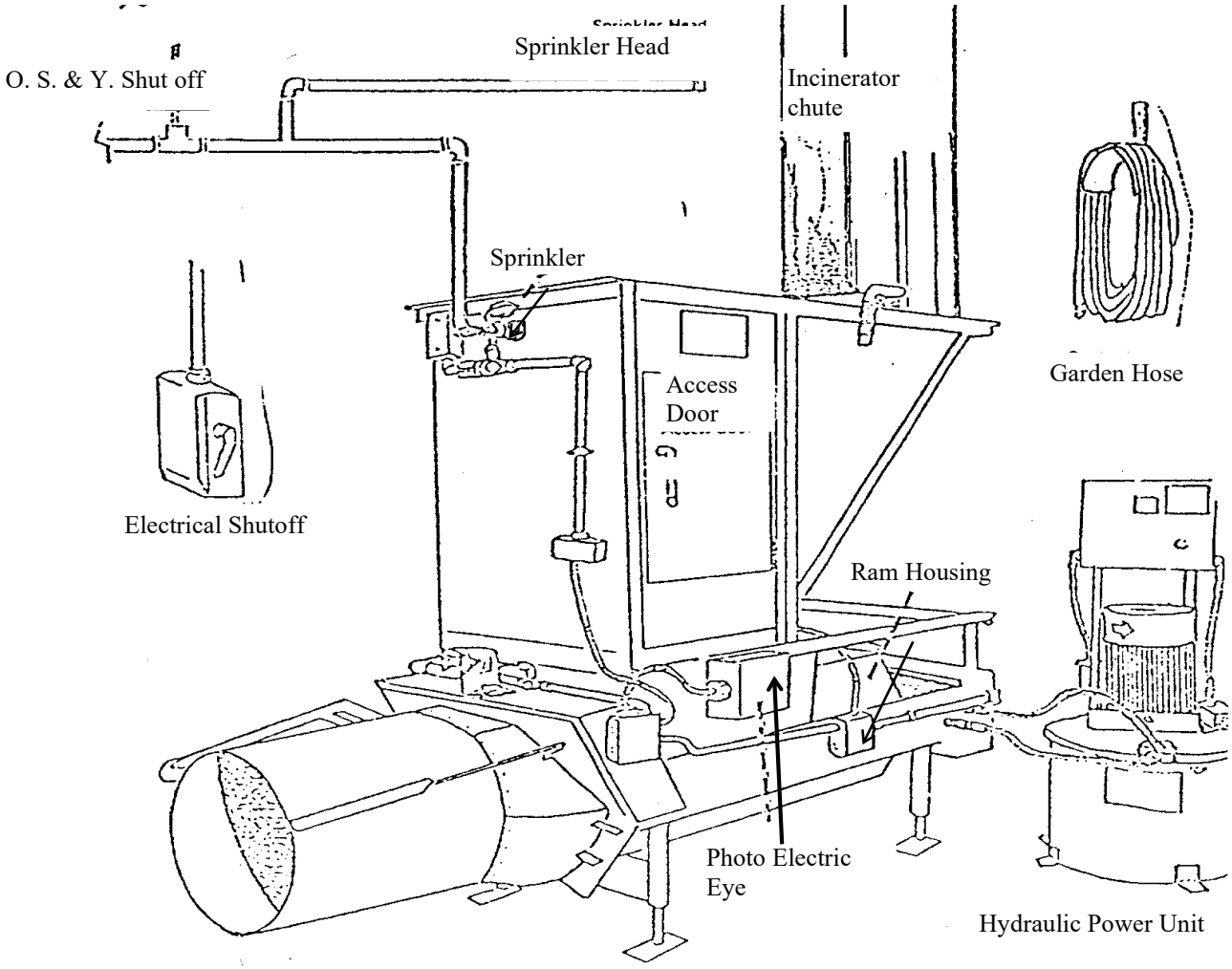
REFERENCE #3 ***Redacted for PFS***



REFERENCE # 4
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TRAINING BULLETIN
FIRES 8
October 28, 2009

OPERATIONS AT MOTOR VEHICLE INCIDENTS AND EMERGENCIES

1. INTRODUCTION

1.1 The dangers associated with present day traffic conditions have demonstrated a need for this Department to reassess and modify its operations on all roadways, especially express highways and other high-speed thoroughfares, as well as many secondary roadways. Traffic hazards formerly associated with only a few dangerous locations are now encountered throughout the city. These hazards include, but are not limited to:

- Disregard for speed limits and other traffic regulations.
- Persons driving vehicles incapacitated by virtue of alcohol and/or drug consumption, or other impairments.
- Distracted drivers, (e.g., cell phones, audio and visual entertainment devices.)
- Tailgating.
- Higher volume of traffic.
- Construction and road repair on many roadways.
- Tourists and others traveling unfamiliar routes making sudden stops, lane changes or other unexpected maneuvers.
- Rubbernecking.
- Inexperienced drivers performing faulty evasive actions.

2. *Redacted for PFS*

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3. DEFINITIONS

3.1 **Express Highways:** Limited access highways and parkways, (e.g., Long Island Expressway, Belt Parkway, Cross Bronx Expressway, Staten Island Expressway.)

3.2 **Divided Boulevards:** Main primary routes, usually with service roads. The main road may have a physical center divider, or the center divider may be painted on the road surface, (e.g., Queens Boulevard, Grand Concourse, Kings Highway, Pelham Parkway.)

3.3 **Main Arteries:** Those with posted speed limits higher than 25 mph, such as Union Turnpike, Northern Boulevard, Hylan Boulevard.

3.4 **Secondary Roadways:** Other city streets, avenues, not falling into one of the categories above.

3.5 **Known Speedways:** Roadways where local experience shows frequent or regular disregard for speed limits. These "known speedways" may fall into any of the categories above.

3.6 **Secondary Collisions:** A "Secondary Collision" is one between a vehicle traveling in the vicinity of the fire or emergency and any other vehicle, object or person - happening at the time of the arrival of the Fire Department or thereafter.

4. CRITICAL FACTORS AFFECTING OPERATIONS

4.1 Some important points to be considered are: At a highway operation, the FDNY has an obligation to its members and to the civilian population to prevent further injury and to provide a safe working area, consistent with conditions.

4.2 Immediately upon arrival at an operation on a highway, the officer in command must take steps to prevent escalation of the incident in the form of a secondary collision.

A-B. ***Redacted for PFS***

C. On arrival, the officer in command must assess the potential for secondary collision based upon:

- Traffic flow: the volume and speed of the moving traffic on the highway or street. The greatest danger of secondary collision occurs during periods of light to moderate traffic volume with the usual accompanying high speed.

  During this type of traffic flow we can expect speeds of 70 mph or more, despite posted speeds of 50 mph on express highways.

- Visibility of roadway: Weather conditions, topographical layout, curves and hills, buildings, overpasses, shrubbery and trees as well as smoke from the fire all affect the ability of oncoming drivers to perceive a dangerous condition in the roadway ahead in time for them to take proper and timely evasive action.

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- A very important fact which must be considered is that on DRY pavement with GOOD brakes a fully loaded tractor-trailer combination will need over 500 feet to stop at 50 mph AFTER THE DRIVER PERCEIVES THE DANGER! Unfortunately, many trucks of this type do not have good brakes. A passenger car traveling at 70 mph will need over 500 feet to stop. Wet pavement and other weather factors can double the stopping distance!

4.4 Police Assistance: NYPD will **not** respond to vehicular collisions which involve *damage to vehicles only*. In all other situations, the FDNY IC shall immediately notify the dispatcher that NYPD response is required.

4.4.1-4.4.3 ***Redacted for PFS***

4.5 Sanitation Assistance: During freezing weather, water should be used judiciously to minimize formation of icing conditions. Where necessary, Sanitation Department should be promptly requested through the dispatcher for spreading of salt or sand.

4.6 Other Considerations:

- "Rubbernecking' which may result in a secondary collision.
- Smoke obscuring driver's vision, possibly resulting in a secondary collision.
- Time of day, physical and traffic conditions such that high speed light traffic is present.
- Eventualities such as fuel tank explosion, hydraulic cylinder rupture, bursting of tires, causing firefighters to react by inadvertently stepping out of the safe operating area into the path of traffic.

4.7 Where weather conditions (snow, rain, fog, sleet, etc.) or smoke blowing across highway limit visibility, highway must be closed.

5. RESPONSE

5.1 One engine and one ladder from **each direction,** and a Battalion Chief will be assigned to all express highway incidents. No fewer than two units shall operate at an incident on an express highway or other potentially dangerous roadway.

At least one vehicle, other than the pumper being used to extinguish the fire, shall be used to divert or block oncoming traffic for the duration of the operation or until the police department arrives on scene and assumes traffic control. There may arise occasions where additional units are necessary to establish a proper area of safety. Example: Both units operating, handline stretched and extrication tools in operation. High Visibility Safety Vests shall be donned as per Section 7.

5.2 ***Redacted for PFS***

5.3 All fires and emergencies involving motor vehicles on other than express highways shall receive a minimum response of one engine company and one ladder company.

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6. PLACEMENT OF APPARATUS

6.1 Apparatus shall usually be placed to the rear of the incident or emergency in a manner that reduces the chance of a vehicle being struck by oncoming traffic. The apparatus should be positioned to shield the operational area and place the pump panel in the protected area. Apparatus should be placed at an angle to the incident when feasible to maximize safety (between the fire or emergency and the oncoming traffic).

However, an obvious exception will be a fire in a flammable liquids tank truck or other hazardous material carrier located on a grade. In such a case, the highway will have to be closed at a sufficient distance from the incident to prevent civilian vehicles becoming involved if a container should rupture or develop a leak. Apparatus will have to be located uphill of the involved vehicles.

6.2 Where placement of apparatus will expose it to the possibility of fire extension, pumper may be placed beyond the fire vehicle, but second apparatus, and third if necessary, shall always be placed between oncoming traffic and the operating forces.

6.3 Where the fire or emergency occurs near a curve, or beyond a hill, the second apparatus shall be located where it will be visible to oncoming traffic and furnish a warning to such traffic in sufficient time to avoid a secondary collision.

6.4 At times, particularly when fire is small and a period of examination and overhaul is necessary, it may be possible to move the fire vehicle and the fire apparatus off the roadway to a safe location. Even when the operation occurs off the roadway, an apparatus must be placed to provide a safe working environment.

6.5 Blocking apparatus shall be placed at least fifty (50) feet behind the first operating unit to create a safe working area.

6.6 Members shall avoid standing on highway pavement to the rear of second apparatus, unless placing flares, cones or signs, and traffic is stopped.

7. HIGH VISIBILITY SAFETY VESTS

7.1 Department policy requires all members to wear high visibility safety vests when operating on all highways at all times, day or night. This includes, but is not limited to, incidents such as vehicle collisions, extrications, fluid spills, dangerous conditions, vehicle fires, and at any operation that the Incident Commander deems necessary. The scene must also be protected from the hazards of moving traffic by utilizing apparatus blocking or total lane closure. For additional information, see Addendum 1.

8. USE OF FLARES AND CONES AT OPERATIONS

8.1 Flares and cones shall be used as follows:

A. Flares and cones have been issued to all Battalions for distribution to all Engine, Ladder, Rescue and Squad companies.

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B. Except as stated in subsection D, flares shall be used at night or periods of reduced visibility and cones shall be used during both day and nighttime operations.

C. Flares and cones may be used at any time where, in the judgment of the officer in command, their use would add to the safety of operation.

D. Flares shall **not** be used in cases of flammable or combustible liquid or gas leak where their use would create a danger of fire or explosion.

E. Placing Flares and cones.

1. Flares and cones should be placed to block one or two lanes or to completely block a roadway. At least 4 to 6 cones and/or flares should be used to build a lane closure or safety zone. Vests shall be worn as per section 7.

2. Member should obtain required number of flares and or cones. Before leaving apparatus light one flare and, carrying the lit flare, walks the proper distance to place the furthest flare and or cone first.

   Member should stay off the roadway and walk on the shoulder or divider facing traffic. The highest speed expected to be encountered should be estimated. Using this estimated speed, place flares and or cones at the distance indicated.

3.

Fastest Speed Expected	**Minimum Distance to furthest Flare**
mph	**Feet**
20	100
30	150
40	220
50	310
60	420
70	550

NOTE (*Addition for PFS)*: For ease in computation, multiply the fastest speed expected by the first digit of the fastest speed expected and then add 60. This will provide you with distance to the furthest flare. For example, if the fastest speed expected is 50 mph, 50 multiplied by 5 is 250. Add 60 to get 310 feet to the furthest flare.

4. The furthest flare and or cone is placed about 2' from the edge of the roadway. The next flare and or cone is then lit and or placed equidistant back to the scene of the operation, moving the flares and or cones about 2 feet further into the roadway at each point. This is continued until the lane is completely blocked.

5. When encountering curves in roadway, distance may have to be expanded or more flares and or cones employed to provide additional coverage.

6. The distance mentioned in the above table takes into account, reaction time, of oncoming drivers as well as stopping distance or distance required for a safe lane change maneuver.

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7. When placing flares and or cones, member shall only step into roadway to place flare on pavement and then shall return to shoulder to walk to next flare location only when traffic is stopped. Never walk on pavement with back to traffic and never walk on pavement assuming that flares and or cones already placed will protect you! After traffic is stopped, two members should place flares and or cones. Flares shall be carried on apparatus in a secure dry compartment as they are not waterproof.

F. Lighting and Carrying Flares

1. When lighting flares or carrying a lit flare, care must be taken to point flares away from body at all times. Carry lit flares in a horizontal position to avoid burning wax or chemical from dropping onto hand or body. Never look directly at lit flare as this may cause temporary "night blindness" which will hamper your ability to see oncoming traffic. Avoid breathing fumes from lit flares. When placing flares on pavement, first bend wire stand to form a tripod with base of flare.

2. Flares burn for approximately 30 minutes. If operation will exceed 30 minutes, prepare to replenish flares in time to prevent burnout before replenishment is completed.

9. ACCESS TO EXPRESS HIGHWAYS/ PARKWAYS OPERATION

9.1 Fires or emergencies on express highways require prompt response to render aid to persons injured or trapped and extinguish fire. However, a safe route to the incident will often furnish this prompt response better than a "fast" one. A fast approach is often the most dangerous. Following safe access rules will greatly reduce the chance of injury to our members or others and ensure our arrival at the fire/emergency.

A-B. ***Redacted for PFS***

C. Normally, operating across a center divider shall be avoided. If absolutely necessary to do so, traffic shall be stopped in both directions and safety warning devices set up. When encountering a barrier, divider or highway separation of any type (permanent or temporary) the IC shall select an area for access to the incident only after performing the following safety considerations:

- The preferred area of crossing shall be visually identified.
- Direct a member to use a tool to test the surface on the opposite side of barrier, divider or highway separation for the presence of a solid and stable surface.
- Once the presence of a solid and stable surface is verified, communicate location to all members.
- This safe crossing corridor shall be the only means of access and egress utilized at this incident unless otherwise directed by IC.
- Whenever a safe crossing corridor is established, it shall be clearly marked (cones/barrier tape) to identify the designated area. In addition, at night or whenever visibility is reduced, members shall use all available means of lighting to illuminate the area.

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- If a safe crossing corridor cannot be established, members shall not cross any barrier, divider or highway separation.

Note: ***Redacted for PFS***

D-I. ***Redacted for PFS***

10. QUICK SAFETY TIPS AT MOTOR VEHICLE EMERGENCIES

- Do not trust moving traffic.
- Never take a partial lane.
- Never assume traffic will behave the way you expect.
- Proper apparatus positioning is the first step to providing safety of the working crews at the scene of an incident.
- Many motorists and truck drivers have no regard or respect for emergency vehicles or personnel on the scene. In many cases, they don't even slow down near an accident scene.
- Never allow traffic to come around both sides of an accident scene.
- Request police assistance ASAP.
- Company officers should be given the discretion to summon additional resources as necessary.
- Ensure scene is controlled before commencing operations.
- Start operations at highway incidents defensively.
- Do not allow personnel to "wander" around the scene.

The following is a summary of results taken from case studies conducted nationally of firefighter fatalities on highways. ***Redacted for PFS***

11. FIREFIGHTING OPERATIONS AT MOTOR VEHICLE FIRES

11.1 Operational considerations for extinguishment include:

- Apparatus shall be properly placed. Both the apparatus and the motor vehicle should be chocked. Be aware autos can start and proceed under their own power.
- Full personal protective equipment (PPE).
- Only minimum members in danger area.
- Approach vehicle from the sides and upwind if possible.
- Position line between the motor vehicle and exposures.
- For a fire in the engine compartment, where the hood is difficult to open, pry up the side of the hood and operate stream through this opening. Do **not** attempt to operate through the front grill.
- Cool hydraulic bumpers, tires or gas tanks in vicinity of the fire. Some foreign vehicles have gas tanks in the front. (See reference 1)

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- Use a coarse spray stream when magnesium parts are on fire.

- When victims are trapped in the vehicle, use a fog stream to drive the fire away from victim.

- Members not operating the line, such as door or control position, may be used to:

  a. Search the passenger compartment.

  b. Search the general area (victim may have wandered off or been ejected from the motor vehicle). Use of thermal imaging camera may aid in this operation.

  c. Search the area for evidence of arson.

  d. Open the trunk and search it for extension, victims, etc.

  Note: Flashlights are mandatory at night. Members shall always face the traffic and have a prearranged area of safety.

- Ladder company members may be used to operate a second line to either protect victims or to protect extrication procedure.
- Exposures such as buildings or other vehicles should be checked for extension.
- The possibility of damage to overhead wires or downed wires from damaged utility poles should be considered.
- When opening the hood during fire operations utilize the following guidelines:

  a. A charged line should be in place during this operation.

  b. Try the passenger compartment hood release first.

  c. Use vise grips if the handle is burned away.

  d. Pry up the side of hood for access to fires in engine compartments.

  e. Operate handline streams through hood openings to extinguish the fire.

  f. Stand back when opening the hood. (There may be a burst of flames).

  g. Bolt cutters may be needed to cut locks or chains.

  h. Use a 6' hook to support the hood once it is opened.

- Vans.

  a. Engine cover in the passenger compartment should be removed after the fire is knocked down.

  b. Stand to one side of the cover when removing it. Do not open it from the rear. (A sudden flare up could cause burns to the face and neck area.)

- Pneumatic pistons, which are used to hold up the hood in the open position, have become a serious danger at vehicle fires. The danger is the result of exploding hood pistons. When heated due to a fire in the engine compartment the rods have become projectiles penetrating the hood and grill. This could cause serious injury to anyone standing in front of the vehicle.

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- The trunk must always be examined for victims or extension. Hazards which may be found in trunks include gas cans, pressurized containers, booby traps, glass containers, ammunition/guns, etc.

- The methods of opening the trunk include:

  a. Drive in the cylinder with the point of a halligan tool and unlock the trunk with a screwdriver.

  b. Pull out the cylinder with a Bam-Bam tool and use a screwdriver to turn the lock.

  c. Cut around the bezel ring on the cylinder (with an ax or a screwdriver), then turn the cylinder with a screwdriver.

  d. If entry into trunk is difficult consider the following:
     - Entry via rear seat.
     - Extinguishment of trunk fire via taillight. Use a tool to break plastic tail-light housing.

  e. The striker plate should be bent with the back of an axe after the trunk has been opened. This will prevent the trunk from relocking and prevents children from being locked in trunk after units leave the scene.

11.2 Additional hazards at motor vehicle fires:

A. The battery must be disconnected to prevent: sparks, the starter from engaging, or power windows from operating and causing injuries to members or civilians. Some vehicles have two batteries which are remote from one another. The negative terminal must be removed first to eliminate sparks. Be aware that hydrogen gas from batteries could explode and spray acid. (See reference 2)

B Magnesium parts may be difficult to extinguish. Engine companies should use a coarse spray stream (partially open nozzle with tip removed) to extinguish these fires. Particles of molten magnesium may fly in all directions or steam explosions may occur, endangering members. Full PPE should be used, including eye shields.

C. The hazards of the passenger compartment include: windows shattering, noxious fumes, PVC, gas cans, pressurized containers, flammable liquid storage, gasoline powered equipment, etc. (See reference 3)

D. The hazards of the engine compartment include cooling systems that are under pressure and pneumatic hood pistons which when heated by fire become projectiles penetrating the hood and grill.

E. Propane tanks which when involved in fire can BLEVE. (See reference 4)

F. Use extreme caution when operating at fires in vehicles that contain large tires (i.e. construction equipment, large buses, tractor trailers, etc.). Tires exposed to heat may violently explode, even after the fire has been extinguished. Projectiles from large tire explosions may travel large distances. When operating at vehicle fires containing large tires approach as close to in-line with the tread as possible, never more than 45 degrees from the tread. Do not immediately approach a tire which has been exposed to significant heat.

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11.3 Container ruptures:

A-D. ***Redacted for PFS***

E. The application of excessive exterior heat on hydraulic or pneumatic pressure systems, such as hydraulic brakes, steering or confined pressurized systems, coolant systems and energy-absorbing units for bumper systems can cause them to rupture violently. Each of these, by itself, can cause serious injury if the pressure contained in that system is suddenly and unexpectedly released. The liquid contained in some of these systems (hot oil or water) is spewed in all directions, and small parts, breaking off from major components can act like projectiles.

F. ***Redacted for PFS***

11.4 Other hazards:

A-B. ***Redacted for PFS***

C. Electrical systems can cause sparks, shocks and burns. Short circuits can activate windows convertible tops, etc. But the most dangerous is the possibility of vehicle being in gear on a stick-shift transmission and the starting motor being engaged, moving vehicle. Always chock wheels to insure maximum degree of safety.

D. Loss of brakes due to fire may cause vehicle to roll down incline. Chock wheels.

E. When victims are trapped in vehicular fires, all attempts must be made for their removal and protection from fire by use of fog streams driving fire away from them. When removing victims, all precautions must be exercised to prevent further injuries especially where there is no fire involvement. In the latter case, stand fast with a charged line. Use wood or blocks when necessary to prevent slippage and possible production of sparks.

F. ***Redacted for PFS***

11.5 ***Redacted for PFS***

11.6 Hybrid Vehicles:

A Hybrid vehicles are becoming a more common sight on roads today. In some hybrids, the car starts out in a full electric mode to save gas, then starts the engine and switches to gasoline mode when the vehicle reaches a certain speed. Other hybrids do not have a full electric mode. Instead, they use their hybrid battery and electric motor primarily for the engine start/stop system that saves gas when the vehicle is stopped in traffic, or to boost engine power when accelerating or passing. Though hybrids get better fuel economy than conventional vehicles, they also present some unique hazards. The high voltage hybrid battery and hybrid powertrain components create a potential shock hazard.

B. The voltage in most hybrid batteries can deliver a lethal shock, much like that of an electric chair. The voltage from a hybrid battery is Direct Current (DC). Hybrid vehicles can be rated between 144 and 330 volts DC. The threshold voltage where DC becomes dangerous can be as low as 55 to 60 volts, compared to 110 volts for AC.

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C. Hybrid Vehicle Safety Considerations:

- To avoid being in the path of a moving vehicle do not approach from the front or rear until the vehicle has been disabled. Hybrids may appear as if they are shut down but may actually be in "Ready Mode". Never assume the vehicle is off simply because it is silent. The vehicle makes virtually no noise when the drive system is powered.

- **NEVER** cut any high voltage cables. High voltage cables in hybrid vehicles are usually color-coded to warn you of their potential danger. On most, the high voltage cables are color-coded ORANGE. Although some cables are color-coded BLUE. Avoid contact with these cables unless the high voltage battery in the back of the vehicle has first been disconnected.
- All hybrid batteries have a safety switch or disconnect mechanism to disconnect the battery from the vehicle's electrical system. The location of the battery disconnect safety switch and the disconnect procedure will vary from one application to another.
- Many hybrid vehicles use a keyless start system. Make sure the ignition is OFF and the key or key fob is at least 15 feet away from the vehicle.
- Make sure the READY light is not on. If the power is on, the high voltage system is live and poses a shock hazard should you come into direct contact with any of its uninsulated electrical components (such as the inverter under the hood).
- At a hybrid vehicle fire, **ALWAYS** make sure that the high voltage battery case is cooled down to prevent re-ignition.
- Always chock the vehicle, put transmission in park, shut off ignition, remove key, and engage parking brake.

12. CONCLUSION

12.1 When operating at incidents (especially on highways), all personnel must be continually alert to the ever-present danger of oncoming traffic, and must be vigilant and ready for the unexpected. The collective safety of the entire fire force depends on the individual safety contributions of each member. If one member should let down his/her guard, all members may be jeopardized in a moment.

BY ORDER OF THE FIRE COMMISSIONER AND CHIEF OF DEPARTMENT

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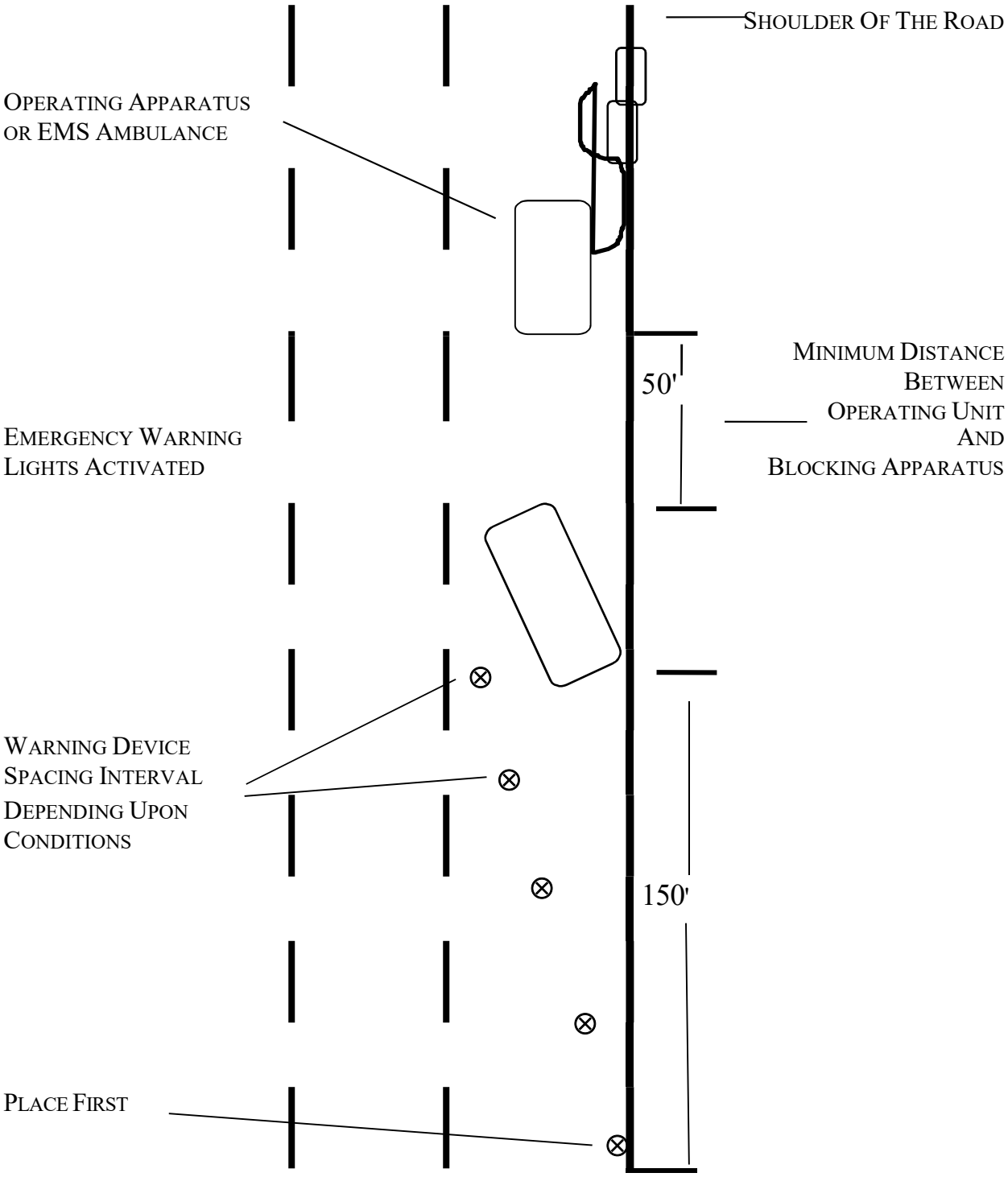
Figure 1

GENERAL PLACEMENT OF WARNING DEVICES

(WARNING AND CHANNELING DISTANCE REQUIRED FOR TRAFFIC TRAVELING AT 30 MPH)



NOTE: ACCIDENT IS IN THE RIGHT LANE OF A MULTI-LANE HIGHWAY

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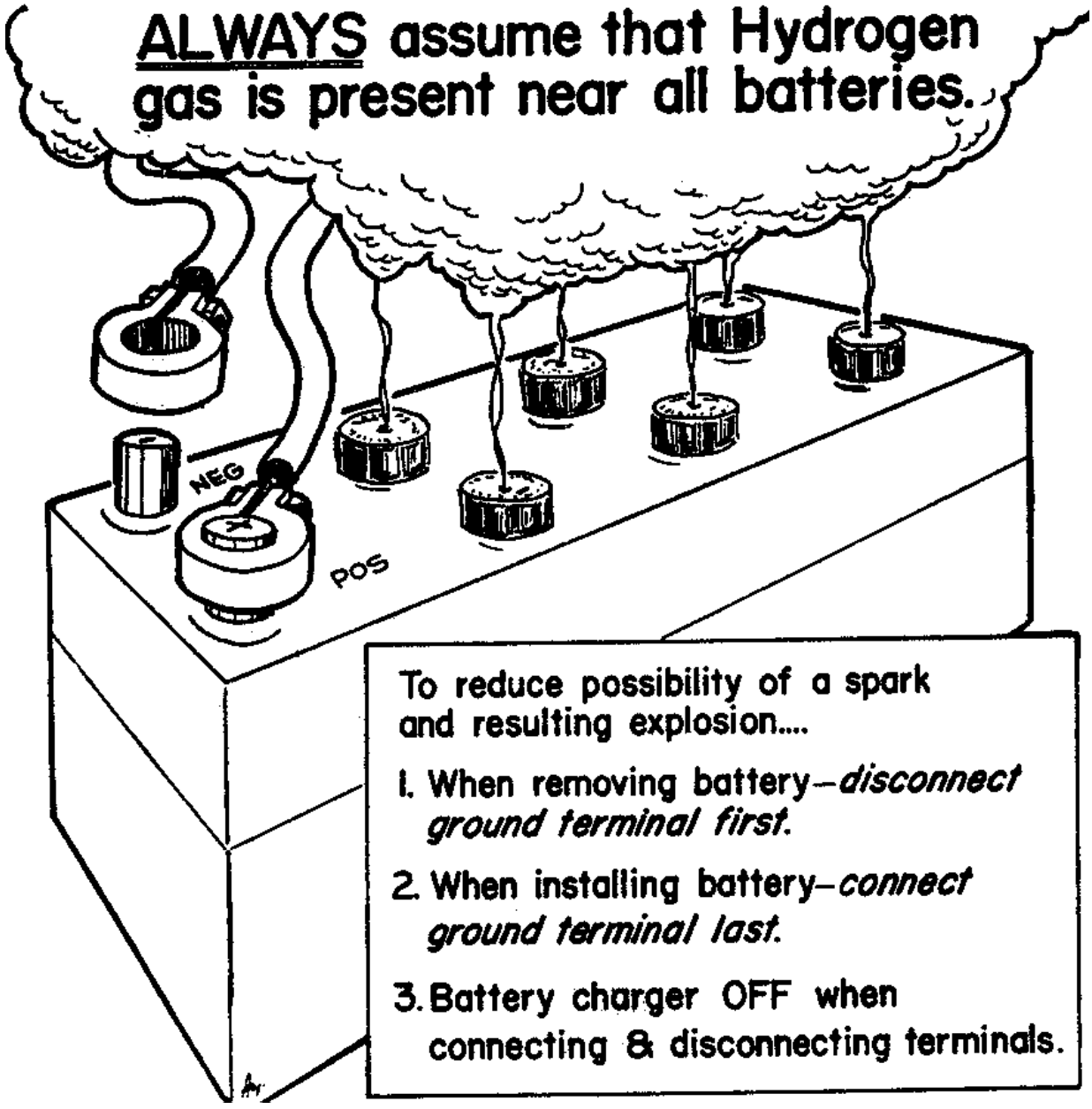
Reference 1
Redacted for PFS

Reference 2



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Reference 3

1. HAZARDOUS SITUATION – Motor Vehicle Fires

1.1 At a motor vehicle fire, units encountered a potentially hazardous situation. The fire began in the engine compartment and extended through the dashboard into the interior of the vehicle. The fire was extinguished without incident. During overhaul, a six gallon can of kerosene was found between the seats.

1.2 The vehicle contained a machine for steam cleaning carpets. The machine is fueled by the kerosene. Vehicles used as dog grooming services may also contain a heater fueled by kerosene. The purpose is to warm water for bathing pets.

2. PRECAUTIONS

2.1 It should be noted that the above-mentioned vehicle was not marked, and members were unaware that the vehicle was used for such a purpose.

2.2 When a fire occurs in these types of vehicles, exercise extreme caution.

2.3 As a final note, members should also be cognizant of vehicles that are used to carry power washing machinery, tree services, stump grinding, etc. These vehicles may house machinery containing gasoline as fuel. They may also be carrying a can for refueling.

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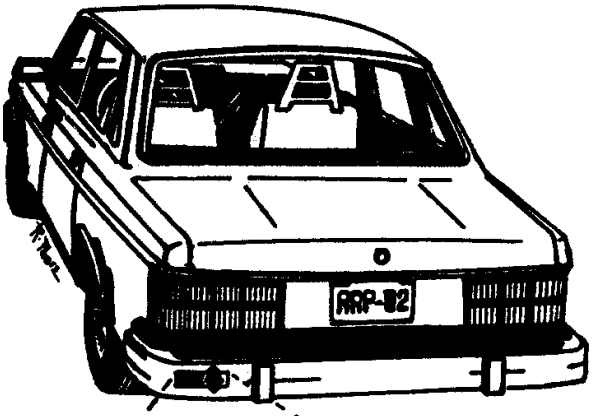
Reference 4

THIS PASSENGER CAR IS....

PROPANE POWERED



IF INVOLVED IN FIRE
BEWARE OF

BLEVE

Boiling **L**iquid **E**xpanding
Vapor **E**xplosion

LOOK FOR THIS REFLECTORIZED WARNING
STICKER ON THE LEFT SIDE OF THE BUMPER

Reference 5
Redacted for PFS

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Reference 6

Incidents involving garbage truck fires have been reported the Safety Command for information and dissemination to field units. The following is one account:

PARTICULARS:

An Engine and Ladder Co. responded to a fire involving a "commercial" garbage truck. On arrival, the trash container of the truck was found to be fully involved. The truck was parked in the garage. In order to preclude extension to the structure, the truck driver was ordered to drive the truck onto the street. This was done. Without the knowledge of the officers and members operating at the scene, the driver then attempted to raise the back portion of the truck. In doing this, the driver placed pressure on the hydraulic system of the truck. The driver was unaware of the possibility that the hydraulic lines may have been burned. In this case, they were. When hydraulic pressure was applied, it forced fluid out of the burned lines. Two bursts of fluid passed through the burning trash, out of the rear of the truck, and were ignited. In both instances, a fire ball, similar to that from a military flame-thrower, was hurled approximately forty feet.

CORRECTIVE ACTION:

If the truck is not equipped with a 2 1/2" female inlet coupling then the rear of the truck will have to be raised in order to extinguish the fire

Certain precautions should be used when using a hydraulic system to raise the rear of the truck.

A. No one should be allowed within 50' of the rear of the truck.

B. Position the truck so that the rear does not face an exposure that could cause additional problems

C. Brakes and chocks should be used to prevent truck movement.

D. All members shall have on full protective equipment.

E. No one shall be allowed to work or stand under a raised section of the truck.

F. No one shall be permitted to enter the garbage storage section of the truck.

G. Hydraulic systems are under pressure and usually contain flammable oils.

H. Garbage storage section could contain pressurized cans that could explode.

I. All vehicles contain a multiple of pressurized cylinders, i.e., braking systems, bumper systems, air conditioners, etc.

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TRAINING BULLETIN
FIRES 8
ADDENDUM 1
April 14, 2022

HIGH VISIBILITY SAFETY VESTS

1. INTRODUCTION

1.1 High visibility reflective/fluorescent safety vests have been issued to all units, one for each riding position. These fire resistive dual certified ANSI 107 and 207-compliant Class II high visibility safety vests are required by the Federal Worker Visibility Act, 23 CFR 634. This new federal regulation requires emergency service personnel to wear an ANSI 107-compliant high visibility safety vest when working within the right-of-way of a Federal-aid highway.

2. PROCEDURE

2.1 Department policy requires all members to wear high visibility safety vests when operating on all highways at all times, day or night. This includes, but is not limited to, incidents such as vehicle collisions, extrications, fluid spills, dangerous conditions, vehicle fires, and at any operation that the Incident Commander deems necessary. The scene must also be protected from the hazards of moving traffic by utilizing apparatus blocking or total lane closure.

2.1.1 Exemptions from wearing high visibility safety vests are for members directly involved and in the immediate vicinity of firefighting, hazardous material mitigation, or technical rescue. Some examples include:

- Members operating with donned bunker gear and SCBA working in close proximity to a source of heat during fire suppression.
- Members operating with donned hazardous material personal protective equipment.
- Members operating with donned technical rescue PPE and/or equipment for a technical rescue incident.

2.1.2 Once members complete their activities in fire suppression, hazardous materials mitigation, or technical rescue, or when they leave the immediate vicinity of the incident, they are required to don a high visibility safety vest.

2.2 The high visibility safety vests are designed to be worn over bunker gear and are flame resistant in compliance with ASTM standards. Each unit will be issued one vest per riding position. Members shall pre-fit the vest at the beginning of the tour for a custom fit and ease of donning.

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3. MARKING THE VEST

3.1 Vests shall be marked with unit designation using a black permanent marker on the inside of the vest, centered on the back of the lower reflective stripe.

Examples: E-264, L-134, B-46

4. DONNING THE VEST

4.1 Vests shall be donned prior to leaving the apparatus or in an area that is blocked by an apparatus and protected from vehicular traffic.

4.2 Don the vest by putting arms through arm holes. Secure front closure by pressing hook and loop closure tape together at each silver reflective band. Adjust both bands on each side of the vest by pulling the excess tape and securing the hook and loop closure tape together. Allow some room for movement.

5-8. *Redacted for PFS*

9. INSPECTION

9.1 Vests shall be inspected after each use and during semi-annual inspection.

BY ORDER OF THE FIRE COMMISSIONER AND CHIEF OF DEPARTMENT

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TRAINING BULLETIN
FOAM
January 27, 2016

FOAM

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DATA SHEETS

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1. INTRODUCTION

1.1 This bulletin will explain the use of foam on flammable and combustible liquid fires and spills. The topics that will be addressed include foam concentrates, foam equipment and the foam delivery system. Strategic and tactical considerations, as well as training in the use of foam, are essential components of a successful operation. Proper foam storage, replenishment of supplies and maintenance of equipment is necessary to keep the foam delivery system operational and effective.

2. CHARACTERISTICS OF FOAM

2.1 Foam is a fire-extinguishing agent designed for certain unusual-type incidents. There are two main categories of foam in use in the Department - low expansion foam and high expansion foam (Hi-Ex). Low expansion foams are useful on Class “B” fires and spills involving flammable and combustible liquids. They provide extinguishment and vapor control when properly selected and applied. High expansion foams are intended to fight fires of Class "A" combustible materials in areas that are inaccessible to firefighters, such as cellars and ship-holds. High expansion foam is not suitable for use on outdoor, flammable liquid fires.

2.2 *Advantages of Foam*

Foam provides firefighters with several advantages over other extinguishing agents such as dry chemical, carbon dioxide or halons, when used on flammable liquids.

- Foam extinguishes progressively. Firefighters can begin extinguishing a fire at the edge of the fuel that is nearest to them and continue to apply more agent, projecting the boundary of the foam blanket further away with each movement. Other agents are very “transient,” meaning that the area extinguished is subject to fire coming back across the surface as the agent disperses. An important point to consider is that the fire must be **completely** extinguished or it will begin to burn back across the surface as soon as the foam begins to break down. In this case all of the foam applied will have been wasted.
- Foam provides long-lasting control. This is due to the comparatively long life of a foam blanket. With any of the other agents, as soon as discharge stops the extinguishing ability stops, unless contained within an enclosed area.
- Foam can prevent ignition. While it is possible to use halon or carbon dioxide to inert an enclosed space, this is not possible on open-air liquid spills. Foam can be applied to such spills to minimize the release of vapors, preventing them from reaching their explosive range.

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2.3 *Foam Concentrate*

- Foam concentrate is a mixture of various foaming agents specifically formulated to produce a mass of air-filled bubbles which, when mixed with water and air in the proper proportions, will float on the surface of a fuel.
- There are a wide variety of foam concentrates, each designed to behave in slightly different fashion for a specific purpose. There is not any one specific foam concentrate that will solve every problem the Department faces. Different concentrates may be required for different fuels. Concentrates that work well on most fuels have drawbacks that prohibit their use in everyday operations, such as freezing conditions or corrosiveness. For this reason, the FDNY deems it necessary to utilize a number of foam concentrates.
- The Department presently uses the following low expansion foams:
  - Universal Gold 1% - 3% Alcohol Resistant - Aqueous Film Forming Foam (AR-AFFF) – for flammable and combustible liquid fires; and
  - ***Redacted for PFS***

  Note: The AR-AFFF foam that the Department now utilizes surpasses all other foam concentrates that the Department has considered.
- ***Redacted for PFS***
- Members must be aware of the properties of the different types of foam they may encounter. They must select the proper type of foam for the particular incident and apply it properly. Failure to do so could result in inability to extinguish the fire and/or sudden ignition of the spill, potentially causing injury or death to members operating in the vicinity.
- Different types of foam concentrates are not compatible and should **never** be mixed during operations or for storage (e.g. in the tanks of Foam Tankers, the Foam Tender, etc.)
- At an incident it is permissible to apply two different types of low expansion foam simultaneously using two different appliances (e.g. handlines, deck guns, etc.) if necessary due to a lack of sufficient quantities of the correct type of foam to complete extinguishment (i.e. Fluoroprotein, Alcohol (Polydol), Universal Gold 1% - 3% AR-AFFF). Hi-Ex foam, for use on Class "A" confined space fires, is not to be used in conjunction with low expansion foam for flammable liquid fires.
- ***Redacted for PFS***

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2.4 *Foam Solution*

- Foam solution is the mixture that results when foam concentrate is proportioned at a predetermined rate with water. Foam solution can be produced in several ways:
  - ***Redacted for PFS***
  - Another method used to obtain foam solution is to educt the concentrate into a moving stream of water using a foam eductor. Water moving through a hoseline is forced through the body of the eductor, which tapers down to a narrow throat area where it is then permitted to expand back to the full size of the hose. As the water rushes across the throat and expands, it creates an area of low pressure. This is called the "venturi effect." This venturi effect is used to draw concentrate out of its container up through a pick-up tube and into the eductor where it is mixed with the water stream.
  - Foam solution can be produced by injecting a supply of concentrate at the proper proportion into a pumper that is also receiving a source of water. The foam and water mix in the pump and are discharged as solution. This is accomplished by a portable Foam Injection Metering Module (FIMM) carried by Satellite Units and Foam Tankers.

2.5 *Finished Firefighting Foam*

- Finished Firefighting Foam is what is applied to the fire or spill and accomplishes the extinguishment. Aerating foam solution produces much lighter, finished foam. The Department primarily uses aerated foam when producing a 3% finished foam blanket. When aerated at 3%, foam produces a better flashback and burn-back resistant foam blanket, increasing safety for personnel who may have to operate in or near pools of fuel. Aerating foam also prolongs the consistency of the foam blanket.
  - **Note:** ***Redacted for PFS***

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- Finished firefighting foams are designed to be lighter than the fuels they are placed on and thus float on the surface of the fuel. This results in four primary methods of extinguishment:
  - Smothers - prevents air from mixing with the flammable vapors given off by the liquid.
  - Suppresses - stops or reduces the generation and release of flammable vapors.
  - Separates - separates the flame from the surface of the fuel, which reduces the tendency of the fuel to boil, thus giving off fewer vapors.
  - Cools - water content of the foam cools the fuel, further reducing vapor generation. It also extinguishes burning Class "A" materials in the spill area and cools adjacent metal surfaces such as tank walls.

3. TYPES OF LOW EXPANSION FOAM

3.1 Universal Gold 1% - 3% Alcohol Resistant - Aqueous Film Forming Foam (AR-AFFF)

- *Extinguishing Characteristics*
  - AR-AFFF foam concentrate is designed to fulfill two specific functions. The first is to form a protective membrane between the fuel and the foam. The second is to make the foam much more stable and heat-resistant, which provides better burn-back resistance.
  - AR-AFFF is freeze/thaw stable. If the product is frozen, upon thawing there is no performance loss.
  - AR-AFFF should not be **mixed** with any other type of foam product.
  - AR-AFFF can be **used** side-by-side with other foam products on the same fire, when necessary.
  - AR-AFFF foam can be generated with either fresh or salt water.
  - Properly stored, AR-AFFF can remain effective for up to 25 years.
- *Distribution*
  - AR-AFFF foam is the most widely used concentrate in the Department and is currently allotted as follows:
    - Three (3) red-banded five-gallon containers issued to every Engine company.
    - Two (2) red-banded five-gallon containers issued to every Ladder company.
    - 1500 gallons stored on each of the Department's five (5) Foam Tankers.
    - Stored in 55-gallon drums at each of the Foam Tanker locations.
    - Stored in five-gallon containers at each of the 19 Foam Depots citywide.
    - Marine Division carries 3000 gallons in both the "343" and "Firefighter 2." "The Bravest" holds 200 gallons and each of the 10 - 33' boats carry 25 gallons.

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3.2 ***Redacted for PFS***

4. IDENTIFICATION

4.1 It is imperative that the correct foam concentrate is used for the situation encountered. To ensure that foam concentrates are not mixed, containers are color-coded (banded) around the top, as follows:

- AR-AFFF RED
- Hi-Expansion YELLOW
- ***Redacted for PFS***

4.2 ***Redacted for PFS***

5. FOAM PROPORTIONING

5.1 ***Redacted for PFS***

5.2 The FDNY purchases low expansion foam concentrate that is used in 1% - 3% proportioning ratios. Units shall identify the foam to be used in order to set operating equipment at the correct flow rate

6. FOAM EQUIPMENT

6.1 Eductors are the most common way to produce foam solution. Every Engine company in the Department is equipped with a foam nozzle and eductor that can be used with a 1 ¾" or a 2 ½" hoseline.

6.2 Handlines with foam nozzles may be used in conjunction with an eductor and are very useful at a small operation like an oil burner with fire outside the pit, gas pump knocked over, car fire with a ruptured gas tank, a small spill (approximately 600 square feet) or similar situation.

6.3 Self-Educting Nozzles have the eductor built into the nozzle. They have a greater capacity than hand-held nozzles and are very useful at facilities with stationary monitors or when attached to apparatus with a supply of foam concentrate. The Department uses these nozzles in conjunction with its Foam Tankers. The Foam Tanker is a self-contained unit capable of supplying foam concentrate or finished firefighting foam when supplied with water. This method of supplying finished firefighting foam is a fast and efficient way of producing an effective knockdown at a medium-sized flammable/combustible liquid incident such as a spill over 600 square feet, tanker truck mishap, loading rack incident or similar situation.

6.4 Master Stream Nozzles are used at the largest-type operations such as oil tank farms, large spills over 2,000 square feet or a large capacity tank truck that has spilled its product. In order to perform this operation, the foam delivery system must be activated.

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7. FOAM DELIVERY SYSTEM

7.1 The FDNY Foam Delivery System is a multi-tiered approach, which provides different levels of response to various sized incidents.

7.2 *First Alarm Units*

- ***Redacted for PFS***
- Each Engine company must carry at least three (3) five-gallon containers of AR-AFFF (red band) foam concentrate. Each Engine company has also been issued a handline foam eductor, which flows 125 GPM, and an aerating foam nozzle; both carried in a pelican case. This equipment provides the Department with limited foam capabilities until the arrival of a Foam Tanker to augment the operation.
- A first alarm assignment of three Engines and two Ladders should provide 13 five-gallon containers of foam which is a total of 65 gallons of AR-AFFF foam concentrate. This will provide approximately 17 minutes of finished firefighting foam at a 3% setting on the eductor with the aerating foam nozzle. At 3% the eductor will be consuming 3.75 gallons of foam concentrate per minute.

7.3-7.8 ***Redacted for PFS***

8. STRATEGIC AND TACTICAL CONSIDERATIONS

8.1 The FDNY has the ability to deal with all types of incidents requiring foam application. The strategy for dealing with many of these incidents includes stopping the leak and covering the spill surface with foam. In some cases, covering the spill will not allow the owner to recover the product. If there is no hazard with leaving a spill uncovered it will greatly assist in recovery, however, if the Incident Commander has any doubts about a product, cover it with foam.

8.2 General considerations when dealing with any type of flammable/combustible liquid incident include the following:

- Position apparatus upwind.
- Position apparatus uphill.
- Stretch a foam handline and put it into operation if upon arrival the following is observed:
  - The product is on fire.
  - It is a flammable liquid.
  - Members will be operating in the area.
  - The product causes an exposure problem.
- Eliminate all sources of ignition starting with the area downwind and downhill.
- Remember that many of these vapors are heavier than air and will collect in basements and depressions.
- Evacuate as per prescribed distances in the DOT Emergency Response Guidebook.

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8.3 *Fire in a Confined Area; Tanks, Pits, etc.*

- If there is sufficient freeboard on the interior of a tank, direct the stream against the side or back of the burning area. The velocity of the stream will be broken and foam will fall gently over the surface.
- ***Redacted for PFS***
- With tanks of this magnitude it is imperative that enough foam concentrate is on scene before any foam operation is started. This cannot be stressed enough. If enough concentrate is not on scene before starting foam operations and the fire is not extinguished, it will burn back and involve the entire tank again. All of the concentrate that was used will have been wasted.
- ***Redacted for PFS***

8.4 *Spills*

- If the spill has ignited, stretch a foam handline and extinguish the fire. The amount of concentrate available on a first alarm assignment is 13 five-gallon containers. With one handline in operation, you will be able to extinguish approximately 600 square feet (20'X30') of fire. This supply will last approximately 17 minutes at a 3% setting. Using two handlines simultaneously will increase the area covered, but reduce operational time. Both criteria are important for a successful operation. Anything more than a small spill may require additional alarms as well as the transmission of signal 10-86.

  Note: ***Redacted for PFS***

- If the spill is contained or not flowing:
  - Direct a foam stream on the ground ahead of the fire in such a manner as to bounce the foam onto the fire. This will achieve the widest pattern at the lowest velocity.
  - Try to deflect the stream against something and allow the foam to slide down and work its way across the burning liquid.
  - If the above methods are not possible, then direct the foam stream skyward in a slow back and forth motion, allowing the foam to fall as gently as possible over the surface. This will cover the spill and reduce disruption at the blanket.
- If the spill is flowing and not contained:
  - Work against the run of the spill, either directly or from the flanks, towards the source of the spill, directing a foam stream on the ground ahead of the fire in such a manner as to bounce the foam onto the fire. If the burning liquid is running down a ditch, gutter or depression, it is best to establish a heavy foam blanket below the point of fire, so that when the burning liquid reaches the blanket it will flow underneath it and be extinguished. A hole dug or an earthen dike erected to collect burning liquid, then covered with a foam blanket, can be utilized under certain conditions to prevent further flow.

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- ***Redacted for PFS***
- ***Redacted for PFS***
- ***Redacted for PFS***

8.5-8.12 ***Redacted for PFS***

8.13 *Additional Considerations*

- Additional foam must be applied to maintain the foam blanket. Drainage time of the blanket will depend on the type of concentrate used. The faster the drainage rate, the more frequent the application necessary. If personnel are working in the blanket reapplication should be constant.
- Avoid disturbing the foam blanket; this is especially true when walking through it. There will be instances (i.e. rescue) where members will have to enter the blanket. All members that enter the blanket shall wear all personal protective clothing, including a donned facepiece. Personnel working in a foam blanket should be kept to a minimum. All personnel that are not needed to maintain this blanket should be withdrawn to an area that could not become involved in the incident.

9. *Redacted for PFS*

10. STORAGE

10.1 Storage and supply of foam concentrate play an important role in the foam generating system. Proper stacking and rotation of supplies are essential to ensure effective foam concentrate is available to attack fires.

- Foam concentrate should be stacked no more than two containers high.
- All foam concentrates have a shelf life. Each manufacture has its own recommendation.
- ***Redacted for PFS***

11. *Redacted for PFS*

12. MAINTENANCE

12.1 Foam concentrate can have a severe, debilitating effect on the equipment used to generate it. Foam eductors, pick-up tubes, FIMMs, generators, hose, pumps, etc. are to be washed out and cleaned after every use. Anything that comes in contact with foam requires flushing. When cleaning an eductor, water should be educted through it until clean water flows through the eductor.

All valves, pumps and gates of foam pumpers need to be operated on a regular basis to maintain functionality.

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12.2 ***Redacted for PFS***

12.3 The following maintenance schedule shall be followed:

- All eductors of Engine companies should be tested at weekly MUD using the following procedure:
  - Attach the eductor onto a gated outlet of the apparatus.
  - Stretch a hoseline from the eductor.
  - Connect a foam nozzle to the hoseline.
  - The ECC supplies 200 PSI to the eductor.
  - Place a hand over the bottom of the foam pick-up tube. Suction should be felt.

12.4 Any nozzle or eductor that is not functioning properly should be sent to the Fire Tools and Equipment Unit with a RT-2 attached, describing the malfunction.

12.5 ***Redacted for PFS***

13. HIGH EXPANSION FOAM

13.1 High expansion foam concentrate is a detergent-based product designed for use in special generators that blow large quantities of air through a screen, which is being sprayed with solution. This results in the production of large quantities of very large, light foam bubbles. These bubbles have much less resistance to disruption by wind, water spray, heat or fire than do other foams. Hi-Ex foam is best suited for use in confined areas on Class "A" fires.

It is not recommended for use on flammable liquid incidents because the foam blanket can become permeated with vapors, which can subsequently ignite.

13.2 Hi-Ex foam is primarily used to control fires that are inaccessible or difficult to approach due to excessive heat. It is particularly suited for use on Class "A" fires in confined spaces. Hi-Ex foam can confine and suppress the fire to a point where final extinguishment can be achieved with less debilitating effect on members. Under certain conditions Hi-Ex foam has been found effective on:

- Liquid Natural Gas (LNG) fires.
- Suppressing or minimizing the release of toxic or flammable vapors with the exception of Liquefied Petroleum Gas (LPG).

Expansion is dependent upon the type of Hi-Ex foam concentrate and generator used. ***An expansion ratio of 200/1 to 1000/1 is necessary to be classified as Hi-Ex foam.***

13.3 Bubbles are much larger and consistencies considerably lighter than low expansion foam.

13.5 The size and consistency of Hi-Ex foam bubbles are determined by:

- Type of foam concentrate.
- Type of generator.

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- Water pressures at eductor and generator.
- Contents of foam bubbles (fresh air, smoke, CO_2, CO, etc.).
- Eductor mixture setting.
- Use and configuration of foam chute.

13.6 Limitations of Hi-Ex foam:

- Should not be used on alcohol or polar solvents.
- Short drainage time, necessitating frequent re-applications.
- Relatively poor burn-back resistance.
- Freezing weather could have an adverse effect on the foam concentrate and finished foam blanket.

The effectiveness of a Hi-Ex foam blanket depends on the expansion ratio, eductor mixture setting and thickness of the blanket, and drainage time characteristics. Increasing the setting on the eductor can increase the thickness of the blanket, increase the foam's resistance to heat and fire and improve drainage time. The amount of concentrate used will also increase.

13.8 Components of the Hi-Ex Foam System:

- Foam concentrate in five-gallon containers with yellow band.

- Water supply line. The length of the line should be kept as short as possible by placing the pumper or manifold as close to the operation as conditions permit. Fresh or salt water can be used to develop Hi-Ex foam.
- In-line proportioning device (eductor) with a pick-up tube affixed to it. This device employs a venturi action to pick up foam concentrate from a container and introduce it into the stream.
    - Only the eductor supplied with the Hi-Ex generator should be used. This eductor should have a 1" yellow band painted around the throat.
    - Each eductor is designed to operate at a pre-determined amount of water flow.
    - The metering valve, if present, may be adjusted from 1% to 6%. The dial can be set at any point to give a more diverse selection of foam consistency. These calibrations are relative and do not necessarily indicate the actual percentage of solution that will be formed. The higher the setting, the heavier the resulting body of foam and the quicker the rate of foam concentrate consumption.
    - The balance between the eductor intake pressure and the pressure at the foam generator is critical. Any factor that would upset the balance (e.g. friction loss in the line, head pressure, etc.) could affect the formation of foam.
    - Insufficient pressure at the eductor may prevent pick up of foam concentrate or supply inadequate pressure at the foam generator. The generator's distance from the eductor, as well as the grade difference between the generator and eductor, also affects the pressure at the foam generator.

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13.9 Although a relatively small flow of water is required in Hi-Ex foam operations (60 GPM), high pump pressure is necessary to overcome the pressure loss at the eductor. Maintain between 200 PSI and 220 PSI at the inlet of the eductor to deliver sufficient water under proper pressure to the foam generator.

13.10 Eductor placement is dependent on the conditions encountered in the field. It may be placed one length from the pumper or at the generator. Placement one length from the pumper is the recommended position for most fire situations. This location affords better control of:

- Water flow rates.
- Metering valve settings.
- Foam supply (reduces distance foam concentrate must be transported).

13.11 The eductor is equipped with a ball check. If the generator is shut down or there is a restriction in the hoseline, the ball check prevents water from flowing into the foam container.

13.12 At the completion of foam operations, the ECC should remove the eductor pick-up tube from the foam container, place it into a pail of fresh, clean water and run the system at the same pressure used during operations for 15 minutes to adequately flush foam from all components of the system. If the eductor is not flushed thoroughly, foam concentrate may dry inside it, causing the unit to malfunction.

13.13 The foam generator converts foam solution into Hi-Ex foam.

- Foam solution is supplied to the inlet of the generator at a pressure specific for the generator.
- A nozzle-like orifice sprays solution into the body of the generator.
- Air is forcibly introduced into the spray by a water or electric-powered fan mounted on the rear of the generator.
    - Aerated spray is forced through a screen on the front of the generator and expands into Hi-Ex foam.

13.14 The Foam Chute Applicator is a plastic sleeve used to deliver Hi-Ex foam from the generator to the fire.

13.15 ***Redacted for PFS***

13.16 *Members Operating In a Foam Environment*

- Personnel shall be equipped with full firefighting clothing, SCBA, search rope, hoseline and necessary tools for checking the path in front of the team.

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- Entering a Hi-Ex foam mass without a SCBA shall not be attempted. Under fire conditions, foam may become contaminated with products of combustion and toxic materials. Inhalation or ingestion of these products could create immediate breathing problems, coupled with disorientation due to noise suppression created by the Hi-Ex foam.
- If a SCBA malfunctions in the foam mass, the member should leave the area accompanied by another member, and notify his/her officer. A backup team should always be made ready for possible assistance or relief.

- Layout of the area, type of storage, and length, height, depth and width of the building must be considered before entering.
- Electrical equipment **must be de-energized** before the team enters the area.
- Members are cautioned to move slowly through foam to avoid stepping into any openings or tripping over any obstructions.
- Members are to avoid becoming completely immersed in foam. If submerged in foam, members' hearing and vision will be impaired and the possibility of becoming disoriented greatly increases. The use of handie-talkies will be difficult because of possible contamination of the microphone caused by the foam, which will also garble messages. The microphone can be protected inside of the turnout coat; however, when used to transmit, it shall be placed directly on the voicemitter while the other hand uses a waving motion to clear the area around it.
- The foam is essentially a detergent and any prolonged contact with the skin can cause a detergent burn. It also has an irritating effect on the eyes and nose, causing sneezing and burning eyes, similar to any soap product.

13.17-13.18 ***Redacted for PFS***

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DEFINITIONS

Alcohol – A colorless, water-soluble, volatile flammable liquid widely used as a solvent in drugs, cleaning solutions, explosives and beverages.

Alcohol Foams – Firefighting foam, resistant to the detrimental effects of water-soluble substances such as alcohol and polar solvents.

Angus Modified Foam Cannon – A large capacity (1000 GPM) aerating foam nozzle used to apply large quantities of foam.

Aerated Foam – Foam produced by nozzles that force air into the flow of foam solution.

Application Rate – The rate in GPM of foam solution that is needed to extinguish a flammable or combustible liquid fire or to cover a fuel spill.

Redacted for PFS

Back-Flow Prevention Valve – A 4 ½" check valve designed to prevent foam solution from backing up into the domestic water supply. This valve must be attached to the hydrant supply when the pumper is involved in a FIMM operation. This includes any pumper used to augment the FIMM pumper.

Backup Pumper – A 1000 GPM pumper that responds when a Satellite 2000 GPM pumper is not available for a foam operation. It is assigned to transport the Satellite apparatus with its tools and equipment.

Boiling Point – The temperature at which vapor pressure equals atmospheric pressure. The lower the boiling point, the faster the liquid will change to a vapor.

Burn-back Resistance – The ability of a foam blanket to resist direct flame contact.

Combustible Liquid – A liquid with a flash point of 100 degrees F. or higher.

Drainage Time – Amount of time it takes for the water to drain from a finished foam blanket.

Eductor – A proportioning device that employs a venturi action to pick up foam concentrate from a container and introduce it into a stream of water, thus producing foam solution. The eductor must match the rated flow from the nozzle (GPM).

Fire Point – The temperature to which a vapor has to be heated to sustain combustion. This temperature is usually no more than three degrees above the flash point.

Flammable Liquid – A liquid with a flash point below 100 degrees F. and a vapor pressure of 40 PSIG at 100 degrees F.

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Flammable Range (Explosive Range) – The percent of a flammable vapor mixed in air to form an ignitable mixture.

Flash Point – The minimum temperature to which a liquid must be heated to produce enough vapors to allow a vapor flash when an ignition source is present.

Flashback Resistance – The ability of a foam blanket to resist ignition by the flammable vapors coming in contact with a hot surface or a spark.

Foam (Finished Firefighting Foam) – An unstable air/foam solution emulsion used for firefighting.

Foam Tanker – A tanker which carries 1500 gallons of AR-AFFF foam concentrate. This unit is equipped with a foam deck gun.

Foam Chute – A plastic sleeve used to deliver Hi-Ex foam from the generator to the fire.

Foam Concentrate – A liquid which, when mixed with water, creates a foam solution.

Foam Coordinator – A Battalion Chief trained in the operation of the foam system. All Battalion Chiefs are trained to function in this role.

Foam Depot – A unit that stores at least 50 five-gallon containers of AR-AFFF, 50 five-gallon containers of Hi-Ex foam concentrate. ***(Edited for PFS)***

Foam Injection Metering Module (FIMM) – A device that attaches to the gated inlet of a pumper and proportions foam concentrate into the pumps as it is supplied by the Foam Tanker. It is ejected under pressure into water, creating a foam solution.

Foam Nozzle (Aerating) – A nozzle used to discharge foam solution, mixing air into the solution to produce finished firefighting foam.

Foam Solution – A mixture containing foam concentrate and water. Solution is pumped through hoselines with foam nozzles where it is mixed with air to produce finished firefighting foam.

Foam System – The Department's foam system consists of the Satellite System (six 2000 GPM pumpers along with their corresponding Satellite apparatus), backup pumpers, Foam Tankers, the Foam Tender, Foam Depots, Foam Coordinators and Marine units.

Frothing – The production of a mass of bubbles in or on a liquid. This occurs when foam concentrate is transferred at a rapid rate or is allowed to splash into a container.

Fuel Shedding – The ability of foam to resist saturation by hydrocarbons.

Hi-Ex Foam Concentrate – A detergent-based liquid which, when mixed with water and deployed with an aerating device, produces lightweight foam with an expansion ratio of 200/1 to 1000/1.

Hydrocarbons – Compounds that only contain carbon and hydrogen. Examples are methane, ethane, butane and propane. Gasoline, diesel, home heating oil and crude oil are hydrocarbons that contain additives.

Methyl Tertiary Butyl Ether (MTBE) – A slightly polar additive, added to gasoline to meet Federal Air Standards.

Non-Aerated Foam – Foam produced by a nozzle that does not force air through the foam solution. A foam nozzle that is non-aerating generally has a greater reach than an aerating nozzle; the tradeoff is a foam blanket that is not as stable as one that is produced with aerated foam.

Pick-up Tube/Hose – A tube or hose in which the foam concentrate is moved from the source (container) to the eductor.

Polar Solvent – Water-soluble chemicals that readily combine with water in a foam blanket, thus destroying it. Examples are alcohol, ether, lacquer, thinner and acetone. Alcohol resistant foam needs to be used on these substances.

Pour Point – The minimum useable temperature at which foam concentrate can be proportioned.

Satellite System – Six 2000 GPM pumpers (along with their corresponding Satellite apparatus) that are equipped with a FIMM incorporated into the pump control panel.

Self-Educting Nozzle – A nozzle with a built-in venturi section.

Solubility – The ability of a material to mix with water.

Specific Gravity – A measure of density in liquids relative to water. Refers to whether a substance will float on, or sink in, water. A liquid with a specific gravity of less than 1.0 will float on water while a liquid with a specific gravity equal to or greater than 1.0 will sink in water.

Surfactant – A chemical that lowers the surface tension of a liquid.

Vapor Density – A measure of density in vapors compared to air. Refers to whether a gas will rise or fall when mixed with air. A substance with a vapor density greater than 1.0 will sink while a substance with a vapor density of less than 1.0 will rise, when mixed in air.

Vapor Pressure – The pressure of a confined vapor in equilibrium with its liquid. Increasing the temperature of a liquid will produce more vapors and increase the vapor pressure.

Venturi Action – As water flows through an eductor, negative pressure is created in the pick-up tube. The foam concentrate is suctioned from the container to the appliance.

Water Supply Pumper – An Engine company assigned the duty of supplying water to a FIMM pumper. This water supply pumper must use a Back-Flow Prevention Valve.

BY ORDER OF THE FIRE COMMISSIONER AND CHIEF OF DEPARTMENT

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125 GPM FOAM EDUCTOR AND NOZZLE

1. DESCRIPTION

1.1 The 125 GPM Foam Eductor has been issued to all Engine and Squad companies. It is housed in a protective pelican case which includes the following equipment:

- 125 GPM Foam Nozzle with pistol grip (adjustable fog/straight stream)
- Extra-long pick-up tube
- Go-gauge (with Red and Green indicators)
- Metering head (meters at 1% - 3% - 6%)

1.2 The 125 GPM Foam Eductor shall be used with Universal Gold 1%-3% AR-AFFF foam concentrate (red band container).

1.3 The 125 GPM Foam Eductor and Foam Nozzle combination provide the following benefits:

- Allow for longer stretches, when required
- Greater reach of the stream
- Faster foam on the fire
- Faster clean-up

1.4 The go-gauge needle has two positions; **green** and **red.** The needle in the **green** indicates proper foam proportioning. The needle in the **red** indicates there is a problem such as the following:

- Kink in the line
- Burst length
- Nozzle not fully open
- Nozzle shut
- Elevation problem

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Figure 1: Pelican Case with Eductor and Nozzle

Figure 2: Go-Gauge

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Figure 3: 125 GPM Foam Nozzle with Pistol Grip

2. OPERATION

2.1 The eductor is to be operated at the pumper outlet **only** and is not to be operated in-line.

- Place the eductor onto the pumper outlet.
- Connect the metering head to the eductor.
- Place the pick-up tube into the foam bucket.
- Eductor is to be operated with either 1 ¾" hose or 2 ½" hose. The stretches are not to be combined. When stretching 1 ¾" hose not more than six (6) lengths are to be used off of the eductor. When using 2 ½" hose not more than ten (10) lengths of 2 ½" hose are to be used off of the eductor.
- When using 2 ½" hose, a 1 ½" x 2 ½" increaser and a 2 ½" x 1 ½" reducer is required. These fittings should be kept inside the eductor box for easy access.
- When foam is called for, the ECC supplies the foam line with 200 PSI/125 GPM.
- The nozzle is to be maintained completely open.
- The nozzle is capable of providing fog or straight stream and is equipped with a flush position.

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- During operation the nozzle can be operated with the tip in either the seated position or the extended position. When the cone is operated in the seated position, a foam blanket is produced. When the cone is used in the extended position, an aerated foam blanket is produced. The aerated position produces a longer lasting foam blanket and should be used on hydrocarbon fires with an alcohol content.
- The go-gauge needle should be in the **green** position. If the needle is in the **red**, a problem exists and foam is not being produced at the desired percentage. When the Chauffer notices that the needle of the go-gauge is in the red position he/she will need to find and solve the problem. The nozzle team and the officer may not immediately notice a difference in foam production.
- When foam operations are completed, the line and nozzle shall be flushed out until clean water has flowed through the nozzle. At that time, the nozzle shall be shut down and the chauffer will go to idle on the pumper, reduce pressure at the outlet and press the red flush button on the eductor. Pressing the red button on the eductor back flushes the eductor and pickup tube. This shall be done until fresh clean water is flowing through the pickup tube. When the equipment is flushed out, the eductor can be packed away in its case and be ready for a future foam operation.

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Figure 4: Eductor <u>correctly</u> assembled

Figure 5: Eductor <u>incorrectly</u> assembled

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STRETCHING A FOAM HANDLINE

1. EQUIPMENT

- Pumper
- Sufficient 1 ¾" or 2 ½" hoseline
- Sufficient five-gallon supply of foam concentrate
- 125 GPM eductor with go-gauge & 125 GPM foam nozzle

2. PROCEDURE

2.1 Connect the pumper to a hydrant and charge the pumps.

2.2 Location for the eductor is at the pumper outlet **only.**

- 1 ¾" hose - maximum stretch is six (6) lengths to the nozzle.
- 2 ½" hose - maximum stretch is ten (10) lengths to the nozzle.

2.3 Ensure a sufficient quantity of AR-AFFF (red band) foam concentrate (five-gallon containers) is at the location of the operating pumper.

2.4 The officer gives the command to start water. The member at the pumper places the pick-up tube into the container and the ECC starts water, providing **200 PSI at the eductor**. The foam nozzle shall then be **fully opened** and directed at the fire.

- Upon opening the nozzle, foam solution will immediately flow from the nozzle. Avoid opening and closing the nozzle as this interrupts the educting process and causes an intermittent flow of foam.
- After charging the line, the ECC shall monitor the go-gauge to ensure that, with the nozzle fully open and water flowing, the go-gauge needle remains in the **green**. If the needle enters the **red**, this will indicate a flow problem which the ECC needs to correct. When the needle is in the **red** the following could be the cause of the problem:
  - Kink in the line - Ensure there are no kinks in the supply line.
  - Elevation - When operating uphill, head pressure is created and will have minimal effect on foam production; however, this could cause the needle on the go-gauge to approach the **red.**
  - Nozzle not fully open - In order for the eductor to function properly, the nozzle should be opened fully when in use.
  - Nozzle shut down.

2.5 Always use the matching GPM foam nozzle and eductor.

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DCN: 4.06.02

TRAINING BULLETIN
FORCIBLE ENTRY 1
March 15, 1997

FORCIBLE ENTRY

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1. INTRODUCTION

1.1 Forcible entry requires close coordination between all members of the forcible entry team.

1.2. When forcible entry is required, start immediately. A door should be forced in such a manner as to preserve its integrity. Take note of the type of door. (Wooden, metal, glass or glass panel). Try the doorknob.

1.3. For situations such as food on the stove, gas leak, water leak, etc. try to find the least damaging means of entrance. Entrance off a fire escape, portable ladder or aerial will permit the door to be opened from the inside.

1.4. If upon arrival an open apartment door is found allowing fire and smoke to extend to the public hall, close the door but ensure the door does not lock.

2. DOORS (INWARD OPENING)

2.1 Doors found with one, two or three locks may be forced in one of several ways or a combination of ways.

A. By placing the fork of the Halligan approximately 6" above or below the lock with the bevel side of the fork next to the door, slightly canted toward the floor or ceiling. Strike the Halligan with the axe driving it past the interior door jamb. Apply pressure on the Halligan toward the door, forcing the door open. Reference #1, Figure 1.

NOTES:

1) If stiff resistance is met while driving the Halligan with the axe, turn the Halligan so the bevel side of the fork is against the door jamb. Drive the Halligan in and force the door.

2) To provide additional leverage, place the axe head between the door and Halligan. Reference #1 , Figure 2.

B. Drive the hook of the Halligan completely into the door jamb 6" above or below the lock. Apply downward pressure on the Halligan. Reference #1, Figure 3.

NOTES:

1) When forcing doors with two locks use the above procedures placing the tool between the two locks.

2) The door should not be allowed to spring inward exposing members at the doorway to heat and smoke. The door should be held partially closed if immediate entry cannot be made.

C. Taking action at the hinge side of the door is another method of forcing entry. With the back of an axe, or maul, strike the solid part of the door adjacent to the upper hinge location. If the door shows signs of being effectively forced in this manner continue striking until the upper hinge is freed and then use the same method on the lower hinge.

NOTE: Always attack the upper hinge first so that smoke and heat will rise while completing forcible entry on the bottom of the door.

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3. DOORS (OUTWARD OPENING)

3.1 The method used to force outward opening doors is determined by the position of the door in the frame.

A. Flush fitting doors. These doors may be forced using either the adz or fork end of the Halligan.

1) When using the fork end of the Halligan, place the concave side of the fork toward the door, tool canted slightly for initial penetration. As the tool is driven in between the jamb and door, it is brought to the perpendicular to avoid penetrating the jamb. When the tool has spread the door as far as possible, force the adz end away from the door.

2) Place the adz of the Halligan 6" above or below the lock and drive it into the space between the door and jamb being careful not to penetrate the door stop portion of the jamb. Pry downward and out with the fork end of the tool.

B. Recessed doors or doors with a wall adjacent to the lock side of the door.

Place the adz of the Halligan 6" above or below the lock and drive it into the space between the door and jamb being careful not to penetrate the door stop portion of the jamb. Pry downward and out with the fork end of the tool.

4. THROUGH THE LOCK METHOD

4.1. REMOVING CYLINDER

A. "K" TOOL.

1) Mortise and rim cylinder puller.

2) Used to pull out majority of lock cylinders.

3) This tool is used in conjunction with the axe and Halligan.
   a. Force working edges of K-tool behind cylinder and ring.
   b. Tap with axe until K-tool takes a bite into body of cylinder.
   c. Using the Halligan, pry cylinder out of door.
   Reference #2, Figure 1.

B. LOCK CYLINDER PULLERS.

Used to pull mortise or rim cylinder that are flush with door or recessed below door surface.

The lock cylinder pulling tool is forced over and behind the trim ring and face of the lock cylinder until the blades of the tool "bite" into the body of the lock cylinder. After getting a bite with the tool, the tool leverage itself is used to forcibly pull the cylinder out of the door and lock. Reference #2, Figure 2.

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C. Vise grips.

1) Use to remove mortise cylinders when time is not a factor.

2) Lock on to the cylinder and turn counter-clockwise to remove cylinder.

3) This method takes a little longer than with the K-tool and should be used with good judgment.

4.2. To open locks after the cylinder has been removed, different key tools and methods are used for the various type locks.
Reference #3, Figure 1.

A. MORTISE LOCK. Designed to fit into a cavity in the edge of a door.
Reference #3, Figure 2.

1) Cam principle. The key turns a cam that slides the bolt out of the strike.
Reference #3, Figure 3.

2) 5 o'clock to 7 o'clock principle. Before pulling the lock cylinder check the position of the keyway. The keyway is always your 6 o'clock position. After pulling the cylinder insert the bent end of the key tool into lock through cylinder hole, holding key tool parallel to ground and perpendicular to door. With bent end pointing to approximately 5 o'clock, move the bolt slide to the 7 o'clock position or if slide is found at the 7 o'clock position move the slide to the 5 o'clock position.
Reference #3, figure 4.

3) Deadlock mechanism.

a. Some mortise locks also have a deadlock mechanism which prevents the bolt from being moved. Reference #4, Figure 1.

b. It will be found at either the 5 o'clock' or 7 o'clock position. To slide bolt out of the strike (jamb), you must depress the deadlock mechanism with the end of the key tool, while sliding the bolt.

4) If after the dead bolt is retracted (5 to 7) and latch is still in the locked position (knob will not turn), continue rotating the key tool until contact is made with spring loaded latch lever, which is usually found at 9 o'clock or 3 o'clock. Depress this latch to release the spring latch.

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B. RIM LOCK - Manufactured to fit on the inside surface of the door with the cylinder visible from the outside. Reference #4, Figure 2.

1) Screw driver principle. Key turns stem on the end of the cylinder which fits into the backplate of the lock. The stem opens or closes the lock in the lame fashion as a screw driver.

2) Pull cylinder and check rear of cylinder for stem size.

3) Insert straight end of key tool into stem slot on the lock. Turn key tool either direction left or right.

4) If for any reason you cannot insert key tool into stem slot (shutter present) or turn the key tool (night latch thrown), place the point of the Halligan or similar tool in the cylinder hole and drive the lock off the door.

NOTE: Some rim locks have a shutter which will move into the area vacated by the stem as the cylinder is withdrawn. This shutter can be moved by the use of a tool such as a dental pick if time permits.

5) On police locks (rim locks) the stem of the cylinder is square shaped thus requiring a special 5/32" square key tool for those locks.

Police locks, also known as vertical bar locks, are usually found in tenement areas on wooden or kalamein doors. Usually a few good shots an the door may cause the vertical bar to jump from the hole in the floor, thus unlocking the door.

6) (Double bar lock - Fox locks) Easily recognizable by the location of the cylinder in the center of the door.

a. Cylinders are usually covered with a metal plate with four bolts.

b. Using a Halligan, shear off the top two bolts and one bottom bolt then turn the plate down exposing the lock cylinder. Remove the cylinder with the K tool. Using the square key tool, turn the tool towards the bottom bar thus unlocking the door.

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5. PADLOCKS

5.1 Padlocks are portable or detachable locking devices having sliding and pivoting shackles that pass through a staple and are then made fast.

A. There are two types:

- *Regular*

All padlocks with shackles of ¼ inch or less and not hardened.

- *Heavy duty*

Padlocks with a shackle of more than ¼ inch and hardened.

NOTE: A feature on many of the newer heavy duty padlocks is toe and heel locking. This means that both ends of the shackle (toe and heel) are locked when the shackle is depressed into the lock case. On this type of padlock, cutting only one side of the shackle will not permit us to pivot the lock and remove the padlock from the staple. Both sides of the shackle must be cut. On regular padlocks, cutting one end of the shackle is usually sufficient to pivot lock.

B. Attack points:

- Staple.
- Point of attachment.
- Shackle.

C. Tools.

1) Halligan.
2) Duck bill.
3) Bolt cutter.
4) Saw (Diamond blade)
5) Cutting Torch
6) Bam-bam tool.

D. Operation.

1) Attack the point of least resistance.
2) Hook of Halligan or the duck bill can be driven through staple or shackle.
3) Bolt cutter to cut staple or shackle.
4) Case hardened locks requires use of saw with the diamond blade. It is also possible to pull the cylinder on some of these locks with a bam-bam tool.

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6. AMERICAN LOCKS SERIES 2000

6.1 A portable or detachable locking device that fits over a staple, etc. and locks by use of a movable steel pin located in the body of the lock.

A. Attack points.
- ♦ Point of attachment.
- ♦ Body of lock.

B. Tools.
1) Saw (Diamond blade).
2) Cutting torch.

C. Operation.
1) Use either of the above tools to cut staple or other point of attachment to wall, etc.
2) Cut through the lock about 2/3rds of the distance up from the keyway, cutting it in two pieces. Then remove the pin from the security gate. Reference #5 Figure 1.

7. BARS AND SLIDING BOLTS

7.1. *Bar*
A piece of wood or steel held in place by brackets, which traverses both sides of the door frame. Reference #5, Figure 2.

7.2. *Sliding bolt*
¼ to ¾" steel with a throw of 1" or more. Mounted on the door and projects into the frame. Reference #5, Figure 3.

7.3. Forcible entry may be made using the axe and Halligan. The bar brackets or bolt may be driven off the door frame by driving the fork end of the Halligan directly at the bar or bolt.

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8. WINDOWS

8.1 By placing the fork end of the Halligan under the window at the center of the window sill and applying downward pressure on the Halligan a single window and/or window lock can be forced.

A. Some windows found at the ground floor level or fire escape will have window gates behind the glass. By attacking the window gate at the hinge side (opposite the locking device), using a Halligan, the gate is easily forced. After taking the top and bottom hinge, slide the gate towards the locking device thus clearing about 2/3rds of the window.

NOTE: Any other method (forcing or kicking in) of forcing a window gate could result in jamming of the gate and a loss of time.

B. Protect-A-Guard window gate.

1) Similar to accordion and scissor gates.

2) Easily opened from the inside and there is a total absence of padlocks. The gate is equipped on the inside with a small box-like enclosure which contains a door and a swivel type knob. To open the gate from the inside, turn the swivel knob, open the door and lift the weight.

3) When forcing this gate, member should concentrate on hinge side.

NOTE: When entering an apartment through a window, take out the whole window, creating a vent and a quick means of escape if necessary.

9. MULTI-LOCK DOORS

9.1 Found in some projects and newly renovated buildings. The lock is not necessarily centered in the door but easily recognizable by the large plate covering the lock. Four bars, one in each direction, enter the door jam when the lock is engaged.

NOTE: Make sure multi-lock is engaged prior to forcing entry. By sliding paper or cardboard under the door along the bottom, you will be able to tell if lock is engaged or not.

To force the door, cut a inverted triangle in the lower quadrant of the door on the doorknob side. This will enable you to unlock conventional locks as well. Make the cut large enough to get your arm through and back out, but small enough so that you don't cut the bar. Reference #6, Figure 1.

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10. SECURITY GATES

10.1. Found in all areas of the City. There are three types, manually, mechanical and electric.

A. **Manually operated doors** - Commonly found on the fronts of smaller stores. Readily recognized by the absence of any raising mechanism housing at drum level (top) and the presence of lift handles attached to the bottom bar. These doors usually have from two to four padlocks installed on the bottom or along the sides. To force entry remove the padlocks and removable eye bolts that penetrate the gate. Then lift door.

B. **Mechanically operated doors** - The operating mechanism is a chain hoist assembly similar to that found in many firehouses. They are easily recognized by the gear and chain mechanism located in a housing at the top of the door alongside the drum with approximately one foot of the operating chain remaining visible beneath this housing. The chain hangs down alongside the door and is covered by a vertical length of angle iron. This cover is mounted on hinges and is locked against the curtain guides by two padlocks. To force entry remove all padlocks from chain cover and door; then, using chain, raise the door.

C. **Electrically operated doors** - As the name implies, these doors are electrically operated. The unit containing the motor and related components is contained in a large metal housing. This is located on the outside of the installation, adjacent to either side of the drum. This large housing readily identifies this type of door. The electric key switches that activate the operator will be found usually on the building wall on either side of the door.

1) All electrically operated doors are equipped with an auxiliary chain hoist which can be used in the event of a power failure. The auxiliary hoist mechanism is located inside the operator housing and is not visible from the outside.

2) To force entry remove the padlocks from the door. Remove the cover plate of the operator housing or remove the entire housing by use of the forcible entry tools. This will expose the working mechanism of the operator. The lever that changes the operator from electrical to mechanical will be readily visible. Pushing the lever towards the chain hoist mechanism will engage the unit and the door can be raised mechanically by the use of the chain provided.

3) Another method may be used to raise the electrically operated door. Remove the front cover plate or the housing itself. A roller chain similar to the drive mechanism of a bicycle will be visible. Cut the bicycle chain using the bolt cutters and the security gate is now hanging free. You now have a manually operated door. Two or three members may now raise the door.

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10.2. If a delay is anticipated and heavy fire conditions exist and application of water is of immediate necessity, the security gate may be cut using the saw.

A. A small triangle shaped opening, can be made rapidly, below the center of the door and a stream directed into the store.

B. By making a larger triangle cut, the slats on either side of the opening can be easily removed. Slide the slats toward the cut.

BY ORDER OF THE FIRE COMMISSIONER AND CHIEF OF DEPARTMENT

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Reference 1

Figure 1

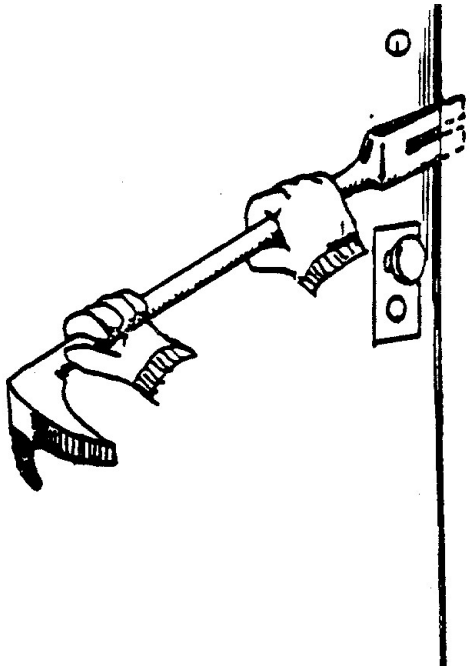


Figure 2

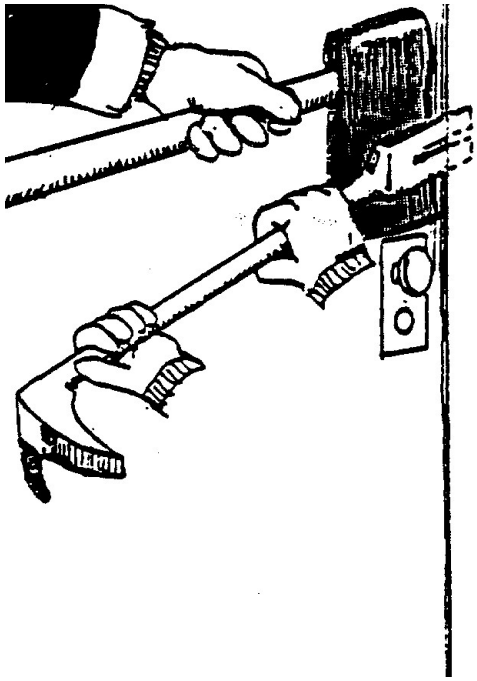
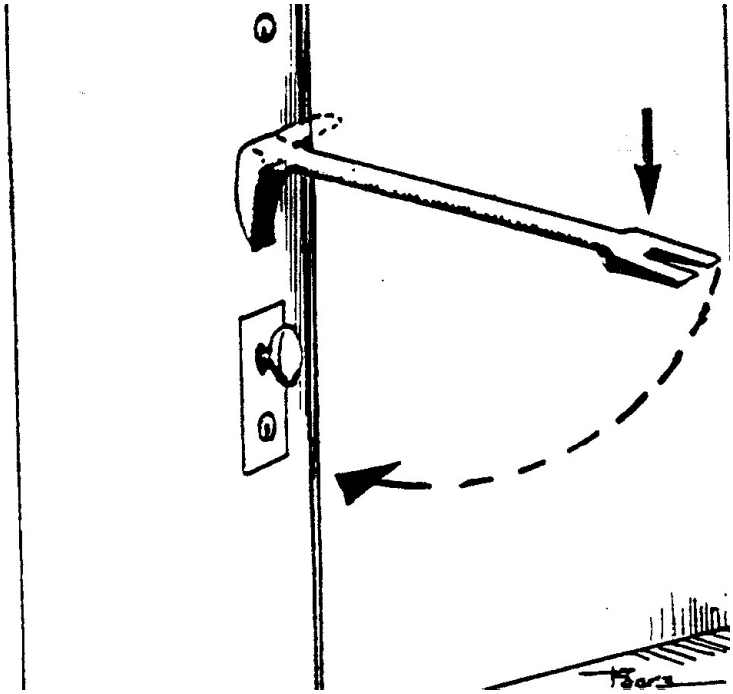


Figure 3



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Reference 2

Figure 1

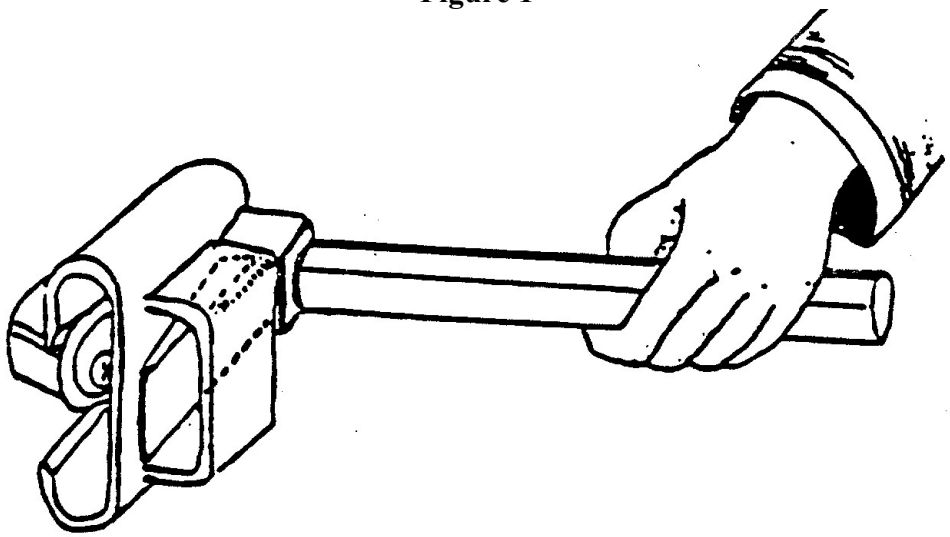
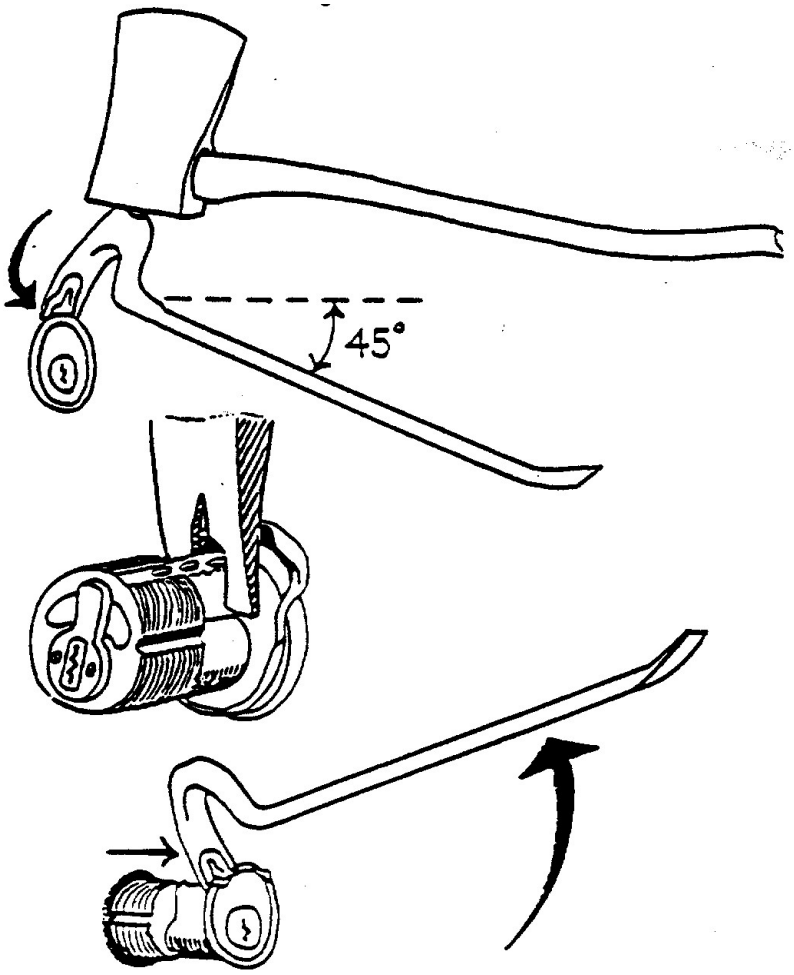


Figure 2



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Reference 3
KEY TOOLS

Figure 1

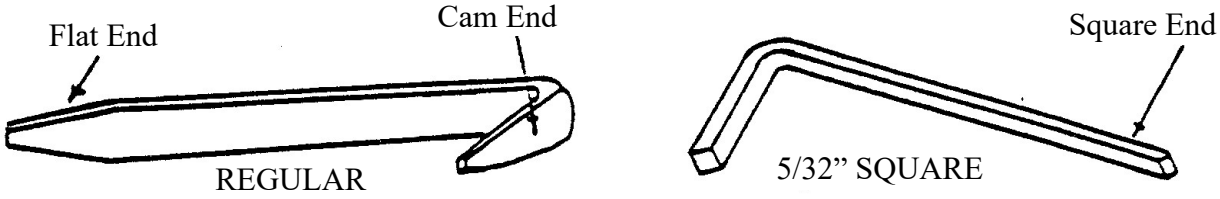


Figure 2

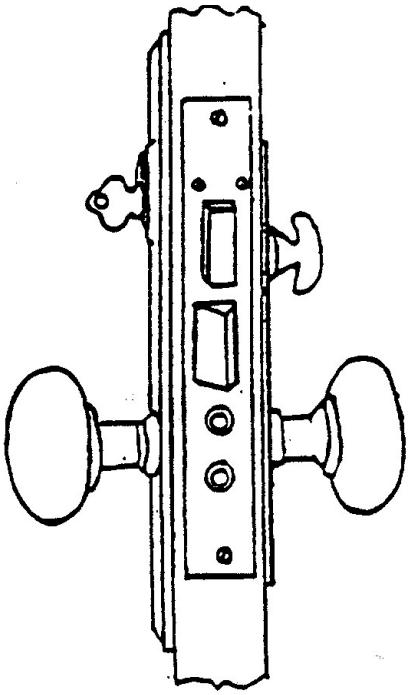


Figure 3

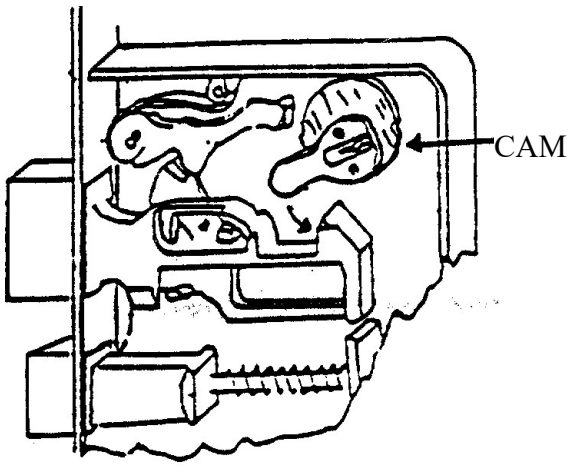
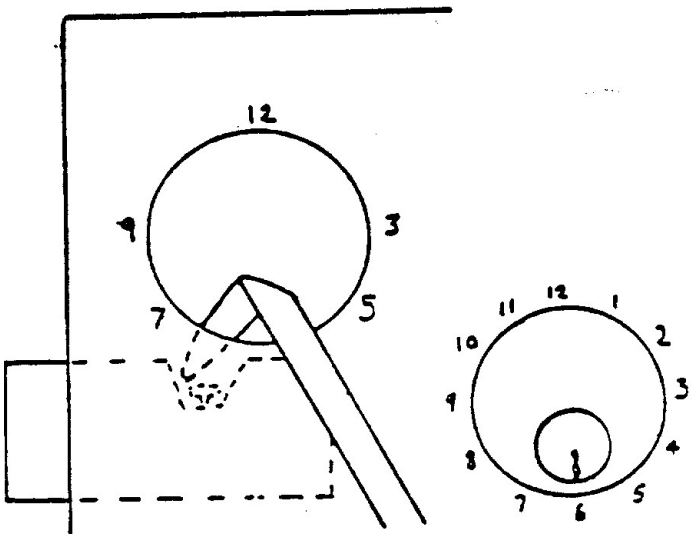


Figure 4



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Reference 4

Figure 1

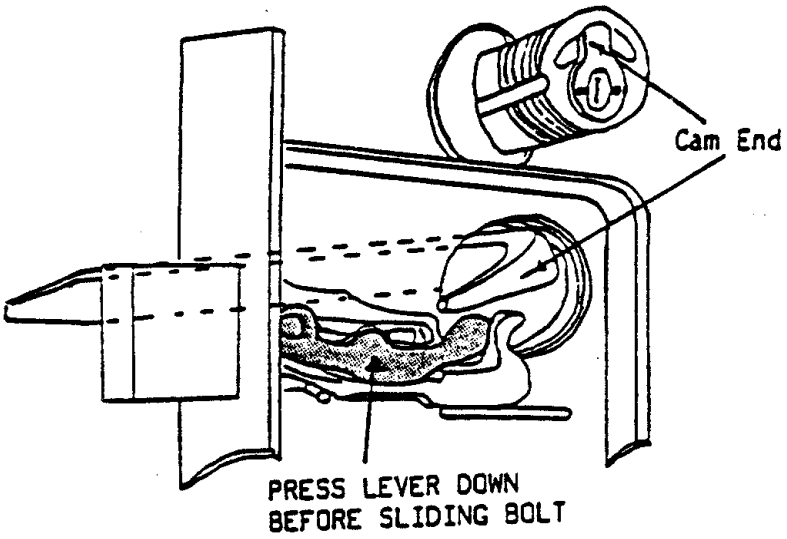
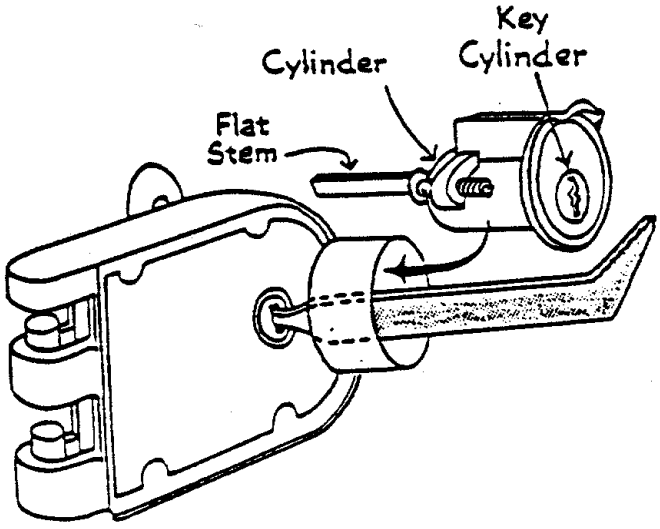


Figure 2



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Reference 5

Figure 1

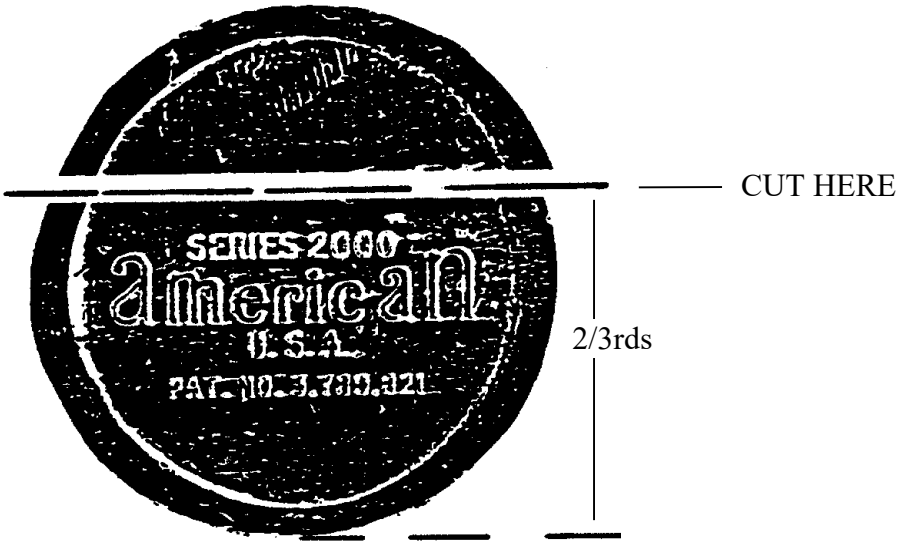


Figure 2

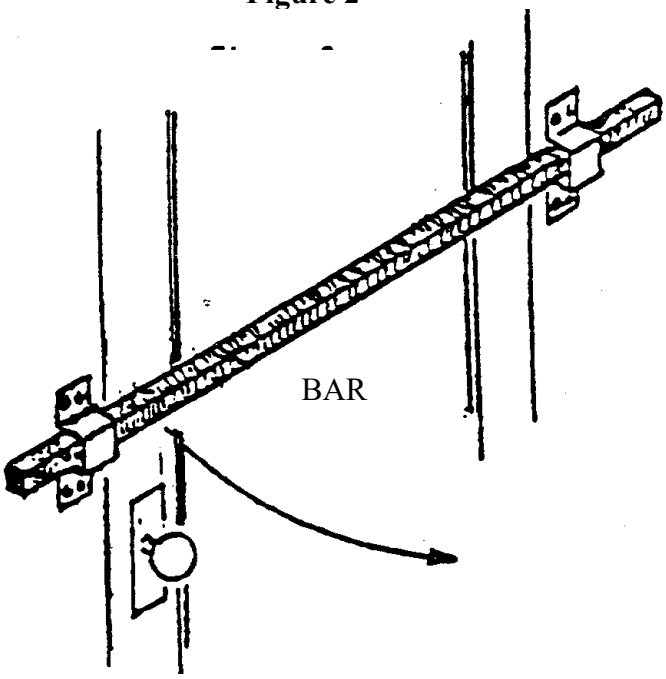
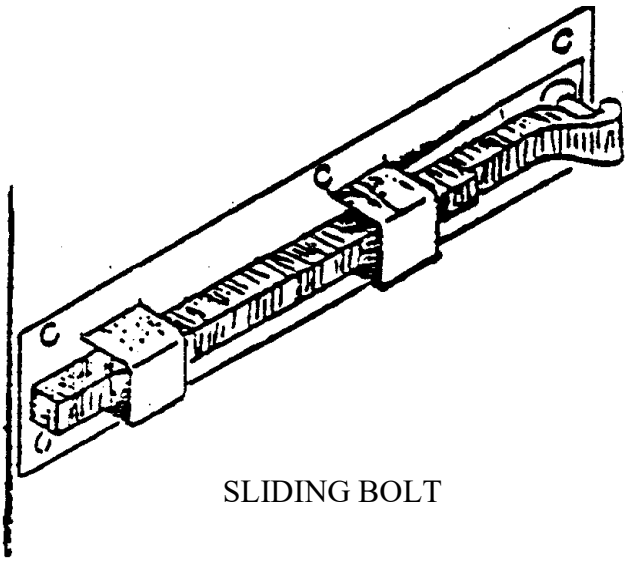


Figure 3



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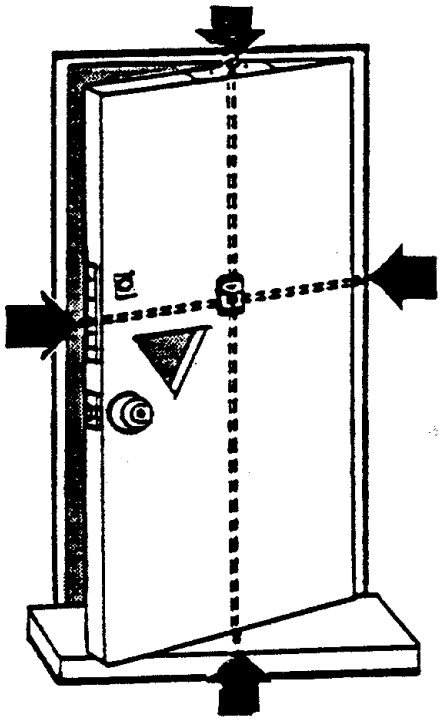
Reference 6

MULTI-LOCK DOOR

Figure 1



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DCN: 4.06.02

TRAINING BULLETINS
FORCIBLE ENTRY 2
March 15, 1997

FORCIBLE ENTRY - TENEMENT BUILDINGS

1 FORCIBLE ENTRY IN TENEMENT BUILDINGS

1.1 GENERAL

A. For minor non-vital situations such as food on the stove, minor fires etc., consider using the least damaging means of entrance. E.g., an adjacent apartment or one above or below may be used to gain access to the fire escape and thence to the desired apartment via the forcing of the fire escape window. The door may then be opened from the inside.

B. When required, forcible entry should be initiated immediately. Force door in a manner to preserve its integrity. If, after forcing door, excessive heat conditions make it impracticable for immediate entry and search, the door may then be held closed (DO NOT RELOCK) until line is charged and ready to advance. This is done to lessen the danger of serious exposure to occupants or operating personnel in public hall above the fire area. If on arrival an open apartment door is allowing fire to extend to the public hall, every effort should be made to close this door in order to re-establish and maintain the security of the public hall and stairs.

C. The conventional method of forcing doors that open inward will be explained, but an evaluation of the door about to be forced should be made before placing tools to work.

1. ***The cardinal rule - Try the doorknob.***

2. A panel should not be removed except for a relatively minor fire when difficulty has been encountered using normal forcible entry procedures. If a heavy body of fire exists and a panel is broken out of the door, it will not be possible to isolate the fire area while waiting for water.

3. Look at the locking device (see Section 1.4).

4. Select the best method for forcing this door.

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1.2 FORCIBLE ENTRY (Axe and Halligan Combination) Doors opening inward.

The use of the axe and halligan tool is obviously a team operation. The member holding the halligan tool is the coordinator of the action, telling the axe firefighter when to strike. To avoid injury the axe firefighter shall never strike without being specifically instructed to do so by the member holding the halligan tool.

TRY THE DOORKNOB FIRST.

A. Halligan Tool (Figures 1A, 1B, and 1C)

The following is the most widely accepted method of forcing doors in this type occupancy.

1. The tool is held with the hand at the adz end palm up and the hand at the fork end palm down. This affords good control and provides a greater margin of safety for the member holding the tool.

2. Place the fork of the halligan tool approximately 6" above or below the lock.

3. Place the bevel side of the fork end next to the door. The bevel is placed as described in order to provide two distinct advantages after the initial penetration has been accomplished. It affords a greater spread thereby increasing the chances of the tongue of a lock slipping its keeper in the door jamb, while at the same time it almost eliminates the possibility of losing the purchase obtained with the tool when pressure is applied in order to actually force the door.

4. Cant the tool slightly toward the floor or ceiling, whichever is more comfortable for the member striking with the axe (Figure 1A). This is done as it is easier initially to drive in a single point of the fork end than both ends of the fork. After the first point is driven in, the halligan tool should be brought parallel to the floor.

5. While penetration is being accomplished, gradually bring the tool to a position perpendicular to the door and continue striking with the axe until the fork end is well past the interior door jamb. Slowly moving the halligan tool to a perpendicular position will: (see Figure 1B and text 1B①, 1B② and 1B③).

6. Apply pressure toward the door, forcing it in (see Figure 1B④). The other firefighter may help by adding extra weight.

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Tool canted toward the floor or ceiling

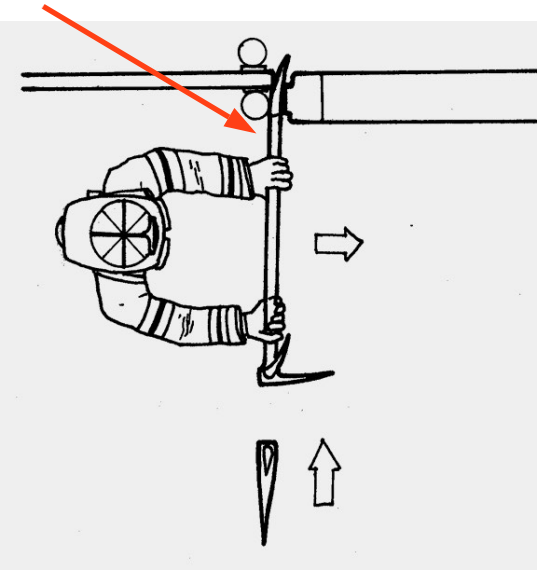

Figure 1A

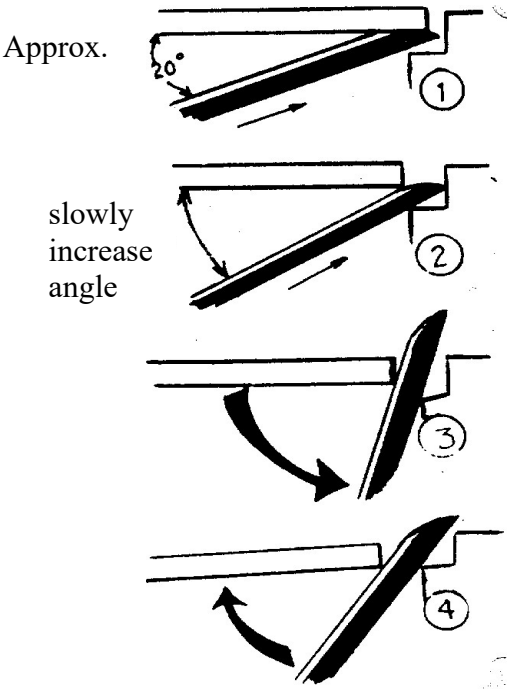

Figure 1B

Figure 1C

1B① spread the door from the door jamb,
1B② prevent driving the halligan tool into the doorjamb slowing the operation and
1B③ minimize damage (see Figure 1B).

Notes:

a. The door should not be allowed to spring inward as this would expose the members at be doorway.

b. A hook or other tool may be used to partially close the door if immediate entry, is not possible or practicable.

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B. Axe (Figure 1C)

1. The axe is held with the upper hand near the head of the axe and the other hand near the bottom of the handle.
2. The firefighter holding the axe stands at the side opposite the member holding the halligan tool in order to reduce the chance of striking the other firefighter.
3. The adz end of the halligan tool is struck at nearly a right angle.
4. The axe is not swung, it is used with the shoulder and stiff arm. An alternate method is to hold the axe with the lower hand higher on the handle and strike the halligan, tool by twisting the upper body while keeping the axe in the same horizontal plane.

1.3 UNUSUAL SITUATION

An awkward condition encountered is pictured below in Figure 2, where a wall will not permit the members to operate on opposite sides of the halligan tool.

A. Halligan tool firefighter as pictured.

B. Axe firefighter on one knee and on the same side as the halligan tool firefighter as shown. Normally the axe firefighter is on the other side of the halligan tool.

Figure 2

Firefighters **FORCED** to work on same side

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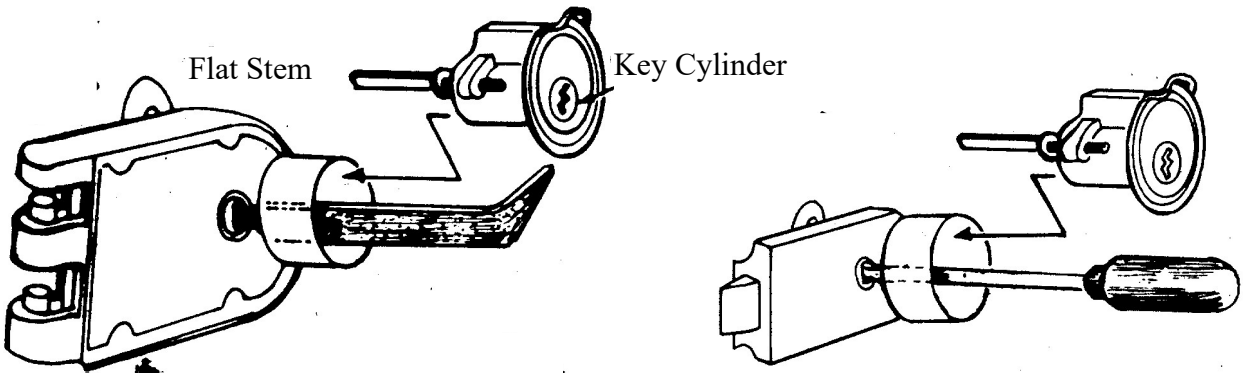
1.4 LOCKING DEVICES (Figures 3A, 3B, 3C)

A. A lock frequently met is the ordinary spring action type (Rim Locks). (Figure 3A)

Figure 3A



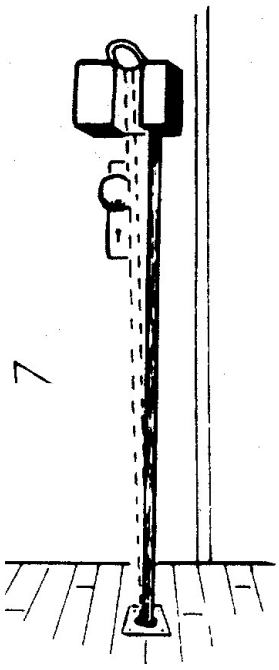
The body of the lock is attached to the inside of the door and the tongue slides into a metal receptacle, which is attached to the door frame. The cylinder extends through a hole drilled in the door and is secured on the outside by a metal ring that protrudes about 1/8 " on the public hall side of the door. This type gives a minimum of difficulty whether by forcing as illustrated or by use of a special tool to remove the ring and cylinder and then turning the tongue out of the keeper with a screwdriver or other tool designed to fit the small slot now visible through the hole

Reference: Article by Captain Sunilla - WNYF Autumn 1961.

B. The Police Lock (vertical bar Figure 3B)

Figure 3B

This type is readily determined by observation. The ring holding the tumbler in place will be almost flush with the door. On the inside, the lock has a metal rod extending down into a metal receptacle in the floor. This receptacle is about 2' from the door so that the rod is placed at an angle from the lock. Difficulty will be encountered when trying to force this door by conventional methods as this device offers great resistance. The use of the special tool mentioned in (A) above has been extremely successful.



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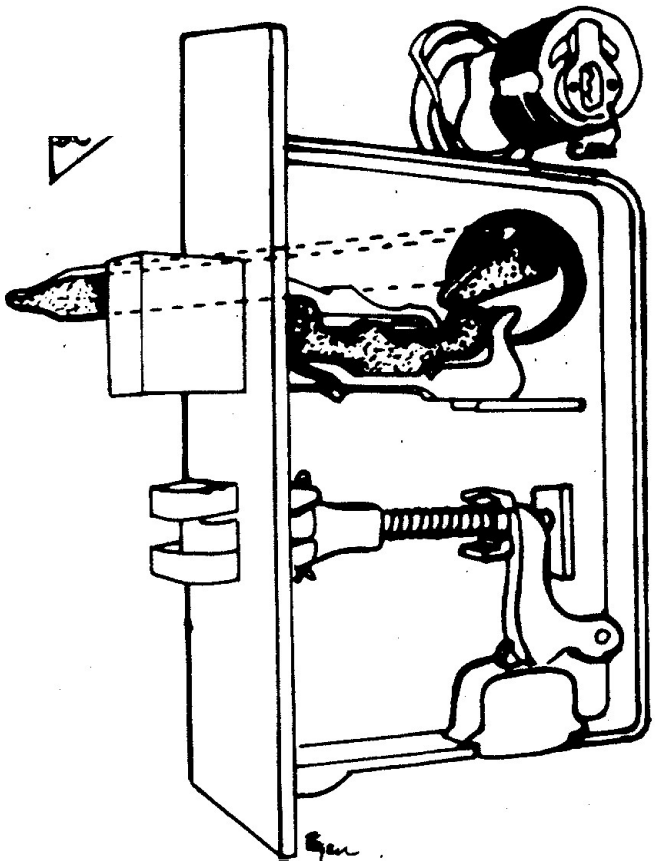
C. Mortise Type Lock (Figure 3C) **Figure 3C**



If neither of the above types are present then the original locking device, which is a part of the doorknob assembly, will be the problem. This lock has a bolt that slides into a receptacle drilled into the frame. If it is a wooden door, the chances are excellent that conventional forcing will open it.

1.5 ALTERNATE METHODS

A. Another means of entry is forcing the door at the hinge side. Inward opening doors do not have the hinges on the outside so that entry by removing the hinge pins is not possible, therefore force must be used. With the back of the axe, strike the solid part of the door adjacent to where the upper hinge is located. If the door shows signs of being effectively forced in this manner continue striking until the upper hinge is freed and then use the same method on the lower hinge.

B. If this fails drive the fork end of the halligan tool in with the axe below the upper hinge forcing the screws from the hinge. Repeat the same process above the lower hinge. Judgment will be required since the hinges will not be visible.

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C. By using a Halligan tool (Figure 4A) another and frequently easier method is to drive the pike end of the Halligan tool into the door jamb behind the lip and near the hinge (Fig. 4B). The pike end is driven deep into the jamb and then the Halligan tool is moved towards the door tearing the hinge and screws from either the door or the frame. Repeat this process near the lower hinge.

Figure 4A

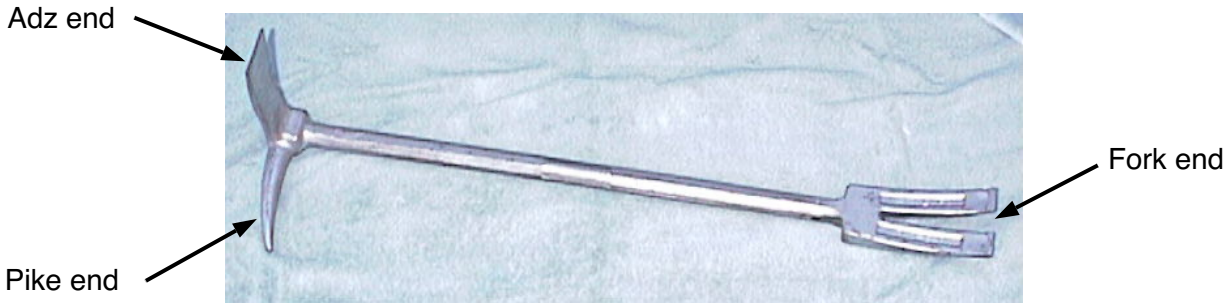
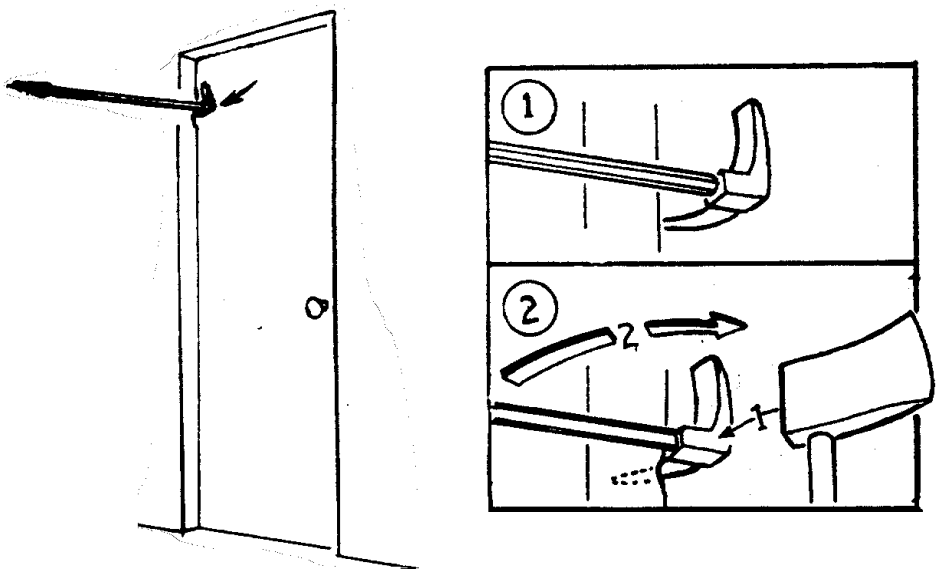


Figure 4B



Note: The upper hinge is always attacked first so that the smoke and heat will rise while you complete the forcible entry at the bottom.

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1.6 STORE GATES AND SIDEWALK CELLAR DOORS

A. Figures 5A and 5B show sidewalk cellar door and gate in locked position.

Figure 5A

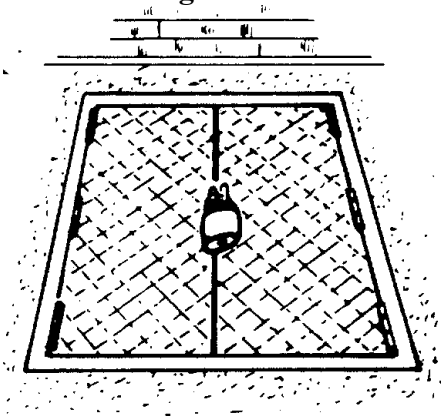
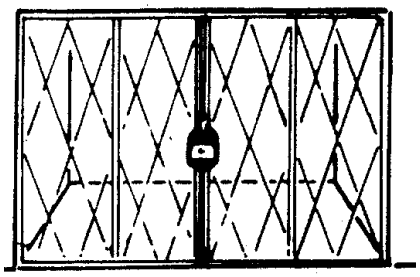


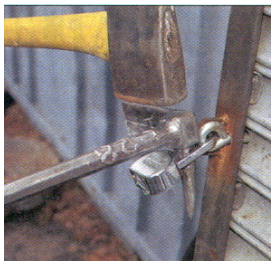
Figure 5B



Pry or hit with axe

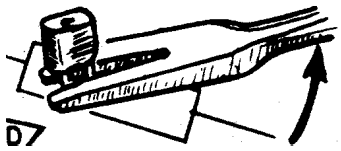
B. Figure 5C shows the pike end of the halligan tool in the bow of the lock. Insert pike end of halligan tool from underneath and press down thus applying leverage against the heel of the halligan tool, or hit the adz of the halligan tool with an axe.

Figure 5 C



C. Figure 5D shows the fork end of the halligan tool placed over the bow of the lock.

Figure 5 D



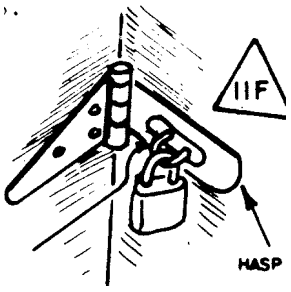
D. Figure 5E shows the bolt cutter being used to cut the bow of the lock.

Figure 5 E

Bolt Cutters

E. Figure 5F shows a lock of an exterior hasp. It may be removed by pulling or cutting the staple or by working on the lock.

Figure 5 F



BY ORDER OF THE FIRE COMMISSIONER AND THE CHIEF OF DEPARTMENT

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TRAINING BULLETIN
January 30, 2020

HUMAN PERFORMANCE

1. INTRODUCTION

1.1 The FDNY has had a longstanding commitment to developing a superior understanding of how our operational environment (buildings, infrastructure and fire) behaves and responds to stress. However, the department has historically given less attention to one critical element in a scientific context – the human factor. More recently, the FDNY renewed its commitment to optimizing human and mental performance with the roll out of the Mental Performance Initiative (MPI).

1.2 MPI is a strategic initiative that seeks to foster a greater understanding of human performance at fires and emergencies. The principal objective of MPI is to optimize human performance in order to enhance the FDNY's tactical, operational and strategic capability. MPI enabling objectives include developing an improved understanding of human behavior in an operational context and developing a common language around human behavior and performance.

2. MPI METHODOLOGY

2.1 MPI is a departure from traditional FDNY training and professional development programs. MPI is rooted in human factors science and best practices in optimal human performance in ultra-competitive industries that include professional sport and the US military.

2.2 Specifically, MPI actively addresses five critical human performance themes:

1. Human factors – the physiological and psychological response to operational stress
2. Tactical decision making and cognitive function under stress
3. Tactical fitness
4. Mental conditioning & stress inoculation
5. Psychology of risk and resilience

3. HUMAN PERFORMANCE UNDER STRESS

3.1 It is well established that on the fireground, every member regardless of rank, is subject to the effects of operational stress on both the body and mind. These effects can be both positive and negative. The negative effects may range from mild to severe depending on many variables. Often these effects go unnoticed and uncorrected due to a fundamental misunderstanding of firefighter mental and physical performance under stress.

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3.2 The human factors science that is applied today to military special operations training and elite-level athletics is built upon the foundation of early twentieth century psychologists Robert Yerkes and John Dodson. These individuals were pioneers in understanding performance under stress and their research proves an empirical relationship between arousal (physiological response to stress) and human performance. Their seminal work is characterized by the *Yerkes-Dodson Law*, or what is commonly referred to as the Inverted or Upside-Down U-Curve. (Figure 1)

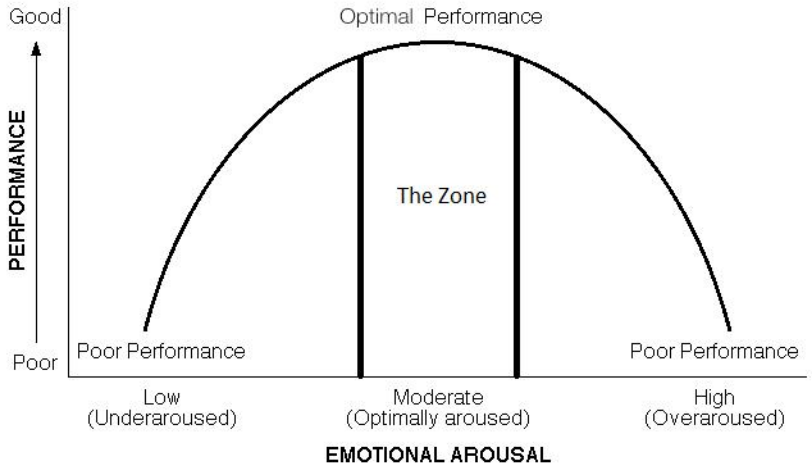

Figure 1

3.3 The Yerkes-Dodson Law shows that under-arousal is linked to poor performance and may be associated with apathy and boredom. Under-arousal potentially yields complacency which can lead to sub-optimal performance at fires and emergencies.

3.4 Yerkes-Dodson also suggests that increasing levels of arousal elicit higher performance, until reaching an increased level of arousal that corresponds to optimal performance. Coaches and athletes in contemporary endeavors refer to optimal performance as "the optimal zone" or a "flow state." The benefits of arousal, however, quickly transitions to detriment, as hyper arousal or too much physiological activation inhibits motor function, situational awareness and decision-making. As arousal and emotional stress levels increase, the sympathetic nervous system causes the release of stress hormones to include epinephrine which stimulate increased activity in the heart. Subsequently, the heart rate from emotional stress provides the best indicator of physiological strain. The "backside of the curve" is a reference to performance that is negatively impacted by excessive emotional arousal. Where the "front side" of Yerkes-Dodson shows that a) under-arousal is related to suboptimal performance, and that b) increasing levels of emotional stress are associated with enhanced performance *until reaching the optimal zone*, the "backside of the curve" models more significant risk. This area illustrates that increasing levels of arousal inhibit rather than enhance performance. Of greatest concern is the descending trajectory of the curve's backside, where mental and physical performance will continue to degrade with increasing levels of arousal. It is important to note, that the human body is far more sensitive to psychophysiological stress than it is physical stress.

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3.5 The Yerkes-Dodson Law and a century's worth of associated human factors research align with what FDNY members have experienced firsthand at fires and emergencies. Scientists, wartime practitioners and more recently FDNY performance leaders alike have identified that hyper-arousal can lead to an assortment of factors that endanger both tactical performance and compromise safety survivability: impaired senses and communications, premature fatigue, impacted decision-making processes, and reduced situational awareness.

3.6 Situational awareness is characterized as the perception of the elements in an environment within the context of time and space. Reduced situational awareness, more accurately termed perceptual distortion, is the main consequence of elevated stress on the mental state of a member which negatively impacts the body and mind's ability to function effectively. Perceptual distortion can manifest as significantly degraded motor skill, poor acute memory, the inability to track time and/or spatial orientation and auditory exclusion. While the range and consequences of perceptual distortion cannot be avoided, they can be reduced and managed with greater understanding and conditioning.

4. ***Redacted for PFS***

5. TRAINING FOR OPTIMAL PERFORMANCE - THE HUMAN FACTOR

5.1 Human performance under stress is a significant determinant of success or failure at fires and emergencies. It follows then that the human element should receive primary consideration in training for success in an operational environment.

5.2 All aspects of training and preparation must account for the human body's physiological response to tactical and operational stress. These drills must also account for the ever-critical mindset which enhances survivability in high-threat and high-risk environments.

5.3 There are several performance enhancing techniques and skills that all members must be familiar with and can employ to enhance performance under stress. These techniques are designed to shift the department's tactical advance on the fireground by enhancing human performance and increasing the time spent in the optimal zone of the performance curve. Creating a common vocabulary for human and mental performance enables all members of the department to better prepare and discuss human performance.

- Goal setting: Members should approach every challenge at fires and emergencies as an opportunity and strive to respond to a given situation rather than react to it.

- Process focused objectives: specific and detailed performance objectives that are within the control of an individual and/or unit. Performance objectives focus exclusively on processes and not outcomes, particularly since outcomes are determined by a considerable number of variables outside the direct control of members.

- Performance routines: a series of mental and physical productive behaviors that focus on relevant information. Research confirms that precise physical and mental routines limit the effects of mental and emotional static.

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- Self-talk: a short self-statement or inner monologue that is realistic and objective enabling an individual to keep their thoughts productive increasing the likelihood of relaxation and enjoyment in stressful situations.

- Tactical breathing: the use of a deliberate diaphragmatic breathing mechanics and pacing for arousal control in training, performance and active recovery settings.

- Posture and movement/mobility: the position in which we arrange our bodies while operating at fires and emergencies. Research suggests that sound posture is positively correlated to improved physiological function and physical performance; sound posture serves to reduce arousal and enhance cognitive function in high-stress situations. Body alignment and fluid movement convey a non-verbal message to subordinates and subsequently influences how subordinates think about the operational environment and the level of stress involved.

- Visualization: also referred to as tactical performance imagery, has a long history in human performance enhancement. A mental rehearsal of the employment of individual skills in a specific situation where a member visualizes what the event will look like and feel like. Imagery exercises are of greater value when they include all of senses.

- Physical and/or mental reset: a physical or mental tactic or technique that an individual relies upon to create a rapid performance timeout during a tactical evolution. A performance reset serves to reduce arousal and create clarity during a highly stressful evolution or operation, particularly in instances where success is being met with resistance. In addition, a reset allows a member the ability to rapidly move past a negative action or error, thus limiting its impact on the rest of operation.

5.4 Performance enhancing techniques such as tactical breathing and self-talk require practice and repetition to become habitual in a high-risk, uncertain and dynamic environment. Performance enhancing mental skills require an increased level of self-awareness and a recognition that a leader must favorably manage his/her own emotions before they can effectively manage others.

5.5 Given the high levels of stress that members navigate at fires and emergencies, the optimal drill is three-dimensional and includes not only a tactical and physical component, but a mental/physiological component. This level of preparation will allow members to master tactical skills as well as mental skills that will prove valuable at fires and emergencies.

5.6 Mental conditioning enhances tactical resilience and provides a valuable tool during the reflection phase of performance that follows an operation.

5.7 The environmental, tactical and human complexities involved with operating at fires and emergencies often make optimal performance elusive. Human errors are all but inevitable, particularly at complex fires and emergencies where members are operating under considerable pressure. Units and members should objectively identify human performance shortcomings and weaknesses in order to foster learning and improvement for future fires and emergencies.

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TRAINING BULLETIN
September 1, 2010

PURPLE K DRY CHEMICAL EXTINGUISHER

1. INTRODUCTION

Purple K dry chemical extinguishers have been issued to various units of the department. Purple K is a potassium bicarbonate base dry chemical. While other dry chemical extinguishers are effective, Purple K has demonstrated a superior extinguishing capability in combating methanol fires. Methanol's use as an alternate fuel for gasoline and diesel-powered vehicles and equipment throughout the city will inevitably lead to fire situations at which the extinguishment of this fuel will be required. Purple K is also effective on gasoline, diesel and compressed gas fires.

2. HANDHELD EXTINGUISHER

2.1 DESCRIPTION

2.1.1 Cylinder of heavy gauge steel welded construction having an internal corrosion resistant coating.

2.1.2 Nozzle - High velocity.

2.1.3 Height 23 3/4", weight 52 lbs. (27 lbs. of which is dry chemical).

2.2 FEATURES

2.2.1 Purple K Dry Chemical Capacity of 27 lbs.

2.2.2 Discharge Range 19' - 20'.

2.2.3 Discharge Time - 11 seconds.

2.2.4 Coverage approximately - 30 square feet.

2.2.5 Temperature restrictions - extinguisher can be used between minus 40 and 120 degrees.

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2.3 OPERATION

2.3.1 Remove ring pin and hose.

2.3.2 Squeeze handle.

2.3.3 Direct stream at base of flames using a side to side motion. In order to achieve even distribution, and to obtain best results the nozzle should be held with the member's strongest hand. Hold the extinguisher upright.

2.3.4 Expended extinguishers can be exchanged by attaching an RT-2 and forwarding to Technical Services for replacement.

2.4 INSPECTION

The extinguisher shall be checked at the beginning of each tour and thoroughly examined once a month.

2.4.1 Inspection at the beginning of each tour is to include:

A. Ensuring the extinguisher is in its designated place and is accessible for immediate use.

B. Examining the extinguisher shell for evidence of physical damage, corrosion or other impairments.

C. If extinguisher is defective for any reason, attach an RT-2 and forward to Technical Services for replacement.

3. ***Redacted for PFS***

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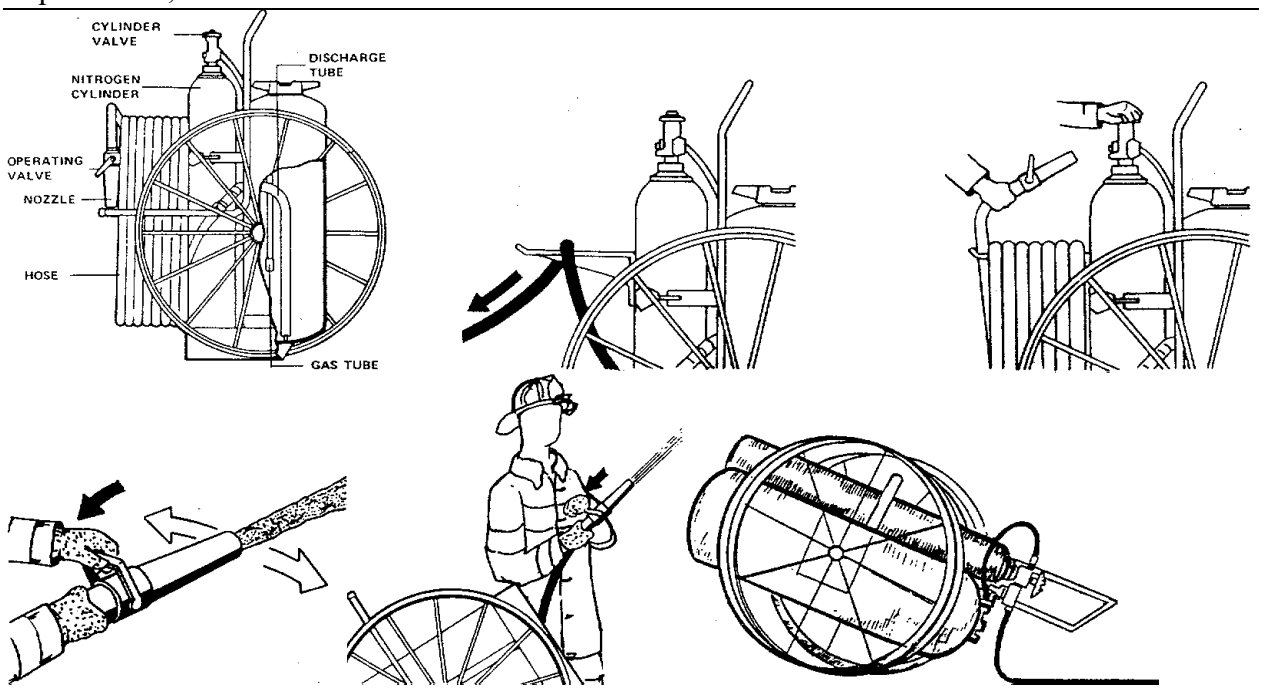

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5. ***Redacted for PFS***

BY ORDER OF THE FIRE COMMISSIONER AND THE CHIEF OF DEPARTMENT

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ROPE
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TRAINING BULLETIN
ROPE 1
August 16, 2007

9/16" NYLON LIFE SAVING ROPE

1. INTRODUCTION

1.1 The life saving rope is 9/16" in diameter. It is made of a continuous filament of Nylon 707 with a length of 150', weight of 14½ pounds, and a working load of 600 pounds.

1.2 Nylon rope is stronger than manila rope of the same size. A breaking strength test was conducted on the 9/16" nylon life saving rope. The rope broke at 10,240 pounds.

1.3 Acceptance of the rope requires that it have a minimum breaking strength of 9,000 pounds. In addition, our rope must survive a drop test. This test consists of tying a 600 pound weight to the end of the rope and dropping the weight from a platform ten feet, seven inches high. There must be two feet of slack in the rope. The rope must survive five such drops.

1.4 The life saving rope not only survived the drop test, it also survived an additional breaking strength test. The section of the rope subjected to the drop test was laboratory tested and broke at 9,800 pounds. The life saving rope has a high breaking strength quality.

1.5 In order to retain this strength, the rope must be properly maintained.

1.6 Members should be aware that the actual length of the life saving rope may be less than the nominal length of 150 feet due to natural shrinkage after several years in the field. Over a period of time some ropes have shrunk 8 to 10 feet. This fact should be considered when planning to use the life saving rope.

2. INTENDED USE

2.1 To lower a firefighter or another person from a roof or upper floor to a place of safety below.

2.2 To lower a firefighter from a roof or upper floor to enable him/her to remove another firefighter or person from an untenable position.

2.3 To allow a firefighter trapped in an untenable position to remove him/herself to safety by means of a single slide.

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2.4 Communications are essential in all life saving rope operations. Often, information from the Roof Firefighter to the members operating in the building regarding the location of the victim will preclude the necessity of a life saving rope operation. This is especially true in fireproof buildings, where the victim may access a temporary area of refuge.

2.5 Communications with the Inside Team of the ladder company(s) is vital prior to any life saving rope rescue attempt. It is also critical that notification be given directly to the Incident Commander or Sector Supervisor prior to commencing a life saving rope rescue attempt. The IC must coordinate all interior operations and the life saving rope rescue attempt. The IC must determine if units are unable to place an operational hoseline between the victim and the fire in a timely manner, and if members are prevented from reaching the victim via the interior of the apartment, an adjoining apartment, a balcony or fire escape, or exterior ladders.

2.6 Upon determining that a life saving rope rescue is the only available option, the Incident Commander may dispatch additional resources to the descent point as well as adjoining apartments and/or apartments on the floor(s) below to provide the greatest chance of a successful rescue. A life saving rope rescue must be a coordinated team effort with support coming from inside, above the victim, adjacent to the victim, and below the victim. Such coordination is only possible with clear communications.

2.7 Under no circumstances should a life saving rope evolution be attempted if:

- a viable substantial object is not available
- the effectiveness of the anti-chafing device would be compromised due to building construction (protruding facades, exposure of the life saving rope to sharp surfaces)
- there are not enough members at the lowering point and at the adjoining windows or floors below to ensure a successful pick-up and retrieval of the firefighter and victim.

2.8 The life saving rope evolution shall only be attempted as a **last resort** when all other avenues have been eliminated. Any attempt to perform the life saving rope evolution **MUST** be in strict accordance with existing procedures and guidelines.

3. OPERATIONS

3.1 Number of turns required when using the Atlas Life Belt or Personal Harness.

3.2 Lowering of 1 person and/or use of the Single Slide.....4 turns

3.3 Lowering of 2 people .....4 turns

4. CARE AND MAINTENANCE

This life saving rope shall be used only for life saving purposes. It shall not be used for drill purposes.

4.1 First and foremost, the life saving rope shall be used only for life saving purposes, and always with the anti-chafing device. Use of this rope for any other purpose is strictly prohibited.

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4.2 A life saving rope subjected to the weight of two people shall be placed out of service forthwith and replacement requested.

4.3 Immediately after a life saving rope has been subjected to the weight of one person, the rope shall be carefully examined for any signs of damage or abrasion before being placed back in service. Proper journal entries shall be made by the company officer of the results of such examination. An entry shall also be made in red on the Life Saving Rope Record Card (RP-100). The officer, after supervising the examination of the rope, shall notify the Safety Command by telephone of the incident.

4.4 Care shall be taken to avoid wetting the life saving rope. The life saving rope can lose from 10% to 15% of its strength when wet. This loss of strength occurs when the rope is submerged in water at room temperature for twenty four hours. Whenever a rope becomes wet it shall be allowed to dry naturally before being repacked and stored on the apparatus. The rope regains its strength when it dries.

4.5 Ice particles within the strands of a rope can damage the inner fibers. Therefore, a frozen life saving rope shall be placed out of service.

4.6 Dirt on the surface and imbedded in rope acts as an abrasive to the strands and fibers. When a life saving rope becomes dirty, it shall be washed with mild soap and water. It should be allowed to dry naturally before being repacked and stored on the apparatus.

4.7 The detrimental effect of rust on nylon rope cannot be overemphasized. The life saving rope should be stored where it will not come in contact with rust. When a rust stain is found on the life saving rope, it should be immediately removed with soap and water. A persistent rust stain is a definite indication of fiber damage and a reduction in the strength of the rope. It should be placed out of service and replacement requested.

4.8 Nylon rope is susceptible to damage from acids and their fumes. Formic acid, hydrochloric acid, sulfuric acid, nitric acid and phenol are highly destructive to nylon rope. If the rope comes in contact with acids or their fumes, it shall be placed out of service and replacement requested.

4.9 Ropes that are damaged or show signs of wear are to be put out of service and replaced.

4.10 Prolonged exposure to sunlight (ultra-violet rays) or fluorescent light is injurious to nylon rope. Therefore, the life saving rope shall be stored where the effects of sunlight and fluorescent light are kept to a minimum.

4.11 Nylon rope when exposed to heat over 300°F will progressively lose strength, and will melt at 482°F. Rope that has been exposed to highly heated surfaces cannot be considered safe and shall be placed out of service and replacement requested.

4.12 The life saving rope must be stored in the driest compartment on the apparatus and the carrying case must be stored in the upright position. Due to heat transmission, the rope shall never be stored on engine covers or in compartments adjacent to the engine compartment.

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4.13 When a rope is repeatedly twisted in one direction, a kink will develop. Kinks pulled through a restricted space will seriously damage a rope. A kink should be removed from a rope by rotating the rope counter to the direction of the kink. (Figure 1) Every effort shall be made to prevent a rope from kinking during its use.

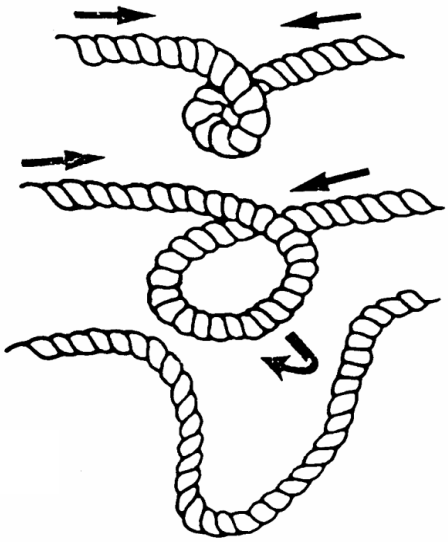

Figure 1

4.14 Strand hockles develop when force is used to remove a kink in rope. A hockle is very difficult to remove. A hockle reduces the strength of a rope by 40% to 50%. Should a hockle occur in the life saving rope, the rope should be placed out of service and replacement requested. (Figure 2)

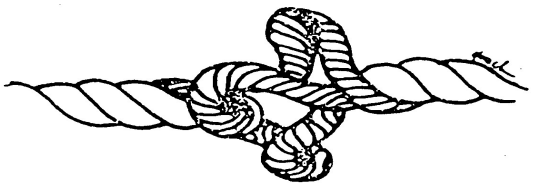

Figure 2

4.15 All units, except Engine Companies, shall inspect and repack the Life Saving Rope every Monday on the 9x6 tour. Engine Companies shall inspect and repack on Tuesdays on the 9x6 tour. Record the inspection on the Life Saving Rope Card (RP-100).

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4.16 Inspection shall cover the entire length of the rope. Look for cut fibers, abrasion, rust, wetness or anything that might indicate possible degradation of the rope.

4.17 This inspection should not be conducted on the apparatus floor due to the possibility of the rope coming in contact with material that might be harmful to it. Since the apparatus floor is concrete, it is a prime means of causing abrasion to the life saving rope. Abrasion is one of the primary causes of a rope losing its strength.

4.18 When any doubt exists regarding the serviceability of a life saving rope it shall be placed out of service.

4.19 A Lost Property Report (FS-112) is required for lost equipment.

4.20 A history of every life saving rope shall be maintained on the Life Saving Rope Record Card (RP-100).

5. *Redacted for PFS*

6. CONCLUSION

6.1 The 9/16" nylon life saving rope is stronger than any rope available today that will satisfy our needs. Given proper care and maintenance, it will provide us with a reliable life saving tool.

BY ORDER OF THE FIRE COMMISSIONER AND CHIEF OF DEPARTMENT

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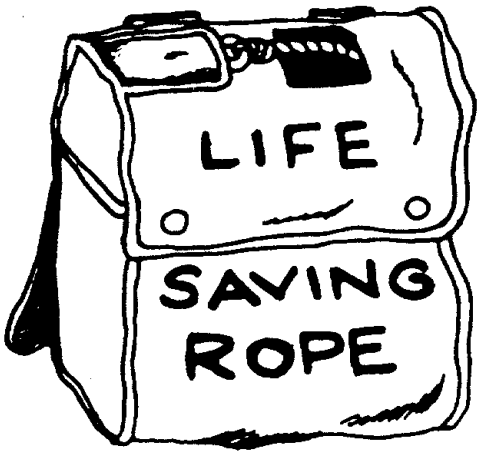
LIFE SAVING ROPE CARRYING CASE

1. DESCRIPTION

1.1	F.D.N.Y. Designation	Life Saving Rope Carrying Case (Figure 1)
1.2	Material Used	Vinyl Reinforced Nylon with Nylon Webbing Strap
1.3	Weight	Approximately 1½ lbs.
1.4	Dimensions	14" x 14" x 6"
1.5	Color	White with Red Lettering

Figure 1



2. INTENDED USE

2.1 To store, carry and deploy the life saving rope, with the anti-chafing device attached.

2.2 This case provides for instantaneous use of the life saving rope in lowering and sliding operations by eliminating the need to flake out the rope before use.

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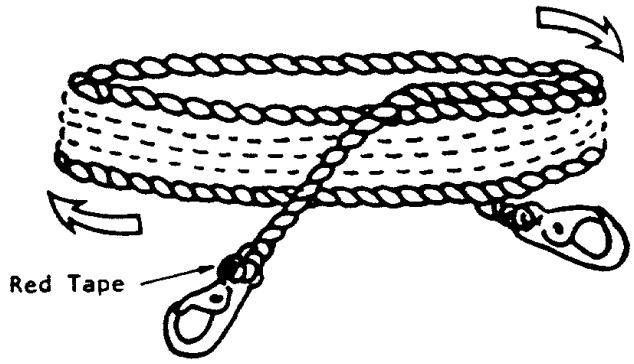
3. PACKING OF THE LIFE SAVING ROPE IN THE CARRYING CASE

3.1 The entire rope is coiled CLOCKWISE. The diameter of the coil should be approximately 4 feet. (Figure 2)

Figure 2

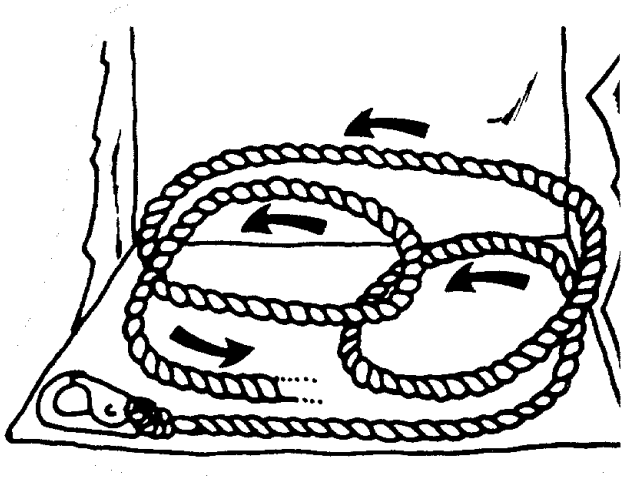


3.2 Stand the open carrying case on the floor, to the left of the coiled rope.

3.3 Place the hook of the life saving rope in the left front corner of the carrying case. Move to the right, making a COUNTERCLOCKWISE circle one half the width of the bottom of the case. (Figure 3)

3.4 Move to the left, making another circle slightly overlapping the first circle. (Figure 3)

Figure 3



3.5 Continue in this manner until the entire rope is coiled in the case.

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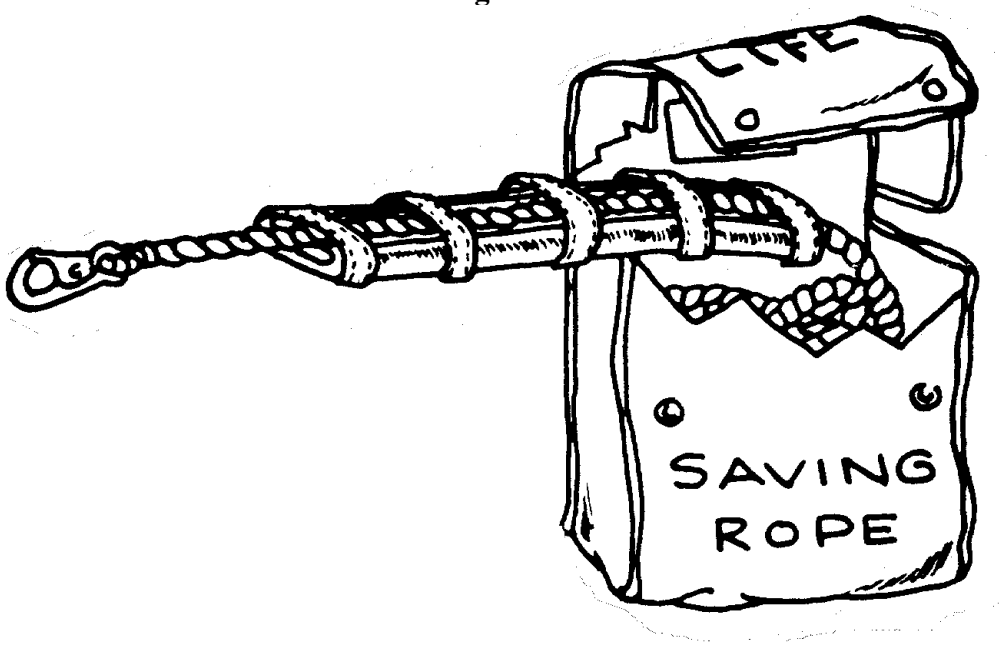
3.6 Remove 3 feet of rope from the carrying case and place the anti-chafing device on this section of the life saving rope. (Figure 4)

3.7 Grasp the hook of the life saving rope and pull 1½ arms length of rope through the anti-chafing device. Tie a bowline on a bight on this section of the rope.

Figure 4



3.8 Move the anti-chafing device along the rope to the bowline on a bight. (Figure 5)

Figure 5

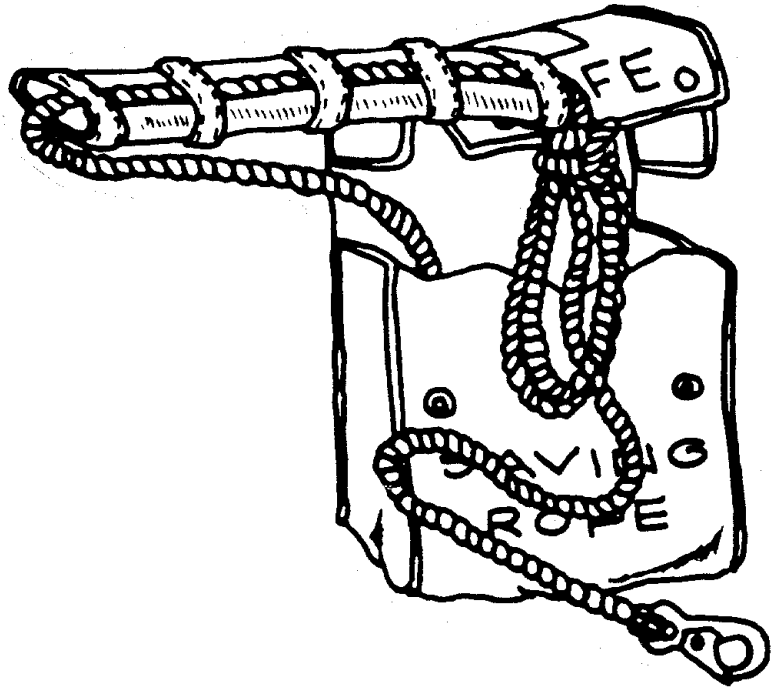


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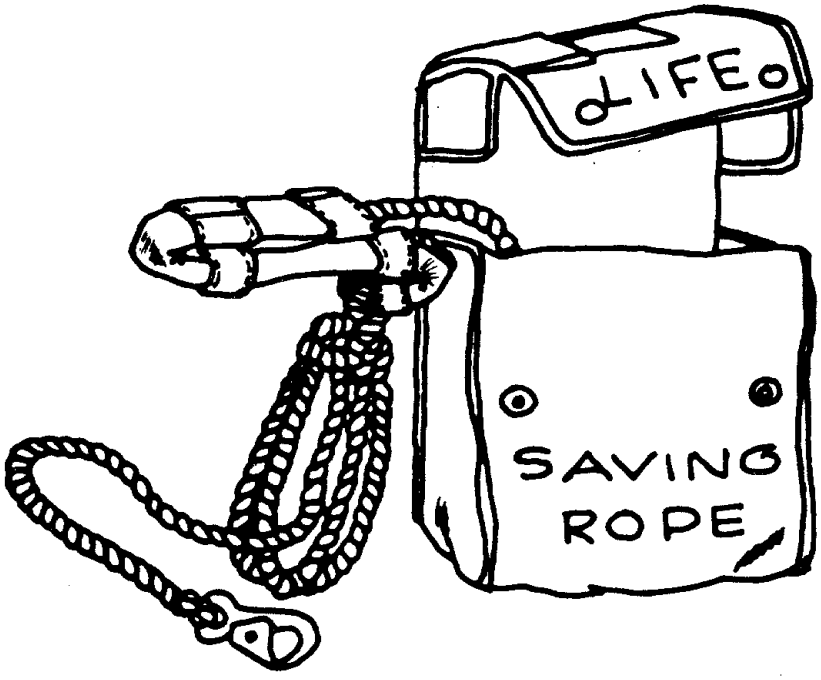
Figure 6



3.9 Fold the anti-chafing device as shown in Figure 6, and place the bowline on a bight and the anti-chafing device in the carrying case as shown in Figure 7.

Figure 7

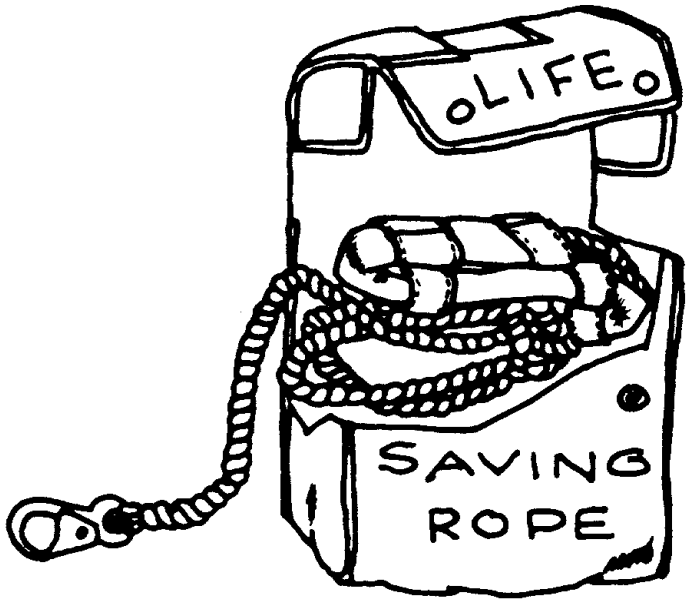


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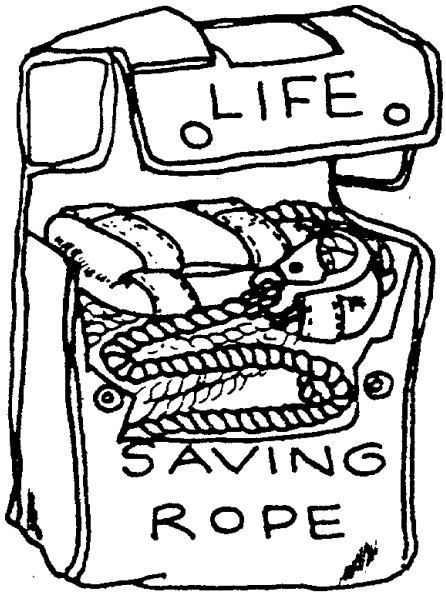
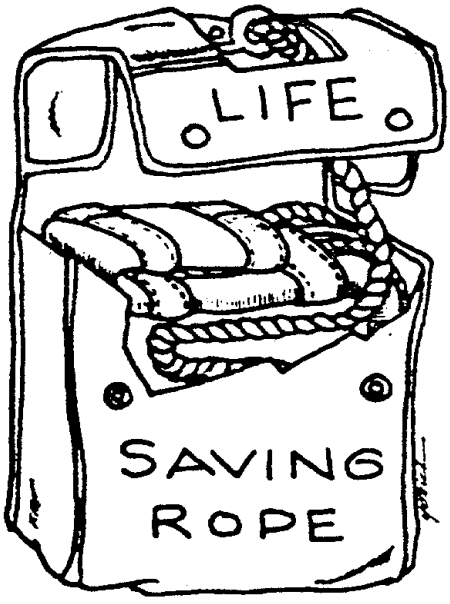
Figure 8



3.10 Carefully fold the remaining rope in front of the anti-chafing device. (Figure 8)

Figure 9



3.11 While closing the flap of the carrying case, pass the hook of the life saving rope through the window of the flap and place it in the pocket on top of the flap of the carrying case. (Figure 9)

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3.12 The life saving rope shall be completely repacked weekly. The rope shall be repacked from the opposite end each time. One hook shall be marked with red tape for distinguishment. (Figure 2)

Note: Do not replace the anti-chafing device until the entire rope has been packed in the carrying case. This will allow any twists in the rope to work themselves out during the packing procedure.

4. CARE AND MAINTENANCE

4.1 Each time the life saving rope is repacked, the carrying case shall be checked for cleanliness and dryness.

4.2 The carrying case can be cleaned by sponging with mild soap and water. It is essential that the carrying case be thoroughly dry before repacking the life saving rope.

4.3-4.4 ***Redacted for PFS***

5. DEPLOYMENT OF ROPE

5.1 For Single Slides (Do not unsnap the flap)

5.1.1 The snap hook, anti-chafing device and the bowline on a bight are removed from the carrying case through the window in the flap. Sufficient rope is pulled through the window before securing to a substantial object.

5.1.2 Follow procedures outlined in the Evolutions.

5.2 For Lowering a Member

5.2.1 Unsnap the top flap, pull the snap hook back through the window, and remove the snap hook, anti-chafing device and bowline on a bight from the carrying case.

5.2.2 Follow procedures outlined in the Evolutions.

BY ORDER OF THE FIRE COMMISSIONER AND CHIEF OF DEPARTMENT

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T. B. ROPE 1
DATA SHEET 2
February 13, 2017

LIFE SAVING ROPE ANTI-CHAFING DEVICE

1. DESCRIPTION

1.1 F.D.N.Y. Designation — Life Saving Rope Anti-Chafing Device
There are currently three types of Anti-Chafing devices that may be encountered in the field. All devices serve the same function and will afford protection when used with the Life-Saving rope. Anti-Chafing devices will be replaced through attrition.

1.2 Material — Three ply canvas

1.2.1 Type 1 (Figure 1A)

a. Size - 5" wide x 24" long.
b. There are four 2½" x 4" x 3/16" splints sewn between the bottom and middle layers of canvas to prevent movement of the device and to provide further protection for the life saving rope.
c. Five strips of webbing maintain the shape of the device and provide for easy examination for wear after each use.

1.2.2 Type 2 & 3 (Figure 1B & 1C)

a. Size - 4" wide (when folded) x 24" long.
b. The full width of the device is 10 inches. There is a 1 inch strip of velcro sewn on to the long edges of the device. When the device is folded, the two pieces of Velcro come together creating a sleeve to provide a safety guide to protect the rope.
c. There is a rubber coating on the underside of Type 3 when folded.

1.3 The end of each device is flexible to permit overlapping at the roof edge. (Figure 2)

Figure 1

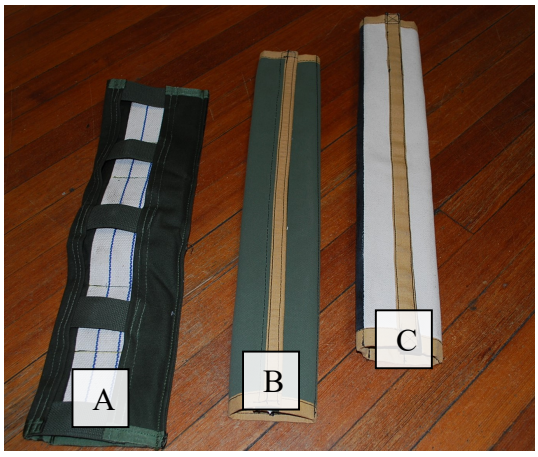

Figure 2

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2. PLACING THE ANTI-CHAFING DEVICE ON THE LIFE SAVING ROPE

2.1 After the life saving rope has been packed in the carrying case, remove 3 feet of rope and pass the rope through the canvas sleeve from either end of the device. (Figure 3)

Figure 3

2.2 Grasp the hook of the life saving rope and pull 1½ arms length of rope through the anti-chafing device. Tie a bowline on a bight on this section of the rope, and place the rope and anti-chafing device in the carrying case as described in Section 3 of Rope 1 Data Sheet 1.

3. USE AND PLACEMENT

3.1 When used in a lowering or single slide operation, the anti-chafing device is placed so that the flexible end overlaps the roof or the parapet wall toward the street. (Figure 2)

4. CARE AND MAINTENANCE

4.1 Check the anti-chafing device for dryness and undue wear each time the life saving rope is repacked.

4.2 The anti-chafing device shall be air dried when necessary.

4.3 Immediate replacement for the anti-chafing device is imperative since the life saving rope cannot be used without it.

4.4-4.5 ***Redacted for PFS***

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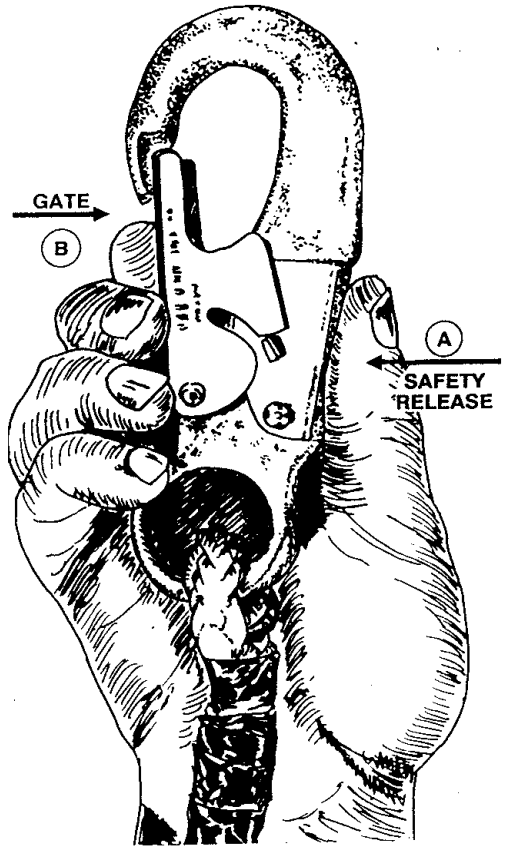
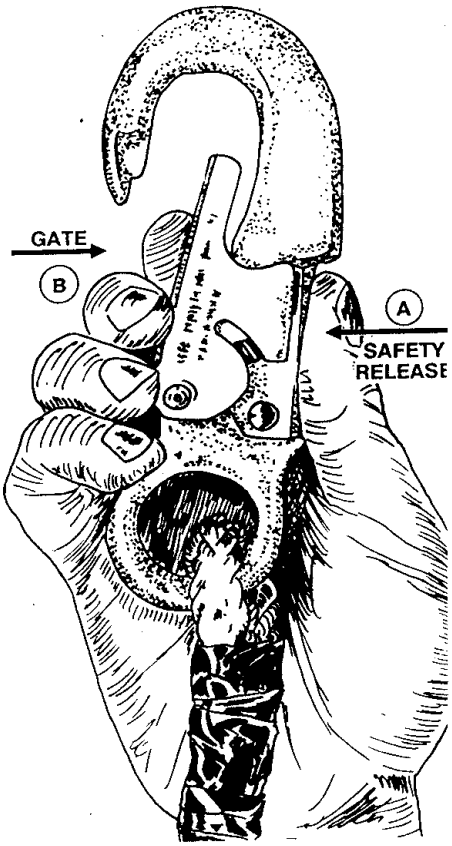
T.B. ROPE 1
DATA SHEET 5
March 8, 2007

DOUBLE ACTING SNAP HOOK

1. Life Saving Ropes and Life Saving Training Ropes received by the department are equipped with double acting snap hooks.

2. Description of Snap Hook:





3. Pressure applied to the Safety Release "A" releases gate "B." Remember, the gate will NOT release unless the Safety Release is pushed first.

BY ORDER OF THE FIRE COMMISSIONER AND CHIEF OF DEPARTMENT

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TRAINING BULLETIN
ROPE 3
March 8, 2007

PERSONAL HARNESS

1. INTRODUCTION

1.1 The personal harness will provide members with a quick and safe means for life saving rope rescues and emergency escapes as well as a safety belt for attachment to a tower, aerial or portable ladder.

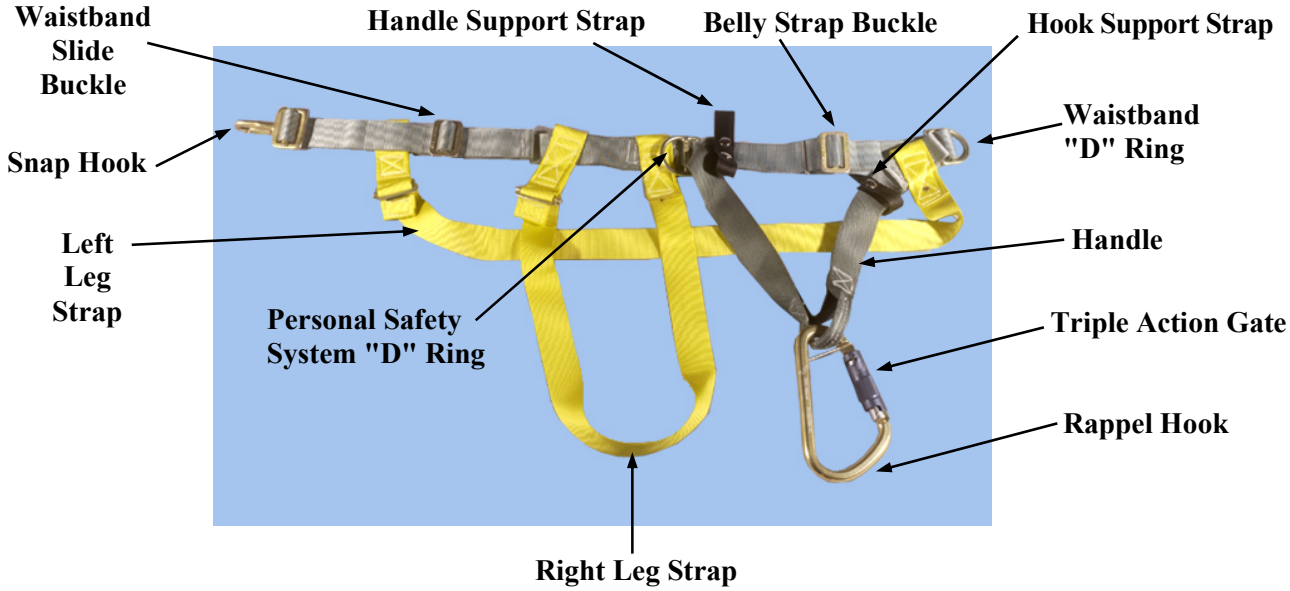
Caution: It is **extremely** important that the Life Saving Rope turns be wrapped around the rappel hook in the proper manner. Training in the use of the personal harness is imperative. Do not slide during rope training without the use of the protective landing mat. The harness will always be attached to the bunker pants.

Note: Members MUST attach the harness snap hook to the waistband "D" ring EVERYTIME they don their bunker pants.

2. DESCRIPTION

2.1 The personal harness is made of nylon webbing and has a minimum breaking strength of 6,000 pounds. The harness comes in three sizes (Small, Medium, and Extra Large) and is adjustable to fit the various size requirements of individual firefighters. Each harness has a unique I.D. number stamped onto a metal tag permanently attached on the inside of the left leg strap. Small harnesses have a small 's' at the end of the serial number, and Extra Large harnesses have a small 'xl' at the end of the serial number.

Figure 1



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2.2 The rappel hook has a gate with a triple action lock.

2.2.1 Members must ensure the gate is in the closed and locked position prior to performing a slide or lowering operation. To check that the gate is locked, apply lateral pressure on the gate with left hand.

2.2.2 The rappel hook is positioned at the center of the waistband while in the stored position. The rappel hook and harness handle are held in the stored position by two straps: a hook support strap and a handle support strap. The handle support strap holds the harness handle to the waistband and the hook support strap holds the rappel hook in a position to the left side of the harness handle. (Figure 2)

Figure 2

2.3 A "D" ring is incorporated to the right side of the harness handle (P.S.S. "D" ring) to provide a connection point to the Personal Safety System. The Personal Safety System "D" ring is permanently attached to the harness and a carabiner is used to connect the EXO descender to the "D" ring. The carabiner is used with the "D" ring so that a firefighter can easily detach from the system once an area of refuge has been reached. The storage bag holding the EXO descender, rope, and anchor hook is attached on the right side of the personal harness.

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3. PRINCIPLES OF DONNING AND OPERATION

3.1 Waist Harness.

3.1.1 The proper position for the waistband of the harness is across the upper level of the hip as shown in Figure 2A.

Figure 2A

Proper Waistband Level

3.1.2 The waistband must fit snugly to prevent the harness from riding up to the area above the hip where there is no bone structure to support the weight of the body on the harness.

3.1.3 The waist strap has two adjustable slide buckles (Figure 3):

- a belly strap slide buckle to center the rappel hook and,
- a waistband slide buckle for proper fit around the waist.

Figure 3

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3.2 It is imperative that the harness be properly adjusted to prevent a member from inverting when using the Personal Safety System or rappel hook. Follow the steps below to insure that the harness is properly adjusted:

3.2.1 Lay out the harness with the waistband "D" ring to the left. Grasp the waistband "D" ring with the left hand, palm down.

3.2.2 With right hand, palm down, grasp the waistband at the midpoint between the right leg strap attachments. The remainder of the harness will hang free from the right hand.

3.2.3 Position the "D" ring at the member's left side. Align the vertical section of the "D" ring with the vertical seam of the bunker pants as shown in Figure 4A.

Figure 4A (Correct)

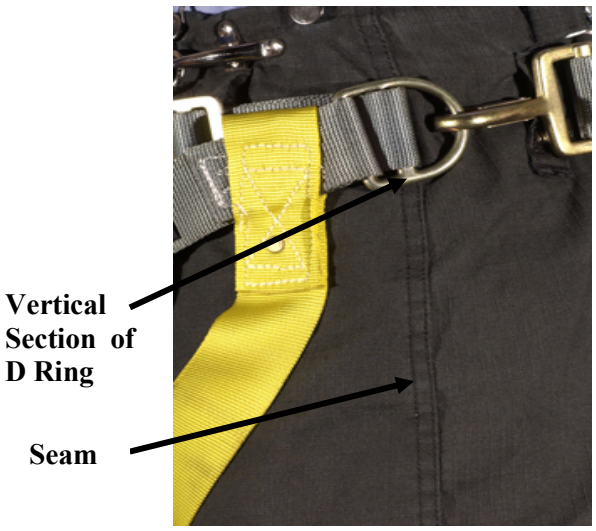

Figure 4B (Incorrect)

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3.2.4 With the right hand, pull the waistband taut.

3.2.5 The right leg strap attachment must line up over the stitched seam of the bunker pants on the members right side as shown in Figure 5A.

Figure 5A (Correct)

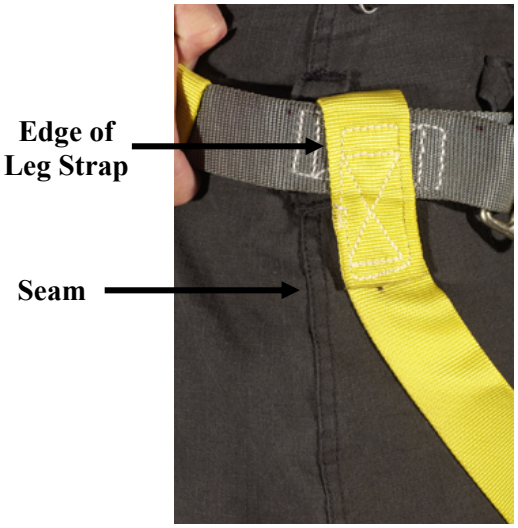


Figure 5B (Incorrect)

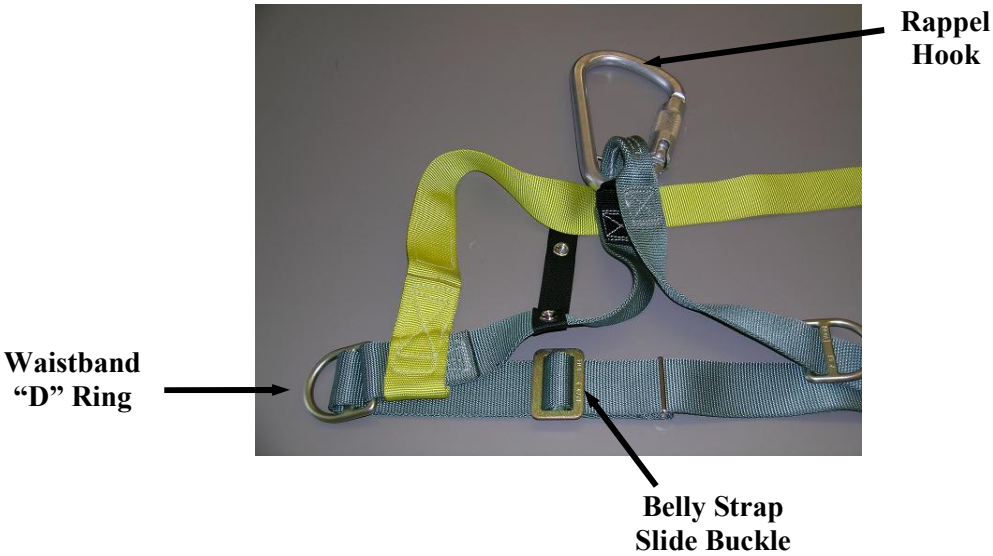
3.2.6 When the waistband "D" ring and the right leg strap attachments do not align as described above, adjustment must be made as follows:

A. Lay the harness on a flat surface with the waistband "D" ring to the left. (Figure 6)

B. Lengthen or shorten the belly strap by feeding the upper layer of webbing through the belly slide buckle in the desired direction to align the waistband “D” Ring as shown in Figure 4A.

C. Recheck harness and repeat until the “D” ring and right leg strap align properly as shown in Figures 4A and 5A.

Figure 6



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3.3 To complete the adjustment:

A. Loosen leg straps.

B. Again, grasp the waistband "D" ring with the left hand palm down.

C. Grasp the snap hook with the right hand palm down.

3.4 The harness is now extended in front of the member and the right foot is placed over and into both leg straps (yellow in color), as shown in Figure 7.

Figure 7

3.5 Pull the waistband upward on the outside of the right leg. The leg straps will be pulled up on the inside of the legs toward the crotch.

3.6 Bring the snap hook behind your back to your left side and attach the snap hook to the waistband "D" ring.

Note: Snap hook and waistband "D" ring will be on left side of body.

3.6.1 A proper fit of the waistband requires a slight degree of effort to connect the waistband "D" ring and snap hook.

Note: The belly strap slide buckle is used only to ensure the proper position of the harness handle and rappel hook.

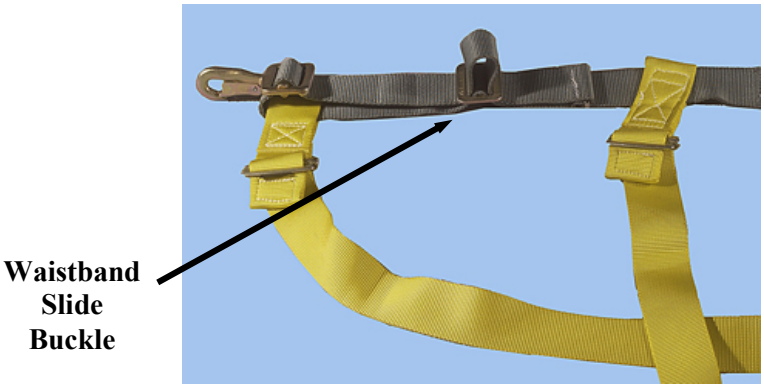
The rear waistband slide buckle is used to insure a snug fit.

3.7 When the adjustment of the waist band is necessary to ensure a snug fit, lay the harness on a flat surface with the snap hook to the left. (Figure 8)

3.7.1 Lengthen or shorten the waistband by feeding the upper layer of webbing through the waistband slide buckle in the desired direction.

3.7.2 Recheck harness and adjust until proper fit is obtained.

Figure 8



3.8 The leg straps should remain loose for a comfortable fit while the harness is worn prior to rappelling or lowering operations.

3.9 Prior to sliding operations, the leg straps must be made snug by reaching back and pulling down on the webbing of each leg strap until the tension of the straps are evenly distributed. Don't over-tighten the leg straps! If the leg straps are over-tightened, the waistband may be pulled down from its proper position.

3.10 When operations dictate the use of the rappel hook, the rappel hook support strap and the handle support strap shall be released and the rappel hook will deploy to the center of the harness handle. **In a situation that dictates the use of the Personal Safety System, only the handle support strap should be released.** The Personal Safety System will slide on the "D" ring to the center of the harness handle. The rappel hook support strap will keep the rappel hook from interfering with the operations of the Personal Safety System.

3.11 Operation of rappel hook gate with triple action lock.

3.11.1 Hold solid part of rappel hook in right hand (Figure 9). With left hand, pull down gate and take a quarter turn to left and push gate toward solid part of rappel hook in right hand. (Figures 9, 9A, 9B, 9C)

Figure 9

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Figure 9A

Pull Down

Figure 9B

Quarter Turn To Left

Figure 9C

Push Gate Towards Solid Part of Hook

3.11.2 Rope is always applied by taking turns under and over the rappel hook away from the rappel hook and away from the body.

3.11.3 To close and lock gate, release from right hand. To ensure that the gate is closed and locked, apply lateral pressure with left hand.

4. INSPECTION

4.1 Harness shall be inspected by the member when issued, replaced or returned, at the start of each tour and after each use.

4.2 Inspect entire harness for cuts, abrasions, discoloration and loose or damaged stitching.

4.3 Check operation of rappel hook gate and triple action lock and captive pin.

4.4 If any abnormality of harness or rappel hook exists place it out of service.

4.5 If persistent or unknown stains are discovered place the harness out of service.

4.6 **Do not** repair or modify the personal harness or rappel hook.

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4.7 Whenever a personal harness is subjected to an impact load it shall be placed out of service. A member free falling three feet or more is considered a sufficient impact load to warrant placing the personal harness out of service.

4.8 When doubt exists regarding the serviceability of a personal harness, it shall be placed out of service.

5. MAINTENANCE

5.1 When the harness is wet, lay it out to air dry.

A. **Do not** lay it in direct sunlight.

B. Avoid placing nylon webbing in contact with metal as this may cause rust stains.

C. When it is dry, re-inspect the harness.

5.2 Lubrication is not necessary for the rappel hook gate.

5.3 Decontamination:

5.3.1 When the Personal Harness becomes contaminated from fireground contaminants, the Personal Harness shall be decontaminated in quarters using a sponge and water. A mild detergent may be used if necessary.

5.3.2 When contaminated with blood or other potentially infectious material, members shall follow the procedures outlined in CFR-D Manual, Chapter 3.

5.3.3 When the Personal Harness has been grossly contaminated from other than fireground contaminants, it shall be placed out of service.

5.3.4 When the Personal Harness is placed out of service due to non-fireground contamination, the officer shall follow the procedures outlined in section 6 and complete and fax form EDR-1 to the Haz-Mat Decontamination Support Unit (DSU) for pick up of the contaminated equipment.

6. REPLACEMENT

6.1 Each Division has been supplied with ten replacement Personal Harnesses to be immediately assigned to members when replacement is necessary. For Personal Safety System replacement procedures refer to Training Bulletin Rope 4, "Personal Safety System." If more than ten Personal Harnesses are needed in one Division, the Division shall contact the Rope unit at the Fire Academy for additional harnesses during normal business hours. SOC has been supplied with 50 replacement Personal Harnesses which can be issued to members when the need arises at any other time.

6.2-6.5 ***Redacted for PFS***

6.6 Each member shall inspect the Personal Harness assigned to them from the Division following Section 4 of this bulletin.

6.7 Decontaminated equipment shall be returned from DSU to the Research and Development unit for evaluation.

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6.8 When the original or replacement Personal Harness is returned to the member, the member's loaner Personal Harness shall be returned to the administrative Division. The Company officer shall make the appropriate entries.

Note: No exchange will be permitted without the completed SCF-2.

6.9 When a member's Personal Harness has been placed out of service and he/she is on duty, the member will continue to respond. However, that member shall not be counted towards that unit's staffing as it relates to the provisions of AUC 287, section 8 (reduced staffed/understaffed unit). Upon arrival, the Company Officer shall inform the Incident Commander (IC) of the unit's status, and the IC shall adjust his/her strategy accordingly. The unit shall follow all of the operational guidelines outlined in AUC 287, section 8. At an incident where members will be operating in an IDLH (Immediately Dangerous to Life and Health) area, the member(s) not equipped with a Personal Harness shall not enter/operate in that area.

6.10 ***Redacted for PFS***

7. ACCOUNTABILITY

7.1 Maintenance of the harness is the responsibility of the member to whom it is issued.

7.2 ***Redacted for PFS***

7.2.1 The member is responsible for inscribing his or her name with an indelible marker on the inside of the harness belly strap.

7.3-7.4 ***Redacted for PFS***

7.5 A Lost Property Report (FS-112) is required for lost equipment.

BY ORDER OF THE FIRE COMMISSIONER AND CHIEF OF DEPARTMENT

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TRAINING BULLETIN
ROPE 4
March 8, 2007

PERSONAL SAFETY SYSTEM (PSS)

1. DESCRIPTION

1.1	F.D.N.Y. Designation	Personal Safety System (PSS)
1.2	Components	Anchor Hook, 50' Kernmantle Rope with Sewn Eye, EXO Descender with triple action carabiner and Storage Bag.
1.3	Hook Material	Dropped Forged Alloy Steel. (Figure 1)
1.4	EXO Descender	Equipped with an operating handle used to control descent. Self locking cam prevents member from an uncontrolled descent when operating handle is released. (Figure 2)
1.5	Hook: Load Capacity	5000 pounds at tip, 10,000 pounds at saddle.
1.6	Rope: Material	Technora Sheath, Technora Core
1.7	Rope: Diameter	7.5 mm (19/64")
1.8	Rope: Length	50 Feet
1.9	Rope Tensile Strength	Meets NFPA standard of 3034 pounds
1.10	System: Work Load	Meets NFPA Std. - 10:1 safety factor based on 300 pounds
1.11	System: Markings	Tracking number assigned by R & D.
1.12	System: Characteristics	Technora Rope with the Anchor Hook attached at the Sewn Eye. The rope passes through the EXO, over the bent flange and through the "U" shaped rope guide. There is a Figure "8" stopper knot tied at the end of the rope.

ANCHOR HOOK WITH SEWN EYE

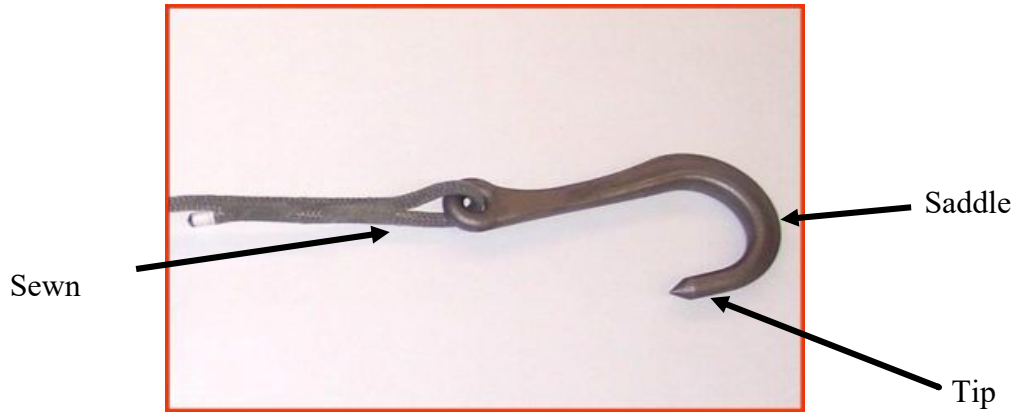

Figure 1
PETZL EXO WITH LOCKING CARABINER

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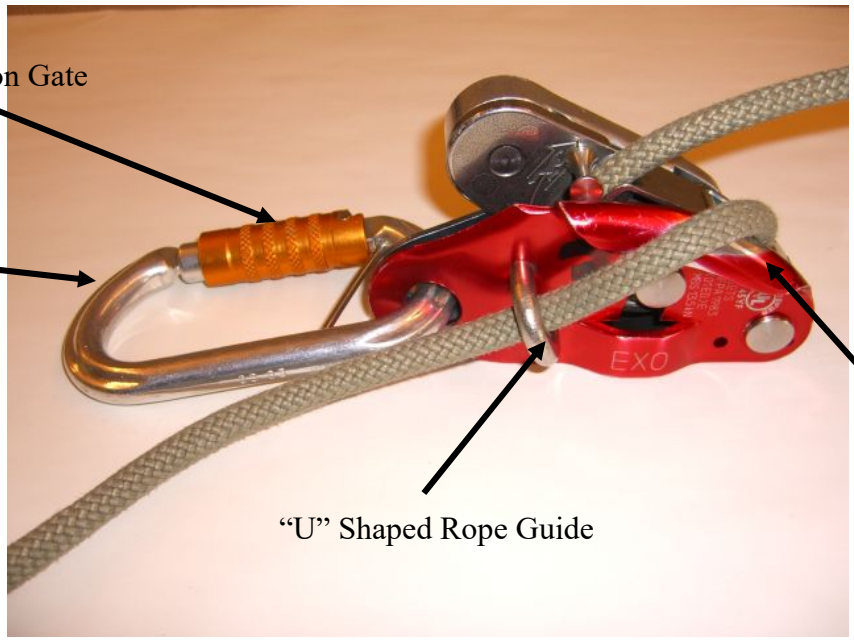

Figure 2

2. INTENDED USE

2.1 Used only by members to remove **THEMSELVES** from an untenable position above grade to a place of safety. **The PSS is a ONE TIME use system** and is only to be used as a last resort.

2.2 After use, the PSS will be placed out of service.

PSS STORAGE BAG WITH EXO AND ANCHOR HOOK WITH SEWN EYE

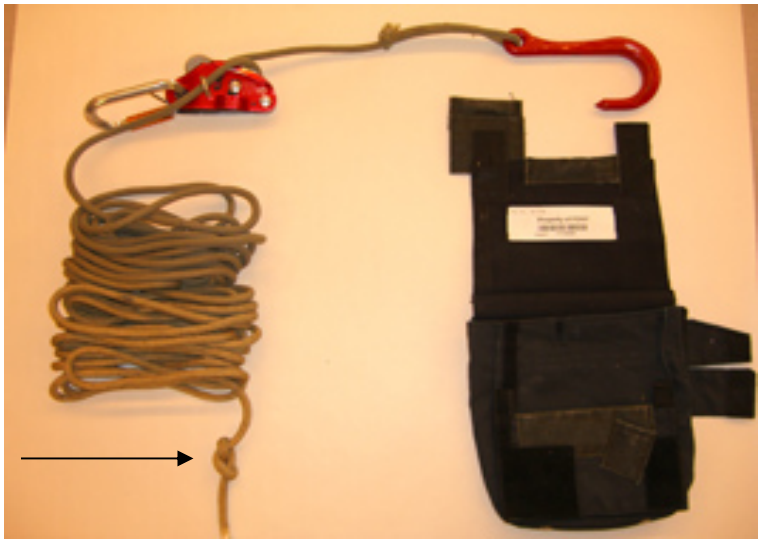

Figure 3

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3. ATTACHING THE PERSONAL SAFETY SYSTEM BAG TO THE PERSONAL HARNESS

3.1 Visually inspect the components of the bag to ensure they are properly packaged as per Training Bulletin Rope 4 Data Sheet 1.

3.2 Lay the packed PSS bag out on a clean surface with Arashield attachment straps facing up. Ensure that all Arashield bag attachment straps and small velcro securing tabs are in the open position.

3.3 With the interior side of the waist band facing up, drape the harness over the PSS bag. Ensure the rear of the right leg loop of the personal harness is positioned between the two Arashield bag attachment straps. (Figure 4)

3.4 Starting with the strap that is between the leg loop, wrap the small Velcro securing tab tightly around the harness waist band.

3.5 Secure large Arashield strap around the waist band and the small Velcro securing tab. Fasten the snap. (Figures 5A & 5B)

3.6 Repeat above fastening procedure with the rear strap. Secure small Velcro tab and Arashield strap just behind the rear of the right leg loop.

3.7 Secure the right leg loop retaining strap by fastening the snap.

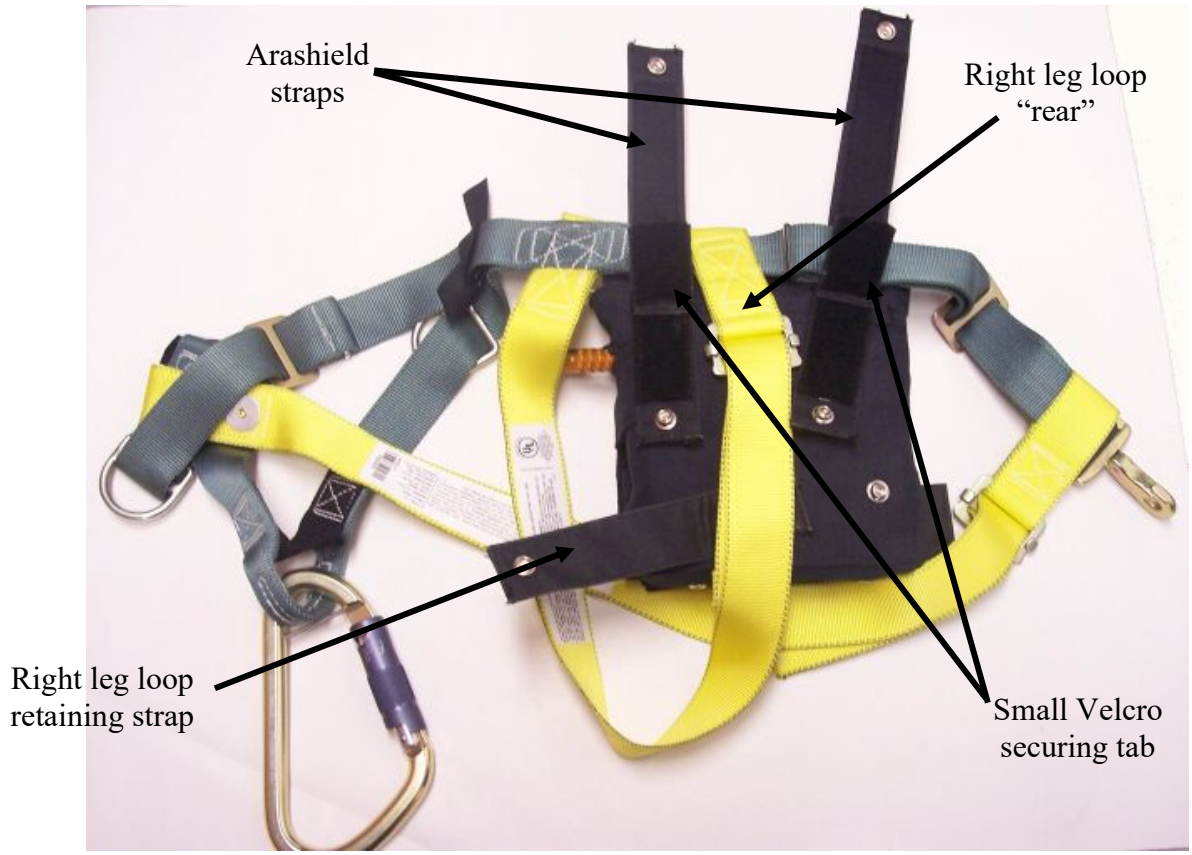

Figure 4

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Figure 5A

Figure 5B

4. CONNECTING CARABINER TO PSS D RING

4.1 After mounting the bag to the waist band of the harness, the carabiner must be attached to the PSS "D."

4.2 Slide the PSS "D" ring back to the point where the harness handle is attached to the waist band. Ensure the harness handle lays flat against the waist band of the personal harness.

4.3 Open Triple Action Gate in the following manner:

4.3.1 Grasp the triple action gate with the right hand.

4.3.2 Slide the gate forward as far as possible.

4.3.3 Take one quarter turn to the left.

4.3.4 Push gate over to the spine of the carabiner.

4.4 Grasp the PSS "D" ring with the left hand.

4.5 Place open carabiner into the center of the PSS "D" ring and allow gate to close around the ***BOTTOM*** portion of the "D" Ring. (Figure 6)

Figure 6

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4.6 Ensure the gate has closed and locked securely by applying lateral pressure on the gate towards the spine of the carabiner.

4.7 When the harness and the PSS are properly donned, the gate should be facing down and away from the body. (Figure 7)

Figure 7

5. INSPECTION

5.1 The PSS shall be inspected at the following times:

5.1.1 At the start of each tour.

5.1.2 Semi-annually.

5.2 The PSS shall be properly connected to the right side of the personal harness at all times, as illustrated in Figure 8.

Figure 8

5.3 At the start of each tour, the PSS shall be inspected for the following:

5.3.1 Bag properly connected to the harness.

5.3.2 Carabiner properly connected to the PSS "D" ring.

5.3.3 If the bag (or any component of PSS) shows signs of heat exposure (discoloration, degradation, melting, charring, etc.) the entire system (PSS bag, rope, EXO, and harness) should be placed out of service as specified in section 6. (Figure 9)

5.3.4 The PSS outer flap should be opened and a visual inspection conducted. The anchor hook, EXO and carabiner shall be checked for any deformities, sharp edges, or defects. Depress the cam and pull 3-6 inches of rope through the EXO to ensure the device functions properly. Pull rope back through the EXO leaving 8 inches between the EXO and the Anchor hook. Replace the EXO and Anchor hook into the bag and ensure the rope separation flap Velcro is secured and EXO is properly positioned on top of it (TB Rope 4, Data Sheet 1). Close the bag, securing components inside. If any doubt exists about the serviceability of any component, the PSS should be placed out of service as specified in section 6.

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Figure 9

5.4 Semi-Annual Inspection of PSS

5.4.1 PSS shall be repacked semi-annually as part of the Semi-Annual Safety Equipment Inspection, and as needed. (See Training Bulletin, Rope 4 Data Sheet 1 for repacking instruction).

5.4.2 The semi-annual inspection shall cover the entire PSS.

5.4.3 The entire length of the rope, including sewn eye, shall be checked for fraying, cut fibers, abrasions or other signs that might indicate possible degradation. If any defects are noted, the PSS is to be placed out of service.

Note: The inside liner of the rope bag is dyed black. Over time, the rope can be discolored in spots by contact with the liner indicated by dark shading to the rope. The discoloration of the rope due to the dye does not affect the load bearing capacities of the rope.

5.4.4 The anchor hook, EXO and carabiner shall be checked for any deformities or sharp edges. If any defects are noted the PSS is to be placed out of service.

5.4.5 Ensure that the figure "8" stopper knot is properly dressed at the end of the rope.

5.4.6 If any doubt exists about the serviceability of any component of the PSS, it shall be placed out of service.

5.4.7 Upon completion of required inspection and repacking, the company officer shall update the "PSS Checklist Application" on the Intranet and ensure the EXO and Harness serial number assigned to each member are correct.

NOTE: The sewn eye is only to be used with the issued hook. No other hardware or device should be placed into the sewn eye.

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5.5 Post Operations Inspection of the PSS

5.5.1 After concluding operations, members shall inspect the outside of the bag for any signs of exposure to heat, defects and/or contamination.

5.5.2 If contamination or defects are found, see Addendum 1.

5.5.3 If replacement is needed, follow steps in Section 6.

6. REPLACEMENT

6.1 Each Division has been supplied with 10 replacement Personal Safety Systems to be immediately assigned to members when replacement is necessary. If more than 10 PSS are needed in one Division, the Division shall contact the Rope Unit at the Fire Academy for additional systems Monday to Friday during normal business hours. SOC has been supplied with 50 replacement PSS which can be issued to members when the need arises at any other time.

In an effort to reduce the time of a company being understaffed or out of service due to a members PSS being placed out of service, 2 additional replacement PSS have been issued to the following selected Battalions; Battalion 23, 42, 47 and 53. In addition, one (1) spare PSS repacking kit has been issued to each firefighting unit up to and including Battalion Chief. The spare PSS can be worn by a member while their PSS is being repacked or while awaiting a replacement PSS.

6.2-6.4 ***Redacted for PFS***

6.5 The PSS is a one-time use piece of equipment and is placed out of service after use.

6.6-6.7 ***Redacted for PFS***

6.8 Decontamination:

6.8.1 When the PSS has been contaminated from fireground contaminants, the PSS shall be decontaminated in quarters using a sponge and water. A mild detergent may be used if necessary.

6.8.2 When the PSS has been contaminated with blood or other potentially infectious material, the members shall follow the procedures outlined in CFR-D Manual, Chapter 3.

6.8.3 When the PSS has been grossly contaminated from other than fireground contaminants it shall be placed out of service.

6.8.4-6.8.6 ***Redacted for PFS***

6.9-6.10 ***Redacted for PFS***

6.11 Each member shall inspect the spare PSS repacking kit and the PSS assigned to them from the Division following the semi-annual inspection procedure outlined in this bulletin prior to securing it to the Personal Harness.

6.12 A supply of replacement bags have also been issued to each Division in the event only the bag is defective or contaminated. Defective Bags can be obtained from the Division on a one for one exchange. The Division shall arrange for exchange of defective bags with the Rope Unit on the next available day.

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6.13 For contaminated bags, follow the procedures outlined in Addendum 1.

6.14 Decontaminated equipment shall be returned from DSU to R & D for evaluation.

6.15 When any part of a firefighter's PSS has been placed out of service it shall immediately be replaced as per the procedures outlined in this document. When the firefighter is not equipped with a PSS and a response is received before a replacement is obtained, they will respond with their unit. However, that member shall not be counted towards that unit's staffing as it relates to the provisions of AUC 287, section 8 (reduced staffed/understaffed unit). Upon arrival, the Company Officer shall inform the Incident Commander (IC) of the unit's status, and the IC shall adjust his/her strategy accordingly. The unit shall follow all of the operational guidelines outlined in AUC 287, section 8. At an incident where members will be operating in an IDLH (Immediately Dangerous to Life and Health) area, the member(s) not equipped with a PSS shall not enter/operate in that area.

6.16 ***Redacted for PFS***

7. ACCOUNTABILITY

7.1 Ensuring the serviceability of the PSS is the responsibility of the member to whom it is issued.

7.2 The Battalion and Company Commanders must record the serial number of the EXO Descender and the name of the member to whom it is issued in the Office Record Journal. The serial number of the EXO Descender included with the spare PSS repacking kit shall also be recorded in the Office Record Journal. The electronic PSS Verification System found on the FDNY Intranet shall be maintained.

7.3 The PSS is the property of the member up to and including the rank of Battalion Chief.

7.4 ***Redacted for PFS***

7.5 Upon retirement or termination of service, the PSS shall be returned by the member to R & D.

BY ORDER OF THE FIRE COMMISSIONER AND CHIEF OF DEPARTMENT

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PERSONAL SAFETY SYSTEM (PSS) REPACKING PROCEDURE

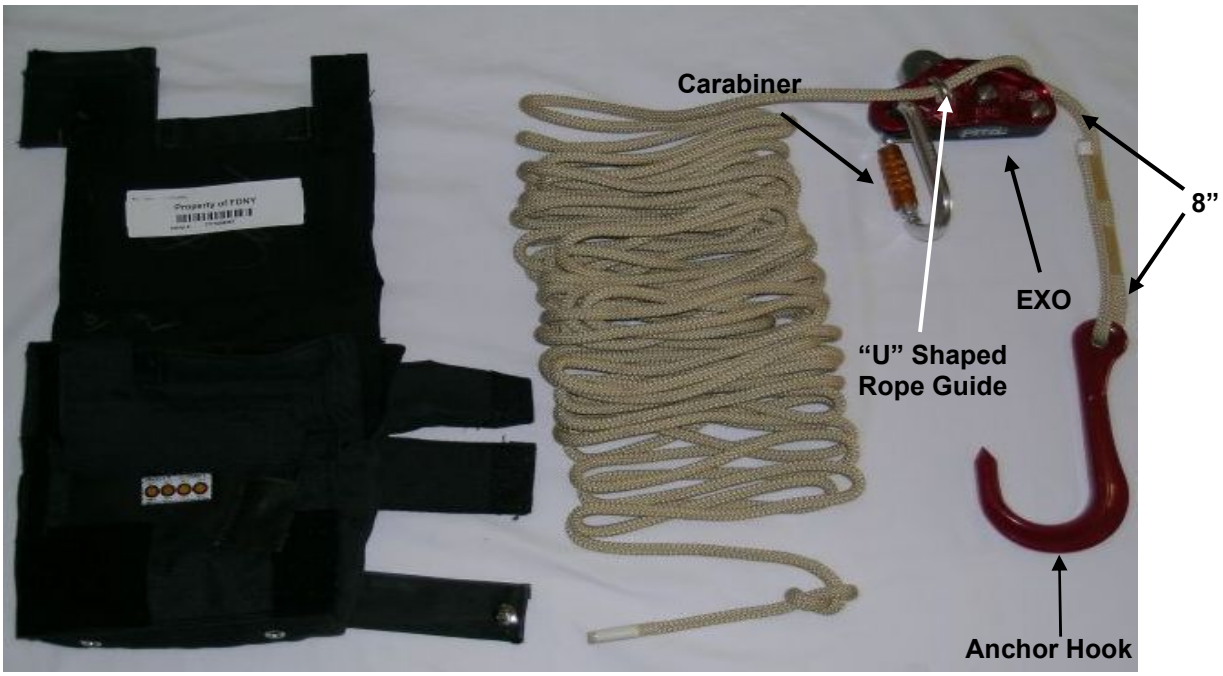

Figure 1

- The PSS is laid out on a clean flat work area. (Figure 1)
- The bag should be placed on its back with bag opening facing away from member.
- Place the figure 8 stopper knot on right edge of flap closure just above rope storage section.(Figure 2)
- Weave rope to opposite edge of flap and return to the right edge, folding the rope next to the previous row. Continue this process making five flat rows. (Figure 2)
- Slide five folds into rope storage section of bag. Repeat this process until approximately 18 inches of rope with hook and EXO remain.
- Be sure to maintain 8 inches of rope between eye of hook and EXO. (Figure 1)

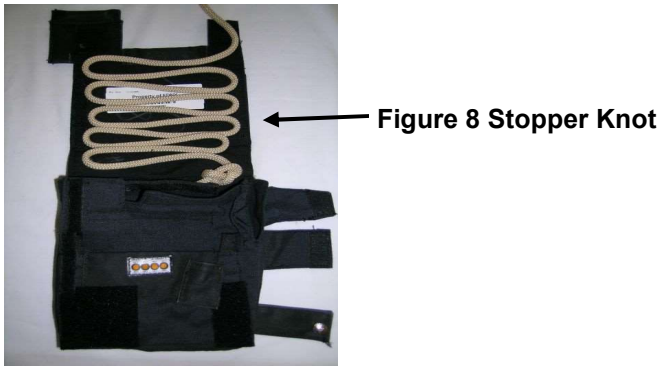

Figure 2

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- Secure rope in lower compartment by closing the rope separation flap and fastening Velcro closure.
- The portion of rope coming from the rope storage area to the EXO should pass through the small cutout in the rope separation flap and rest on the side of EXO closest to the body if the bag were mounted on waist band of the personal harness.
- The rope shall have an eight inch loop between the "U" shaped rope guide and the EXO. (Figure 3)
- Place EXO flat side down on top of the rope separation flap with the handle of the EXO facing away from the body if the bag were mounted on the waist band of the personal harness.

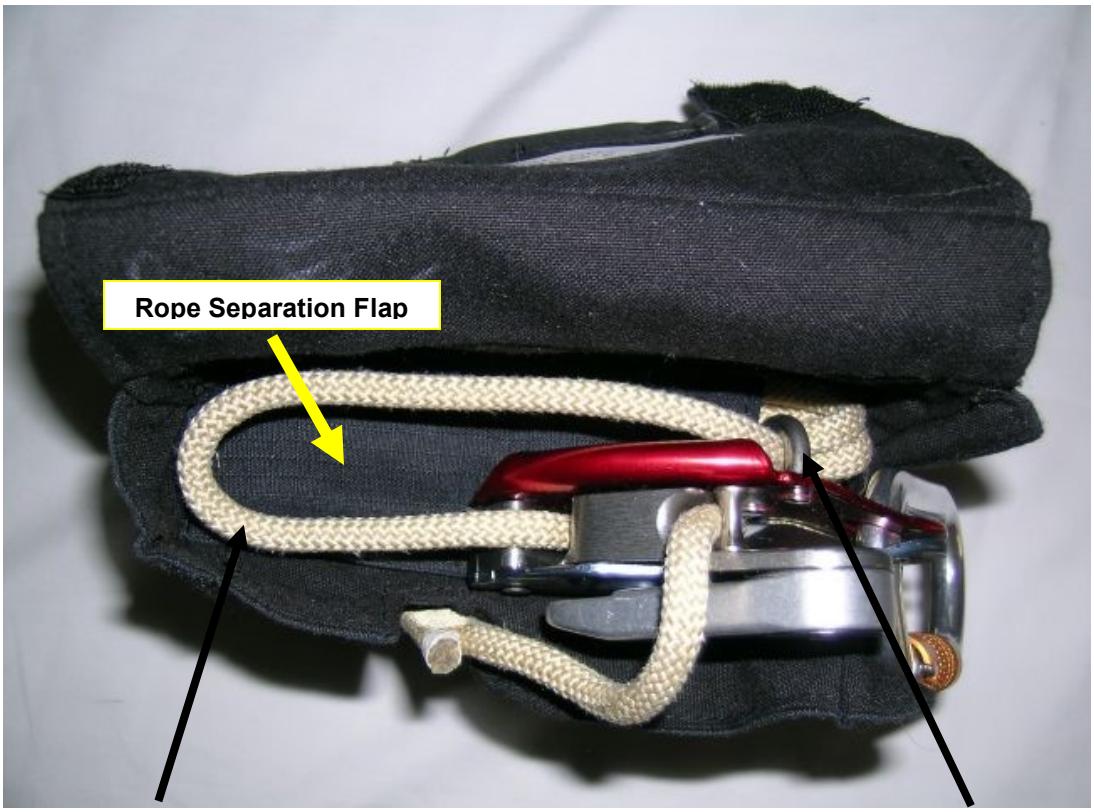

Figure 3

- The end of rope connected to the hook/anchor then passes over the handle of the EXO.
- Fold the 8 inches of remaining rope behind back edge of Anchor/Hook and place hook and rope into the hook pocket. Place the tip into its keeper. (Figure 4)
- The carabiner will extend out of the cutout on the leading edge of the storage bag with the (gold colored) triple action lock gate facing away from the body if the bag were mounted on the waist band of the personal harness.
- Any excess rope between storage compartment and EXO should be packed into the lower rope compartment via the 2" cutout in the rope separation flap at this time.

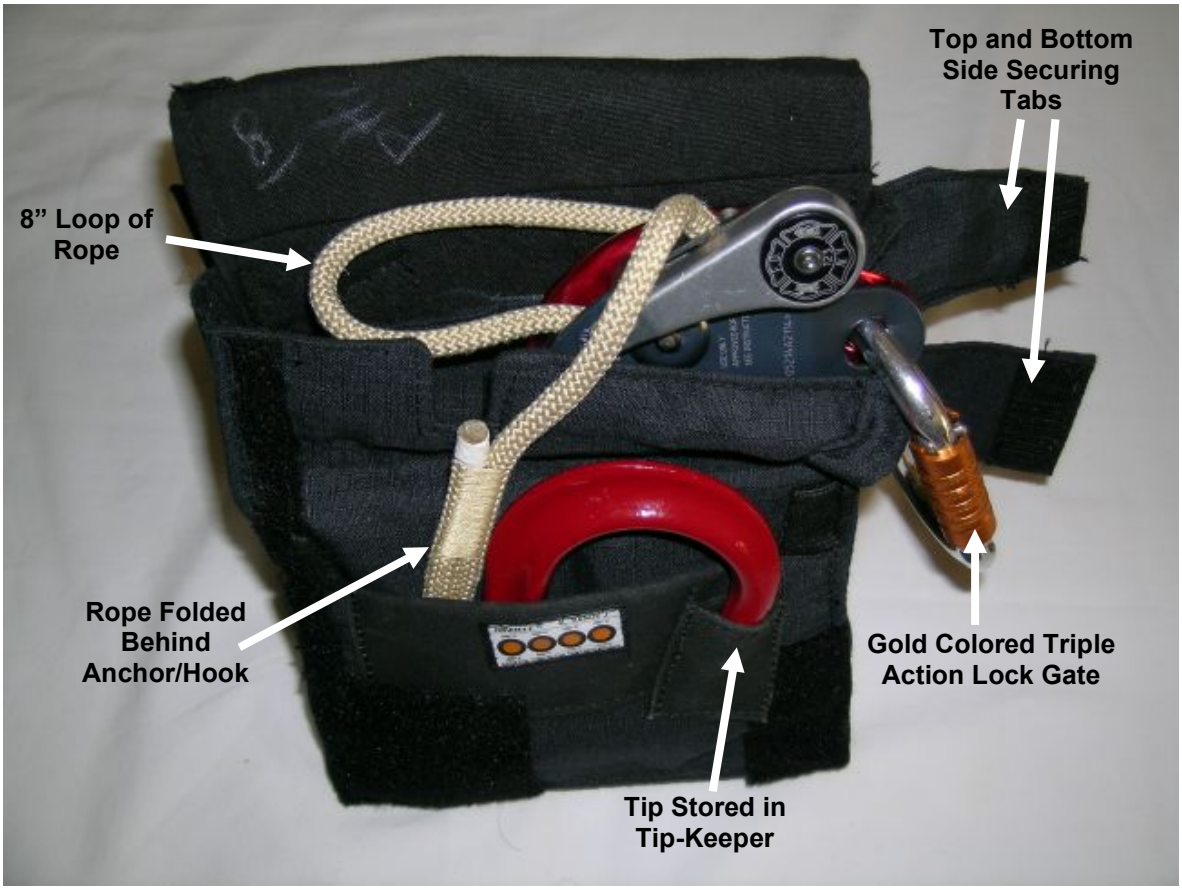

Figure 4

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- Secure outer flap with Velcro closure.
- The two side securing tabs are now connected. The top tab runs through the Carabiner and the bottom tab runs underneath Carabiner. Secure both tabs with Velcro closure. (Figure 4)
- Storage Bag may now be connected to the personal harness.

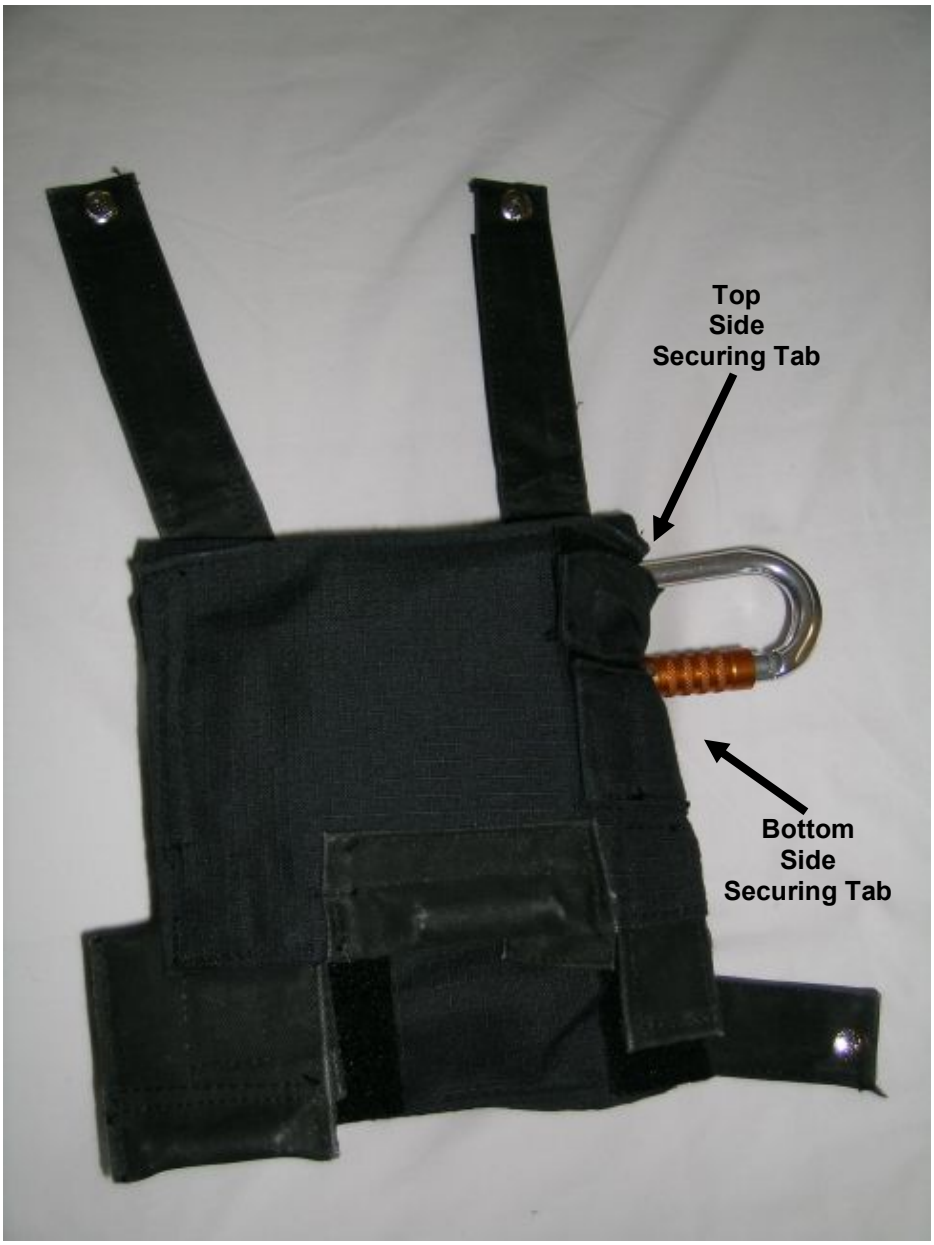

Figure 5

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- Every firefighting unit up to and including Battalion Chief has been issued one (1) spare PSS that can be worn by a member while their PSS is being re-packed or while awaiting a replacement PSS. Battalion and Company Commanders shall secure the spare PSS and ensure that it is only utilized until the permanently assigned PSS is placed in-service. The serial number of the EXO Descender included with the spare PSS shall be recorded in the Office Record Journal.
- Each spare PSS shall be inspected prior to placing it in-service and before being re-secured by the Battalion or Company Officer after use. The spare PSS shall be re-packed as needed and Semi-annually as per TB Rope 4.
- Instructions for attaching the spare PSS to the Personal Harness are found in Training Bulletin Rope 4.

BY ORDER OF THE FIRE COMMISSIONER AND CHIEF OF DEPARTMENT

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T.B. ROPE 4
ADDENDUM 3
August 26, 2014

PERSONAL SAFETY SYSTEM (PSS) WITH TEAR AWAY FLAP

1. INTRODUCTION

The storage bag for the Personal Safety System (PSS) has been enhanced with more durable materials to provide for increased longevity. The outer flap has also been replaced with a Tear Away Flap (TAF), designed to allow a member the ability to quickly and completely remove the protective flap allowing unrestricted access to the anchor hook.

2. DESCRIPTION

In addition to the detachable flap, PSS systems equipped with the TAF have the following new features (See Figures 1 and 2):

- The exterior of the flap is provided with orange and silver reflective 3M material.
- An Alignment Positioning Snap (APS) is provided to secure the flap to the bag.

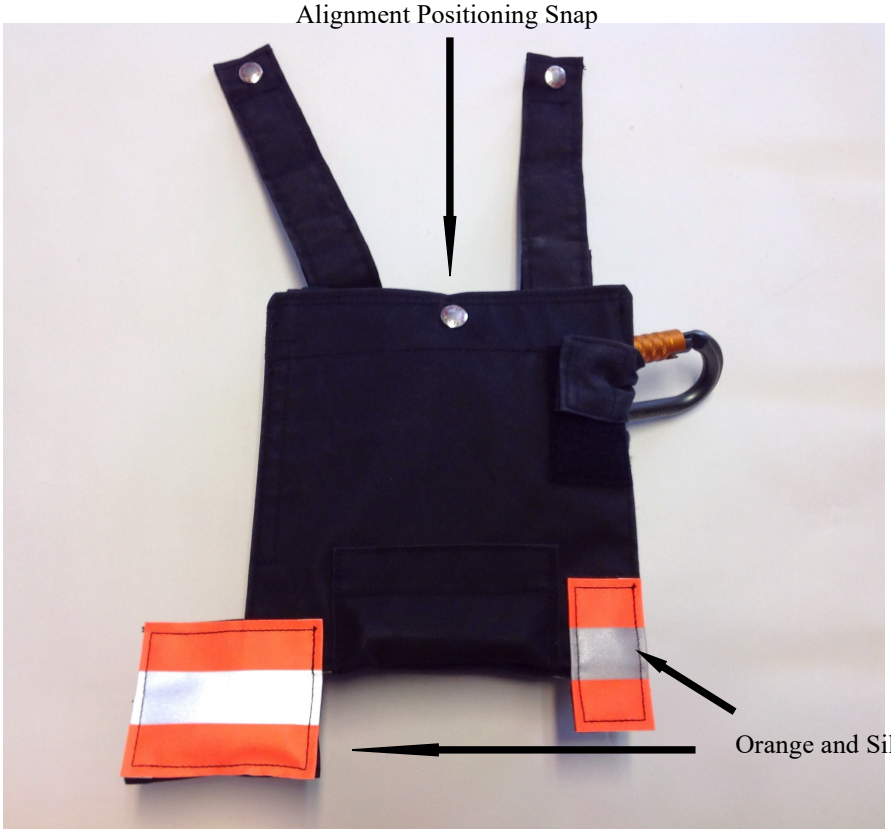

Figure 1

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- The top of the storage bag has a ¾" strip of Velcro and snap to attach the TAF.
- The TAF is provided with a 1" strip of Velcro and snap to secure it to the storage bag.
- The bottom of the TAF is provided with a 1" strip of Arashield to assist in grabbing and removing the flap during deployment.
- The interior of the flap is covered with yellow Kevlar.

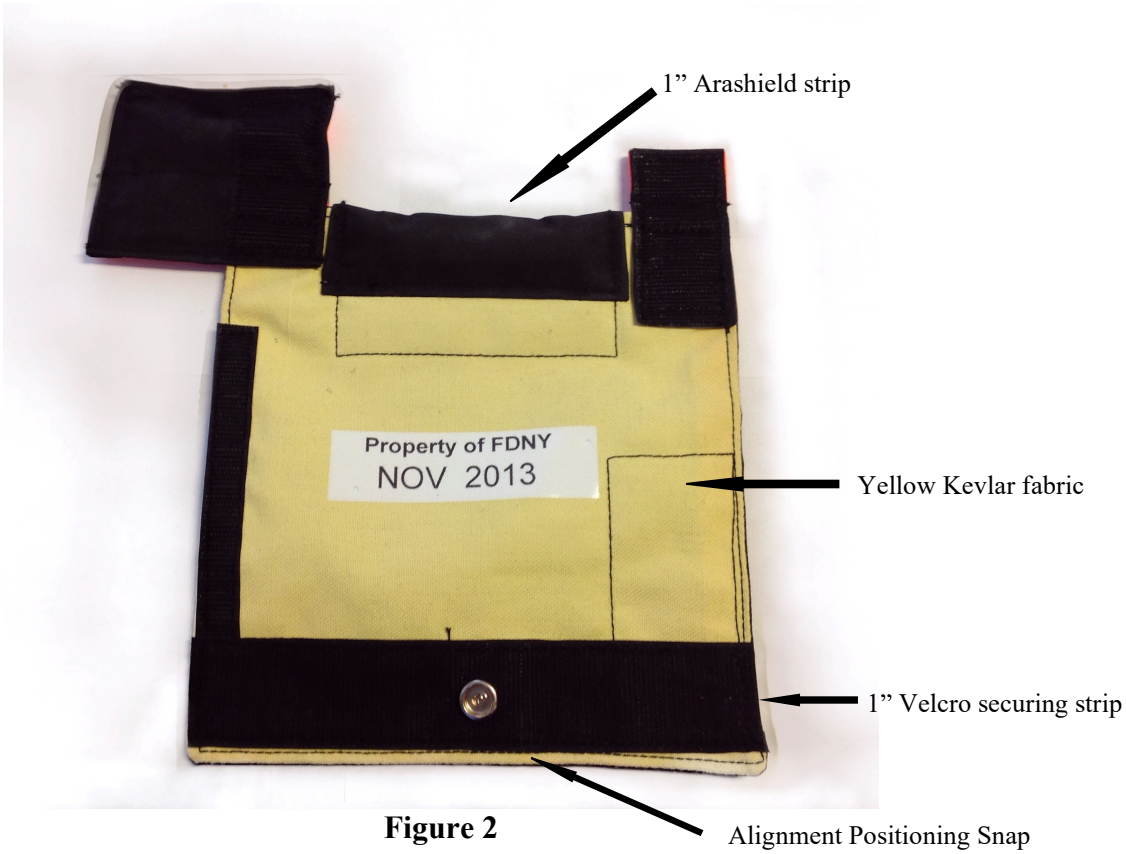

Figure 2

3. ATTACHING THE TAF TO THE STORAGE BAG

- Align the ¾ inch Velcro strip at the top of the storage pouch with the 1 inch Velcro strip at the top of the TAF (See Figure 3).
- Secure the two components together with the alignment positioning snap.
- Close the TAF over the front of the storage bag and secure the bottom with the two Velcro tabs. To ensure a proper attachment, the TAF should be square to the edges of the storage bag when it is closed.

Note: If the TAF cannot be securely attached to the storage bag follow the existing PSS replacement procedures found in Training Bulletin Rope 4.

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Figure 3

4. IMPLEMENTATION

The PSS with the TAF is designed to replace the original PSS bag.

- Procedures for deploying the PSS with the TAF do not change from those found in current FDNY documents, with one exception:
  - When deploying, grab the flap, rip it straight up, and pull it completely off to expose the hook.
- Procedures for packing and inspecting the PSS with the TAF do not change from those found in current FDNY documents, with the following addition:
  - During daily and semi- annual inspections, members should ensure that the Velcro and the APS have not been damaged and are functioning properly.
- All other procedures concerning the use, inspection, replacement, etc… of the PSS system remain unchanged.

BY ORDER OF THE FIRE COMMISSIONER AND CHIEF OF DEPARTMENT

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TRAINING BULLETIN
ROPE 5
March 8, 2007

KNOTS AND HITCHES

NOMENCLATURE

Hitch	A temporary method of securing an object, fastened so that it can be readily undone, i.e., Half Hitch.
Bend	The tying of the ends of two ropes to make a continuous rope, i.e., Becket Bend.
Knot	The tying of the parts of one or more ropes so that they will not slip, i.e., Bowline.
Bight	Formed by making a loop in the rope.
Working End	The part of the rope which is used in tying the knot.
Standing Part	The long unused portion of the rope.

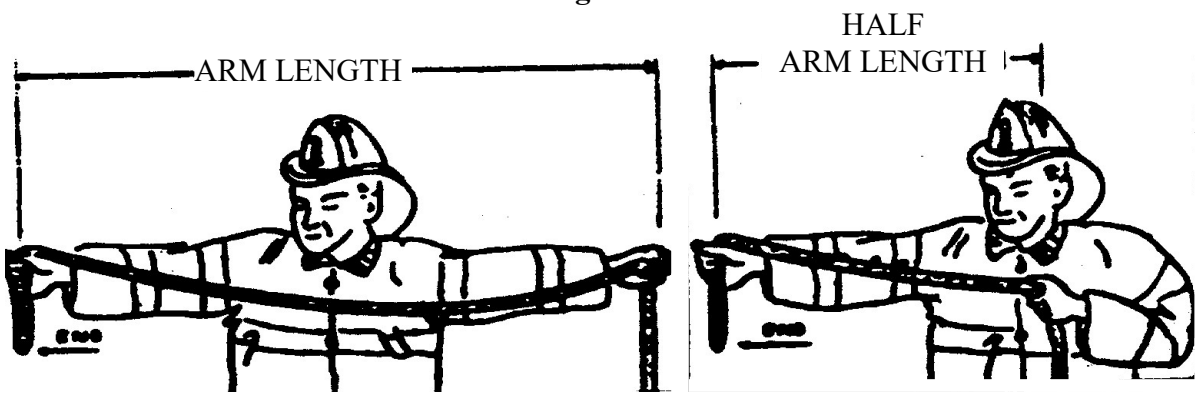
REQUIRED LENGTH OF ROPE FOR KNOTS

Bowline on a Bight	-	1½ arm lengths
Rolling Hitch	-	1½ arm lengths
Knots to Hoist Ladders	-	1½ arm lengths with a 1 ft. end

MEASUREMENT

Measurement of rope required to form the various knots and hitches is made by stretching the arms out and holding the rope between the hands. The full distance measured is one arm length. A half arm length is measured by holding the rope in the left hand at the center of the chest and stretching the rope to the right. Note that approximately 6" is allowed to dangle from the right hand.

Figure 1



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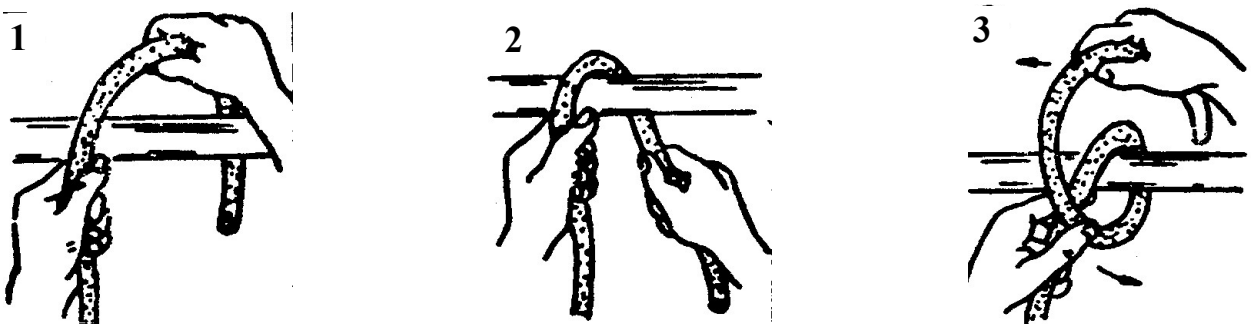
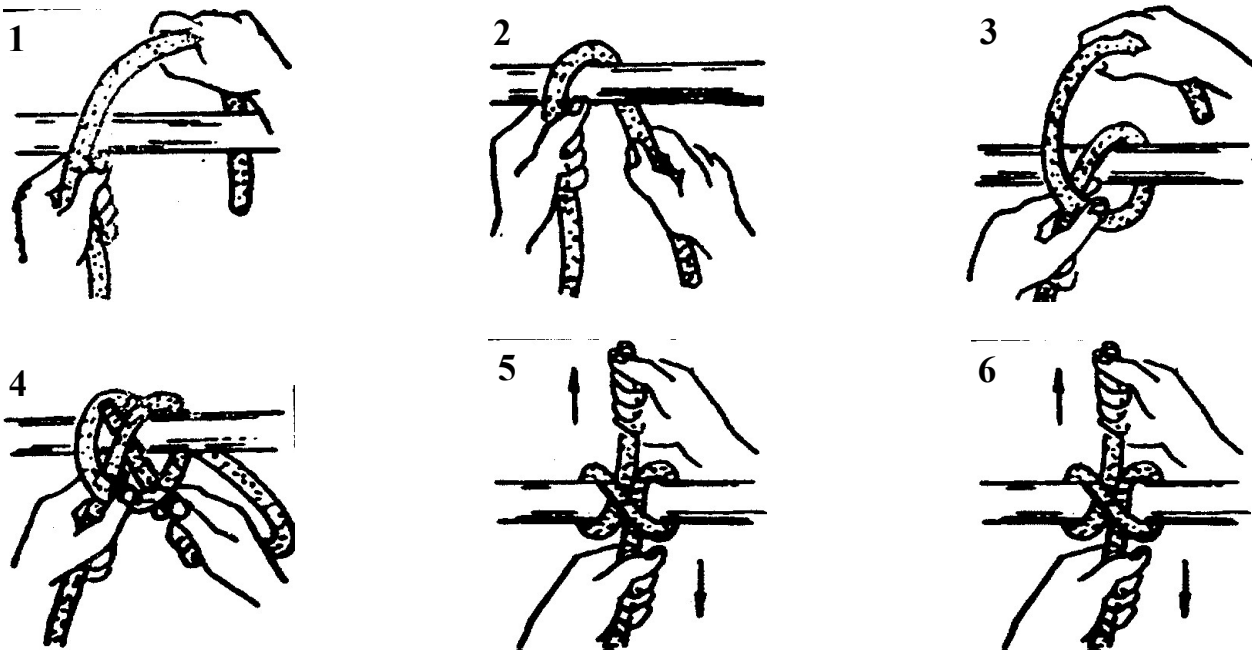
Knots and hitches are shown tied loosely to demonstrate the proper method. In method practice knots and hitches shall be made up securely.

HALF HITCH



The half hitch is used when hoisting or lowering tools and equipment. It is also used as a binder to secure knots.

CLOVE HITCH



The clove hitch is formed by making two half hitches. It is used in the hoisting and lowering of tools and equipment, in the hoisting of hose lines, when drafting water and various other operations. Unless otherwise specified, a binder shall always be tied in conjunction with a clove hitch, except where it is tied away from the working end of the rope (slip-over clove hitch).

When making a clove hitch for the hoisting of tools and equipment, the pull on the rope may be from the upper or lower hitch depending on how the hitch was started or if the slip-over hitch was used.

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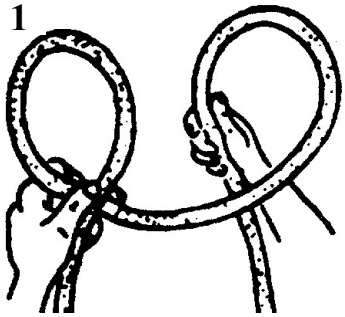
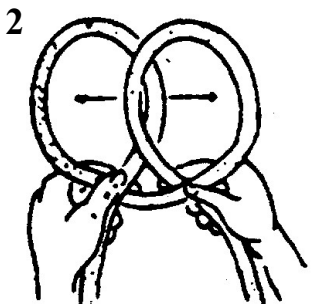
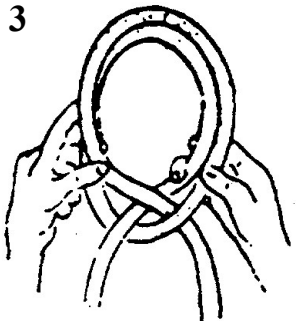
SLIP-OVER CLOVE HITCH

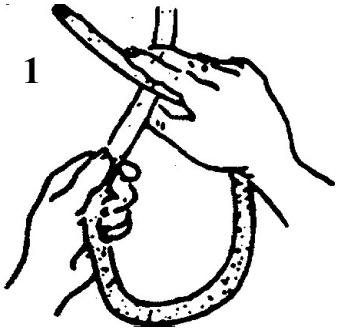




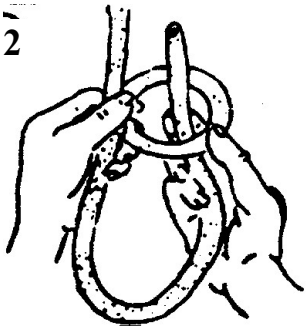


The slip-over clove hitch is made by forming two half hitches in the hand. It may be used to advantage by slipping the completed clove hitch over the end of the object, as in hoisting the hook, halligan tool or extinguisher.

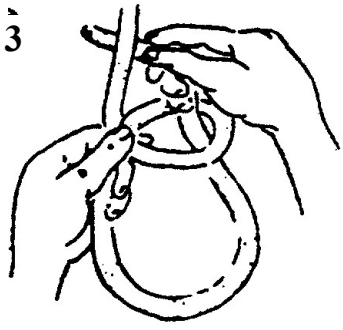
THE BOWLINE KNOT



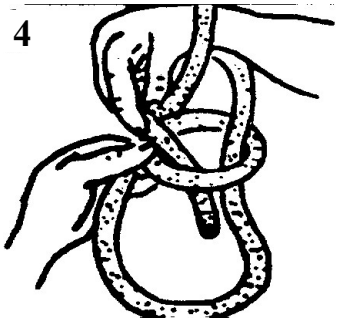
With rope held in this position, press down with fingers and up with thumb of right hand and forming loop in rope.



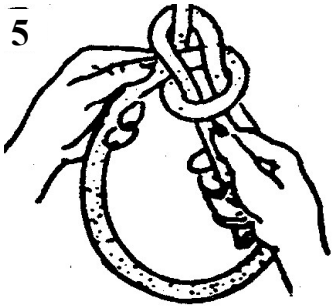
Loop is held in position with left hand until knot is completed.



End of rope brought up through loop with right hand, taken around in back of rope held in left hand.



Continue to bring rope around until end is placed down into loop held with left hand.



Take hold of rope end coming down through loop with right hand and pull tight to complete knot.

The bowline knot will not slip nor tighten under tension and is easily untied. It is used in hoisting and lowering ladders (20’ and over). The bowline is useful where a loop is needed that will not slip.

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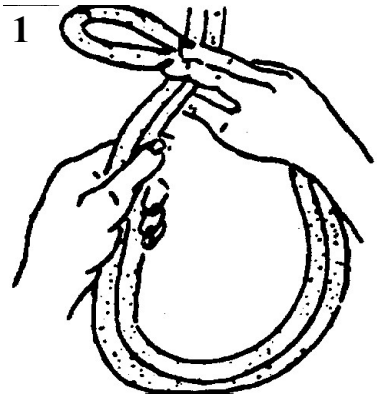
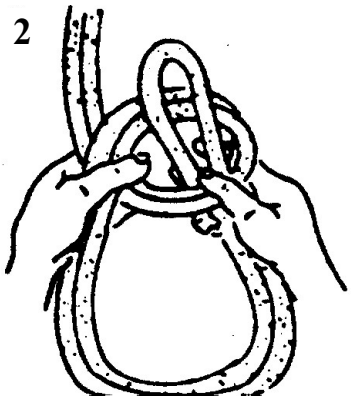
THE BOWLINE ON A BIGHT

1



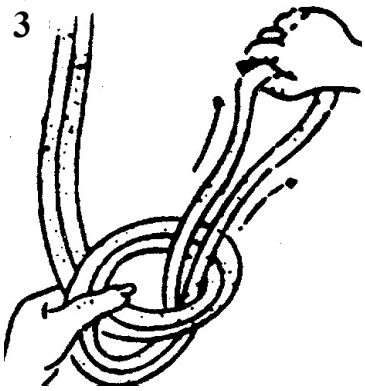
Measure 1 1/2 arm lengths; loop rope back on itself. Hold doubled rope in left hand about 4' from looped end. Place loop across doubled rope above left hand.

2



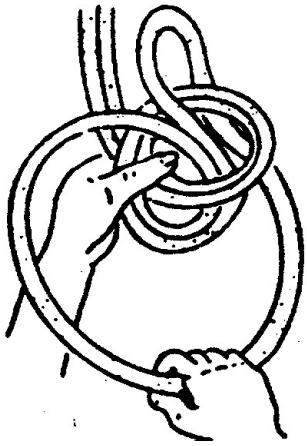
Form a small loop with left hand by turning the rope forward and up over the doubled rope held in right hand.

3



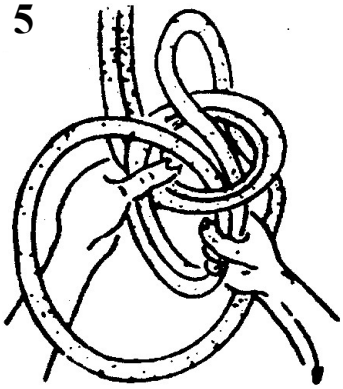
Pull the doubled end completely through the loop.

4



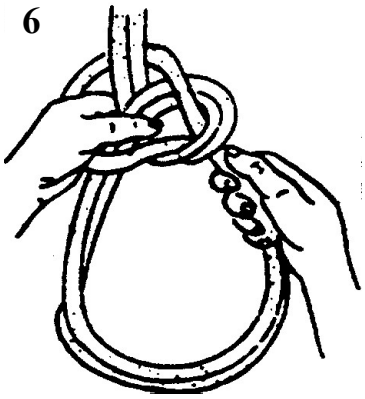
Fold the large loop behind the small loop.

5



Pull the doubled rope down through small loop.

6



Make up knot securely.

The bowline on a bight is a very important knot. It is commonly used to lower a firefighter to rescue persons trapped at windows which are not readily accessible to ladders. Other rescue purposes include the lifting of persons from excavations, sewers, etc., and the lowering of persons from places where safer escape routes are not available. The bight forms a cradle to support the firefighter and the bowline prevents the rope from tightening or slipping. The bowline on a bight is used in conjunction with a half hitch and a slippery hitch tied about the chest.

Note: The 4' referred to under illustration 1 is approximate. Allowances must be made according to size of the person to be lowered.

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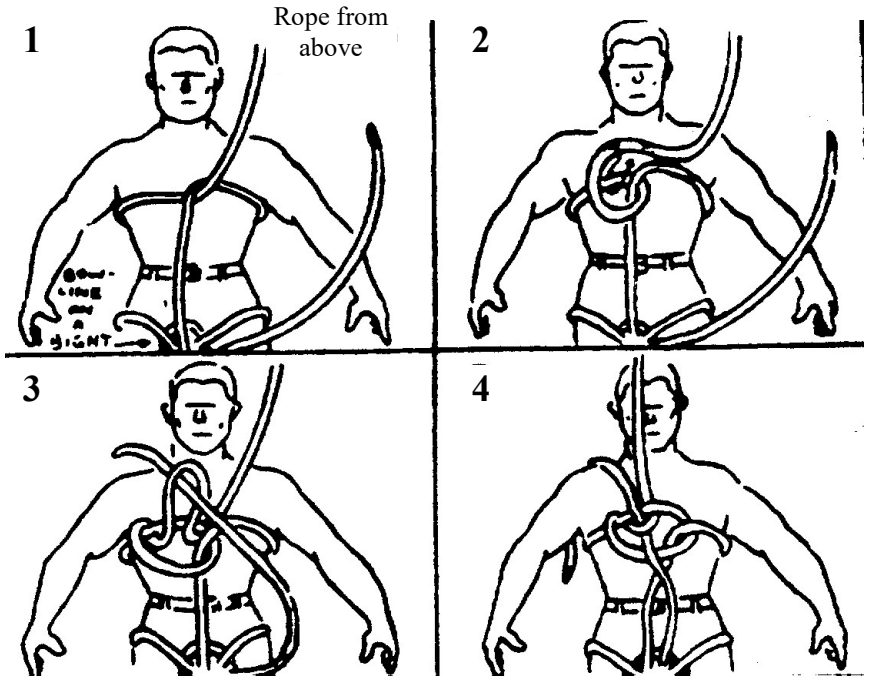
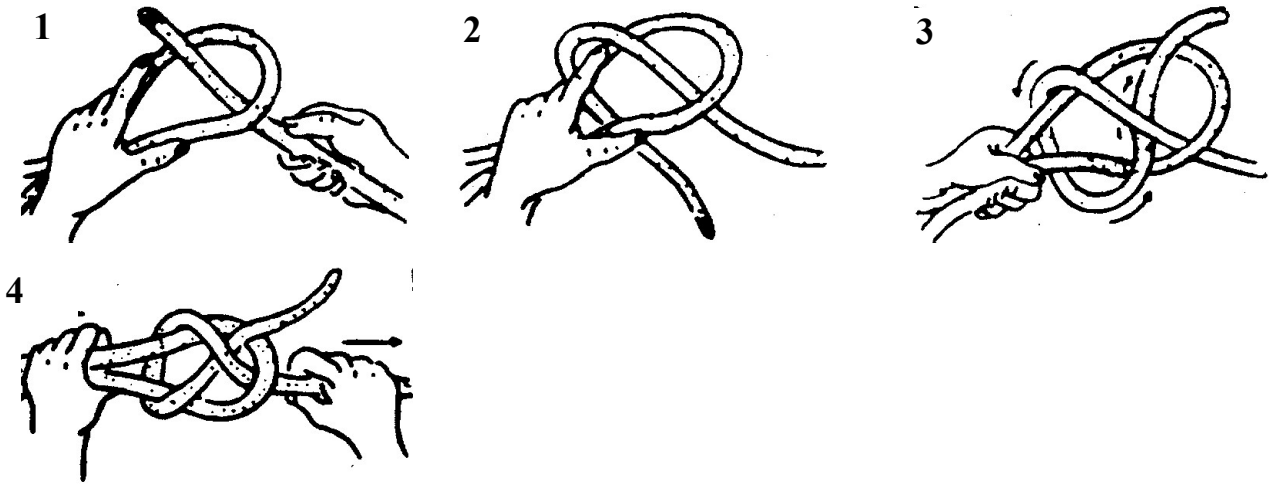
SLIPPERY HITCH



This knot is used in conjunction with the bowline on a bight when hoisting or lowering a person. It is tied around the upper chest to give stability and eliminate binding on the chest that would be caused by an ordinary half hitch.

BECKET BEND



The becket bend is used to join the ends of two ropes.

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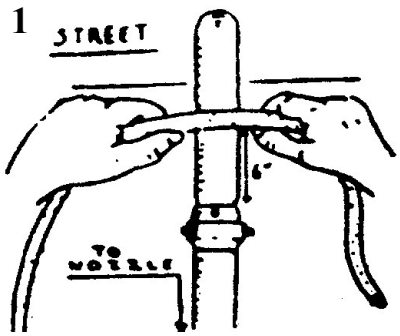
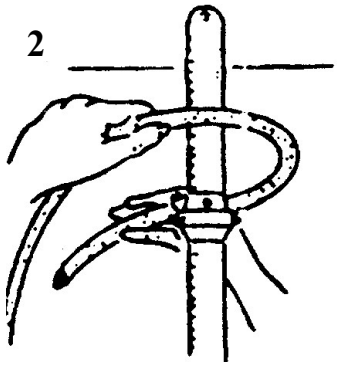
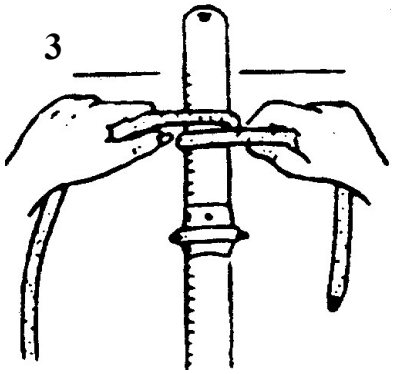
ROLLING HITCH



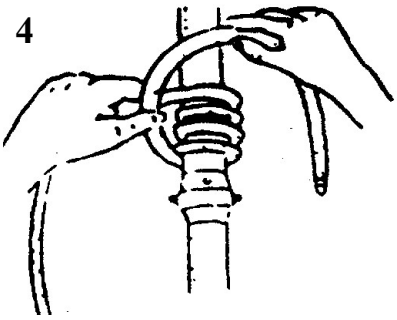
Hose butt is brought on to roof; 1 1/2 arm lengths of rope are measured; rope is held in left hand; knot is tied with right hand.



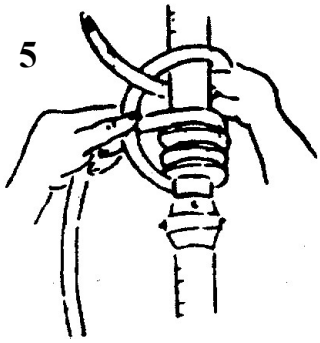
Rope is brought around and over hose below butt.



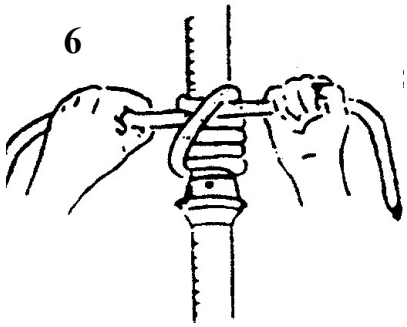
Continue turns around hose.



Until four turns have been made.



Bring rope end over the four turns and around hose with a half hitch.

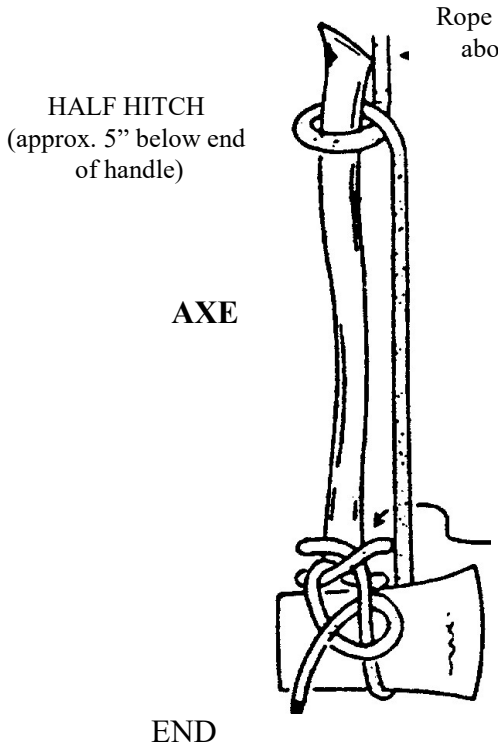


Slide the turns of rope close to hose butt and pull ends tight.

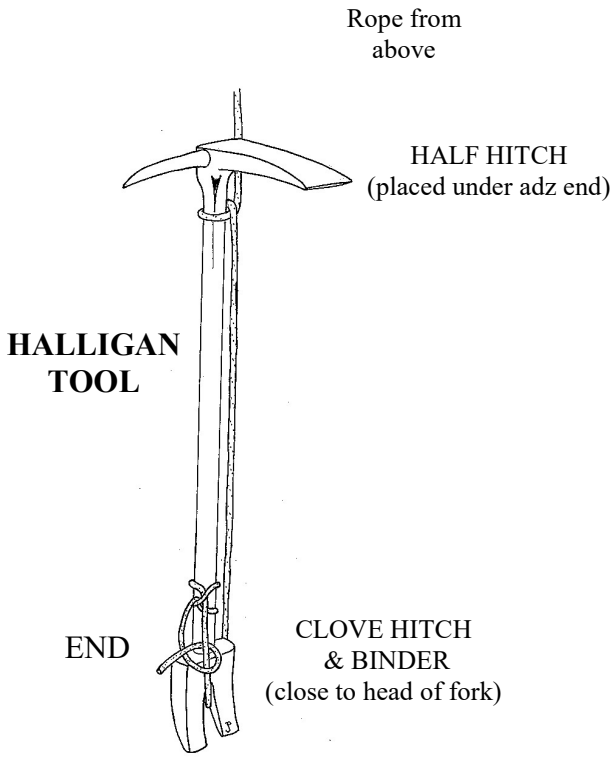
Ease hose butt over roof. Take rope back on roof and tie to a secure object.

The rolling hitch is used to secure a hose line which has been hoisted via the outside of a building. It is tied directly beneath the couplings just below the edge of the roof or window. The free end of the rope is taken back on roof and secured to some substantial object. The rolling hitch relieves the couplings of the weight of the hose.

KNOTS AND HITCHES USED TO HOIST AND LOWER TOOLS AND EQUIPMENT



Tie a clove hitch and binder on handle close to blade. Bring working end of rope around blade and up to handle end. Tie a half hitch on handle. The axe is hoisted and lowered in vertical position with handle up.



Tie a clove hitch and binder on halligan tool close to fork. Bring working end of rope through fork and up to adz end. Tie half hitch under adz end.

Halligan tool is hoisted and lowered in vertical position with adz end up.

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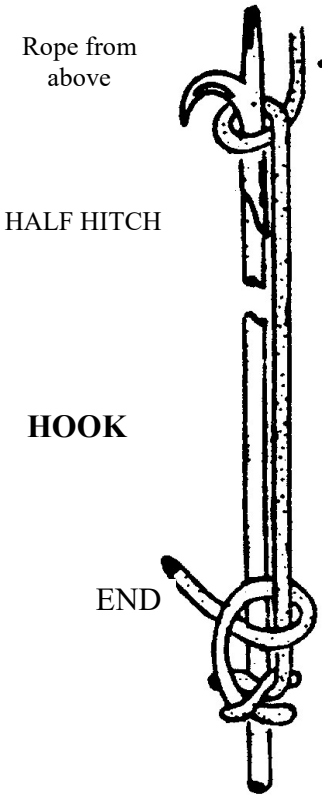
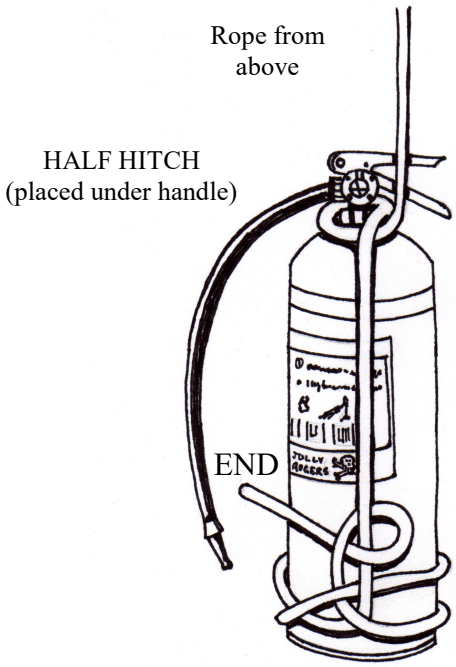


Tie a clove hitch and binder on handle. Bring working end of rope up and tie a half hitch under hook. The hook is hoisted and lowered with the hook end up.



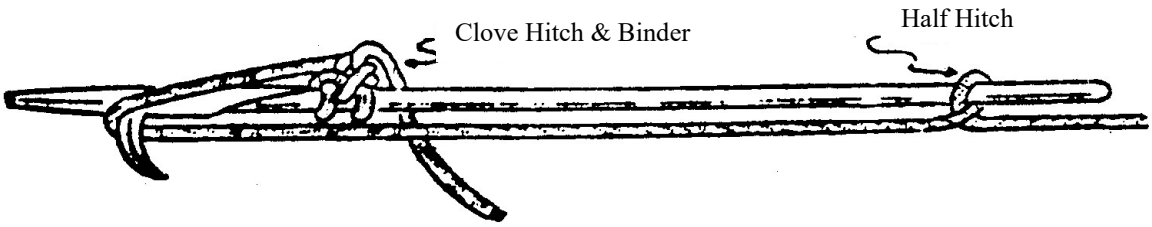
EXTINGUISHER

Tie a clove hitch and binder on lower part of extinguisher. Bring working end of rope up and tie a half hitch under cap. Extinguisher is hoisted and lowered in upright position.

Foam extinguisher is hoisted and lowered in same manner.

CO2, Pressurized Water and Dry Powder extinguishers are hoisted and lowered in same manner. Half hitch is tied under handle and discharge hose.

PULL-DOWN HOOK



Tie a clove hitch and binder on handle close to metal. Bring working end of rope around top of hook and back to handle end. Tie a half hitch around handle about 12" from the end. The hook is placed in position on the object to be pulled; a strain is kept on the rope and the firefighters move back to the working position.

Hooks are tied in this manner for pulling down partitions, fences, copings, etc., enabling members to work in safe areas away from falling objects.

BY ORDER OF THE FIRE COMMISSIONER AND CHIEF OF DEPARTMENT

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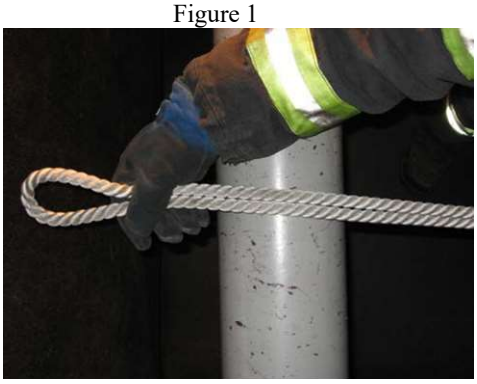
Addition for PFS

SUBSTANTIAL OBJECT KNOT OR

CLOVE HITCH AND BINDER ON THE TAUT PART OF THE ROPE

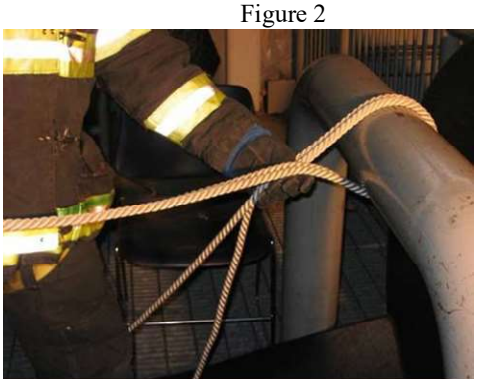
The **Substantial Object Knot**, also known as a **Clove Hitch And Binder On The Taut Part Of The Rope**, is used to tie off to an anchor point during the Lowering A Member, Rescue Pick-Up and Single Slide Evolutions. It is tied by making three half hitches over the top of the rope.

Figure 1



Pull a double strand of rope around your substantial object. Fig. 1

Figure 2



Have 4 feet of rope from the point where the ropes cross. Fig. 2,3

Figure 3

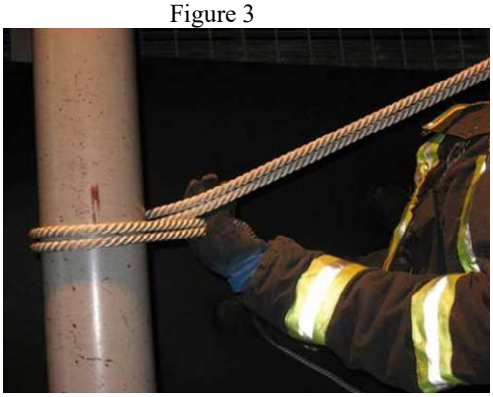
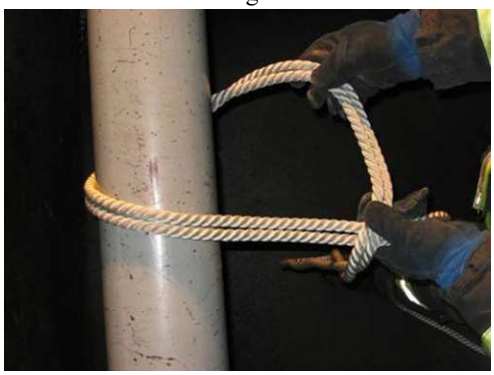


Figure 4



Cross the working end in your right hand over the rope in your left hand forming a letter 'D'. Fig. 4

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Addition for PFS

Figure 5

Figure 6

Reach into the 'D' with your right hand, grab the working end and pull it through the hole creating a half hitch. Fig. 5 and Fig. 6

Figure 7

Figure 8

Tighten by pulling forward with your right hand ONLY. Fig. 7

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Addition for PFS

Figure 9

Figure 10

Make two more half hitches in the same manner. Fig. 8 , Fig. 9 and Fig.10

Figure 11

Tighten and set the knot. Fig. 11 A properly tied knot will have enough rope left to tie one more half hitch. Fig 11 and Fig. 12

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Addition for PFS

Figure 12

A finished knot. Fig. 12

Figure 13

A loose knot for illustration purposes only. Fig 13

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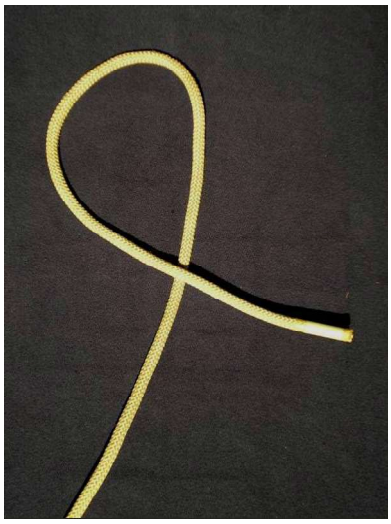
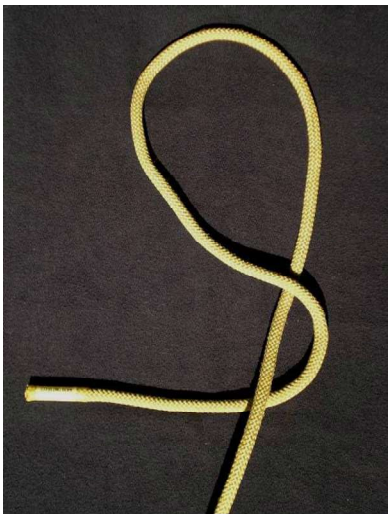
Addition for PFS

FIGURE 8 OR STOPPER KNOT

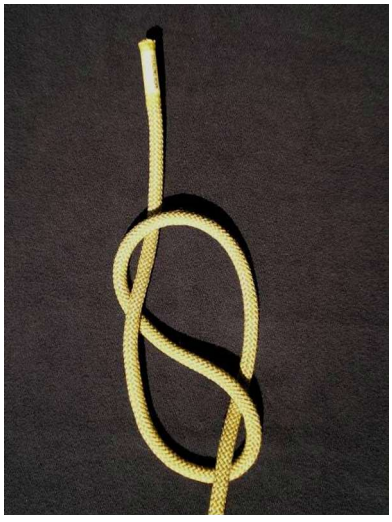
The Figure 8 knot is tied at the end of a rope and keeps the rope from slipping out.



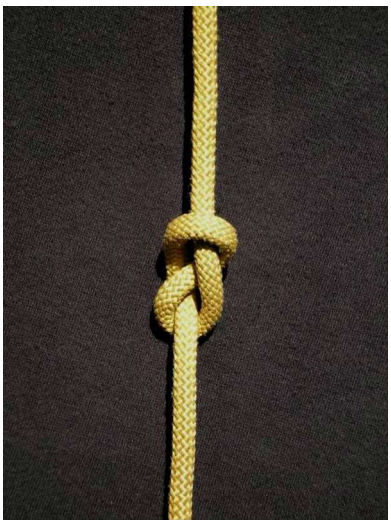
Make a loop



Bring the end around the standing part



Put the end through the loop



Dress and set the knot

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BUTTERFLY KNOT

The Butterfly Knot is used to make a loop in the middle of a rope. It can be used as a tie-off point or to make a three directional pull.

Figure 1

Figure 2

Figure 3

Starting from the back of your left hand, make 3 loose loops around your hand.
Fig. 1, Fig. 2 and Fig. 3

Take the middle loop and pull it under the left loop to your palm.
Fig. 3 and Fig. 4

Figure 4

Now pass the loop in your palm over the other two loops. Fig. 4 and Fig. 5

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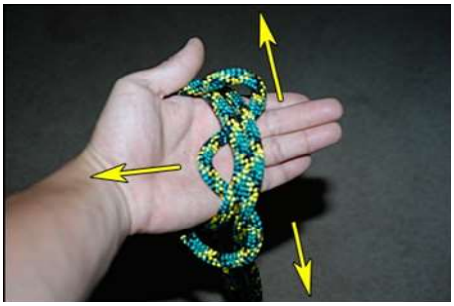
Figure 5

The loop that went over from your palm now goes back under the same two loops back towards your palm. Fig. 5.

Figure 6



Pull the rope thru and take all the loops off of your hand. Fig. 6

Figure 7

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T.B. ROPE 5
ADDENDUM 1
July 30, 2021

KNOTS & HITCHES FOR KERNMANTLE LIFE SAVING ROPE SYSTEM (KLSR)

1. INTRODUCTION

1.1 The Kernmantle Life Saving Rope system (KLSR) requires the use of the Figure Eight (8) knot with a bight of approximately 10”-12”, and a Tensionless Hitch.

1.2 The bowline-on-a-bight with a slippery hitch might be required for use with the KLSR. Refer to Training Bulletin Ropes 5 for instructions on tying the bowline-on-a-bight and slippery hitch.

2. TYING THE TENSIONLESS HITCH

2.1 The number of wraps required to create a proper Tensionless Hitch depends upon three factors:

2.1.1 The diameter of substantial object.

2.1.2 The surface tension of your substantial object.

2.1.3 The amount of squared edges.

Note: There is no set predetermined number of wraps for a Tensionless Hitch.

2.2 Hold the Red anchor carabineer in your right hand. Grab the Kernmantle rope with your left hand, palm down.

Note: Left-handed members can start with Red anchor carabineer in their left hand. Grab Kernmantle rope with right hand, palm down. Adjust hand positions in sequence as appropriate.

2.3 With your right hand place the carabineer over or around your substantial object. Reach underneath or around the substantial object with your right hand, grab the carabineer, and pull enough slack so that you can form a complete wrap around the substantial object. (Figure 1)

2.4 Using your right hand, continue to make wraps over and under, or around your substantial object. The left hand can assist in creating slack by sliding back upon the rope, grasping firmly, and in a punching motion bring more rope forward and towards the substantial object. (Figure 2)

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2.5 In a punching/pulling fashion, you can create numerous wraps upon the substantial object. Punch the rope forward with your left hand and pull the rope back with your right hand.

Figure 1

Figure 2

2.6 Before placing the carabineer back upon the rope, test to determine if there are enough wraps to prevent any movement of the rope or carabineer around the substantial object.

2.7 Dress up the hitch by sliding the wraps so that they lay aside each other. Ensure that none of the wraps overlap one another.

2.8 Allow the carabineer to hang freely, grasp the rope leading back to KLSR system firmly with both hands. Pull strong and steady with both hands and visually observe the wraps and carabineer to see if there is any movement. Anticipate the weight of two members. (Figure 3)

2.9 If any movement of the wraps or carabineer is observed, more wraps are required. Continue adding additional wraps until there is no movement of the wraps, or carabineer. Anticipate the weight of two members.

2.10 When assured of no movement of the carabineer, open the Red anchor carabineer and place it on the rope leading back to the KLSR. (Figure 4)

Note: The red anchor carabineer MUST be placed on the rope leading back to the KLSR. The red anchor carabineer CANNOT hang freely.

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Figure 3

Figure 4

3. TYING THE FIGURE EIGHT (8) KNOT

3.1 Begin with the rope on the right side of your body.

3.2 With an outstretched right arm in front of you, grab the Kernmantle rope firmly in your right fist, palm down. Reach out with left hand and grab the rope at a point just behind the right fist.

3.3 Slide your left hand, palm up, back towards your right armpit, doubling the rope upon itself. Allow the rope to slide thru your gloved left hand. This should create a bight of at least two (2) feet. (Figure 5)

Figure 5

Figure 6

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3.4 Turn to your right, facing the rope. Continue to grasp both strands of the rope firmly in your left hand, palm up. Ensure that the bight between your right and left hand is approximately two (2) feet. Bring your right hand, holding the bight, back towards your body, and across the top of your left forearm.

3.5 With your right hand, drop the bight over the top of the two strands leading up to your left fist, the rope should be adjacent to the pinky finger of your left hand. (Figure 6)

3.6 Release the rope in your right hand. This will create an overhand loop. With the right hand, reach underneath the two strands and grab the bight. (Figure 7)

Figure 7

Figure 8

3.7 With the right hand, bring the bight up and over the overhand loop. Push the bight down from the top, through the overhand loop. The bight should be adjacent to your left thumb. (Figure 8)

3.8 Release the bight from your right hand. Reposition your right hand, by grabbing the bight that has come through the overhand loop. Pull hard with your right hand, tightening the Figure Eight (8) knot. The left hand can be used to tighten the Figure Eight (8) knot by pushing the knot back towards the substantial object. (Figure 9)

3.9 Adjust any slack that appears in your Figure Eight (8) knot.

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Figure 9	Figure 10

3.10 A visual inspection should reveal two strands of rope continuously through the Figure Eight (8) knot. At no time should a single strand of rope be showing. (Figure 10)

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MANAGING MEMBERS IN DISTRESS
CHAPTER 3, ADDENDUM 3
November 1, 2011

NYLON TUBULAR WEBBING

(Also Found in Volume 2)

Relocated for PFS

1. **SPECIFICATIONS**

- 1" nylon tubular webbing in 20' lengths
- Breaking Strength 4000 lbs
- Knotted breaking strength 3000 lbs

2. PREPARATION FOR USE

2.1 Before the webbing can be used in the field it must be made into a continuous loop by using a water knot (see Illustration).

3. PURPOSE

3.1 To be used to assist in the removal of an unconscious member or civilian from a hazardous environment.

3.2 Spinal immobilization may not be possible due to the need for immediate removal of the member from an imminently dangerous situation.

3.3 To enhance simple maneuvers through the use of knots attached to an individual firefighter's body or SCBA. This will improve leverage and allow additional individuals to assist in the removal. In the event that a firefighter should become unconscious during an incident, members in close proximity will be able to quickly conduct a removal.

3.4 Webbing shall only be used for **dragging** victims; no vertical lifts should be attempted.

4. DISTRIBUTION

4.1 Each Officer and member will be issued a length of webbing, which will become part of the member's personal equipment.

5. REPLACEMENT

5.1 ***Redacted for PFS***

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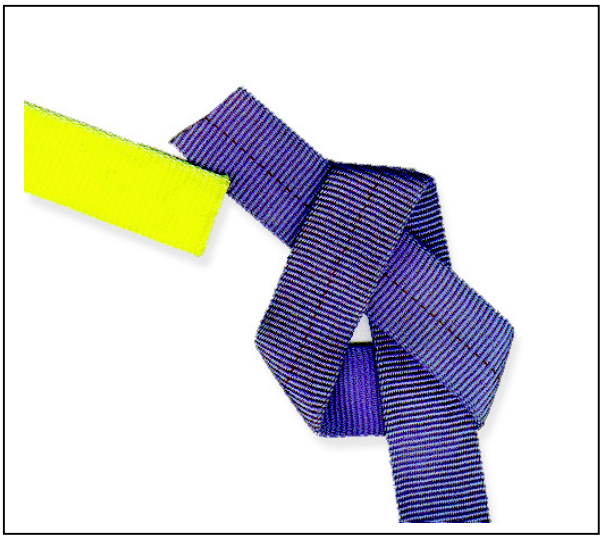
6. CARE AND MAINTENANCE

6.1 The webbing can be cleaned with mild soap and water. It should be allowed to dry naturally, avoiding direct sunlight.

6.2 The webbing should be inspected monthly and after each use.

ILLUSTRATION



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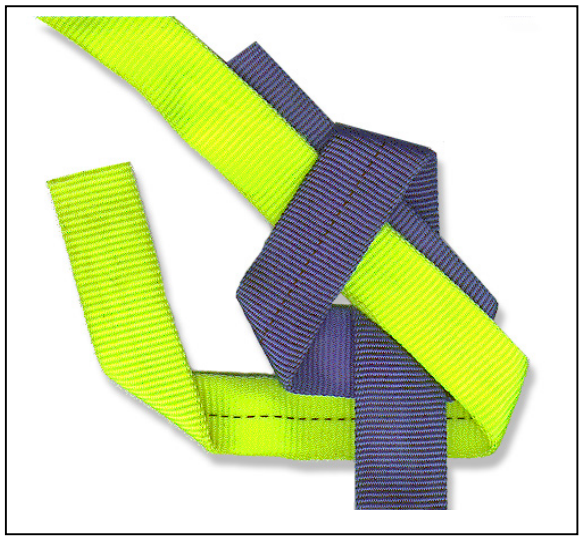

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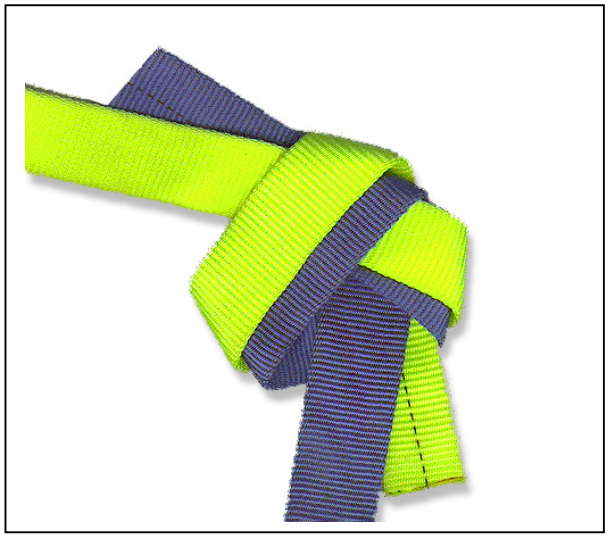

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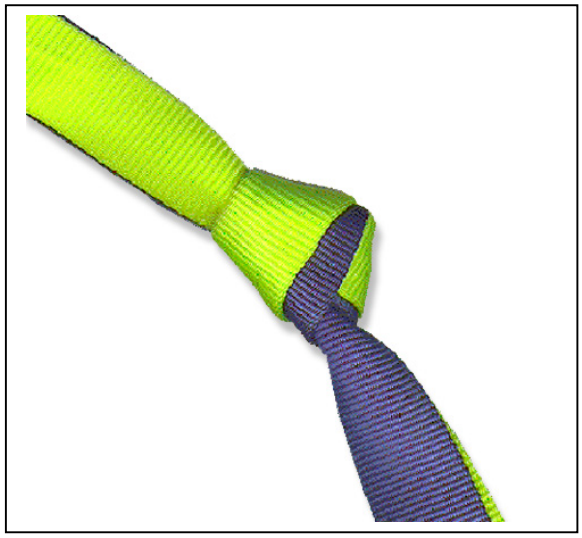

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TRAINING BULLETIN
ROPE 6
October 2, 2020

SEARCH ROPE

1. INTRODUCTION

1.1 The search rope is to be used as a supervisory tool to maintain search team integrity under difficult circumstances. The failure to maintain search team integrity has led to serious injuries and fatalities to firefighters during operations. The search rope is also designed to provide members with finding a means of egress under heat and smoke conditions when searching for life or fire. The rope can also be used to assist in search, prevent duplication of areas searched and to locate units for assistance or relief.

1.2 Examples of when the search rope shall be deployed include, but are not limited to:

- Large areas such as gymnasiums, ballrooms, convention centers, etc.
- Complex areas such as schools, banks, office areas, commercial/industrial buildings, etc.
- Below grade areas e.g., subways, tunnels, basements, cellars.
- Areas where maze like conditions may be encountered.

Note: Search rope shall be deployed in the above locations even in light to moderate heat and smoke conditions since conditions can deteriorate rapidly.

1.3 The Thermal Imaging Camera (if available) should be used in conjunction with the search rope. The officer can evaluate conditions and monitor the members' progress. Members should not become dependent on the Thermal Imaging Camera; it is an electronic device and can malfunction.

1.4 While many search tactics described in other FDNY bulletins will still be applicable, the use of the search rope adds additional considerations that are addressed in this bulletin.

2. DESCRIPTION

2.1 The Search Rope is made of a 7.5 mm diameter Kernmantle design. The rope is 200 feet long with a double-action snap hook at the working end and a single-action snap hook at the opposite end that secures the rope to the bottom of the bag. This will help to repack the rope in the correct direction.

2.2 The rope is packed in a yellow carrying bag marked with the company number.

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2.3 Each search rope will have a company I.D. tag attached to the rope and to the bag. (Figure 1)

Figure 1

2.4 The adjustable carrying strap on the bag has been designed to keep the bag parallel to the ground. It allows the rope to pay out of the bag smoothly and helps the officer and members stay in constant contact with the rope. (Figure 2)

Figure 2

3. DIRECTIONAL / DISTANCE MARKERS

3.1 The search rope uses a series of plastic markers to identify both direction and distance.

3.2 The markers are a cone shaped high strength plastic material, and are approximately 1 ½" long. Their width is tapered from 1" to ½". The tapered cone shape is designed to provide members with the ability to determine which direction they are proceeding (Into or Out of the IDLH) while operating with a gloved hand. The narrow ½" end of the cone clearly identifies the direction of egress OUT of the IDLH. (Figure 3)

← Out of IDLH Area

Figure 3

3.3 The distance between each set of directional/distance markers is 25 feet.

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3.4 A single marker is set at 25 feet, two markers set at 50 feet, three markers set at 75 feet, four markers set at 100 feet, five markers set at 125 feet, six markers set at 150 feet and the last set of seven markers for 175 feet. (Figure 4)

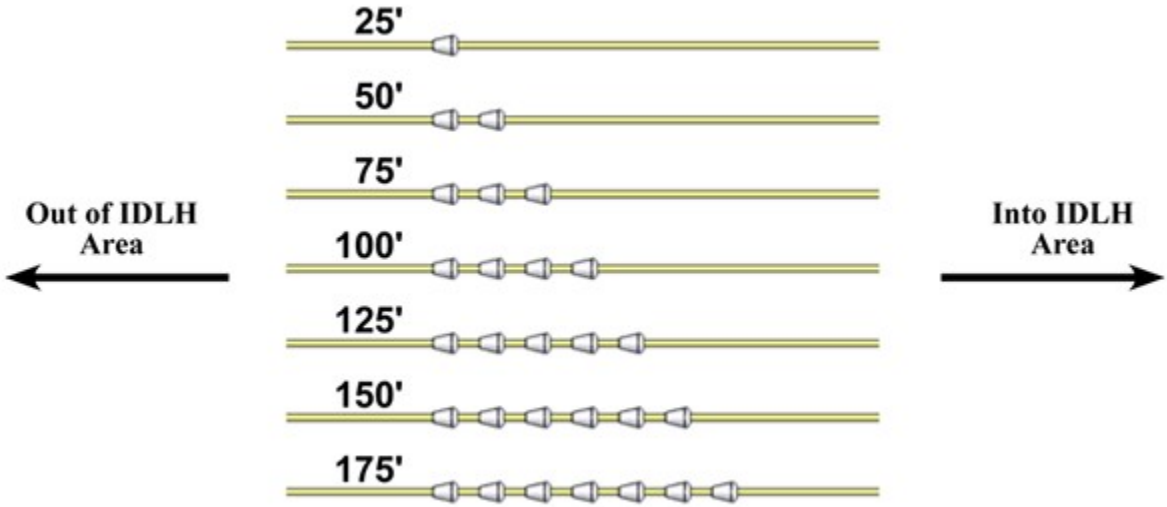

Figure 4

4. ADVANTAGES OF SEARCH ROPE DEPLOYMENT

4.1 Deployment of the search rope will allow the ladder company to begin a search of the immediate fire area more rapidly and assist the engine company in reaching the fire location.

4.2 Assists in searching more efficiently and safely for fire and/or victims in an Immediately Dangerous to Life and Health (IDLH) atmosphere.

4.3 Provides a point of reference to guide members in and out of an area.

4.4 Allows the FAST Unit to approximate the location of a member in distress.

4.5 Allows support members to quickly locate searching members needing assistance with difficult removals, additional tools or equipment, etc.

5. DEPLOYMENT

5.1 When a unit deploys the search rope they must notify the Incident Commander (IC) or Sector/Group Supervisor.

5.2 Pay out the working end of the rope through the round hole in the flap of the carrying bag.

5.3 Secure the double-action snap hook to a substantial non-movable object in a clear, safe environment (floor below fire, enclosed staircase, objects on sidewalk such as lampposts, mailboxes, street signs, etc). Remember an area that is clear at the beginning of an operation may not be clear when you return.

5.4 The bag is designed to be worn over the shoulder but may be carried in one hand.

5.5 The officer controlling the search pays out the rope while keeping it taut, maintaining a handhold on the rope or bag at all times.

5.6 The rope should be tied off at intervals to help keep it taut and off the floor. The rope shall be maintained approximately one to two feet above ground. This will keep it out of water and make the rope easier to find. When changing direction or grade, the rope shall be tied off. This allows the member to traverse the same ground when exiting.

5.7 Voice contact (without HT use) shall be maintained with all search team members.

5.8 If more than 200 feet of rope is needed, attach the double-action snap hook of a second search rope to the single-action snap hook of the first rope.

5.9 If a team's search is interrupted (e.g., low air, victim removal), tie off the line and leave the bag with the remainder of the rope. Another unit can continue the search using this rope.

5.10 If there is nothing to tie off to, take a few wraps around the bag with the rope and leave in place.

5.11 The officer supervising the search rope shall remain cognizant of the amount of search rope deployed by using the distance/directional markers, and transmit this information to members searching on the rope and to the IC or Sector/Group Supervisor.

Note: *Amount of search rope deployed may not be an indication of member's location in a building. Due to the numerous turns and obstacles that may be encountered during a search, distance/directional markers may only indicate amount of rope deployed and not actual distance or location in a building. Example: in a maze-like layout, members may have deployed 100' of search rope and actually traveled only 30' from the point of deployment.*

6. OFFICER

6.1 The officer is responsible to coordinate the search.

6.2 ***Redacted for PFS***

6.3 The officer must decide if members will conduct searches off of the rope (out of contact with the search rope). Factors in this decision include:

- The size of the area to be searched.
- The configuration of the area to be searched. Will maze-like conditions be encountered which may lead the search team members to become lost or unable to return to the search rope.
- The experience level of the search team.
- The heat/smoke conditions. (Severe conditions may dictate that all members remain together, maintaining contact with the rope)
- The ability to stay within voice contact (without HT use)

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6.4 ***Redacted for PFS***

7. THE SEARCH TEAM

7.1 Under most conditions, the number of members assigned to the search rope team should be limited to three.

7.2 A unit (other than 1st alarm) receiving orders to search an area requiring a search rope shall maintain unit integrity and will perform this function with all members.

- The officer and two firefighters will operate as the first search team.
- The remaining members shall remain at the tie off point to:
  a. Standby as the back up team.
  b. Monitor search team progress.
  c. Monitor handie-talkie transmissions and when necessary relay any messages to or from the search team with the IC or Sector/Group Supervisor.
  d. Monitor fire conditions and notify the search team of any changing conditions affecting their operation.
  e. Be ready to assist the search team with recoveries or needed tools/equipment.
  f. Monitor the team's on-air time.

8. RELIEF COMPANY

8.1 The relieving company should communicate directly with the initial search team regarding any hazards that the relief team may encounter and provide information on areas already searched.

8.2 If it becomes necessary to relieve a unit at a forward point of the search, the relieving company should enter the area to be searched with their right hand in contact with the rope (if possible). The company being relieved should exit the IDLH with their right hand in contact with the rope (if possible.) In this manner, companies entering and leaving the area will all be on opposite sides of the rope and will not interfere with one another.

8.3 Members relieving a company on a search rope must communicate with each other about the areas already searched to eliminate duplication of effort and to ensure areas that have not yet been covered are subsequently searched.

8.4 The company being relieved must (if possible) tie off the search rope and leave the bag at the point where the search was discontinued. The relief company should continue the search from the point where the bag was left.

8.5 Officers shall account for all members of their unit outside the IDLH when they have been relieved or have completed their assignment.

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9. TACTICAL CONSIDERATIONS

9.1 Members must realize that search tactics will differ greatly when using the search rope, as opposed to searching without the rope.

9.2 When searching in maze like conditions or large open areas, there is a greater chance for members to become disoriented, separated and lost if the search rope is not used. There usually is not a means of egress in close proximity.

9.3 When using the search rope, a slower, more cautious and deliberate approach should be employed with emphasis on maintaining the safety and integrity of the search team.

9.4 When searching off the rope, members should advise the officer of the area searched, a description of the area searched, and results of search. This will help members visualize the area. The officer shall relay the results of the search to the IC or Sector/Group Supervisor.

9.5 Communications is the key to a good search. It is the responsibility of the search officer to maintain verbal contact (without HT use) with the searching members.

9.6 Companies conducting the search should utilize the fundamentals found in the Training Bulletin Search and other FDNY bulletins.

10. *Redacted for PFS*

11. RESTRICTIONS

11.1 The Search Rope is to be used ONLY for search or guide purposes, not for lifting or lowering.

11.2 Members must be aware that if the rope is tied off at different locations, the length of distance traveled may be less than shown by the distance/directional markers.

12. TRAINING AND MAINTENANCE

12.1 Inspect the rope after each use.

12.2 Repack and inspect quarterly.

12.3 Companies shall conduct frequent drills using the rope. Various building configurations should be utilized if possible. Company Commanders shall develop a schedule for training, inspecting and repacking the search rope.

12.4 When the Search Rope becomes contaminated from fireground contaminants, the Search Rope shall be decontaminated in quarters using a sponge and water. A mild detergent may be used if necessary.

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13. PACKING THE ROPE

13.1 Ensure the rope is dry before packing.

13.2 Lay the rope out on a clean dry surface, removing all kinks and coil clockwise beginning with the end of the rope that has the double-action snap hook.

13.3 Secure the single-action snap hook at the end of the rope to the "D" ring in the bottom of the bag. This "D" ring alerts the member when they are at the end of rope and prevents loss of contact with the rope.

13.4 Coil the rope into the case counterclockwise. Occasionally press the coils down with one hand to prevent one coil from falling below the coil underneath. This keeps the rope from becoming knotted when deployed.

13.5 Pass the double-action hook through the hole in the cover and secure the cover closed. Pass nylon tab through the double-action hook and snap the nylon tab to the side of the bag. (Figure 5)

Figure 5

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TRAINING BULLETIN
ROPE 10
July 30, 2021

½" H3 TECH 125 FDNY KLSR

1. INTRODUCTION

1.1 Designation: TECH 125 (KLSR)

1.2 The Kernmantle Life Saving Rope is 1/2" in diameter. The Kernmantle rope presently in use is manufactured by Sterling Rope Company with a double braid 100% aramid Technora fiber.

1.3 The KLSR meets NFPA Standard for General (G) Use. It has a high heat and abrasion resistance.

1.4 NFPA General Use requirements call for a minimum breaking strength of 40kN (8,992 lbs.). The Kernmantle rope presently in use exceeds the standard.

1.5 The KLSR is a static rope, with minimal stretch. During a lowering operation it will always be used in conjunction with an energy absorber, presently the GEMTOR SOFT-PACK ENERGY ABSORBER. The Gemtor energy absorber is designed to deploy with an approximate 1,400 to 1,500 pound impact load. The Gemtor energy absorber adds a significant layer of protection to the KLSR.

1.6 The KLSR rope will be marked every one (1) meter, the one meter mark is designed to assist the operator in identifying speed of descent and distance. The one-meter mark does not compromise the integrity or strength of the rope.

1.7 In order to retain its strength, the rope must be properly maintained.

2. INTENDED USE

2.1 To lower a firefighter, or another person, from a roof or upper floor to a place of safety below.

2.2 To lower a firefighter from a roof or upper floor to enable them to remove another firefighter, or person, from an untenable position.

2.3 To allow a firefighter trapped in an untenable position to remove themselves to safety by means of a single slide.

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2.4 Communications are essential in all life saving rope operations. Often, information from the Roof Firefighter to the members operating in the building regarding the location of the victim will preclude the necessity of a Kernmantle life saving rope operation. This is especially true in fireproof buildings, where the victim may access a temporary area of refuge.

2.5 Communications with the Inside Team of the ladder company(s) is vital prior to any life saving rope rescue attempt. It is also critical that notification be given directly to the Incident Commander or Sector Supervisor prior to commencing a Kernmantle life saving rope rescue attempt. The IC must coordinate all interior operations and the Kernmantle life saving rope rescue attempt. The IC must determine if units are unable to place an operational hoseline between the victim and the fire in a timely manner, and if members are prevented from reaching the victim via the interior of the apartment, an adjoining apartment, a balcony, fire escape, or exterior ladders.

2.6 Upon determining that a Kernmantle life saving rope rescue is the only available option, the Incident Commander may dispatch additional resources to the descent point as well as adjoining apartments and/or apartments on the floor(s) below to provide the greatest chance of a successful rescue. A Kernmantle life saving rope rescue must be a coordinated team effort with support coming from inside, above the victim, adjacent to the victim, and below the victim. Such coordination is only possible with clear communications.

2.7 Under no circumstances should a Kernmantle life saving rope evolution be attempted if:

- a viable substantial object is not available.
- the effectiveness of the anti-chafing device would be compromised due to building construction (protruding facades, exposure of the life saving rope to sharp surfaces).
- there are not enough members at the lowering point and at the adjoining windows or floors below to ensure a successful pick-up and retrieval of the firefighter and victim.

2.8 The Kernmantle life saving rope evolution shall only be attempted as a **last resort** when all other avenues have been eliminated. Any attempt to perform the Kernmantle life saving rope evolution **MUST** be in strict accordance with existing evolutions and guidelines.

3. OPERATIONS

3.1 For lowering operations the KLSR will be used in conjunction with a mechanical decent control device (DCD), presently the Petzl I'D L.

3.2 For the Single Slide evolution four (4) turns on the Personal Harness Hook are required.

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4. CARE AND MAINTENANCE

The Kernmantle life saving rope shall only be used for life saving purposes. It shall not be used for drill purposes.

4.1 First and foremost, the Kernmantle life saving rope shall be used only for life saving purposes. Use of this rope for any other purpose is strictly prohibited.

4.2 A Kernmantle life saving rope subjected to the weight of two people shall be placed out of service forthwith and replacement requested.

4.3 Immediately after a Kernmantle life saving rope has been subjected to the weight of one person, the KLSR system shall be carefully examined for any signs of damage or abrasion before being placed back in service. Proper journal entries shall be made by the company officer of the results of such examination. An entry shall also be made in red on the Kernmantle Life Saving Rope Record Card (RP-100). The officer, after supervising the examination of the KLSR system, shall notify the Safety Command by telephone of the incident.

4.4 Care shall be taken to avoid wetting the Kernmantle life saving rope. The NFPA General (G) Use standard requires that the breaking strength loss when the rope is wet (soaked for 24 hours) does not exceed 15%. The Kernmantle rope presently in use exceeds the standard. Whenever a rope becomes wet it shall be allowed to dry naturally before being repacked and stored on the apparatus. The rope regains its strength when it dries.

4.5 Ice particles within the strands of a rope can damage the inner fibers. Therefore, a frozen Kernmantle life saving rope shall be placed out of service.

4.6 Dirt on the surface and imbedded in the rope acts as an abrasive to the strands and fibers. When a Kernmantle life saving rope becomes dirty, it shall be washed with mild soap and water. It should be allowed to dry naturally before being repacked and stored on the apparatus.

4.7 Kernmantle rope is susceptible to damage from acids and their fumes. In the instance of contamination, sheath discoloration may be imperceptible, even though the core of the rope has been destroyed. If the rope comes in contact with acids, fumes, or shows signs of contamination, it shall be placed out of service and replacement requested.

4.8 Kernmantle ropes that are damaged or show signs of wear are to be put out of service and replaced.

4.9 The Kernmantle life saving rope shall always be stored in the carrying case.

4.10 NFPA General (G) Use standards requires the Kernmantle rope to be tested in accordance with NFPA 1983 current Ed. (2012) Sec. The Kernmantle rope presently used exceeds this standard. A rope that has been exposed to highly heated surfaces cannot be considered safe and shall be immediately placed out of service and a replacement requested.

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4.11 Impact loads can compromise the rope, the substantial object, member being lowered, and victim. Impact loads **must** be avoided. A Kernmantle rope subjected to an impact load will be placed out of service. A rope energy absorbing component that has deployed from an impact load will immediately cause the rope to be placed out of service.

4.12 The Kernmantle life saving rope must be stored in a dry compartment on the apparatus and the carrying case should be stored flat. Due to heat transmission, the rope shall never be stored on engine covers or in compartments adjacent to the engine compartment that would subject it to excessive heat.

4.13 All Units, except Engine Companies, shall inspect and repack the Kernmantle Life Saving Rope every Monday on the 9 x 6 tour. Engine Companies shall inspect and repack the Kernmantle Life Saving Rope on Tuesdays on the 9 x 6 tour. Record the inspection on the Kernmantle Life Saving Rope Card (RP-100).

4.14 Inspection shall cover the entire length of the rope. Look for cut fibers, abrasion, rust, wetness or anything that might indicate possible degradation of the rope.

4.15 This inspection should not be conducted on the apparatus floor due to the possibility of the rope coming in contact with material that might be harmful to it. Since the apparatus floor is concrete, it is a prime means of causing abrasion to the Kernmantle life saving rope. Abrasion is one of the primary causes of a rope losing its strength.

4.16 When any doubt exists regarding the serviceability of a Kernmantle life saving rope, it shall be placed out of service.

4.17 A Lost Property Report (FS-112) is required for lost equipment.

4.18 A history of every Kernmantle life saving rope shall be maintained on the Kernmantle Life Saving Rope Record Card (RP-100).

5. *Redacted for PFS*

6. CONCLUSION

6.1 The 1/2" H3 TECH 125 FDNY Kernmantle life saving rope presently in use is an incredibly strong, heat and abrasion resistant rope. Given proper care and maintenance, it will provide members with a reliable life saving tool.

BY ORDER OF THE FIRE COMMISSIONER AND CHIEF OF DEPARTMENT

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T.B. ROPE 10
DATA SHEET 1
July 30, 2021

KERNMANTLE LIFE SAVING ROPE CARRYING CASE

1. DESCRIPTION

1.1 F.D.N.Y. Designation: Kernmantle Life Saving Rope Carrying Case (Figure 1)

Figure 1

1.2	Material Used:	Vinyl with Nylon Webbing Strap
1.3	Weight:	Approximately 1.5 lbs.
1.4	Dimensions:	24” x 7” x 8”
1.5	Color:	Black with White Lettering with Red/Green flaps and reflective tape
1.6	Packed weight:	17.6 lbs.

2. INTENDED USE

2.1 To store, carry, and deploy the Kernmantle life saving rope, with the Descent Control **Device** (DCD), Energy Absorber and anti-chafing device included.

2.2 This case provides for instantaneous use of the KLSR in Lowering, Single Slide, and emergencies by eliminating the need to flake out the rope before use.

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3. PACKING OF THE KERNMANTLE LIFE SAVING ROPE IN THE CARRYING CASE

3.1 Place the KLSR carrying case on a dry, clean surface. Open the three orange tabs, remove DCD, anti-chafing device and shock absorber and place to the side.

3.2 Open black Velcro flap and completely remove rope from carrying case. Inspect the case for any signs of damage or wear and tear.

3.3 Locate the approximate middle of the rope, stretch the rope out on a dry, clean surface. Two members will apply equal pressure from opposite ends of rope. Working first from the middle towards the ends, and then back towards middle of rope, inspect rope with ungloved hands looking for signs of wear or deformity; e.g. fraying, exposed inner strands, exposure to heat, glazing, etc.

3.4 Place the approximate middle of the rope in the center of the bottom of the carrying case. Ensure that the Red anchor carabiner will line up with the red flap. Close and secure black Velcro flap.

3.5 Working from both ends, stuff rope into carrying case, approximately 6” inches at a time.

3.6 When reaching the ends, stop and inspect the Petzl I’d (DCD) with friction cleat, both red carabiners, anti-chafing device, energy absorber, and the green carabiner. Any signs of wear or deformity, e.g. physical damage to DCD, excessive wear to anti-chafing device, warped carabiner, fraying, deployment of shock absorber, etc., immediately place KLSR system out of service.

3.7 Ensure that the Green carabiner is completely exposed from the end of the anti-chafing device, and that there are approximately 8” inches of slack between the DCD and the anti-chafing device.

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3.8 Lay the DCD, black handle down on top of the carrying case. The Red carabiner attached to the DCD should reach the opposite end of the case adjacent to the red flap. The Green carabiner should be completely exposed from the end of the anti-chafing device. (Figure 2)

Figure 2

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Note: In order to prevent damage to the Captiv bar of the Red Carabiner, it will ALWAYS be positioned with the gate upright in the carrying case pointed in the direction of the red flap. Doubling the Red Carabiner over, back upon the DCD, will cause damage to the Captiv bar. (Figure 3)

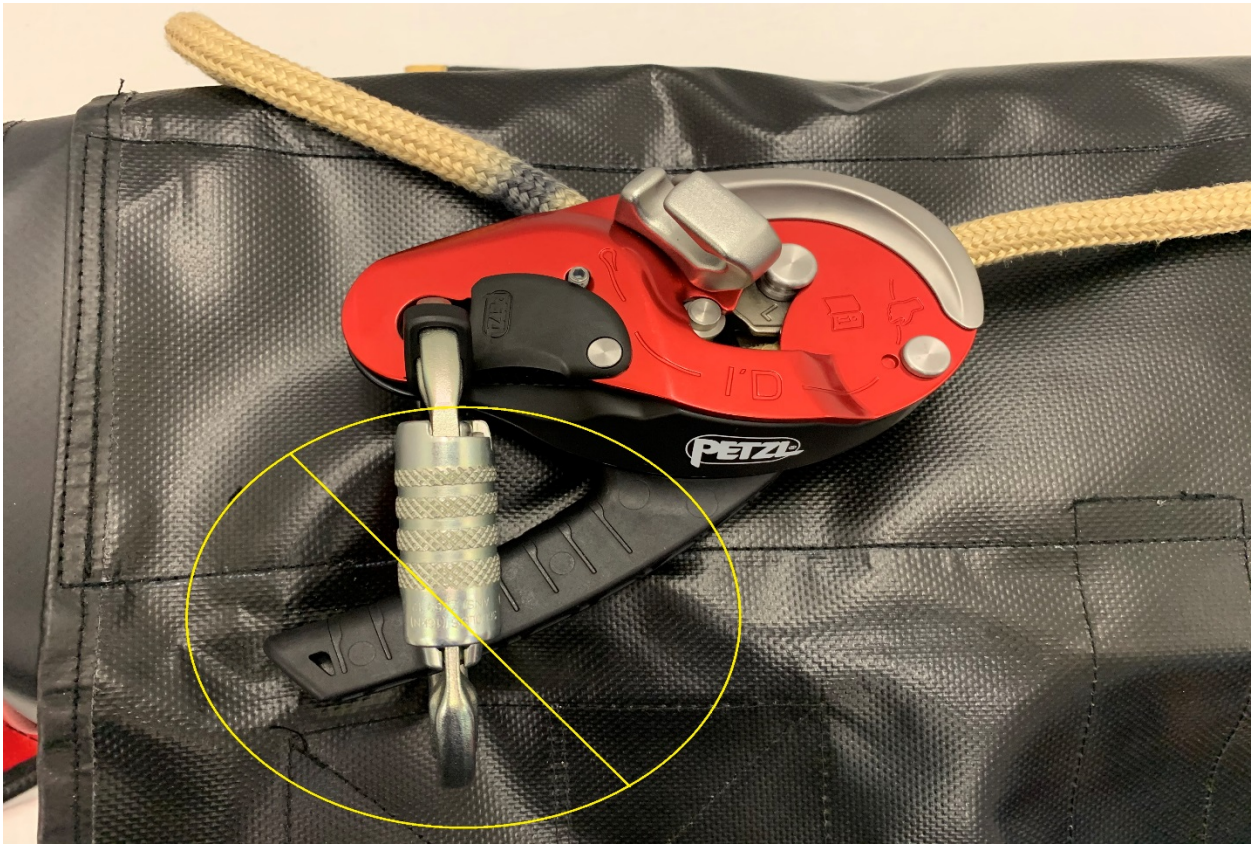

Figure 3

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3.9 Lay the anti-chafing device on top of the DCD, and alongside of the Red DCD carabiner, providing protection for the DCD from damage. (Figure 4)

Figure 4

3.10 Close the two black covers over the top of the DCD, anti-chafing device and energy absorber ensuring that the velcro is securely fastened.

3.11 Place the Green carabiner in the pocket on the inside of the Green flap.

3.12 Tuck any excess rope into the carrying case before closing the Green flap. Make sure the velcro on the Green flap is securely fastened.

3.13 Place the Red anchor carabiner in the pocket on the inside of the red flap.

3.14 Tuck any excess rope into the carrying case before closing the Red flap. Make sure the velcro on the Red flap is securely fastened.

3.15 Adjust the carrying case strap as needed.

3.16 The Kernmantle life saving rope shall be inspected and repacked weekly.

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4. CARE AND MAINTENANCE

4.1 Each time the Kernmantle life saving rope is repacked, the carrying case shall be inspected for damage, cleanliness and dryness.

4.2 The carrying case can be cleaned by sponging with mild soap and water. It is essential that the carrying case be thoroughly dry before repacking the Kernmantle life saving rope.

4.3-4.4 ***Redacted for PFS***

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T.B. ROPE 10
DATA SHEET 2
July 30, 2021

KERNMANTLE LIFE SAVING TRAINING ROPE ½" SUPERSTATIC 2

1. DESCRIPTION

1.1	F.D.N.Y. Description:	KLSR Training Rope
1.2	Materials Used:	Sterling Rope Company; ½" 100% nylon low stretch Kernmantle
1.3	Diameter:	½"
1.4	Length:	125'
1.5	Capabilities:	Meets NFPA standards for General use

2. INTENDED USE

2.1 The KLSR Training Rope is used in the KLSR Training system, which incorporates many of the same components as the KLSR system.

2.2 A KLSR Training Rope system has been issued to each Firehouse for use at company drills in the Kernmantle life saving rope evolutions.

2.3 The KLSR Training Rope shall never be used without the landing mat positioned beneath the line of descent.

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2.4 The anti-chafing device **MUST** be used during all evolutions, including the single slide. The training rope is a static nylon rope and does not have the same abrasion and cut resistance as the Technora ½" Kernmantle rope.

3. OPERATIONS

3.1 Each division has been issued a landing mat, blower motor (TB Rope 1, Data Sheet 4) and a Kernmantle life saving training rope system for use at company drills.

3.1.1 The case is yellow with black lettering to ensure that the KLSR training rope is only used for drill purposes.

3.1.2 The carrying case shall be packed with the yellow Kernmantle Life Saving Training rope for use.

3.1.3 At the completion of each drill the KLSR training system will be properly repacked in the carrying case for storage. The KLSR training system will be stored in a cool, dry area of the company office.

3.1.4 The KLSR training system shall not be carried on the apparatus except while transported to drill sites, at which time it will be under the complete control of the officer on duty.

3.2 Members shall perform all sliding and lowering operations according to the evolutions.

3.3 After each single slide, remove the energy in the rope by shaking the rope vigorously back and forth while suspending the hanging end.

3.4 Engine companies shall participate in training sessions with ladder, rescue and squad companies are per schedules promulgated by Division Commanders.

4. CARE OF TRAINING ROPES

4.1 Precautions must be exercised while using the Kernmantle life saving training rope to prevent shortened service and damage to the rope. Points of contact in which abrasion could occur must be avoided.

4.2 To reduce abrasion, do not use a point of operation where a protruding portion of the building, such as a window façade, may cause abrasion to the rope. The anti-chafing device MUST be used during all evolutions.

4.3 The maximum number of times this rope may be used is 200.

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4.4 A history of every Kernmantle Life Saving Training Rope shall be maintained on the Training Rope Record Card (RP-101)

4.5 The Kernmantle Life Saving Training Rope shall be cared for in the same manner as the Kernmantle Life Saving Rope.

5. USE RESTRICTIONS

5.1 The Kernmantle Life Saving Training Rope shall not be used in place of the Kernmantle Life Saving Rope.

5.2 The Kernmantle Life Saving Training Rope may be used at heights to a maximum of three stories.

5.3 The practice of tying maintenance ropes together in order to increase the length of the rope is STRICTLY PROHIBITED.

5.4 The following objects are not to be considered for use as substantial objects:

5.4.1 Plumbing vent pipes.

5.4.2 Sheet metal housings for roof vents.

5.4.3 T.V. Masts.

5.4.4 Newel posts or banisters.

5.5-5.6 ***Redacted for PFS***

6. ***Redacted for PFS***

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T.B. ROPE 10
DATA SHEET 3
July 30, 2021

PETZL VULCAN TRIACT-LOCK

1. Description

1.1	F.D.N.Y. Designation:	Vulcan Triple Action Carabiner
1.2	Material Used:	Steel
1.3	Rated:	N.F.P.A. General rating; 45KN
1.4	Weight:	8.6 oz

2. Uses

2.1 Kernmantle Life Saving Ropes and Kernmantle Life Saving Training Ropes issued by the Department are presently equipped with Vulcan carabiners with triple action locking gates. In addition, the Petzl I'D is also equipped with a Vulcan carabiner. The Vulcan carabiners have a Captiv bar in place that will prevent the carabiner from rotating freely.

2.2 To reduce risk of inadvertent opening of the carabiner gate, the carabiner shall be attached to the harness handle of the personal harness, gate up, Key-Lock Nose up. The gate of the carabiner will face towards members body. (Figures 1 & 2 below)

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Figure 1

Figure 2

3. Maintenance and Inspection

3.1 The Vulcan carabiner will be inspected weekly, prior to and after each use. Any signs of physical damage, e.g. bent, warped, out-of-align, damage to lock, missing/bent/unsecured Captiv bar, etc., immediately place the carabiner KLSR system out of service.

3.2 The Vulcan carabiner can be cleaned with warm water and mild soap. The Vulcan carabiner must be completely air dried before returning to service. The Vulcan carabiner does not require any type of lubrication.

3.3 In order to prevent damage to the Captiv bar, the Petzl I'D decent control device (DCD) must be properly packed when stored in the carrying case. Vulcan carabiner attached to the DCD must be placed in an upright position when repacked. The anti-chafing device will lie alongside the carabiner. The Vulcan carabiner is not to be folded back upon the DCD, damage to the Captiv bar could occur.

3.4-3.6 ***Redacted for PFS***

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T.B. ROPE 10
DATA SHEET 4
July 30, 2021

PETZL I'D L DESCENT CONTROL DEVICE (DCD)

1. DESCRIPTION

1.1	F.D.N.Y. Designation:	PETZL I'D (DCD)
1.2	Ratings:	Meets NFPA 1983 (2012 ED.) G (GENERAL USE) standard
1.3	Material:	Aluminum alloy (side plate), Stainless Steel (cam), Chrome-plated Steel (anti-error catch), Nylon (lever)

2. INTENDED USE

2.1 The Petzl I'D (DCD) is intended for use with the Kernmantle Life Saving Rope system, presently using the Sterling ½" Technora rope.

2.2 The Petzl I'D (DCD) is a self-braking decent control device used to lower a Firefighter for a rescue pickup of a trapped victim.

2.3 The Petzl I'D (DCD) is also intended for use in the Civilian Vertical Escape System (CVES), to assist in the vertical ascent/descent of victims, e.g. stuck occupied elevators

2.4 The Petzl I'D (DCD) is also intended for use in emergencies where the Kernmantle Life Saving Rope might be attached to a Firefighter, i.e. confined space entry, ice rescue, etc.

Note: The Petzl I'D is not to be used to haul a victim vertically by Engine or Ladder Companies.

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3. DESCRIPTION

3.1 Nomenclature of parts (Figures 1, 2)

(1) Side plates

(2) Flange/Friction plate

(3) Cam

(4) Anti-error catch

(5) Lever

Additional Components:

(6) Attached Vulcan carabiner with Captiv bar.

(7) Attached Friction cleat, secondary Friction device.

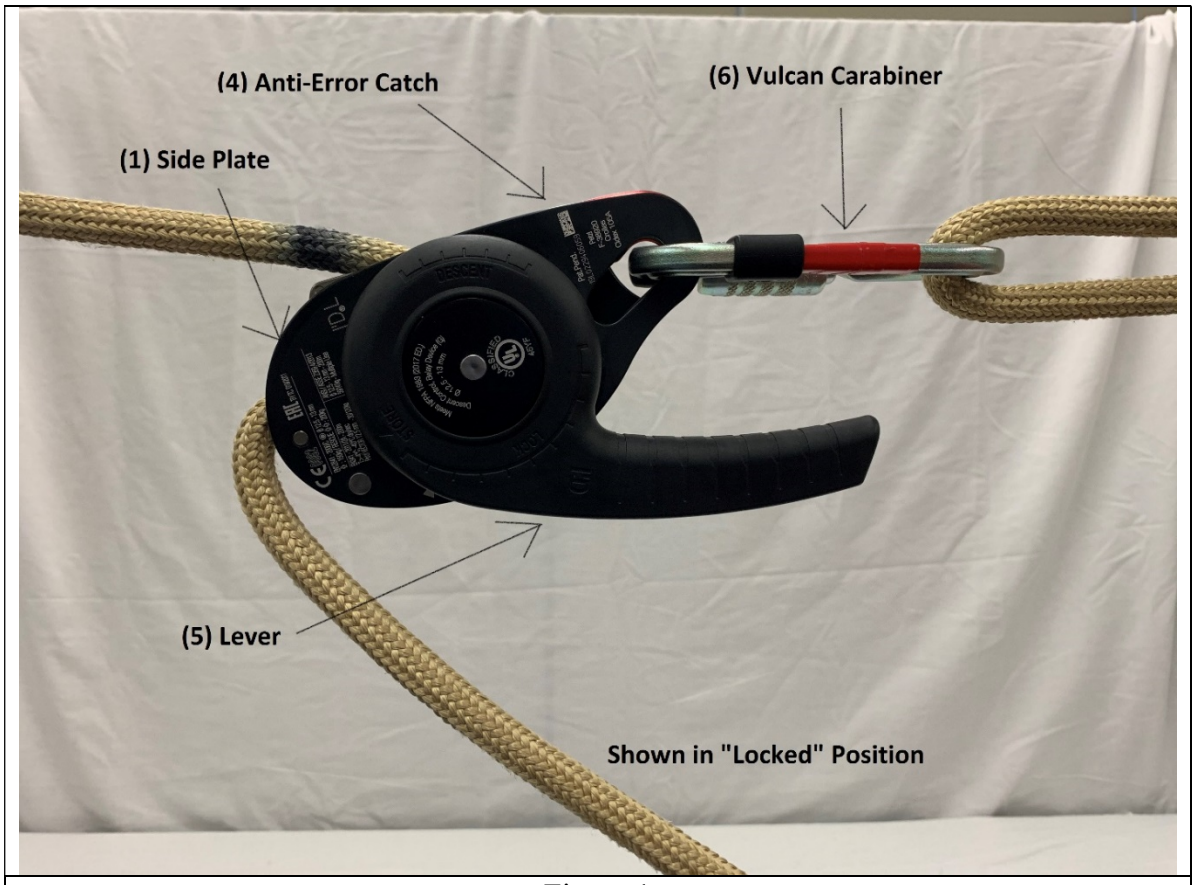

Figure 1

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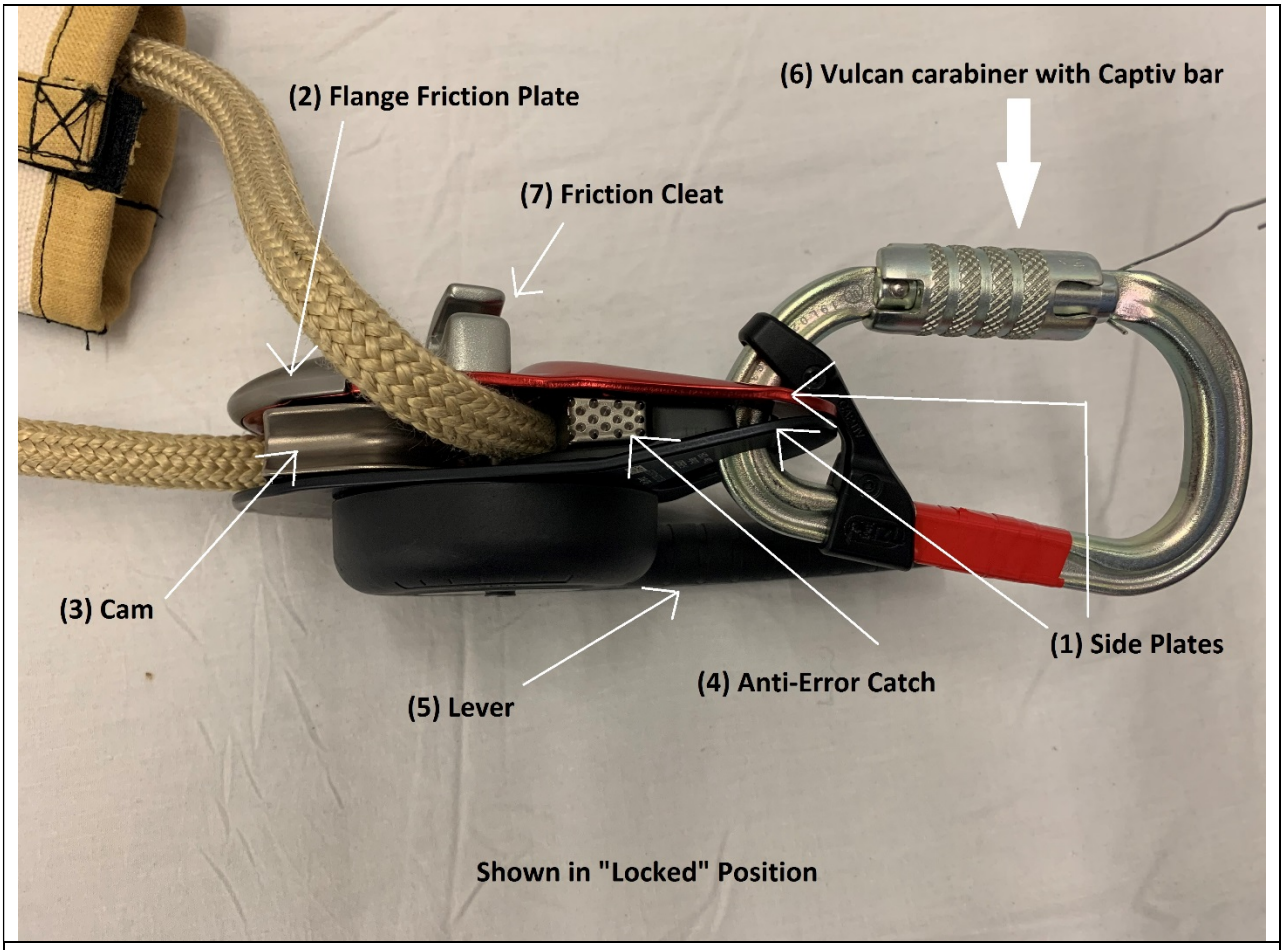

Figure 2

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3.2 Lever Positions

(1) LOCKED (Figure 3)

(2) HORIZONTAL PAYOUT (Figure 4)

(3) DESCENT (Figure 5)

(4) PANIC LOCKED (Figure 6)

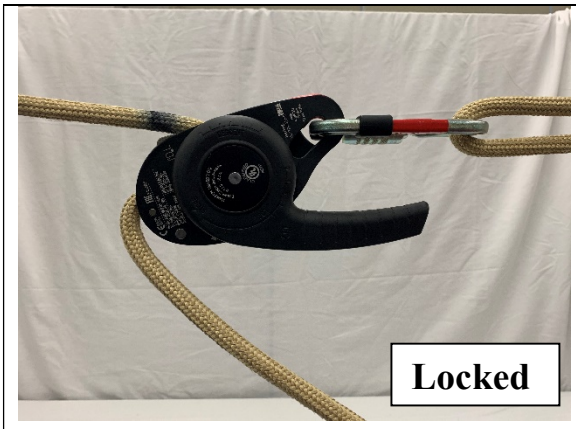

Figure 3 (Locked)

Figure 4 (Horizontal Payout)

Figure 5 (Descent)

Figure 6 (Panic Locked)

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4. USE

4.1 Loading System; to test auto-lock feature, immediately before use, the member to be lowered will use the weight of their body to determine if the auto-lock feature engages (confirms correct placement of rope on device).

Note: Companies for no reason should open or alter the Petzl ID. If the device has been altered, the rope is placed incorrectly on the device, the anti-error catch should engage when loaded, preventing a catastrophic fall. The device will not operate properly when rope is loaded incorrectly. Catastrophic failure will occur.

4.2 Horizontal pay-out

Lowering Member (Member# 1) places left hand on lever, right hand on rope. Gently pull back on lever, opening cam slowly. Right hand can be brought forward and parallel to working end of rope to reduce friction. (Figure 7&4)

Figure 7

4.3 Panic-lock; the device has a Panic-lock feature. In the event the lowering member pulls back too quickly on the lever while lowering a member, the device will go into a panic-lock mode. To reset the panic-lock it will be necessary to ease the lever forward with the left hand until an audible "click" is heard. In the event of loud background noise, allow lever to return to the locked position.

Note: It is possible to engage the PANIC-LOCK during the horizontal payout. Reset using the same procedure.

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4.4 Lowering; left hand lever, right hand rope. All lowering operations require that the rope will be placed around the Friction Cleat. The speed of the descent is controlled with the right hand. By bringing the right hand forward and parallel to the working end of the rope (rope going over edge) friction is created around the secondary friction device, the Friction Cleat. To reduce friction, increasing speed of descent, the right hand is brought back, away from the member being lowered. Left hand opens cam slowly, right hand controls descent.

Note: The Lowering Member (Member# 1) NEVER releases right hand from the rope while the Member to Be Lowered (Member# 2) is attached to the system.

4.5 Resetting the System; the KLSR system can quickly be reset by hauling the rope back up and through the Petzl I'D. To reset; the lowering member removes the rope from the Friction Cleat with right hand. Using a hand over hand motion the rope can quickly be hauled up back thru the device.

5. INSPECTION

5.1 The Petzl I'D shall be inspected weekly, before and after use. Any signs of physical damage or excessive wear, e.g. bent, cracks, broken lever, etc., the device will immediately be placed out of service.

5.2 During inspection special attention must be given to the Captiv bar located on the Red DCD carabiner attached to the Petzl I'D. If the Captiv bar is missing, or shows signs of physical damage, e.g. bent, warped, displaced, etc., the device will immediately be placed out of service.

5.3-5.5 ***Redacted for PFS***

BY ORDER OF THE FIRE COMMISSIONER AND CHIEF OF DEPARTMENT

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T.B. ROPE 10
DATA SHEET 6
July 30, 2021

GEMTOR SOFT-PACK ENERGY ABSORBER

1. DESCRIPTION

1.1	F.D.N.Y. Designation:	Gemtor Energy Absorber
1.2	Ratings:	Begins to deploy approximately 1,400lb to 1,500lb impact force
1.3	Material:	Kevlar webbing with heat resistant shield
1.4	Dimensions:	Approx. 11.5” x 2.0” x 1.75”

2. INTENDED USE

2.1 The Gemtor soft-pack energy absorber is an integral component of the FDNY Kernmantle Life Saving Rope system (KLSR) and Kernmantle Life Saving training rope system.

2.2 The KLSR system presently contains a static rope, ½” Technora, manufactured by Sterling Rope Company. The Kernmantle training rope is a static nylon rope. By incorporating a soft-pack energy absorber the chance of compromising either system is reduced.

2.3 In the event of an unintended impact load, approximately 600 lb. load falling 2’ or more, the Gemtor energy absorber will begin to deploy, absorbing some of the energy, lessening the chance of a failure of the substantial object and/or the rope. The energy absorbed will also lessen the physical impact on the member being lowered, reducing the chance of physical injuries.

2.4 During an impact load on the device the internal engineered stitches on the webbing will begin to break, causing the device to elongate. As the stitching breaks, the webbing progressively deploys, and some of the energy of the impact will be absorbed.

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3 INSPECTION

3.1 The Gemtor energy absorber will be inspected weekly, prior to and after each use. Any signs of physical damage, e.g. rips, tears, elongation, etc. the device will be immediately placed out of service.

3.2 During inspection special attention will be given to the Gemtor energy absorber to ascertain if the device has been compromised by an impact load. The two webbed loop ends will be examined closely to determine if an impact load has elongated the device by deployment of the webbing. With any sign of an impact load, the device will be immediately placed out of service.

3.3-3.5 ***Redacted for PFS***

BY ORDER OF THE FIRE COMMISSIONER AND CHIEF OF DEPARTMENT

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TRAINING BULLETIN
SCBA
August 24, 2010

SCOTT 4.5 POSITIVE PRESSURE SELF-CONTAINED BREATHING APPARATUS (SCBA)

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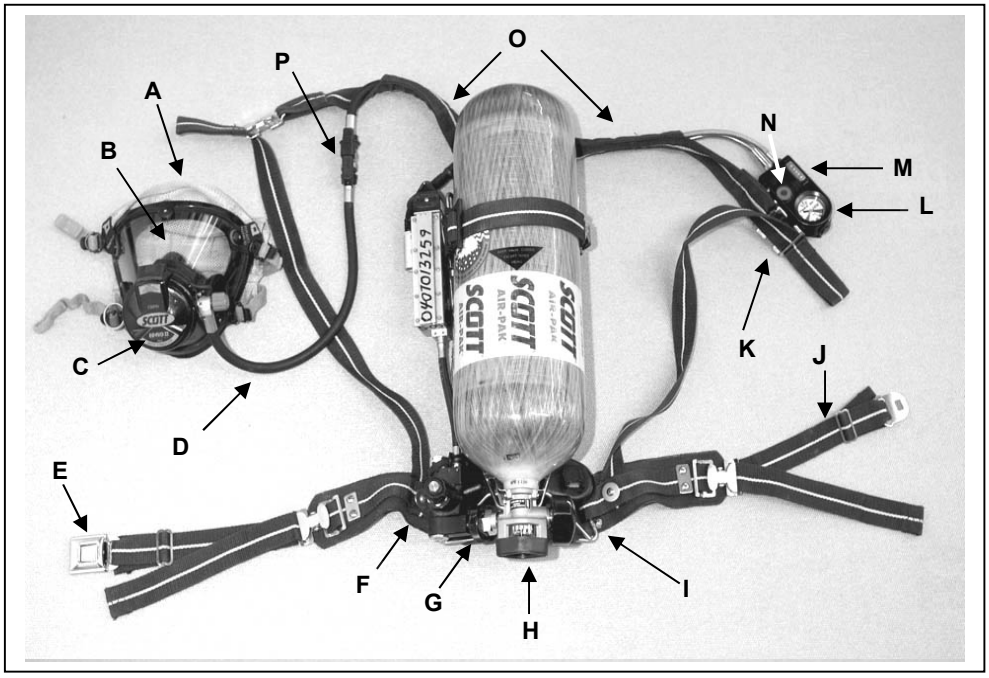

A Kevlar Head net
B Facepiece
C Regulator
D Low Pressure Hose
E Quick Release Buckle
F Universal Air Connection
G High Pressure Coupling
H Cylinder Valve & Gauge
I Pak-Alert SE 7
J Waist Belt
K Alligator Clip
L Remote Console
M Indicator Lights
N Manual Alert Button
O Shoulder Straps
P Quick Connect/Disconnect

1. INTRODUCTION

1.1 FDNY currently uses the NFPA 2007 Edition, Scott 4.5 Positive Pressure, Self Contained Breathing Apparatus (SCBA). This SCBA meets the approval of the National Fire Protection Association (NFPA), Occupational Safety and Health Administration (OSHA) and National Institute for Occupational Safety and Health (NIOSH). Use of the SCBA is regulated by the U.S. Department of Labor Safety and Health Act and together with full firefighting clothing, makes it a part of the framework of firefighters' personal protective equipment.

1.2 The NFPA 2007 SCBA Standard mandates that all SCBAs must have a visual and audible low air alert device. All of the FDNY's SCBAs have a Heads-Up Display (HUD), a Universal Air Connection (UAC), and a Chemical, Biological, Radiation, Nuclear (CBRN) approval. The regulator diaphragm is made of butyl rubber similar to a "Level A" entry suit. The CBRN approval means that the SCBA has met the NIOSH and NFPA criteria for exposure to Liquid Mustard and Sarin Agents. An approved SCBA CBRN regulator can be identified by its orange background label. An approved back frame assembly can be identified by a CDC NIOSH sticker.

1.3 **Members are not fully protected from CBRN agents unless wearing the NFPA 2007 compliant SCBA in conjunction with Proper Protective Clothing (e.g., "Level A" entry suit) and proper Haz-Mat training.**

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2. LIMITATIONS

2.1 PROTECTION

2.1.1 The SCBA is designed to protect against an Immediately Dangerous to Life and Health (IDLH) atmosphere.

2.1.2 The facepiece further protects against entry of contaminants through the eyes.

2.1.3 Because the facepiece does not cover the ears, airborne contaminants can enter the respiratory tract through a punctured or ruptured eardrum.

2.1.4 The SCBA does not protect against the absorption of toxic and hazardous substances, or radiation through parts NOT covered by the facepiece.

2.1.5 The SCBA does not protect against heat exhaustion or exposure to flame or heat.

2.1.6 The actual working and exit time achieved from an SCBA will vary considerably depending upon physical conditioning, type of work load, physical characteristics, training, and a number of other factors. It is the individuals' responsibility to know their work and exit times of the SCBA.

2.1.7 If a member runs out of air, that member should remove the regulator from the facepiece. The donned facepiece will provide some protection to the skin on the face. Notify Officer and immediately leave the contaminated area. This member MUST be accompanied to a safe area by another member using an SCBA.

2.2 CONFINED SPACES

The Code of Federal Regulations 29-CFR 1910.146 defines a confined space as any area that is:

- Not designed for continuous human occupancy; and
- Large enough so a person can enter and work; and
- Has limited means for entry and escape

2.2.1 Confined spaces include, but are not limited to, basements, sub-basements and cellars, manholes, pits, tunnels, wells, windowless buildings, storage containers, and other spaces that may be oxygen deficient or contain dangerous levels of airborne contaminants.

2.2.2 All confined spaces are to be considered dangerous until proven otherwise.

2.2.3 All members entering a confined space shall operate with SCBA donned until the space is deemed safe.

2.2.4 Members operating in a confined space must work in teams of two or more and maintain contact with each other, in case assistance is needed.

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2.2.5 When a member of a rescue team has to leave an area to service an SCBA, this member must be accompanied to a safe area by another member using an SCBA.

2.3 CONTACT LENSES AND GLASSES

2.3.1 Contact lenses may be worn with the SCBA.

2.3.2 When the use of corrective eye lenses is required during SCBA use, the corrective lenses must not interfere with a good seal between face and facepiece. Glasses with temple bars or straps that pass between the face and the seal of the facepiece **must not be used**. Each size facepiece may be equipped with a lens frame kit. The Department will issue corrective lens kits to members that request them.

2.4 UNDERWATER USE

2.4.1 The SCBA is NEVER to be used underwater.

2.4.2 Submersion in water will render the SCBA inoperative.

2.4.3 If the SCBA becomes submerged it MUST be placed out of service and returned with a completed service tag (RT-2) stating the problem to the Mask Service Unit.

3. DESCRIPTION

3.1 BACKFRAME AND HARNESS ASSEMBLY

3.1.1 The backframe is the rigid base and back plate to which the Harness Straps and Pressure Reducer Assembly are attached. Its main purpose is to hold the air cylinder. This is done by means of an adjustable cylinder band and a locking tab.

3.1.2 The harness assembly consists of two adjustable shoulder straps and adjustable waist straps made of Kevlar with a quick release buckle. The shoulder straps have pockets through which the low pressure hose and the remote gauge line pass. The waist belt rests on the hips of the wearer and distributes most of the weight of the SCBA to that area.

3.2 BREATHING AIR CYLINDER

3.2.1 Cylinders are constructed of an aluminum shell and wrapped with a fiber composite including neck and bottom, which strengthen and protect the shell.

3.2.2 Pressurized to 4500psi, the cylinder holds purified breathing air.

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Figure 1

Figure 2

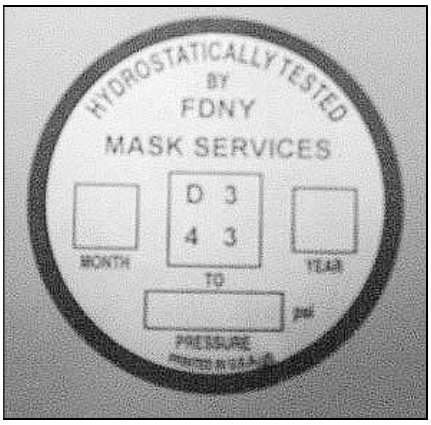

Figure 3

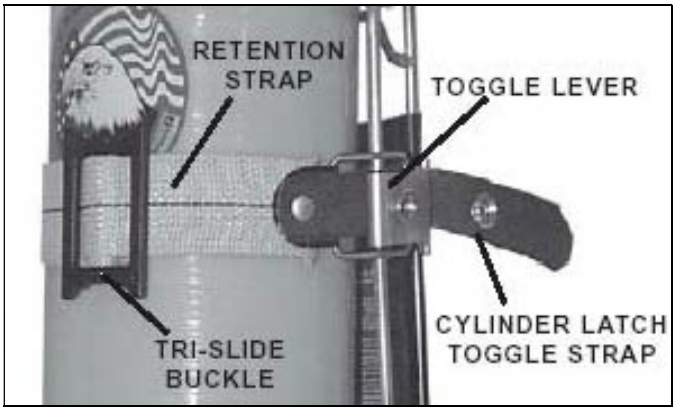

Figure 4

3.2.3 The Date of Manufacture is listed on the SCOTT label by month and year. The service life of an air cylinder is 15 years. If a manufacture date is greater than 15 years, the cylinder must be removed from service, bled down, tagged, and returned to MSU. (Figure 1)

3.2.4 Hydrostatic testing is done every 5 years. If the test date shows greater than 5 years, the cylinder must be removed from service, bled down, tagged and returned to MSU. The hydrostatic test date will also be found on the top of the cylinder. For example, the number 102 will indicate that this cylinder was tested in January of 2002, and will need to be retested by January of 2007. (Figure 2)

A. ***Redacted for PFS***

3.2.5 Cylinders that have had a Hydrostatic retest will have a round Hydro Recertified label glued to it, with month and year of retest. (Figure 3)

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3.2.6 The SCBA assembly has the capability of accepting 30, 45 or 60 minute cylinders. Since all 4.5 cylinders are pressurized to 4500psi, the difference between them is their varying cylinder sizes. The cylinder slide buckle is the only adjustment that must be made when using a different duration cylinder. Each cylinder has a similar hanger to lock onto the backframe. (Figure 4)

3.2.7 ***Redacted for PFS***

3.2.8 These are rated durations and the actual time achieved from the cylinder will vary considerably. The End of Service Time Indicator (EOSTI) alarms (vibralert and HUD) actuate when approximately 25% of full cylinder pressure remains in the cylinder and valve assembly. The alarms will continue to operate until the cylinder is nearly depleted. It is the individuals' responsibility to know their working and exit time of the SCBA.

3.2.9 The working and exit time of the SCBA will depend on factors such as:

- The degree of physical activity of the user.
- The physical conditioning of the user.
- The degree to which the user's breathing is affected by excitement, fear or other emotional factors.
- The degree of training or experience which the user has with this or similar equipment.
- Whether or not the cylinder is fully charged at the start of the work period.
- The atmospheric pressure; for example, if used in a pressurized tunnel or caisson at 2 atmospheres, the duration will be one-half as long as when used at 1 atmosphere; and at 3 atmospheres, will be one-third as long.
- Loose or improperly fitted facepiece.
- The condition of the SCBA.

3.2.10 The cylinder valve assembly consist of: (Figure 5)

A. **Rubber Bumper-**for protection of the assembly.
B. **Cylinder Gauge**-reads the pressure of the air within cylinder and gauge assembly. Cylinder gauge must read the same on both sides.
C. **Cylinder Hanger-**connects cylinder to backframe assembly.
D. **Over Pressurization Disk**-a safety feature should the cylinder be over pressurized.
E. **Cylinder Valve**-to be opened fully counter clockwise when in use. To close, push valve in and turn clockwise to stop.

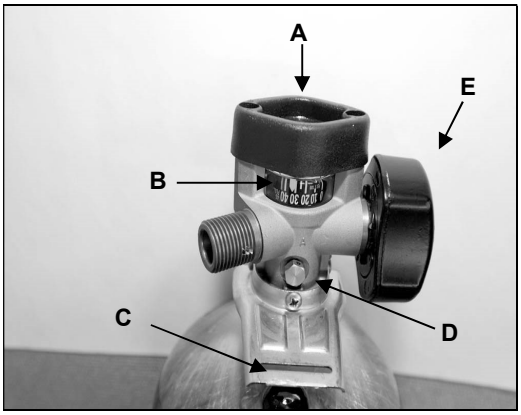

Figure 5

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3.2.11 Spare cylinders should be placed in either storage boxes or apparatus holders. Extra cylinders should be placed on their sides, with the valve stem and handle protected from damage

3.2.12 Inspect all spare cylinders (depots, High-Rise Units, company and reserve apparatus) weekly on Mondays for FULL pressure (4500psi). Stored cylinders found below FULL should be tagged and returned to the Mask Service Unit for further inspection.

3.2.13 Compressed air is dangerous. When servicing cylinder, position it so that it does not fall or roll away. Do not open the cylinder valve when the cylinder is not in the backframe or secured in some other manner. When opening a cylinder valve of a secured cylinder, be sure not to direct airflow at yourself or any other individual.

3.2.14 Avoid fully depleting cylinders and leaving valve open. Doing so will allow moisture and contaminates to build up inside the cylinder.

3.2.15 Designated training cylinders are identified with a blue top and/or a polymer protective sleeve. These cylinders are **not** to be used for firefighting purposes

3.2.16 It is prohibited to use company or spare SCBAs when performing any of the dragging methods outlined in Training Bulletin, Unconscious Firefighter Removal. Only the equipment included in the Emergency Removal Training Kit shall be used. Dragging a member with an SCBA attached, **for training purposes**, has caused injury to members and unnecessary damage to air cylinders and SCBAs. Each Battalion has been issued an Emergency Removal Training Kit which includes a mannequin outfitted in condemned bunker gear and a mask harness for training purposes.

3.3 CYLINDER EXCHANGE

3.3.1 Exchange cylinder for one that is FULL when:

A. Prior to operating, the remote gauge reads less than FULL (green area).

B. While operating, when the remote gauge and HUD reads less than 1/4 (Vibralert, Remote Gauge and HUD (EOSTI) will warn of this).

3.3.2 Exchange Procedure

A. Shut down the cylinder valve FULLY and purge all residual air from the SCBA.

B. Uncouple the high pressure hand coupling from the cylinder.

C. Unsnap and lift cylinder toggle strap.

D. While pressing down on the cylinder locking tab, grasp the cylinder at the rubber bumper and slide the cylinder hanger away from and free of the bottom hook.

E. Slide cylinder over locking tab until top of cylinder clears band.

F. Slide in a FULL cylinder in opposite direction of removal.

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G. As cylinder hanger clears bottom hook of wire frame, let hook slide back and lock into hanger slot.

H. Attach high pressure hand coupling to cylinder and turn clockwise. Coupling is to be made hand tight, **never** use a wrench to tighten coupling.

I. Push down on cylinder band toggle lever to firmly secure cylinder to backframe. Toggle lever should not be hard to push down, but have some tension. If necessary, readjust the slide buckle on the retention strap.

J. Open cylinder valve FULLY. Listen for any leaks in the entire SCBA system.

K. Shut down the cylinder valve and purge all residual air from the SCBA system, prior to placement in apparatus mounting bracket.

3.4 HIGH PRESSURE HOSE AND HAND COUPLING (Figure 6)

A High Pressure Hose

B Relief Valve

C UAC Connection

D Nylon O-Ring

E High Pressure Hand Coupling

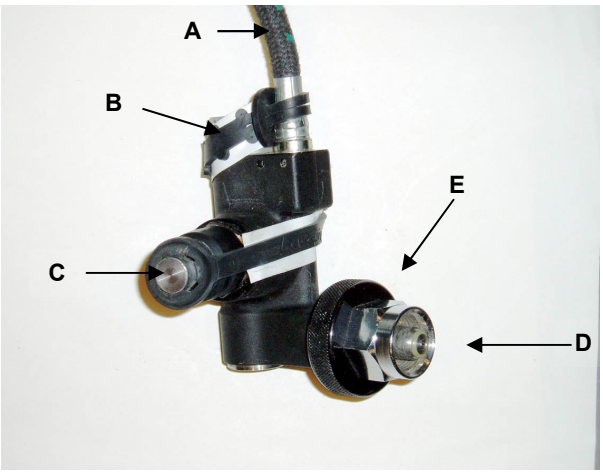

Figure 6

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3.4.1 The high pressure hose and high pressure hand coupling conveys breathing air from the cylinder to the pressure reducer assembly. Air pressure within this hose can be as much as 4500psi.

3.4.2 During inspection of the SCBA, there may be a need to tighten or replace the Nylon O-Ring. To do so, use a 1/8" Allen wrench and a 7/16" open end wrench. (Figure 7)

Figure 7

3.5 UNIVERSAL AIR CONNECTION (UAC) (Figure 8)

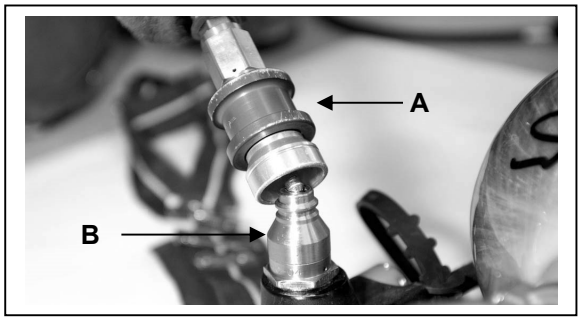

Figure 8

3.5.1 SCOTT 4.5 SCBAs are fitted with a UAC System which permits **emergency replenishment** of an approved SCBA breathing air supply cylinder on a user's SCBA from an approved air supply source while in use. This is not a Quick Charge attachment and must **not** be used for routine recharging of the air cylinder, buddy breathing, transferring air from another SCBA, or any other unapproved use. The UAC is for **emergency use only** when the SCBA user is incapacitated within the hazardous atmosphere. The UAC manifold is equipped with a relief valve which will open if the supply pressure of the emergency air supply exceeds the maximum pressure rating of the complete SCBA. However, the supply pressure from the High Pressure Coupling (**A**), of the emergency air supply to be connected to the UAC (**B**), must not exceed 4500psi. (Figure 8)

3.5.2 The UAC Connection must have its protective dust cover in place. A missing cover allows damage to the UAC or debris and contaminates to enter the connection, facilitating a possible malfunction when used with an approved air supply source. An SCBA with a missing UAC dust cover shall be placed out of service. It must be tagged with an RT-2 and forwarded to MSU.

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3.6 PRESSURE REDUCER ASSEMBLY (Figure 9)

3.6.1 The Pressure Reducer Assembly (PRA), mounted on the left side of the backframe, reduces the high pressure breathing air received from the cylinder. Consisting of two systems, the PRA normally reduces the operating pressure to 100 psi before entering the regulator's low pressure hose. The regulator then controls the pressure within the facepiece to slightly above atmospheric pressure.

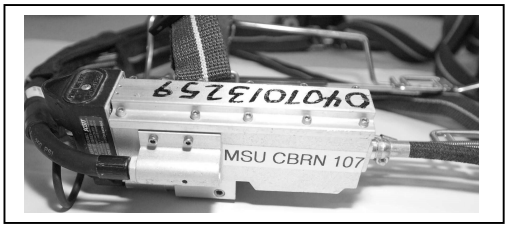

Figure 9

3.6.2 A malfunction of the PRA's primary system will automatically direct breathing air into a secondary system. When this occurs, the operating pressure will only be reduced to 150 psi and cause the vibralert alarm to activate. The member will only know that the vibralert alarm has activated and **must notify their officer and immediately leave the contaminated area**. This member must be accompanied to a safe area by another member using a SCBA.

3.6.3 Failure of both the primary and secondary systems in the open position will activate a Relief Valve in the PRA, which will rapidly discharge all pressure in excess of 185 psi into the atmosphere. When this occurs, the cylinder valve should be partially closed, allowing only a minimal amount of air to release, permitting the member to both breathe and conserve air. **The member must notify their officer and immediately leave the contaminated area.** This member must be accompanied to a safe area by another member using a SCBA.

3.7 LOW PRESSURE HOSE

3.7.1 The low pressure hose conveys breathing air from the PRA, to the regulator assembly.

3.7.2 The Low pressure hose incorporates a Quick Disconnect with HUD connection. This connection allows for one of the options with the Fast Pak.

3.7.3 To disconnect – While pushing the plug “D” into the socket, pull the locking sleeve “E” back toward the guard. The plug “D” will separate. (Figure 10)

3.7.4 To reconnect - align the HUD plug with the mating connector and push plug “D” into socket until the locking sleeve “E” pops forward. Test for proper engagement by tugging on the coupling. (Figure 11)

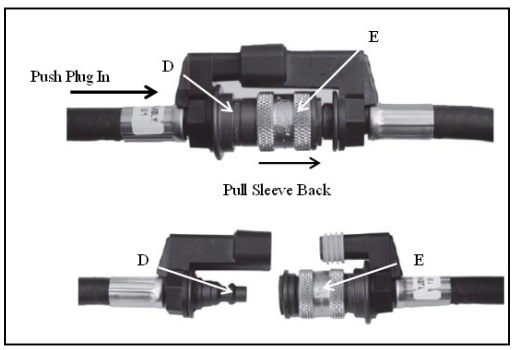

Figure 10

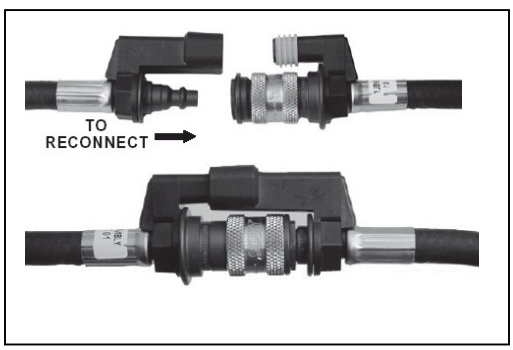

Figure 11

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3.8 REGULATOR ASSEMBLY

3.8.1 Positive Pressure Demand Regulator- Regulates and maintains pressure within the donned facepiece. This is done with the breathing air received from the Pressure Reducer Assembly. The positive pressure inside the facepiece (internal pressure) is slightly higher than the pressure outside (atmospheric pressure), and is maintained when the seal between the two atmospheres is disturbed. Internal pressure within the facepiece creates an outward thrust of breathing air from any opening, thereby preventing contaminants from entering the member's breathing zone. Prolonged facepiece disturbance can deplete available breathing air sooner than expected.

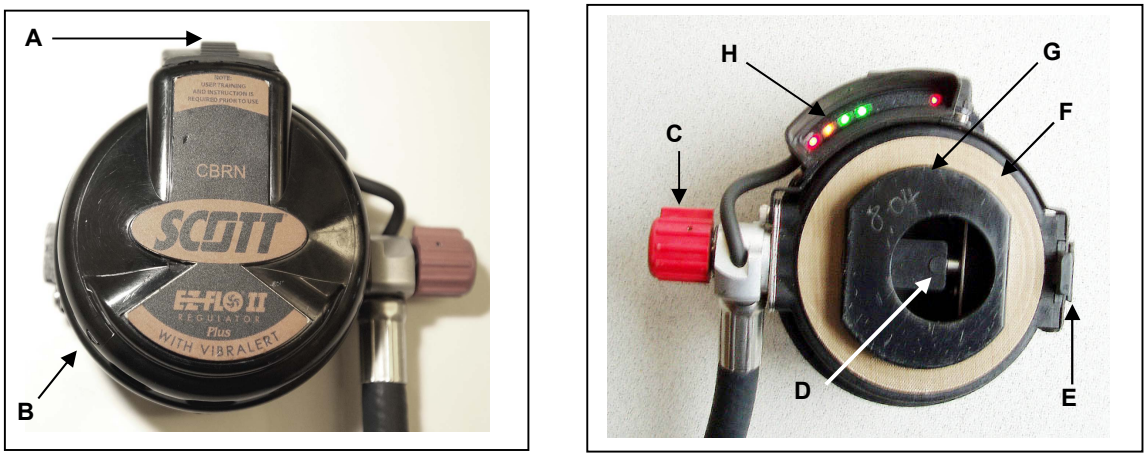

Figure 12

A Manual Shut-Off Switch
B Regulator Cover
C Purge Valve
D Vibralert Alarm
E Snap Lock
F Regulator Gasket
G Spray Bar
H Heads-Up Display

3.8.2 Manual Shutoff Switch (Figure 12 {A})

A. A manual shut-off switch is mounted on top of the regulator assembly. The function of the switch is to stop the flow of air into the facepiece prior to facepiece removal. When used, the switch conserves the limited amount of breathing air which can remain in the SCBA. If the switch is not pressed, a full 45 minute cylinder can be depleted in approximately 4 minutes, exhausting the member's available breathing air.

B. When pressed, the switch holds the regulator in the closed position, stopping air flow. The switch automatically releases when the member inhales sharply through the facepiece, allowing air to continue to flow. If the manual shut-off fails to release for any reason, turn the red purge valve downward, 180 degrees to start the flow of air. Notify the officer and leave to a safe area, accompanied by another member using a SCBA.

3.8.3 Regulator Cover (Figure 12 {B})

A. The EZ Flow II regulator has a high density plastic cover that won't dent. It provides less exhalation resistance, which can increase overall operating time.

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3.8.4 Purge Valve (Figure 12 {C})

A. A red purge valve knob is located on the left side of the regulator assembly. It is a manual override allowing the user to create a constant flow of air into the facepiece of up to 225 liters per minute. Control this flow by partially closing the purge valve. When the regulator is correctly positioned on the facepiece, a stem on the purge valve will point upwards in its normal mode. Turning the valve downward 180 degrees away from the member's face will activate the purge. Do not force the valve past the 180 degree stop.

B. The purge valve is used:

1. To relieve any residual pressure remaining in the SCBA system after the air supply is shut down.
2. To release all air remaining in the attached breathing air cylinder, prior to placing the entire SCBA assembly into a Haz-Mat overpack drum.
3. To clear the spray bar holes of any small particles.
4. To clear the facepiece of any contaminants that may have entered.
5. To defog the facepiece.
6. For the following **Emergencies:**

- Failure of the regulator in the closed position, (no air to facepiece) turn purge valve counter-clockwise. If failure of the regulator in the open position, (too much air flow in the facepiece), air flow can be controlled by opening the purge valve fully and partially closing the cylinder valve.
- To provide airflow if facepiece becomes severely damaged.
- If the manual shut-off switch fails to release for any reason.

NOTE: In all SCBA emergencies, **the member must notify their officer and immediately leave the contaminated area.** This member must be accompanied to a safe area by another member using an SCBA.

3.8.5 Vibralert Alarm (Figure 12 {D})

A. A vibralert alarm is housed within the regulator assembly. The alarm gives warning by both an audible and vibratory action around the facepiece. The vibratory action is especially evident when working in areas with background noises, which may muffle the audible alarm.

B. The vibralert is an End of Service Time Indicator (EOSTI) that activates at approximately 25% of the cylinders air capacity, alerting the member to exit the contaminated area. The vibralert and HUD work independently and may not activate at precisely the same time.

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C. The 30, 45 and 60 minute rated cylinders are durations, and the actual time achieved for exiting the IDLH area from the cylinder will vary considerably depending upon the user's physical condition, type of work load, physical characteristics, training and a number of other factors.

D. The alarm will also activate if the PRA's primary system malfunctions, thus activating the secondary system.

E. Upon activation of the vibralert alarm, **the member must notify their officer and immediately leave the contaminated area.** This member must be accompanied to a safe area by another member using a SCBA.

3.8.6 Snap Lock (Figure 12 {E})

A spring-loaded snap lock is located on the right side of the regulator assembly that secures the facepiece to the regulator. With the lock facing downward and purge valve up, the regulator inserts into the facepiece's molded groove, and is then rotated clockwise until the lock snaps into place. The snapping action between the molded notches on the facepiece correctly positions the regulator for use.

3.8.7 Regulator Gasket (Figure 12 {F})

A regulator gasket glued on the regulator assembly provides a seal between the facepiece and the regulator. The integrity of the gasket ensures contaminants remain outside the facepiece.

3.8.8 Spray Bar (Figure 12 {G})

A spray bar, comprised of nine small holes, surrounds the upper part of the regulator assembly. As the member breathes, air passes through the bar and is directed toward the lens, helping to keep the facepiece clear of any condensation buildup.

3.8.9 HEADS-UP DISPLAY OPERATION (Figure 12 {H} & Figure 13)

The HEADS-UP DISPLAY is an independent EOSTI that provides a visual monitor of the air supply in the cylinder. The display is fitted to the facepiece-mounted regulator and appears across the bottom of the user's field of view through the facepiece. The HUD consists of four rectangular lights to represent the cylinder pressure at Full, Three-Quarters, One-Half, and One-Quarter. A fifth round red light indicates Low Battery. The HUD operates as follows:

A. When cylinder valve is turned on, the HUD will initialize and illuminate all five lights for twenty (20) seconds. Operation of all five lights must be verified every time SCBA use has begun and with every regular operation inspection.

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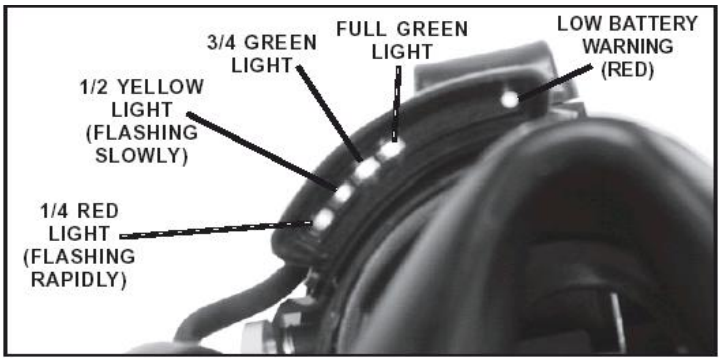

Figure 13

B. After initialization, the rectangular indicator lights will show the level of the air supply in the cylinder as follows:

1. FULL cylinder - indicated by the two green lights glowing near the center of the display.

2. THREE-QUARTERS cylinder - indicated by a single green light glowing.

3. ONE-HALF cylinder - indicated by the yellow light flashing slowly at once a second.

4. ONE-QUARTER cylinder - EOSTI indicated by the red light at the far left flashing rapidly at ten times a second. When this warning light is flashing rapidly, **the member must notify their officer and immediately leave the contaminated area.** This member must be accompanied to a safe area by another member using a SCBA.

INDICATOR LIGHTS	WHAT THEY MEAN	WHAT YOU SHOULD DO
Two Green Lights Glowing	Full Cylinder	Continue Using Mask
One Green Light Glowing	¾ Cylinder	
One Yellow Light Flashing Slowly	½ Cylinder	
One Red Light Flashing Rapidly	¼ Cylinder	**Leave Hazardous Area Immediately**

5. If a member runs out of air, that member should remove the regulator from the facepiece. The donned facepiece will provide some protection to the skin on the face.

NOTE: The HUD and vibralert work independently and may not activate at precisely the same time. It is the individuals' responsibility to know their work and exit times of the SCBA.

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C. When the batteries require changing, the round low battery indicator at the far right of the display will light for twenty (20) seconds and then begin to flash slowly at once a second. When the low battery indicator is actuated, the batteries still have sufficient life to operate the HUD longer than the longest duration cylinder installed in the SCBA. However, the batteries must be changed immediately upon termination of use of the SCBA, or before re-entry into the hazardous atmosphere.

3.9 FACEPIECE (Figure 14)

3.9.1 The Scott AV 2000 is manufactured in three (3) sizes that are color coded. The size and colors are :

- Small size - Green color face seal
- Comfort Seal - Black color face seal
- Extra Large size - Red color face seal

3.9.2 All members are fit tested as part of the respiratory protection policy and must wear the correct facepiece size, that they were fit tested for. Members issued a personal facepiece, should wear that facepiece. When a member's facepiece is placed out-of-service, it must be returned to MSU with an RT-2 attached. Six (6) comfort seal facepieces are provided for all SCBA riding positions. They are etched with the company designation and affiliated SCBA number.

A. ***Redacted for PFS***

3.9.3 The outer edge of the lens is fitted with a frame. The rubber seal is molded to form a chin cup at the lower part of the facepiece where the member's chin rests during use. The remainder of the rubber seal continues around the upper part of the facepiece and has the ability to conform to various facial contours. Failure to get a positive seal will allow air to escape from around the facepiece.

3.9.4 A Kevlar head net and strap assembly is fastened to the facepiece. The net is designed to conform to the member's scalp. Two pull straps are attached to each side of the facepiece; pulling the straps, first the bottom and then the top snug, will ensure a proper facepiece to face seal. A buckle-thumb release is attached to each pull strap and facilitates the loosening of the straps prior to facepiece removal.

3.9.5 Nose cup assembly is designed to be an integral part of the facepiece and **must** be in place. Inhalation valves, voicemitters, voicemitter ducts, and nosecup retainer must all be present to ensure proper inhalation of breathing air. These components help remove carbon dioxide from within the facepiece.

3.9.6 Split ring, attached to a head net tab "D" ring on the user's right side, is provided to secure the facepiece during a stand-by position and while the SCBA is stored on the apparatus.

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3.9.7 SCBAs should not be worn when conditions prevent a good face to facepiece seal. Such conditions may include, but not limited to, growth of beards, side burns, a skull cap that projects under a facepiece or temple pieces on glasses. Also, the absence of one or both dentures can seriously affect the fit of the facepiece. Use of the SCBA without a good face to facepiece seal may reduce the duration of use and/or expose the user to the atmosphere the SCBA is intended to protect against.

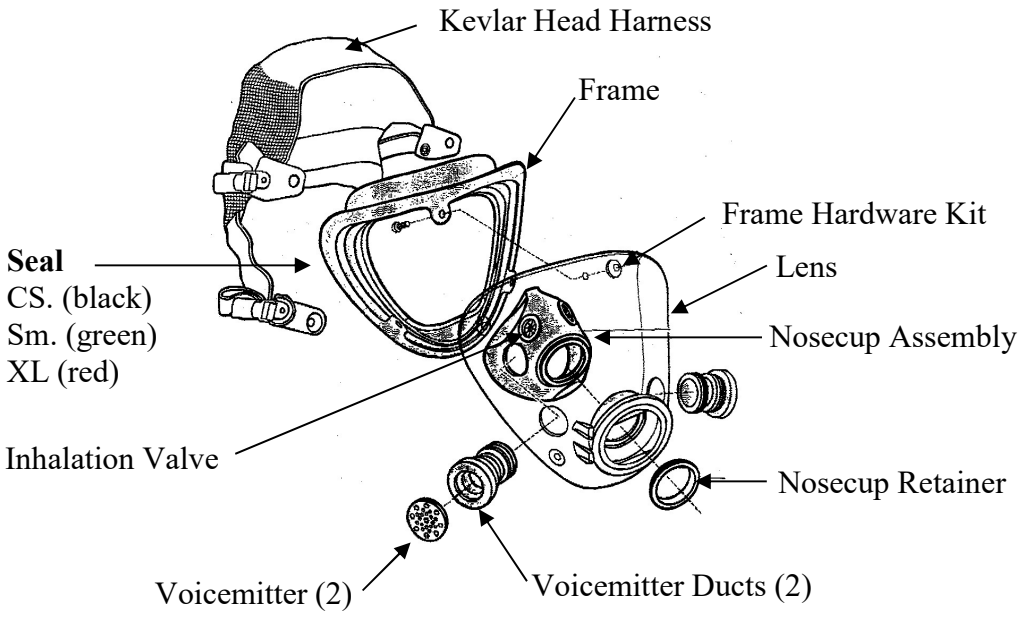

Figure 14

3.10 REMOTE CONSOLE ASSEMBLY WITH PAK-ALERT SE 7

3.10.1 The Scott Pak-Alert SE 7 is intended to be integrated only with the Scott Air-Pak 4.5 Self Contained Breathing Apparatus (SCBA). The Pak-Alert SE 7 is a Personal Alert Safety System (PASS) intended to assist in locating a member who is incapacitated or in need of assistance. The terms Pak-Alert SE 7 and PASS are used interchangeably.

3.10.2 The Pak-Alert SE 7 consists of a motion sensor module mounted to the bottom of the SCBA backframe, a pressure switch mounted between the cylinder and gauge line, and a Control Console mounted on the right shoulder strap at the pressure gauge location. (Figure 15)

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Figure 15

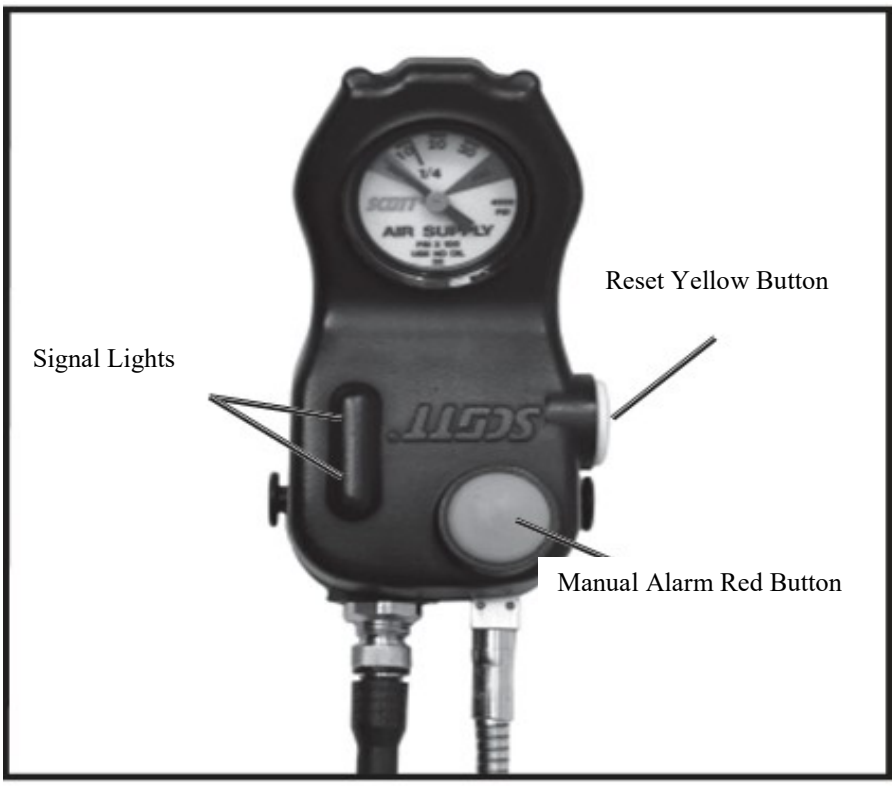

Figure 16

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3.10.3 The Control Console, which is located on the right shoulder strap, contains a cylinder air pressure gauge, a console lens, a manual alarm button (red indicator), and a reset button (yellow indicator) located on the side of the console. (Figure 16)

A break in the Control Console tube will result in a slight air leak. While this leak will not greatly reduce the member's breathing air, **the member must notify their officer and immediately leave the contaminated area.** This member must be accompanied to a safe area by another member using a SCBA.

The vent holes on the back of the Control Console should **NEVER** be plugged or sealed in any way, regardless of a suspected air leak. If a leak is suspected, **the member must notify their officer and immediately leave the contaminated area.** This member must be accompanied to a safe area by another member using a SCBA. There are two (2) lights on the back of the Pak Alert SE 7 called buddy lights that flash green in normal mode and red in alarm mode.

3.10.4 Provided proper batteries have been installed and the cylinder contains air, the Pak Alert SE 7 is automatically activated when the SCBA is pressurized by opening the cylinder valve. Once activated, the Scott Pak-Alert SE 7 will remain activated until:

A. The cylinder is turned off and the residual air pressure purged from the regulator, **and**

B. The reset button has been pressed twice.

3.10.5 In the automatic mode, the Scott Pak-Alert SE 7 constantly monitors motion of the SCBA backframe. The motion sensor is located in the sensor module along with the audible alarm. If the sensor module does not sense motion of the SCBA for 20 seconds, the Pak-Alert SE 7 will signal a pre-alarm condition. If there is still no motion of the SCBA for the next 12 seconds, the full alarm will sound.

A. The audible alarm has a variable pitch that helps eliminate audible alarm saturation. It allows for an easier way to hone in on the audible alarm and reduces reflective alarm sound.

3.10.6 PRE-ALARM

A. Once the SCBA is pressurized, the Pak-Alert SE 7 will automatically sound a pre-alarm if the SCBA remains motionless for more than 20 seconds. When a pre-alarm occurs, the green flashing light on the control console is replaced by a red light which flashes approximately once per second and is accompanied by an ascending/descending alarm that increases in decibels during the pre-alarm cycle.

B. If the user is **not incapacitated or not in need of assistance**, the pre-alarm is normally reset by movement of the SCBA. When reset, the red flashing light will be replaced by the green flashing light and the ascending/descending tone will stop.

C. A pre-alarm may also be reset by pressing and holding the reset button until 3 quick audible chirps are heard and the red flashing light on the control console is replaced by the green flashing light.

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D. The motion sensor is in the sensor module under the air cylinder valve and not in the control console, so that actual movement of the SCBA backframe is required for reset. Shaking the control console will not reset the Pak-Alert SE 7. Buckling and tightening the SCBA waist strap will decrease pre-alarm activations.

3.10.7 FULL ALARM

A. If the Pak-Alert SE 7 is not moved, the Pak-Alert SE 7 will go into full alarm 12 seconds after the pre-alarm starts.

B. Full alarm is indicated by a loud, almost continuous, 3-tone alarm from the sensor module accompanied by flashing of the red signal light on the control console and buddy lights. The full alarm condition can only be cleared by manually pressing the reset button twice, located on the side of the control console.

C. After the full alarm has been silenced by pressing the reset button twice, the Pak-Alert SE 7 will remain activated with the green light flashing once per second. In the activated or "automatic" mode, it will again go into pre-alarm followed by full alarm unless there is movement of the SCBA at least once every 20 seconds for as long as the SCBA is pressurized.

3.10.8 MANUAL ALARM

A. If a member requires immediate assistance, the Pak-Alert SE 7 provides a red manual alarm button located on the front of the control console on the user's right shoulder.

B. The manual alarm causes the full alarm signal to be given. Provided working batteries are in the Pak-Alert SE 7, the manual alarm may be activated by pressing the manual alarm button at any time, **even when the SCBA is not pressurized**. If the manual alarm button has been pressed without the SCBA pressurized, the alarm can be silenced by pressing the reset button twice. The Pak-Alert SE 7 is now on and in an automatic mode. To turn the unit off, press the reset button twice again while the unit is not in the alarm mode.

3.10.9 TURNING THE PAK-ALERT SE 7 OFF

A. The Pak-Alert SE 7 cannot be turned off if the cylinder valve is open and/or pressure remains in the SCBA. Pressing the reset button when the SCBA is pressurized will only reset an alarm condition and return the Pak-Alert SE 7 to automatic mode. When use of the Pak-Alert SE 7 and SCBA is no longer required, first close the cylinder and then vent the residual air from the SCBA by opening the regulator purge valve. After waiting until the airflow stops, close the regulator purge valve and turn-off the PASS by pressing the reset button twice. The green flashing light will go out and a 15 second beep sequence will be heard from the sensor module as residual air bleeds from the system. After the air has been completely bled off the system, the unit will sound a quick two-tone chirp indicating the Pak-Alert SE 7 is deactivated.

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B. If the SCBA is turned off and de-pressurized without pressing the reset button twice, the Pak-Alert SE 7 will continue to monitor motion in automatic mode. This means that the Pak-Alert SE 7 may be used to monitor motion after the SCBA is turned off and de-pressurized. Resetting the full alarm after the SCBA has been de-pressurized **will not** turn off the Pak-Alert SE 7. The reset button must be depressed twice with no alarm condition to turn off the Pak-Alert SE 7 (the 15 second beep sequence and two tone chirp should be heard).

3.10.10 LOW BATTERY

A. If while using the SCBA, the batteries begin to approach the end of their useful life, the sensor module will begin to sound a chirp every two seconds and the green light on the control module will go out. This is a low battery condition. In this condition, the Pak-Alert SE 7 will continue to operate normally, going into pre-alarm after 20 seconds with no motion, and full alarm after 12 more seconds of no motion.

B. While in low battery condition, the Pak Alert SE 7 will continue to operate for a period of time greater than the longest duration cylinder available for the SCBA. However, the batteries must be replaced before using the SCBA again.

C. **Failure to replace the batteries and/or continuing with multiple uses of the SCBA after the Pak-Alert SE 7 has indicated the low battery condition, may result in failure of the Pak-Alert SE 7 during use.**

3.10.11 BATTERY TEST

When the Pak-Alert SE 7 is in the off condition (cylinder valve closed with no green flashing light on the control console), the batteries can be checked by pressing and holding the reset button on the console. A green light will illuminate on the console to indicate sufficient battery power remaining; a red light indicates that the batteries must be replaced before the SCBA is used again.

3.10.12 BATTERY REPLACEMENT

WARNING The Pak-Alert SE 7 is intended to assist in locating a member who may be in a life-threatening situation. Failure to follow the instructions for opening, changing the batteries, and closing the battery compartment may result in damage, which could cause failure of the PASS during a life-threatening situation, or could cause a fire or explosion in a flammable or explosive atmosphere possibly resulting in injury or death.

A. Before replacing batteries, close SCBA cylinder valve, open SCBA purge valve to vent out residual air, close SCBA purge valve and press the reset button twice. A 15 second beep sequence occurs as the residual air bleeds off. Unit will sound a two-tone chirp and green light will go out indicating unit is inactive. Never remove or replace batteries with system pressurized or damage may occur to electronic components.

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- When replacing batteries on SCBA equipped with harness and backframe, place SCBA in a clean**,** non-hazardous area.
- With a Philips screwdriver, carefully remove the battery housing cover and set it aside. (Figure 17)
- Remove used batteries from battery compartment by sliding them out of the battery compartment. (Figure 18)
- Install six (6) new AA batteries of the same brand. (Eveready Energizer Alkaline E91 or EN91, or Duracell Alkaline PC1500, MN1500 or MX1500) Do not mix battery brands. Always replace all batteries at the same time. The battery holder is marked with the style and orientation of the batteries required. (Figure 4).
- Verify correct orientation of batteries as shown by labels inside the battery holder.

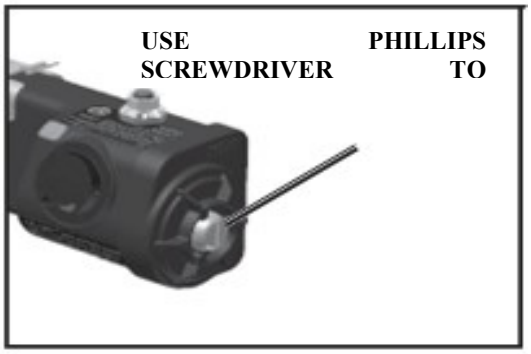

Figure 17

Figure 18

B. The battery cover must be installed so that it is watertight after replacement. Clean the sealing rib around battery compartment and sealing face of the cover by wiping with a clean damp cloth to remove any dirt or foreign matter which might prevent a proper seal. Check cover gasket for tears or cuts. If damage is found, SCBA shall be removed from service, tagged with an RT-2 and forwarded to MSU.

C. Install battery cover and tighten the cover screw until snug. After replacement of batteries, perform a Regular Operational Inspection before returning SCBA to service. Except for the replacement of batteries, no attempt shall be made to do maintenance, or to make adjustments or repairs.

D. Do not mark, paint, etch or drill any of the Pak Alert components or housing in any way.

E. ***Redacted for PFS***

3.10.13 ***Redacted for PFS***

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3.10.14 INTRINSICALLY SAFE LISTING

A. The Pak-Alert SE 7, when installed on a Scott SCBA, is listed as intrinsically safe in Class I Division 1 Groups A, B, C and D hazardous locations.

B. To maintain an intrinsic safe listing, the SCBA with Pak-Alert SE 7 must be inspected regularly as per SCBA inspection procedures. Pak-Alert SE 7 components must not be tampered with in any manner. The battery compartment must only be opened in an area known to be free of flammable or explosive hazards.

C. If the Pak-Alert SE 7 is used in an area of explosive or flammable hazards, failure to regularly inspect as instructed, failure to correct damage before use or the installation of incorrect batteries may lead to a fire or explosion, possibly resulting in personal injury or death.

3.11 CLEANING, MAINTENANCE, AND STORAGE

3.11.1 Cleaning, maintenance and storage of a SCBA with a Pak-Alert SE 7 shall be done as part of the normal SCBA post use inspection and cleaning.

3.11.2 The exterior of the Pak-Alert SE 7 may be cleaned while cleaning the exterior of the SCBA by wiping with a damp sponge and thoroughly wiping dry. The lens on the front of the control console should be cleaned after every use to insure maximum light intensity at all times. Do not use solvents for cleaning or attempt to paint the exterior surfaces of the Pak-Alert SE 7.

A. If during use, the SCBA and/or Pak-Alert SE 7 is suspected of being contaminated with a hazardous substance, the contaminate must be identified and properly removed or the contaminated component(s) must be replaced before next use.

B. The Pak-Alert SE 7 and SCBA must be stored in a clean dry area with an air temperature that does not drop below freezing.

4. INSPECTIONS

4.1 INSPECTION TIMES

4.1.1 SCBAs must be inspected:

- Immediately after the 0900 and 1800 hour roll calls,
- Immediately before the start of Multi-Unit Drill,
- After each use.

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Note: In addition to the 4.2 Inspection Procedures, the following procedure shall apply following contamination from the products of combustion.

Remove SCBA cylinder from the harness assembly. Clean the cylinder and the harness assembly using warm soapy water and a soft or medium bristled brush. Results of several studies have demonstrated that using a brush along with the soapy water effectively reduces polycyclic aromatic hydrocarbons (PAH) contamination. (Exposure to PAH's have been linked to certain types of cancer in addition to cardiovascular disease.)

4.1.2 At the start of each tour, members will be assigned an SCBA for their use. The Company Officer will supervise the inspection of each SCBA by the assigned member, and then make an entry in the Company Journal of this event indicating SCBA #, names of inspecting members, and the results of inspection.

4.1.3 Place defective SCBAs out of service and replace with a battalion spare. ***Edited for PFS***

4.2 INSPECTION PROCEDURES

4.2.1 Remove SCBA from apparatus mounting bracket and rest wire frame on a clean, dry surface with cylinder on top and straps spread out.

4.2.2 Check the cleanliness and condition of the entire SCBA assembly:

A. Backframe - no deformities or breaks at weld spots.

B. Harness Assembly - no cuts, rips or frayed straps. Remove the ends of the waist straps and buckle from the belt retainers. Squeeze alligator clips on waist belt and pull straps, so both ends overlap each other evenly. Ensure that shoulder straps are fully extended.

4.2.3 Facepiece

A. Disinfect and Clean.

B. Inspect head net and straps for fraying and elasticity. Check that buckle thumb leavers are in working order.

C. Inspect **internal parts**:

1. Check rubber seal around lens, be sure there are no deformities, cracks or tears.
2. Inspect for presence of nose cup assembly.
3. Inspect inhalation valves in nose cup assembly, be sure they are both present and lay flat against the nose cup.
4. Make sure voicemitter ducts are present and not deteriorated.

D. Inspect **external parts**:

1. Inspect for cracks, scratches, dirt and debris that would prevent a good seal or distort vision.
2. Look for the presence of two voicemitters and that the edges are sealed by the rubber duct.

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3. Check that the five head harness retaining buttons are present. Check for their tightness by trying to move them with thumb and forefinger.

Note: If either the nose cup assembly or voicemitter is found to be damaged or missing during inspection or at any other time, the facepiece shall be placed out of service and forwarded to the Mask Service Unit for repair. The officer on duty shall forward a letterhead report to the Chief of Operations via the chain of command stating full particulars. Report shall include name of member discovering the facepiece and name of member who last used and/or inspected the facepiece. The officer shall interview all members involved in order to ascertain how the nose cup or voicemitter became damaged or missing.

E. Check Facepiece seal:

1. With the facepiece attached to the regulator assembly, hold regulator in left hand, close eyes and blow into facepiece to clear it of any dust particles. With chin into chin cup, place facepiece against face and inhale. During this action facepiece should close in and hold onto the member's face, indicating that the regulator's diaphragm is functioning. If there is not a proper seal, reposition the facepiece and try again. If the leak persists, there may be a problem with the regulator and/or facepiece. The member may require a different size facepiece. Have a member who can achieve a good seal with a standard facepiece check this unit. Small and extra-large facepieces are available through the Division or Mask Service Unit. Follow procedures outlined in this bulletin if a defect in regulator is suspected. In the event a member can not achieve a good seal with any of the facepieces available, the following action shall be taken:

   a-b. ***Redacted for PFS***

   c. Member is not to operate in areas requiring SCBA until problem is resolved.

2. During the initial inhalation, a click should be heard at the regulator assembly. This click indicates the functioning and ON position of the manual shut-off switch. (If the SCBA was supplied with air, it would then flow into the facepiece). Before removing the facepiece, pause breathing and press the manual shut-off switch on the regulator assembly.

F. Place the facepiece out-of-service for any problems. Complete an RT-2 and forward to MSU.

4.2.4 CYLINDER INSPECTION

A. Remove Cylinder from back frame for full inspection.

1. Be sure SCBA is purged before disconnecting high pressure hose
2. Uncouple high pressure hand coupling.
3. Unsnap and lift cylinder band toggle, push down cylinder retaining latch, push cylinder toward top of backframe, then with two hands, pull cylinder towards you.

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4. Check cylinder hydrostatic test date. Cylinders require hydrostatic testing every five years and have a service life of 15 years.
5. Check cylinder gauge for a full reading, if not replace it with a full one.
6. Inspect cylinder for dents, cracks, gouges, or any damage on the outside of the cylinder including composite over wrap.
7. Check for charred or missing decals, melted rubber, bulging, peeling or distorted fiber. Look for discoloration of paint that has turned brown or black.
8. Inspect cylinder valves for physical damage; ensure pressure gauge reads the same on both sides of gauge.
9. Inspect cylinder valve threads for damage or missing threads. Cracks are indicated by a bright silver line along the cylinder threads. Cracks are caused by strain exerted on the cylinder threads, if an assembled SCBA is dropped at the high pressure hose coupling. (Figure 19)

   Caution: If cylinder threads are cracked, pressure from the opened cylinder could cause the threads to break away, thus causing the high pressure hose coupling to be blown off the cylinder. DO NOT touch the cylinder threads, since although not immediately visible, a metal sliver may pierce the skin like a splinter.
10. If no defects are found with the cylinder after inspection, replace on the back frame and connect to the cylinder hanger.
11. If a cylinder is found defective, it shall be immediately depressurized to a slight positive pressure, placed out-of-service, tagged with an RT-2 and returned to MSU.

Note: Compressed air is dangerous. When servicing cylinder, position it so that it does not fall or roll away. Do not open the cylinder valve when the cylinder is not in the back frame or secured in some other manner. When opening a cylinder valve of a secured cylinder, be sure not to direct airflow at yourself or any other individual

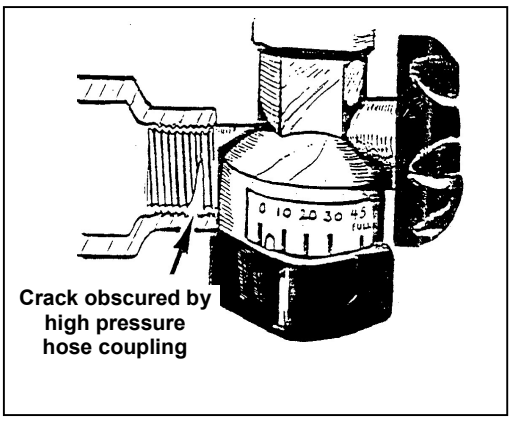

Figure 19

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4.2.5 HIGH PRESSURE HAND COUPLING AND RIC-UAC

A. Inspect condition of high pressure hose and high pressure hand coupling. Check for presence and tightness of nipple seal (nylon "O"-ring). The "O"-ring is held in place and tightened with a 1/8" Allen screw and 7/16" open end wrench.

B. Check the condition of UAC by removing the dust cover and visually inspecting the UAC for damage or deformities. Damage to or dirt in the connection may cause failure of use with Fast Pak. Assure that the dust cover is securely replaced after inspecting the UAC. If the UAC shows any sign of damage or the dust cover is missing, the SCBA shall be placed out-of-service, tagged with an RT-2 and returned to MSU.

C. Reconnect the high pressure hand coupling to the cylinder valve, coupling is hand tight. Secure cylinder, adjust cylinder band slide as needed, and secure with toggle.

D. Inspect spare cylinders the same.

4.2.6 PRESSURE REDUCER ASSEMBLY (PRA)

A. Check PRA for visible damage.

B. Check high pressure hose for fraying and visible damage.

4.2.7 LOW PRESSURE HOSE

A. Check that the low pressure hose is not damaged, is connected to the PRA and swivels freely at purge valve.

B. Check that the quick disconnect is engaged properly by tugging on the coupling and that the HUD plug is properly aligned and fitted into the mating socket.

4.2.8 REGULATOR ASSEMBLY

A. Check that the HUD visor and manual shut-off switch boot is intact, not damaged, or distorted.

B Inspect the regulator cover to ensure there are no signs of cracks, or heat damage.

C. Remove the facepiece from the regulator to check that the regulator gasket is present and seated, not chipped, or torn.

D. Check the regulator locking latch that both screws are present and the latch slides smoothly.

E. Make sure manual shut-off switch is depressed and the purge valve tip is in the 12 o'clock position, so air is not lost when cylinder is turned on.

F. Connect regulator to facepiece:
With purge valve at 12 o'clock to the facepiece, align the flats of the regulator and facepiece together, insert and turn regulator ¼ turn clockwise.

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4.2.9 OPERATIONAL INSPECTION OF SCOTT PAK-ALERT SE 7

A. Inspection and test of the Scott Pak-Alert SE 7 is to be conducted along with inspection and test of the SCBA. If during the inspection any malfunction of the SCBA or the Pak-Alert SE 7 is noted, remove the SCBA from service and tag for repair by MSU.

B. BATTERY TEST

When the Pak-Alert SE 7 is in the off condition (cylinder valve closed with no flashing green light on the control console), the batteries can be checked by pressing and holding the reset button on the console. A green light will illuminate on the console to indicate sufficient battery power remaining. A red light indicates that the batteries must be replaced before the SCBA is used again.

If the low battery condition (a steady chirp every two seconds with no flashing lights) occurs at any time during regular operational inspection, do not use the SCBA. Change the battery in the sensor module immediately and repeat the regular operational test or take the SCBA out of service until the batteries are changed and the regular operational test is successfully performed.

C. In several of the inspection procedures, a full alarm will be observed. The full alarm condition includes an audible tone that can exceed 95 decibels at approximately 10 ft. The alarm should be reset immediately on verification that it is functioning properly. Hearing protection should be worn if prolonged exposure to a full alarm condition is anticipated.

D. While performing the visual inspection of the SCBA:
Visually inspect all Pak-Alert SE 7 enclosures, lenses, and wire conduits for cracks, wear or other damage.

E. Before pressurizing the SCBA by opening the cylinder valve:

Check the Pak-Alert SE 7 manual alarm feature by pressing the manual alarm button, located on the front of the control console. The manual alarm shall begin sounding a loud continuous 3-tone alarm accompanied by flashing of the red signal light on the control console. Reset the manual alarm by pressing twice on the reset button located on the side of the control console. Unit will sound three chirps and the green light will flash. Turn the unit off by pressing the reset button twice again. Unit will sound a two-tone chirp and a green light will go out.

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F. When opening the cylinder valve:

The Pak-Alert SE 7 shall sound 3 quick chirps and the light on the control console shall begin flashing green approximately once per second. The 3 chirps will sound at approximately the same time the vibralert in the mask-mounted regulator actuates briefly. Also at this time, hold regulator in hand to visually check that all five lights on the HUD have illuminated for 20 seconds. After 20 seconds, only 2 green lights shall remain lit, indicating a full cylinder.

G. Check pre-alarm:

With SCBA pressurized but with airflow stopped (with manual shut-off switch depressed on regulator), leave SCBA motionless for 20 seconds. The green flashing light shall be replaced by a red flashing light. An ascending/descending tone will sound, increasing in volume.

H. Check pre-alarm reset:

With the SCBA pressurized but airflow stopped, leave the SCBA motionless until pre-alarm occurs. Move or turn SCBA backframe within 12 seconds of pre-alarm. This will cause the Pak-Alert SE 7 to reset. The red flashing light shall be replaced by a green flashing light and the ascending/descending tone shall stop. Continue with regular operational inspection. During the inspection, the SCBA must be moved or turned every 30 seconds or less to prevent the sounding of the full alarm.

AFTER COMPLETION OF ALL SCBA CHECKS AND BEFORE TURNING OFF CYLINDER VALVE:

I. Check manual reset of pre-alarm:

With SCBA pressurized and airflow stopped, leave SCBA motionless until pre-alarm condition occurs. Within 12 seconds, press and hold reset button. Three (3) chirps shall sound, then release button. The Pak-Alert SE 7 shall reset to the automatic mode and the red flashing will be replaced by a green flashing light.

J. Check full alarm:

Leave SCBA motionless until pre-alarm condition occurs. Do not reset. Within 12 seconds a loud, continuous 3 tone alarm shall begin, accompanied by the flashing of the red light on the control console.

K. Check alarm reset:

While in full alarm, fully press reset button, release, and press again. The Pak-Alert SE 7 shall reset to the automatic mode. The loud alarm shall stop and the red flashing light shall be replaced by a green flashing light.

4.2.10 OPERATIONAL CHECK OF REGULATOR

A. With chin into chin cup, place facepiece against face. Member should then inhale sharply to start the flow of air and then breathe normally, as a functional check of the regulator inhalation/exhalation valve. If the exhalation valve is stuck or a fluttering sound is heard, the SCBA shall be removed from service, tagged with an RT-2 and forwarded to MSU. DO NOT TAKE THE REGULATOR ASSEMBLY APART.

B. Slowly remove facepiece from face and air should flow freely. Stop the flow of air by pressing the manual shut-off.

C. Check the regulator purge valve by rotating purge valve counter-clockwise, air should flow freely from the regulator. Then place purge valve back to 12 o'clock position to stop airflow.

4.2.11 OPERATIONAL CHECK OF THE PAK-ALERT SE 7, HEADS-UP DISPLAY

A. After finishing all SCBA checks involving airflow, turn off cylinder valve. While observing the lights on the Heads-Up Display, **slowly** open the purge valve releasing trapped air. The rectangular indicator lights will simulate four levels of air supply starting at:

Full - two green lights;

¾ full - one green light;

½ full - one yellow light flashing slowly;

¼ full - one red light flashing rapidly (EOSTI).

Return purge valve to off position (12 o'clock)

The Pak-Alert SE 7 shall remain active with green light flashing. Do not move SCBA. Pre-alarm shall occur within 20 seconds. Move SCBA backframe slightly, pre-alarm shall reset and green light shall start flashing again.

B. Turn Pak-Alert SE 7 off:

With cylinder valve closed and all residual air purged from SCBA, press reset button twice. The green flashing light will go out, followed by a 2 tone chirp. If there is air pressure left in the system, a 15 second beep sequence will be heard from the sensor module as residual air bleeds off. When air has bled completely from the system, unit will sound a two tone chirp. The Pak Alert SE 7 is now in the "OFF" condition.

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4.2.12 PERSONAL ADJUSTMENTS

A. With bunker gear on, pick up the entire SCBA assembly and don SCBA. Connect the quick release buckle and evenly pull the loose ends of both waist belt straps. Waist straps should be adjusted to fit the member and to distribute the weight of the entire SCBA assembly. Most of the SCBAs weight will be carried by the waist belt, thus removing the weight from the member's shoulders, thereby reducing fatigue.

Adjust the shoulder straps until the backframe touches the member's back. The strap adjustments will serve as a functional check of the harness assembly.

Note: Waist straps should be fully extended using the adjustable slide on the buckle strap. Waist belt adjustments shall be made using the alligator clips **only**.

B. Fully loosen the shoulder straps, unbuckle the waist belt and remove the SCBA.

C. Upon completion of inspection, if no defects are found to warrant taking the SCBA out-of-service, return the SCBA to the apparatus mounting bracket. SCBA assembly is stored with the facepiece preconnected to the regulator assembly. The facepiece split ring should be hooked over the left shoulder strap alligator clip, similar to the standby position.

D. If during the SCBA inspection any defects are noted, the inspecting member must alert the officer on duty immediately.

4.2.13 OUT OF SERVICE SCBA

If you find any damage to the SCBA such as worn parts, frayed webbing, improper check of Pak-Alert, HUD, or if the SCBA fails to operate properly in any way during your inspection, it must be placed out-of-service, forwarded to MSU with RT-2 attached stating problem.

5. DONNING AND REMOVAL PROCEDURES

5.1 DONNING SCBA (from standing position)

5.1.1 Remove the SCBA assembly from its apparatus mounting bracket, by pulling evenly on the two shoulder straps.

5.1.2 With bunker coat fully snapped and helmet on, hold SCBA in front of legs from the upper part of each shoulder strap with palms down. Backframe of SCBA should face outward and cylinder towards body.

5.1.3 Look over left shoulder to ensure that either no person or object is within the SCBA swing range.

5.1.4 In one continuous motion, swing SCBA over left shoulder, allowing arms to pass through respective shoulder strap loops. Left hand should continue to hold onto left shoulder strap, until SCBA rests on back.

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5.1.5 While bending forward, reach back and grasp both ends of the waist belt. Lift the entire SCBA assembly to allow the belt to rest on hips. Connect the quick release buckle of the pre-adjusted waist straps.

5.1.6 Adjust the shoulder straps until the backframe touches the member's back. DO NOT pull too tight since this will transfer the SCBAs weight from the hips to the shoulders, increasing fatigue.

5.1.7 Reach back with right hand and turn cylinder valve **FULLY** counter-clockwise. Listen for the momentary activation of the vibralert alarm, Pak Alert, and look for the five lights in the HUD.

Note: The activation of the vibralert alarm is **NOT** an indication that the valve is fully open. The valve handle must be turned counter clockwise until it reaches the open stop position. If the cylinder valve is not fully opened, it will restrict air flow, possibly causing an extremely dangerous condition, similar to SCBA shutdown.

5.1.8 At this point, the facepiece will either be donned or placed in a standby position. **Never** allow the facepiece to hang free.

5.2 DONNING SCBA FROM SITTING POSITION

SCBA can be partially donned from an apparatus jump seat equipped with an SCBA bracket mounted behind the member. Other riding positions where the SCBA is mounted next to the member do not allow partial donning, since members must remain in a seated and belted position while responding.

5.2.1 Pass arms through the respective shoulder straps.

5.2.2 Grab hold of the upper part of the left shoulder strap with left hand.

5.2.3 Lean body forward while getting out of jump seat, allowing body motion to pull SCBA from mounting bracket, as hand continues to hold left shoulder strap.

5.2.4 Step off apparatus and complete donning procedure.

5.3 STANDBY POSITIONS WITH SCBA DONNED

5.3.1 While awaiting orders prior to the anticipated entry into a contaminated area, members are to place facepiece in the Standby Position. This position will prevent the facepiece from dangling and possible damage.

5.3.2 A split ring is attached to the facepiece’s right side.

5.3.3 During the standby position, the split ring is hooked over the open tab of the left shoulder strap alligator clip.

5.3.4 When the standby position is used, the open side of the facepiece should be placed against the member's chest, so that debris cannot enter.

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5.4 DONNING AND REMOVAL OF FACEPIECE

Refer to Addendum 9

5.5 REMOVAL OF HARNESS ASSEMBLY

5.5.1 While bending forward, squeeze and fully extend both shoulder strap alligator clips.

5.5.2 Slip right arm through right shoulder strap.

5.5.3 With left hand grasping left shoulder strap, press button on waist belt quick release buckle with right hand.

5.5.4 As left hand continues to grasp shoulder strap, stand straight and allow SCBA to swing over left shoulder to front of body.

5.5.5 Lay entire SCBA assembly down.

5.5.6 Shut down the cylinder valve and purge all residual air from the SCBA system.

5.5.7 Change cylinder if gauge reads less than (45) FULL.

5.5.8 Inspect SCBA.

6. EMERGENCY PROCEDURES WHILE OPERATING

When a member becomes entangled or trapped where he/she needs to perform an emergency procedure, that member MUST transmit a MAYDAY. Waiting to give a MAYDAY transmission after you have attempted to free yourself may be too late for members to assist you. Cancel the MAYDAY after you have become free and safe.

6.1 QUICK RELEASE ESCAPE

If while operating, the SCBA assembly becomes entangled in the rear, the quick release escape must be used to free oneself. Transmit a MAYDAY for assistance.

6.1.1 Leave the facepiece ON if operating in a contaminated area.

6.1.2 Squeeze alligator clips and fully extend both shoulder straps.

6.1.3 With left hand grasp left shoulder strap as high as possible.

6.1.4 Slip right arm through right shoulder strap and unbuckle waist belt.

6.1.5 As left hand continues to grasp shoulder strap, member should turn to their left 180 degrees to face the entangled SCBA.

6.1.6 With free right hand sweep entire SCBA to locate obstruction.

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6.1.7 Free SCBA from entanglement. If a cutting tool is to be used, it is best to be kept in the right pocket of the bunker coat. This allows control of the SCBA with the left hand.

6.1.8 Place both hands on shoulder straps and back away from the obstruction.

6.1.9 Re-don SCBA. Buckle waist belt then shoulder straps. When continuing with firefighting operations, cancel the MAYDAY when member becomes safe.

6.2 LOW PROFILE MANEUVER

There are times where it may be necessary to pass beneath low clearance overhead obstructions. Generally, this may be when crawling through or operating in a confined area.

6.2.1 Leave the facepiece ON if operating in a contaminated area.

6.2.2 Squeeze and fully extend both shoulder strap alligator clips.

6.2.3 With left hand grasp left shoulder strap as high as possible.

6.2.4 Slip right arm through right shoulder strap and unbuckle waist belt.

6.2.5 As left hand continues to grasp shoulder strap, allow SCBA to swing over left shoulder to front of body.

6.2.6 Lay SCBA assembly down on cylinder and push ahead, as body follows behind. The left hand should always continue to grasp shoulder strap as a means of orientation.

6.2.7 Once overhead obstruction is cleared, redon SCBA. Buckle waist belt then shoulder straps.

6.3 REDUCED PROFILE MANEUVER

A reduced profile maneuver is used when a member finds it difficult to maneuver past an obstacle, within a structure or on a fire escape, with the SCBA donned.

6.3.1 Leave the facepiece ON if operating in a contaminated area.

6.3.2 Squeeze and fully extend the right shoulder strap alligator clip.

6.3.3 Slip the right arm through right shoulder strap and grasp waist belt without unbuckling.

6.3.4 While right hand grasps waist belt buckle and left hand grasps cylinder at the rubber bumper, twist the entire SCBA assembly as far left as necessary to pass obstacle.

6.3.5 Use right hand as a guide while passing through obstacle.

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6.3.6 After passing obstacle, return SCBA assembly to its normal position on members' back.

6.3.7 Reach back and pass right arm through right shoulder strap.

6.3.8 Adjust the right shoulder strap for wearing comfort.

6.4 SWIM MOVE

There may be a need to get through a narrow opening such as wall studs without removing the SCBA. If the swim move cannot be performed, use the reduced profile maneuver.

6.4.1 Place right knee, right shoulder, and head through studs. (placing left shoulder through first, may cause low pressure hose to get pinched on the object you are trying to pass, cutting off air supply). (Figure 21)

6.4.2 Bring left arm over left shoulder in swimming motion. (Figure 22)

Figure 21

Figure 22

6.5 DAMAGED FACEPIECE

If the facepiece is damaged while operating, the positive pressure feature will compensate for a leak and continue to maintain positive pressure within the facepiece. This will result in an outward flow of air. The larger the opening, the quicker the air supply will be depleted.

6.5.1 Leave the facepiece ON to continue to provide respiratory protection.

6.5.2 Conserve as much breathing air as possible by covering the damaged area with one hand.

6.5.3 If the leak is more than can be controlled with one hand:

A. Continue to cover as much of the damaged area as possible.

B. Press the manual shut-off switch after each breath to further limit the loss of breathing air.

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C. If damaged area is too large to allow the regulator shut-off to release, then use the purge valve in an ON and OFF motion for each breath. This action helps to conserve the limited amount of breathing air necessary for escape.

6.5.4 Notify Officer and immediately leave the contaminated area. This member MUST be accompanied to a safe area by another member using an SCBA.

Note: If a member runs out of air, that member should remove the regulator from the facepiece. The donned facepiece will provide some protection to the skin on the face.

6.5.5 A member experiencing a failure of the facepiece lens which results in bubbling or a hole, must not touch or attempt to cover the opening. Doing so can cause the hole in the lens to enlarge as the polycarbonate can be wiped away or can stick to a member's gloved hand as the lens melts.

Failure of a facepiece lens can expose a firefighter to toxic gases and can result in burns to the respiratory tract as well as asphyxiation. Documented problems include holes and extensive crazing as well as bubbling and deforming of lenses. In several SCBA-related deaths, degraded masks were found affixed to the faces of victims who suffered thermal burns to their airways.

6.6 FACEPIECE SHARING

6.6.1 Sharing facepieces with other members or civilians is PROHIBITED.

6.6.2 Facepiece sharing with other members and/or civilians is **PROHIBITED**. Facepiece sharing hampers the search for an exit and depletes the limited air supply in less time, thus posing risk to both member or civilian and rescuer. Facepiece sharing increases the exposure to airborne contaminants such as Carbon Monoxide (CO), Hydrogen Cyanide (HCN), as well as numerous other carcinogenic toxins. Therefore, the member or civilian should be removed from the contaminated area as soon as possible, to a location where proper medical treatment can be administered.

6.6.3 If it is not possible to remove the member or civilian from the contaminated atmosphere, then one of the following options can be used to provide an air supply while freeing the trapped individual.

A. For trapped members, utilize the nearest available FAST Pak.
B. For civilians, utilize a FAST Pak other than the one assigned to the FAST Unit.
C. Utilize a spare SCBA to provide air strictly to the trapped member or civilian.

Note: Donning a facepiece in an IDLH/smoke environment, may make it difficult to create the negative pressure needed to release the regulator manual shut-off switch. The red purge valve may have to be turned on, to provide/initiate an air flow.

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7. COMMUNICATION

7.1 COMMUNICATION WITH FACEPIECE DONNED

Communication among members operating with donned facepieces is necessary to jointly accomplish tasks. More importantly is the need to maintain respiratory protection while operating in toxic atmospheres. Therefore, at no time shall a member remove their facepiece to communicate.

7.2 USING THE HANDIE-TALKIE WITH THE SELF CONTAINED BREATHING APPARATUS

7.2.1 Remove the microphone from the harness clip.

7.2.2 Place the microphone **directly on** the voicemitter.

7.2.3 After completing radio transmission, the microphone can be returned to the harness clip.

7.3 COMMUNICATION BY HAND/TOUCH SIGNALS

7.3.1 Speaking between members with facepieces donned is sometimes impractical because of the high noise levels on the fireground from power saws, stream impact, ventilation, etc.

7.3.2 Units should have prearranged hand/touch signals to communicate orders for routine movements. Touch signals will be especially useful when smoke or other factors make visibility poor.

7.3.3 Engine companies can establish signals as outlined in Firefighting Procedures Volume II: Fire Tactics and Procedures - Engine Company Operations.

7.3.4 Ladder, Rescue, and Squad Companies can establish signals similar to those of Engine Companies to communicate orders for search, ventilation, etc.

7.4 EMERGENCY TOUCH SIGNAL

7.4.1 When one member forcibly strikes another member with four distinct blows on the shoulder and then pulls that member in a specific direction, the second member will recognize that the other member knows of an emergency and should promptly follow in that direction.

7.4.2 The standard signal to communicate emergencies (such as mayday transmissions) shall be known, understood and used by all members.

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7.5 EMERGENCY DISTRESS

A member who is in distress and unable to communicate shall immediately activate the emergency button of the Personal Alert Safety System (PASS/Pak-Alert) alerting members to the need for assistance.

When a PASS alarm is activated in the full cycle for ten seconds, the member hearing the alarm should immediately notify the Incident Commander. An immediate investigation of the alarm must be made to determine the cause. The results of the investigation must be transmitted to the Incident Commander as soon as possible.

Note: All members must be teamed-up when operating within an IDLH atmosphere. When a member needs to leave the IDLH area to service their SCBA, they MUST notify their Officer and be accompanied to a safe area by another member using an SCBA. ***All members shall comply with the provisions of Firefighting Procedures, Volume 4, Book 1, Chapter 1 titled Safety Team***.

8. DISINFECTION AND CLEANING PROCEDURES

8.1 DISINFECT AND CLEAN SCBAs

8.1.1 During roll call inspection, after members have each been assigned an SCBA for the tour, and after each use.

8.2 DISINFECTING SOLUTIONS

8.2.1 A hypochlorite solution consisting of one-quarter cup of household chorine bleach to one gallon of water (1:100 dilution) is recommended by the Center for Disease Control. Technical Services distributes bleach packages, use one package to one gallon of water. This solution is to be used in routine disinfecting procedures and to disinfect SCBA parts contaminated with blood or body fluids.

8.2.2 NEVER INCREASE THE CONCENTRATION OF HOUSEHOLD BLEACH IN THE DILUTION BEYOND THE RECOMMENDED AMOUNT. Stronger amounts of the solution will prematurely deteriorate rubber and severely corrode metallic parts. Both solution concentration and duration of immersion must be strictly adhered to.

8.2.3 Certain cleaning and disinfecting agents such as quaternary ammonium compounds (Ammonium Chlorides) found in glass cleaner, will cause damage, deterioration, or accelerated aging to parts of the SCBA. Use only the recommended cleaning and disinfectant solution.

8.2.4 Wear goggles to protect eyes when preparing or using a hypochlorite solution.

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8.3 GROSS DECONTAMINATION

8.3.1 Contaminated SCBAs or components that can't be cleaned or disinfected due to blood or other body fluids shall:

A. be placed in a double sealed clear plastic bag with a biohazard label attached;

B. a tag shall be attached to the bag noting details of the incident including known and suspected contaminants;

C. be placed on the apparatus in an appropriate location to preserve the integrity of the bag, and shall be transported back to quarters;

D. at quarters, bag shall be placed in a light traffic area;

E. notify SOC for pick-up.

8.3.2 When decontaminating, bagging, or handling such equipment to be sent to SOC, members shall wear BSI (Body Substance Isolation).

8.4 CLEANING SOLUTION

8.4.1 When cleaning SCBA parts, use household strength soap or detergent mixed with warm water. Use of strong industrial strength cleansers, abrasive soap pads or brushes are damaging and not recommended.

8.4.2 Never mix disinfectant or cleaning solutions, or their respective cloths and sponges.

8.5 FACEPIECE CLEANING PROCEDURE

8.5.1 Remove facepiece from regulator assembly.

8.5.2 Put on goggles and rubber gloves to protect eyes and hands from hypochlorite solution.

8.5.3 Immerse facepiece in the hypochlorite solution for five minutes, wiping lens with cloth. Never allow facepiece to remain immersed for longer than five minutes.

8.5.4 Remove facepiece from solution and thoroughly rinse under cold running water.

8.5.5 Wash facepiece with cleansing solution and sponge, and again thoroughly rinse under cold running water.

8.5.6 Nose cup is designed to be an integral part of the facepiece and does not need to be disassembled for cleaning and disinfecting.

8.5.7 In the event the nose cup is removed for cleaning or inspection, make certain it is reassembled behind the chin pocket of face seal and properly seated between the flanges of the voicemitter ducts.

8.5.8 Shake off remaining water droplets from facepiece. The facepiece shall be dried; drying shall not be done in direct sunlight or in high heat.

8.5.9 Clean remaining SCBA parts of dirt and debris with damp sponge.

8.5.10 Areas where SCBAs are stored should also be kept thoroughly clean of dust and dirt.

8.5.11 Place the Kevlar head net inside of the facepiece lens. In order to achieve a proper facepiece seal when donning the SCBA, Kevlar head nets shall be stored on the inside of the facepiece. This will prevent the head net straps from entangling with the thumb buckles

8.6 REGULATOR DISINFECTING PROCEDURE

8.6.1 Supplies needed:

- 70% Isopropyl Alcohol in a spray bottle.
- Drinking (potable) water - running or in a spray bottle.

8.6.2 Remove the breathing regulator from the facepiece by rotating the regulator 1/4 turn clockwise.

8.6.3 Remove any obvious dirt from the external surfaces of the regulator using 70% Isopropyl Alcohol with a sponge or soft cloth.

8.6.4 Inspect the inside of the regulator assembly through the regulator opening (Figure 23). If excessive dirt or soil is present, return the entire SCBA with a completed RT-2 to MSU, noting reason. Do not insert any foreign objects into the opening.

8.6.5 Depress the manual shut-off, close the purge knob by turning fully clockwise and spray a minimum of 6 full pumps of 70% Isopropyl Alcohol into the regulator opening. Make sure to also wet the immediate area around the opening (Figure 23). Swirl to completely cover internal components. Turn regulator opening face down and shake excess liquid out. Allow for 10 minutes of contact time to disinfect prior to rinsing.

Note: Alcohol and water should not be directed into the spray bar ports.

Figure 23

8.6.6 Rinse regulator with drinking water using a spray bottle or softly running water. The inside of regulator must be **thoroughly rinsed** after applying the 70% alcohol. Failure to thoroughly rinse may cause a number of adverse effects. Rinsing is a key component to the SCBA integrity after disinfecting.

8.6.7 Shake excess water out of regulator. Completely air-dry the regulator before use. Perform regulator check by opening the purge valve and observe the air flow from the regulator spray bar. Droplets of water indicate the regulator is not dry. If this occurs, repeat drying procedure and regulator check.

Note: Under no circumstances should the face of the regulator be banged against a hard surface to expedite the removal of water. It may damage the spray bar ports or crack the exterior surface of the regulator. Shaking and opening the purge valve is the only acceptable way to remove water.

9. PREVENTIVE MAINTENANCE PROGRAM / INVENTORY

9.1 A calendar year Preventive Maintenance Program has been implemented for each SCBA. The intent is to flow test and ensure the operational condition of each SCBA.

9.1.1 ***Redacted for PFS***

9.1.2 The month and year of the last service date is recorded on the surface of the PRA where the High Pressure Hose connects. (Figure 24)

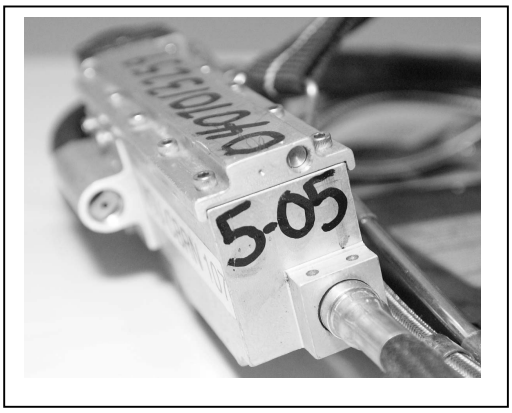

Figure 24

9.1.3-9.1.9 ***Redacted for PFS***

9.2 ***Redacted for PFS***

10. IDENTIFICATION

10.1 The Pressure Reducer Assembly on all SCBAs are labeled with both unit identification and sequential numbering within the unit. (Figure 25)

10.2 The labeling allows for quick identification of SCBAs at operations, as well as, individual assignment of SCBAs at the start of the tour.

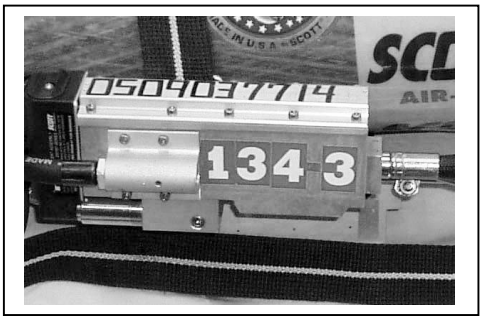

Figure 25

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10.3 SCBA labels are coded with white numerals on colored backgrounds. The colored backgrounds indicate the type of unit to which the SCBA is assigned to, as follows:

UNIT	COLOR CODE	COMPANY	EXAMPLE
Engine	Black	E-245	245-1
Ladder	Red	L-25	25-1
Rescue	Blue	R-2	2-1
Haz Mat	Blue	HM-1	HM-1-1
Squad	Yellow	Sq-1	1-1
Battalion	Yellow	Bn-57	57-1
Battalion Spare	Orange	Bn-33	33-1
Marine	Green	M-6	6-1
MSU Spare	Black	MSU	MS-1

10.4 Labels are not to be removed by members.

10.5 Worn or missing labels will be replaced by the Mask Service Unit.

10.6 All SCBAs are being marked in a manner similar to the handie-talkies. The numbering system duplicates the handie-talkie number designations. For example, #1 is the Officer, #2 is the chauffeur, etc.

10.7 Each SCBA is labeled in the center of the upper section of the back plate on the side that rest against the member's back. The marking is on a 3/4" wide marking tape, and is covered with a clear 4" X 2" protective label. The markings will be visible when the SCBA is properly mounted in the SCBA bracket on the apparatus.

For example, SCBAs in Engine 264 and Ladder 134 would be labeled as following:

SCBA#	Label Wording		SCBA#	Label Wording
264-1	Officer		134-1	Officer
264-2	Chauffeur		134-2	Chauffeur
264-3	Nozzle		134-3	Roof
264-4	Back-Up		134-4	OV
264-5	Control		134-5	Irons
264-6	Door		134-6	Can

11. CONCLUSION

11.1 Members are cautioned against jeopardizing their health by non-compliance with these procedures or by the use of unauthorized modifications or adapters. The practice of intermittent use of SCBA while in smoke or toxic atmospheres and/or the use of "cheaters" is expressly forbidden.

11.2 Unauthorized variations or a modification of this equipment or its related procedures and/or the use of unauthorized adapters or other equipment with the SCBA is strictly prohibited.

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Warning: Only those options and or accessories authorized by SCOTT and approved by NIOSH and where required, by NFPA may be installed on this SCBA. The use of unauthorized and or unapproved options or accessories could cause partial or complete failure of the SCBA which may result in injury or DEATH.

11.3 If a problem arises with an SCBA, and the information required to resolve the difficulties are not covered in this bulletin, unit shall contact the Mask Service Unit and be guided by their instructions.

BY ORDER OF THE FIRE COMMISSIONER AND CHIEF OF DEPARTMENT

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FAST PAK

1. INTRODUCTION

1.1 The Fast Pak is a portable air supply. It is intended for use as an emergency air source for members when they are low or out of air while operating in an IDLH atmosphere. The Fast Pak is carried by all Ladder, Rescue and Squad Companies.

1.2 Units assigned Fast Paks have a decal affixed to an apparatus compartment door with the wording “FAST PAK”, to quickly identify its location. The Fast Pak decal has red lettering on a white background. When additional Fast Paks are required at an operation, members will be able to quickly locate them on nearby apparatus and deliver them to the designated location. Replacement decals can be requisitioned by faxing an RT-2 to the Mask Service Unit.

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2. DESCRIPTION

2.1 The Carrying Bag weighs 16 pounds, has a removable adjustable strap, and is made of a highly visible fabric. It contains both a Low-Pressure and High-Pressure Assembly. The bag has two compartments, one on each end.

2.2 The Low-Pressure side of the bag has a "Ball-Handle" cover (Figure 1) and contains a Non-CBRN Regulator, an AV2000 Facepiece with a Nosecup, a 6-foot long Low-Pressure hose and the dual manifold (Hansen fittings). (Figure 2)

2.3 The High-Pressure side of the bag has a "T"-Handle" cover and contains a 4500 psi Scott Air Cylinder (15 minutes of use) with a Right-Angle Valve, and the 5-foot long High-Pressure hose that has a Universal Air Coupling (UAC).

Figure 1


Figure 2

2.4 An affixed carabiner is attached on each end to assist in packaging of downed firefighters.

2.5 There is a remote pressure gauge with a "Low Air Whistle" assembly.

3. ADVANTAGES

3.1 It is lightweight, very mobile, and has a flexible air system.

3.2 It has a smaller profile with numerous air supply capabilities.

3.3 The Fast Pak is ready for immediate deployment.

3.4 Both the high-pressure and low-pressure systems can be operated simultaneously.

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3.5 The 15 Minute Air Cylinder is smaller, lighter and has a 90-degree angle valve for ease of operation and to prevent use in a SCBA bracket.

3.6 It can be augmented from another air source.

4. LIMITATIONS

4.1 The Fast Pak is NOT equipped with a Vibra-alert or Heads Up Display indicator. However, the unit is equipped with a remote gauge and a Low Air Whistle (Figure 3) which indicates when the cylinder has one-quarter of its full capacity remaining.

Figure 3

4.2 It is essential that one member of the FAST Unit, who has audible communication with the extrication team, is assigned to monitor the actual volume of air remaining in the portable cylinder.

4.3 Always start an operation with a full cylinder.

4.4 The operational time of an SCBA resupplied by a Fast Pak can vary depending on several factors. (e.g., residual air remaining in the distressed member's SCBA cylinder, emotional and/or physical condition of the distressed member.)

4.5 When a Fast Pak is in use, the FAST Unit (Safety Team) shall acquire an additional Fast Pak from another unit on scene.

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5. INSPECTION

5.1 The Fast Pak shall be inspected at the beginning of each tour and after each use.

5.2 Ensure that the Fast Pak is properly cleaned and decontaminated, and that the carrying bag is examined for worn or damaged components.

5.3 The cylinder and valve assembly should be checked for damage such as dents, gouges or discoloration of the composite wrapping. Cylinders showing damage or exposure to high heat or flame shall be emptied and placed out of service. Return the cylinder to MSU with an RT-2 attached.

5.4 Turn on the Fast Pak and listen for any leaks throughout the system.

5.5 Check the high and low-pressure hoselines for cracks, cuts, abrasions, or other signs of damage.

5.6 Check all couplings for damage and cleanliness. Engage all couplings and make sure all are working properly.

5.7 Check the regulator as per the SCBA Training Bulletin.

5.8 Check the cylinder pressure gauge for a "FULL" indication. If the cylinder pressure is less than "FULL", it shall be replaced with a fully charged cylinder.

5.9 Check the Remote Gauge.

5.10 Listen for the "Low Air Whistle" activation when the bottle is turned on and when bleeding out the system.

5.11 Inspect the cylinder coupling on the Fast Pak combination LOW/HIGH pressure assembly to be certain the nipple seal is present and undamaged. If the gasket is present and undamaged, align the coupling with the cylinder outlet.

5.12-5.13 ***Redacted for PFS***

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6. BLEEDING PROCEDURE FOR FAST PAK

6.1 Close the cylinder valve.

6.2 Verify that the dust cap on the high-pressure UAC coupling is in place.

6.3 Bleed down the residual high-pressure air by pushing in on the center of the dust cap to vent the high-pressure supply line.

6.4 Bleed down the residual low-pressure air by using the purge valve.

6.5 Ensure that the "Low Air Whistle" is operational.

7. METHODS OF AIR SUPPLY

7.1 Every emergency situation is unique. Rescuers must be trained to assess each situation and decide which air re-supply or augmentation method using the Fast Pak is best for that situation. This decision varies depending on several factors including fire conditions, the position of the distressed member's body, and the condition of the distressed member's SCBA.

7.2 No single method is recommended for all situations.

7.3 The carrying bag provides many different options for packaging and removal of the downed member. There are two affixed carabiners on the bottom of both ends of the case, which may be attached to the downed member. This will streamline the operation and allow for one less member's participation in the removal. The shoulder strap is also adjustable with quick release buckles, enabling the strap to be connected to itself and assist in removal.

7.4 All members should be packaged for removal in accordance with FFP Managing Incidents Involving Members in Distress.

8. LOW PRESSURE AIR SUPPLY

8.1 The Low-Pressure hose is 6 feet in length. Attached to this hose is a Non-CBRN EZ Flow regulator without Vibra-Alert and a Scott AV2000 facepiece with a nosecup.

8.2 The low-pressure hose has a Dual Manifold that is one foot from away from the regulator, with both male and female Hansen connections (Figure 4). Additionally, there is a carabiner connected to the low-pressure hose that provides the ability to affix the low-pressure hose to the downed member. This will assist in keeping the downed member's facepiece in place when the low-pressure hose becomes entangled, during removal operations.

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Figure 4

8.3 During Low-Pressure operations, one member of the Fast Team MUST monitor the air supply and ensure the facepiece is providing air to the downed member. There are three ways to monitor the volume of air remaining in the cylinder:

8.3.1 Checking the Remote Gauge.

8.3.2 Listening for the Low Air Whistle- activates at ¼ remaining in cylinder.

8.3.3 Checking the cylinder gauge.

8.4 The member assigned to monitor the air supply shall ensure the low-pressure hose is not pulled, entangled, cut, or in contact with hot embers during the removal process.

8.5 The low-pressure hoseline may be used in one of the following three (3) modes:

8.5.1 To replace the member's regulator with the Fast Pak regulator.

8.5.2 To disconnect member's Hansen connection and connect to Fast Pak Hansen Fitting.

8.5.3 To replace the member's facepiece.

8.6 Replacing the member's regulator with Fast Pak's regulator:

8.6.1 Disconnect member's regulator from their facepiece.

8.6.2 Attach the Fast Pak regulator to the member's facepiece, ensuring that the regulator locks into position.

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8.6.3 During the initial inhalation, a click should be heard at the regulator assembly. This click indicates the manual shut off switch is functioning and in the ON position. If the member is unable to activate the inhalation valve, turn the red purge valve downward, away from the members face to achieve a sufficient flow, and ensure the purge valve remains open. Be aware that this tactic will cause a more rapid depletion of air from the supply cylinder.

8.7 Replacing the low-pressure Hansen Fitting of member's SCBA with the low-pressure Hansen Fitting of the Fast Pak:

8.7.1 Disconnect the Hansen fitting on the member's low-pressure hose below their regulator. Push the male coupling in FIRST, then pull back the sleeve to disengage the coupling.

8.7.2 Connect the low-pressure hose from the member's facepiece mounted regulator to the Hansen fitting on the Fast Pak, and test for proper engagement.

8.8 Replacing the member's facepiece with Fast Pak facepiece with the regulator attached:

8.8.1 Remove the member's facepiece.

8.8.2 Place the Fast Pak facepiece on the member and make any necessary adjustments to ensure a proper facepiece seal.

8.8.3 During the initial inhalation, a click should be heard at the regulator assembly. Air will then flow into the facepiece. If the member is unable to activate the inhalation valve, turn the red purge valve downward, away from the members face to achieve a sufficient airflow and ensure the purge valve remains open. Be aware that this tactic will cause a more rapid depletion of air from the supply cylinder.

Note: It is recommended when using one of the low-pressure methods to fasten the Fast-Pak to the member in distress that the associated carabiners be utilized. Using the carabineers at each end of the carrying bag (and the additional carabiner on the low-pressure hose if using the Fast Pak regulator) streamlines the packaging of the member and will allow for a more effective removal. The 6' length of hose also gives the option for a member to carry the Fast Pak while leading or following the member in distress and remain remote from the removal. This member also must monitor the hose to limit entanglement.

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9. HIGH PRESSURE AIR SUPPLY

Figure 5

9.1 The Universal Air Coupling (UAC) is for emergency use only when a member is low or out of air within an IDLH atmosphere. (Figure 5)

9.2 If the cylinder and/or valve assembly of the distressed member show damage or evidence of exposure to high heat or flame, a decision must be made whether the UAC is suitable for recharging.

9.3 This system permits emergency replenishment of an SCBA from an air supply source while the SCBA is in use. This high-pressure UAC coupling will fit all manufacturers UACs.

9.4 The 5 ft. high pressure hose will administer air to a member's SCBA via the UAC.

9.4.1 This will equalize air in both cylinders in approximately 60 seconds.

9.4.2 The Fast Pak has a built-in check valve that only permits air to be delivered in one direction from the Fast Pak to a member's SCBA.

9.5 Remove the member from the IDLH as soon as possible after the charging is complete.

9.6 If air replenishment is needed again and time is of the essence, you can use the Fast Pak's remaining air.

9.7 To use the Fast Pak with a UAC system, proceed as follows:

9.7.1 The Fast Pak cylinder valve should be fully opened, and the dust cap removed from the High-Pressure UAC Coupling on the Fast Pak.

9.7.2 Locate and identify the UAC on the member's SCBA, this will be next to the cylinder coupling. Remove the dust cap from the UAC on the member's SCBA.

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9.7.3 Verify that the cylinder valve on the member's SCBA is fully open.

9.7.4 Connect the high-pressure hose UAC coupler to member's UAC.

9.7.5 Air will immediately begin to flow from the Fast Pak cylinder to the member's cylinder. The air will stop flowing when the member's SCBA cylinder and the Fast Pak air supply equalize. When charging is complete, disconnect the UAC hose assembly.

9.7.6 When removing member from IDLH, the high-pressure UAC coupling must be removed. Severing the high-pressure hose during removal will deplete all the air from the system. The remaining air in the Fast Pak can also be used to equalize the members SCBA again, if needed, or to another member in need of air.

10. HIGH PRESSURE AIR SUPPLY - KEY POINTS

10.1 Handle the high-pressure UAC hoseline assembly in a manner that will prevent a sudden or unexpected pull from moving or damaging the Fast Pak.

10.2 Verify if damage is present to the UAC connection and determine if a different means to supply air should be utilized

10.3 If the cylinder and/or valve assembly of the distressed member shows damage or evidence of exposure to high heat or flame, a decision must be made whether the cylinder is suitable for recharging.

10.4 Connect the Fast Pak's high-pressure UAC coupler onto the member's UAC fitting until the sleeve clicks into place. Check the engagement by tugging on the coupling.

10.5 If the UAC on the member's SCBA is damaged, do not attempt to connect the high-pressure UAC airline assembly from the Fast Pak. (use one of the low-pressure methods)

10.6 If the dust cap on the UAC of the member's SCBA is missing, quickly examine and remove any visible debris before connecting into the UAC. If the UAC is impacted or blocked with debris, use one of the low-pressure methods.

10.7 If at any time during the filling process a leak is detected, immediately discontinue the filling procedure and supply air via one of the low-pressure methods.

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11. AIR AUGMENTATION

11.1 An advantage of the Fast Pak is that while lighter and streamlined for removal, the configuration allows for air augmentation. The Male Hansen fitting on the Dual Manifold allows the Fast Pak to be augmented with air in the following ways:

11.1.1 Utilizing another Fast Pak: The low-pressure hose from the dual manifold can be disconnected on an additional Fast Pak, allowing the female Hansen fitting of the additional Fast Pak to be connected to the male Hansen fitting on the original Fast Pak.

11.1.2 Utilizing an additional mask (not assigned to a member operating). The low-pressure hose may be disconnected at the Hansen fitting on any SCBA, allowing the female Hansen fitting on the mask with the 45-minute cylinder to be connected to the male Hansen fitting on the Dual manifold.

11.1.3 ***Redacted for PFS*** .

12. USE OF FAST PAK ON NON-FDNY MEMBERS

12.1 The Fast Pak can also be used to provide an air supply to non-FDNY members for:

12.1.1 A victim is trapped in an IDLH atmosphere and immediate removal is not possible.

12.1.2 A Confined Space incident.

12.2 The Fast Pak assigned to the FAST Unit shall not be deployed for non-FDNY members. Additional Fast Paks shall be deployed if needed and victims should be removed from an IDLH atmosphere as soon as conditions permit.

12.3 The FAST Unit Fast Pak shall only be used as per FFP Managing Incidents Involving Members in Distress.

13. OPERATIONAL NOTES

13.1 The designated FAST Unit shall always bring their Fast Pak to the ICP.

13.2 Members must be able to disconnect and reconnect couplings or replace a facepiece or regulator while wearing gloves.

13.3 Members should be prepared to operate in zero visibility in an IDLH area, as time is of extreme importance when using the Fast Pak.

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13.4 When use of the Fast Pak is anticipated, it is recommended the member assigned to monitor the air turn on the cylinder when arriving at the location of the member in distress. This will prevent an accidental loss of air while attempting to locate the member in distress.

13.5 Once a Fast Pak is put into operation, the IC shall ensure that a second Fast Pak is readily available at the scene to be used as a required.

13.6 Couplings should always be kept dry. Water on couplings may freeze during low temperatures preventing the ability to make connections.

13.7 The Fast Pak can successfully supply air via all four methods indicated below. It must be noted that even though all four methods are effective, removal drills have shown that a different amount of time is required to complete each method. The amount of time needed to perform each method is indicated below in order of speed from fastest to slowest:

13.7.1 Replace the regulator - this is the fastest method.

13.7.2 Replace at the Hansen fitting.

13.7.3 Replace the facepiece.

13.7.4 Utilize the high-pressure equalization method - this is the slowest method.

Note: The Fast Pak shall only be used as described in FFP Managing Incidents Involving Members in Distress.

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T.B. SCBA, ADDENDUM 2
June 2, 2008

FACEPIECE AND AIR PURIFYING RESPIRATOR (APR) ADAPTOR-40MM AND SINGLE SCOTT CBRN CAP 1 CANISTER

1. INTRODUCTION

The Fire Department is occasionally called to operate at incidents where respiratory protection is necessary for extended periods of time. To provide this protection, the Department has issued Air-Purifying Respirators (APR) to field units. Air Purifying Respirators have certain operational limits and should not be used without the approval of the Incident Commander.

2. DESCRIPTION

The full facepiece respirator issued by the Department consists of three components:

- Scott AV-2000 facepiece.
- Scott 40mm facepiece adaptor with a single filter port.
- Scott CBRN CAP 1 canister for protection against airborne gases, vapors and particulates.

SCOTT CBRN CAP 1 CANISTER

SCOTT 40MM CANISTER ADAPTER

2.1 Each member is fit tested using their Scott AV-2000 personal facepiece during their periodic medical examination. An air tight seal of the facepiece is crucial to the effectiveness of the respirator.

2.2 The respirator removes harmful contaminants from the inhaled air by chemical reaction or mechanical filtration.

2.3 The inhalation valve in the 40mm adapter acts as a check valve to prevent the backflow of exhaled air through the Scott CBRN CAP 1 canister. Exhaled air leaves the facepiece through the exhalation valve in the 40mm adapter.

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3. FULL FACEPIECE RESPIRATOR LIMITATIONS

All filtered air respirators provide a lower level of protection as compared to an SCBA respirator. Filtered air respirators shall not be used in atmospheres where:

- air hazard has not been identified
- air hazard cannot be filtered
- air hazard concentrations cannot be measured
- air hazard concentrations are Imminently Dangerous to Life and Health (IDLH)
- air is oxygen deficient (contains less than 19.5% oxygen)
- air is oxygen enriched (above 23% oxygen)
- air hazard is flammable or explosive
- air hazard is carbon monoxide (CO)
- **NOT** to be used in fire conditions
- **NOT** to be used in either confined spaces or permit-required confined spaces

Even with the proper filter element, the protection offered by a filtered air respirator depends upon many factors such as:

- quality of the facepiece fit
- elapsed time since the filtration element was placed in service
- level of physical activity (increased respiration)
- humidity - high relative humidity shortens the service life of organic vapor canisters

4. OPERATIONAL GUIDELINES AND USES

The Air Purifying Respirator is intended to be used in very limited and specific situations.
The Incident Commander should only make this decision after consultation with the Haz-Mat Group Supervisor and all the risks have been properly evaluated. If any uncertainty exists, than the use of SCBA should be continued until such time as all the hazards can be properly evaluated. No member shall don this respirator without specific instructions from the Incident Commander.

Anticipated uses include:

- Asbestos incidents, non-fire related
- Confirmed or suspected biological incidents where continuous atmospheric monitoring is necessary
- Radiological incidents, non-fire related, where the isotope does not pose a chemical hazard or the chemical hazard can be filtered by the canister
- Decontamination operations of a long duration where the filter will remove the known contaminants and atmospheric conditions are monitored and meet the above criteria

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5. INSPECTION BEFORE USE

5.1 Always inspect facepiece, adapter and Scott CBRN CAP 1 canister before first use.

5.2 Inspections must be at least every 30 days and/or on the first day of each month.

5.3 Examine the facepiece to be certain that it is complete and in serviceable condition. Be certain that all components are:

- clean and undamaged
- all screws and nuts are properly installed and secured
- head harness is properly installed
- the nosecup is properly installed

5.4 Examine the 40mm adapter to be certain it is complete and in serviceable condition. Verify that the butyl cover is properly installed, has no damage, and the connector gasket has no rips or tears.

5.5 Check both the inhalation and exhalation valves for proper installation and evidence of damage. Valves must lie flat and have no wrinkles that would prevent sealing.

5.6 Examine the Scott CBRN CAP 1 canister to verify the expiration date has not been exceeded and is undamaged and in serviceable condition.

5.7 For replacement of filter cartridges and adaptors, forward a 23-BS-2 form to the Mask Service Unit.

6. DONNING PROCEDURE

6.1 Examine the facepiece to be certain it is complete and in serviceable condition. Check to see that the inhalation and exhalation valves are properly installed and operational. Check that the nosecup is properly positioned behind the face seal chin pocket.

6.2 Assemble canister to the adapter and the adapter to the facepiece.

6.3 Don the facepiece.

6.4 PERFORM NEGATIVE PRESSURE LEAK CHECK. Close off inlet side of Scott CBRN CAP 1 canister by placing the palm of one hand over inlet located on front of canister and inhale slowly, holding breath momentarily. Leakage should not be detected and the facepiece should be drawn slightly to the face.

6.5 Should any leakage be detected, attempt to correct the problem by readjusting the facepiece.

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7. DOFFING PROCEDURE

7.1 The respirator removal must be done in a fresh air environment. Leave the contaminated area and be certain that respiratory protection is no longer required.

7.2 If you have been exposed to contaminants, decontamination of PPE must be accomplished prior to removal of the respirator.

7.3 Loosen all head harness straps to their full outward position.

7.4 Remove by pulling the facepiece up and back over the head. Care must be taken to prevent contamination of the interior portion of the facepiece during and after doffing.

7.5 Facepiece should be cleaned according to established procedures. If the respirator is to be reused, replace the expended canister with a new canister and follow the donning procedures above.

8. *Redacted for PFS*

9. *Redacted for PFS*

10. DISTRIBUTION

10.1 Distribution will be conducted by the Mask Service Unit.

10.2 Every Fire Operations field unit will receive this equipment for each approved riding position. The distribution will be as follows:

10.2.1 ***Redacted for PFS***

10.2.3 Engine, ladder, rescue and squad companies will receive six adaptors and twelve cartridges that will remain sealed in their pouches. An expired MPC Plus adaptor and two MPC Plus canisters can be kept in quarters for training purposes.

10.2.4 ***Redacted for PFS***

BY ORDER OF THE FIRE COMMISSIONER AND CHIEF OF DEPARTMENT

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REFERENCES

REFERENCE 1

(FORMERLY SAFETY BULLETIN 57 CASE STUDY # 3)

LESSONS LEARNED AND REINFORCED

1. Carbon monoxide is one of the most abundant of fire gases and poisons by asphyxiation. It is colorless, odorless, and tasteless, making it impossible to detect. Since it combines with hemoglobin (an oxygen carrying constituent of the blood) 210 times more readily than oxygen does, carbon monoxide rapidly robs the blood of oxygen needed by the body. At the same time, carbon monoxide prevents the blood from disposing of the waste carbon dioxide it normally brings back to the lungs. This mode of action makes carbon monoxide dangerous at relatively low concentrations. Exposure to 1.3% of carbon monoxide will cause unconsciousness in two or three breaths and will cause death in a few minutes. Exposure to small concentrations for only a few seconds inhibits one's ability to think clearly, rapidly causes disorientation, and gives a feeling of euphoria compounding the risk hazard.

2. Heavy concentrations of carbon monoxide may be present where there is no smoke or only a light haze.

3. Smoldering fires and fires partially extinguished by sprinkler systems produce large quantities of carbon monoxide. Low heat from these fires effects the buoyancy of gases of combustion making ventilation very difficult. This is particularly true with fires in cellars and other low areas, where means of ventilation are restricted.

4. During mask operations and when encountering any emergency situations, poor visibility, or communication problems, self discipline must be exercised to control any reflex action that may cause you to remove your facepiece.

5. Wear your mask, adhere to the Department's mask policy, accept and understand that carbon monoxide is extremely deadly. This may well save a life - possibly yours.

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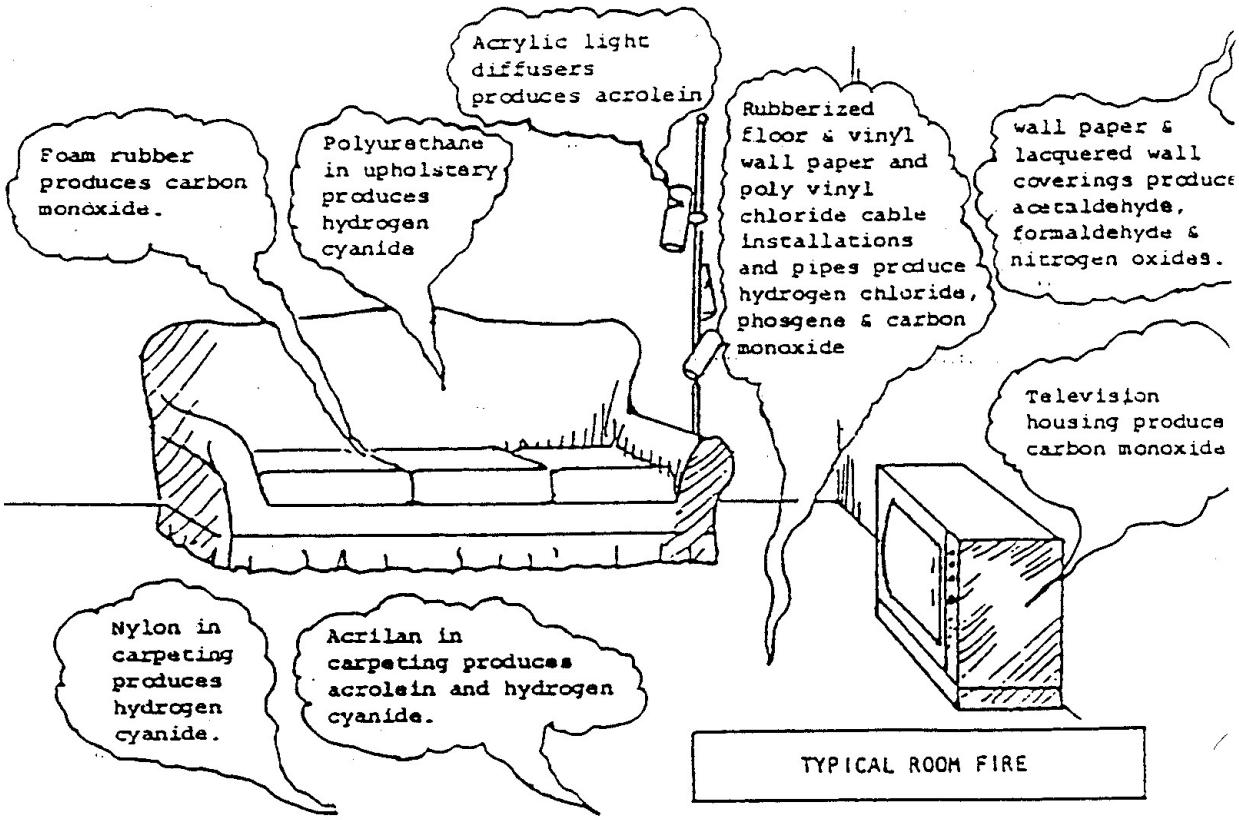
REFERENCE 2

(FORMERLY CWD 5 REFERENCE # 1)



1. CARBON MONOXIDE

Carbon monoxide is produced by the incomplete combustion of many common materials, Including wood and paper. Other more modern sources are foam rubber, rubberized flooring, vinyl wall paper, and pipes and other Installations made with polyvinyl chloride. When inhaled, carbon monoxide crowds oxygen from the blood, and this eventually seriously affects the brain as well as other tissues. If the process is not reversed, death follows.

2. HYDROGEN CYANIDE

Materials that give off hydrogen cyanide when they are burned include rubber and paper, and some frequently used in carpets, namely wool, nylon, and acrilan, and in upholstery, namely polyurethane foam. Hydrogen cyanide is a gas that is colorless but has a noticeable almond odor. It can be absorbed through the skin as well as inhaled. It causes one to gasp in breathing, induces muscle spasms, and speeds up the heart rate. Collapse is often sudden. A concentration as low as 270 ppm (parts per million) is fatal.

3. ACROLEIN

At fires involving plastics, and also petroleum, there may be acrolein in the air. In homes, it can arise from the burning of acrilan in carpeting or acrylic light diffusers. Its extreme irritation to your nose can be felt at less than 10 ppm. It can damage your eyes.

4. HYDROGEN CHLORIDE

Hydrogen chloride (HCL) is becoming more frequent at fires because more plastics containing chlorine, for example in PVC, are now found in homes (and also in drug, toy, general merchandise stores). It is produced by the burning of rubberized flooring, vinyl wall paper, and pipes and other installations made with polyvinyl chloride. At fires, the overhaul stage is especially dangerous, as it is for other noxious gases, because, when you remove your mask, toxic fumes can be lingering. HCL is colorless, but has a pungent odor and is intensely irritating not only to your eyes but also to your respiratory tract which may swell enough to suffocate you.

5. PHOSGENE

Phosgene COC12 is tasteless, and is odorless at first, but at 6 ppm it has a musty-hay smell. Smaller amounts can cause coughing and can irritate your eyes. The moisture in your lungs decomposes phosgene into hydrochloric acid. It may take several hours before you feel the full effect. If the concentration reaches 25 ppm, phosgene is deadly.

6. NITROGEN OXIDES

Nitrogen dioxide, a reddish brown gas, irritates your lungs, and enough of it can cause an edema in them that blocks breathing and so can suffocate you. It is insidious, for you can stand the irritation in your nose and throat, even when you are breathing in a lethal dose, whose real effects may not come for several hours.

Nitric oxide is dangerous in itself, but especially because oxygen and moisture are enough to turn it into deadly nitrogen dioxide. These oxides of nitrogen, when inhaled, form nitrites and nitrates, which chemically attach to your blood and lead to nausea, abdominal pains, vomiting, and discoloration of the skin (from oxygen deficiency in the blood). They can also dilate your arteries, vary blood pressure, and cause headaches, dizziness and delayed physical reactions.

7. FORMALDEHYDE

formaldehyde is used commercially for fumigation and as a preservative. At a fire it may be produced by the burning of such things as wall paper and lacquered wall coverings. It collects on carbon particles and is then inhaled. It is intensely irritating, and also has a suffocating effect. It may inflame the bronchial tubes, from which bronchitis may develop.

8. ACETALDEHYDE

Acetaldehyde is less irritating than formaldehyde but it depresses the central nervous system more strongly. Its fruity odor may be masked by other odors present. Exposure to this gas usually leads to severe irritation to the eyes and the mucous membranes. Ingestion has effects similar to alcohol intoxication.

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REFERENCE 3

Synopsis of Article: "Firefighter Exposure to Carcinogens" (Fire Command, Feburary 1981 Issue)

At fires, Firefighters breathe in many substances that help bring on cancer. The bad effect may not become noticeable for a long time.

There are many more of these dangerous substances today than there used to be. Chemical technology has been rapidly creating new plastics and other new materials that give off toxic elements when they burn. Moreover, there are many new uses for plastics and asbestos, and they are now found everywhere.

Fire departments try to warn their members about the new substances. Medical research is constantly making reports about the bad effects of this or that new material, and whether it breeds cancer. However, research has simply not kept up with all the new developments. It is especially hard to find out whether they involve cancer, since cancer takes a long time to show itself in the individual who has been contaminated. There have been a few studies of the effects specifically on firefighters which seem to indicate increased risk.

It does not take a lot of research to learn how important it is for firefighters to use masks. Firefighters all should know that a mask definitely reduces the risk of inhaling toxic gases. However, firefighters are inclined to forget this at overhaul time. Instead, they are likely to take off their masks in relief, overlooking the fact that toxic fumes are still in the air.

Plastics and Other New Materials:

In order to make autos lighter and cheaper, more and more plastics have been used in manufacturing auto bodies and parts. In the construction of buildings tons of plastics are now used. PVC can be assumed to be present at every structural fire site, because it is now found so frequently in furniture, electric wire insulation, water pipes, kitchen goods, etc.

A tremendous amount of research will be needed to determine the specific hazards of various plastics and other modern materials when they burn. Literally hundreds of different compounds are given off in the burning of lubricants, flame retardants, reinforcing fibers, biological preservatives, coloring agents, etc. Actual burning may not be needed to create a hazard: sometimes contamination is created simply by the increase in temperature near a fire.

Asbestos:

The danger of a firefighter breathing in particles of asbestos is wide spread, because most buildings were put up before the danger was understood and before the use of asbestos was controlled by federal regulations. Building permits fail to give information about whether asbestos is present. A firefighter pulling down a ceiling or breaking open a wall is exposed to asbestos from insulation, acoustical tile, adhesives, jointing compounds, floor tile, etc.

Chlorinated Organics:

Degreasing agents, solvents, and refrigerants contain chlorinated hydrocarbons, which are considered to be carcinogens. Firefighters encounter them at many places. These include service stations, auto repair shops, and auto dealers; also printing and dry cleaning establishments. Some wood preservatives widely used in constructing wooden houses are also noxious.

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Pesticides:

Many pesticides are carcinogenic, and they are found not only on farms but also in garden shops, hardware stores, etc.

Benzene:

There is an airborne danger at fires in places where solvents and other products containing benzene are used or stored. These include gas stations and hardware stores. Moreover, benzene is produced by the burning of PVC, epoxy resins, etc. Benzene is generally thought to be a cause of aplastic anemia, which is often followed by leukemia.

Fossil Fuels and wood:

Coal and oil in burning emit hydrocarbons. Some of these are carcinogenic. Burning wood creates formaldehyde (a carcinogen) which is also found in insulation and wallboard.

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REFERENCE # 4
(FORMERLY SAFETY MESSAGE # 20)

Most smoke related injuries are incurred by firefighters when smoke conditions are "light" and not so excessive as to prevent entry without mask. (See attached case presentation)

Some examples of these "light" smoke conditions that members operate in are food on the stove, oil burner and electrical fires, and fires involving household and office furnishings.

During the course of a tour it is possible that a member could operate within a few of these "light" type smoke conditions without benefit of SCBA.

If member was asked what kind of tour they had, they probably would answer by saying "it was an easy tour, no work, only a few small jobs." However, a member exposed to a few small jobs without the use of SCBA, could incur an accumulative effect associated with some of the following smoke conditions:

TYPE FIRE	GASES GENERATED	EFFECT
Household , Office furnishings	Chlorine, Sulfur Dioxide, Hydrogen Chloride, Phosgene	All are strong pulmonary irritants
Electrical	Hydrogen Chloride is released by thermal degradation of PVC	Irritant to the mucus membrane of the eyes and respiratory tract in concentrations as low as 15 PPM.
Oil Burner	Sulfur dioxide	Irritation to eyes, nose and throat. Usually respiratory tract is affected.
Food on the stove	Sulfur, Nitrogen dioxide	Irritation to mucus membranes and eyes.
All Others	Carbon monoxide	Carbon monoxide, a product of incomplete combination of carbonaceous materials, is found to be present at all fires. CO is considered to represent the most dangerous acute exposure faced by firefighters. Even at low concentrations, CO may impair judgment, visual acuteness and decision making - all faculties crucial to the safety of the firefighters. Furthermore, CO exposure and thermal load in conjunction with rigorous physical activity, present combined stress to the circulatory system, which may contribute to the development of cardiac disease.

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Practically every structure contains materials that when involved during a fire, are capable of producing toxic gases. These gases can be present even though smoke is barely visible.

You may not feel that you have been exposed to “smoke inhalation” by taking these few “light” feeds during a tour. However, you definitely have "inhaled" toxic products of combustion.

The Federal Government issues a warning that smoking cigarettes may be hazardous to your health. Our message is: “The negative effects that the accumulated light feeds have on a firefighter’s body over the course of tours, weeks, months and years, are hazardous to one’s health.”

BY ORDER OF THE FIRE COMMISSIONER AND CHIEF OF DEPARTMENT

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T.B. SCBA, ADDENDUM 5
May 5, 2009

CLEANING AND DISINFECTING THE SCBA REGULATOR

1. PROCEDURE

1.1 Supplies needed:

- 70% Isopropyl Alcohol in a spray bottle.
- Drinking (potable) water - running or in a spray bottle.

1.2 Remove the breathing regulator from the facepiece by rotating the regulator 1/4 turn clockwise.

1.3 Remove any obvious dirt from the external surfaces of the regulator using 70% Isopropyl Alcohol with a sponge or soft cloth.

1.4 Inspect the inside of the regulator assembly through the regulator opening (Figure 1). If excessive dirt or soil is present, return the entire SCBA with a completed RT-2 to MSU, noting reason. Do not insert any foreign objects into the opening.

1.5 Depress the manual shut-off, close the purge knob by turning fully clockwise and spray a minimum of 6 full pumps of 70% Isopropyl Alcohol into the regulator opening. Make sure to also wet the immediate area around the opening (Figure 1). Swirl to completely cover internal components. Turn regulator opening face down and shake excess liquid out. Allow for 10 minutes of contact time to disinfect prior to rinsing.

Note: Alcohol and water should only be applied to the regulator surface and exhalation port. Alcohol and water should not be directed into the spray bar ports.

Figure 1

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1.6 Rinse regulator with drinking water using a spray bottle or softly running water. The inside of regulator must be **thoroughly rinsed** after applying the 70% alcohol. Failure to thoroughly rinse may cause a number of adverse effects. Rinsing is a key component to the SCBA integrity after disinfecting.

1.7 Shake excess water out of regulator. Completely air-dry the regulator before use.

Note: Under no circumstances should the face of the regulator be banged against a hard surface to expedite the removal of water. It may damage the spray bar ports or crack the exterior surface of the regulator. Shaking and opening the purge valve is the only acceptable way to remove water.

1.8 Perform regulator check by opening the purge valve and observe the air flow from the regulator spray bar. Droplets of water indicate the regulator is not dry. Dry the regulator according to section 1.7 and repeat the regulator check.

2. EMERGENCY USE

2.1 It is strongly recommended that the regulator be thoroughly dry before use. However, in emergency circumstances the regulator may be used immediately after cleaning and rinsing as instructed above only if the following requirements are satisfied:

- Shake all excess water out of regulator. Open SCBA cylinder valve, then open purge valve to remove any moisture from the regulator spray bar. Close the purge valve.
- Prevent exposure to temperatures below 32° F / 0° C while in storage and prior to use.
- Before entering hazardous environment, reattach regulator to facepiece and verify that the breathing apparatus is operating normally and that visibility is not impaired by fogging or condensation on the facepiece lens.

3. USE AT LOW TEMPERATURES

3.1 Respirators intended for routine use and respirators not routinely used but kept for emergency use shall be located in areas where the temperature is maintained above freezing (32° F / 0° C). Because the disinfecting procedure involves the use of liquids, respirators stored or used at cold temperature must be warmed before cleaning and disinfecting. Respirators being used at cold temperatures after cleaning and disinfecting must be completely dry. If it is necessary to keep the respirator at a temperature at or below freezing before next use, special care **MUST** be used to verify that all components of the respirator including the regulator are **thoroughly dried**.

BY ORDER OF THE FIRE COMMISSIONER AND CHIEF OF DEPARTMENT

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PAK-TRACKER

1. INTRODUCTION

1.1 The Pak-Tracker Firefighter Locator System is a distress alarm system designed to help identify and locate members in distress. The system consists of two components. The first is a personal transmitter embedded in each SCBA. The second is a handheld receiver (Photo 1) that is capable of receiving a signal from any SCBA in the full-alarm mode.

The Pak-Tracker system serves a dual purpose: The first is its **monitoring/identification** capability, and the second is its **tracking** capability. It is essential for members to understand that the Pak-Tracker receiver is a valuable monitoring/identification tool, serving as an early-warning device and providing a distressed member's identity. In this regard, the Pak-Tracker provides the Department with another valuable identification tool, along with the Electronic Fireground Accountability System (EFAS) and the FAST handie-talkie. In addition, the handheld receiver can also be used as a tracking device in order to guide firefighters to the location of a distressed member.

2. SENSITIVITY DISTANCE

2.1 The maximum range from an SCBA's transmitter to a Pak-Tracker handheld receiver is approximately 900 feet line of sight. The range is dependent on the environmental conditions and anything that might cause interference or reflection of the personal transmitter signal.

3. RESTRICTED USE IN SOME LOCATIONS

3.1 The Pak-Tracker handheld receiver is not suitable for use in potentially flammable or explosive atmospheres. Always check for the presence of a flammable or explosive atmosphere before entering an unknown environment with the Pak-Tracker.

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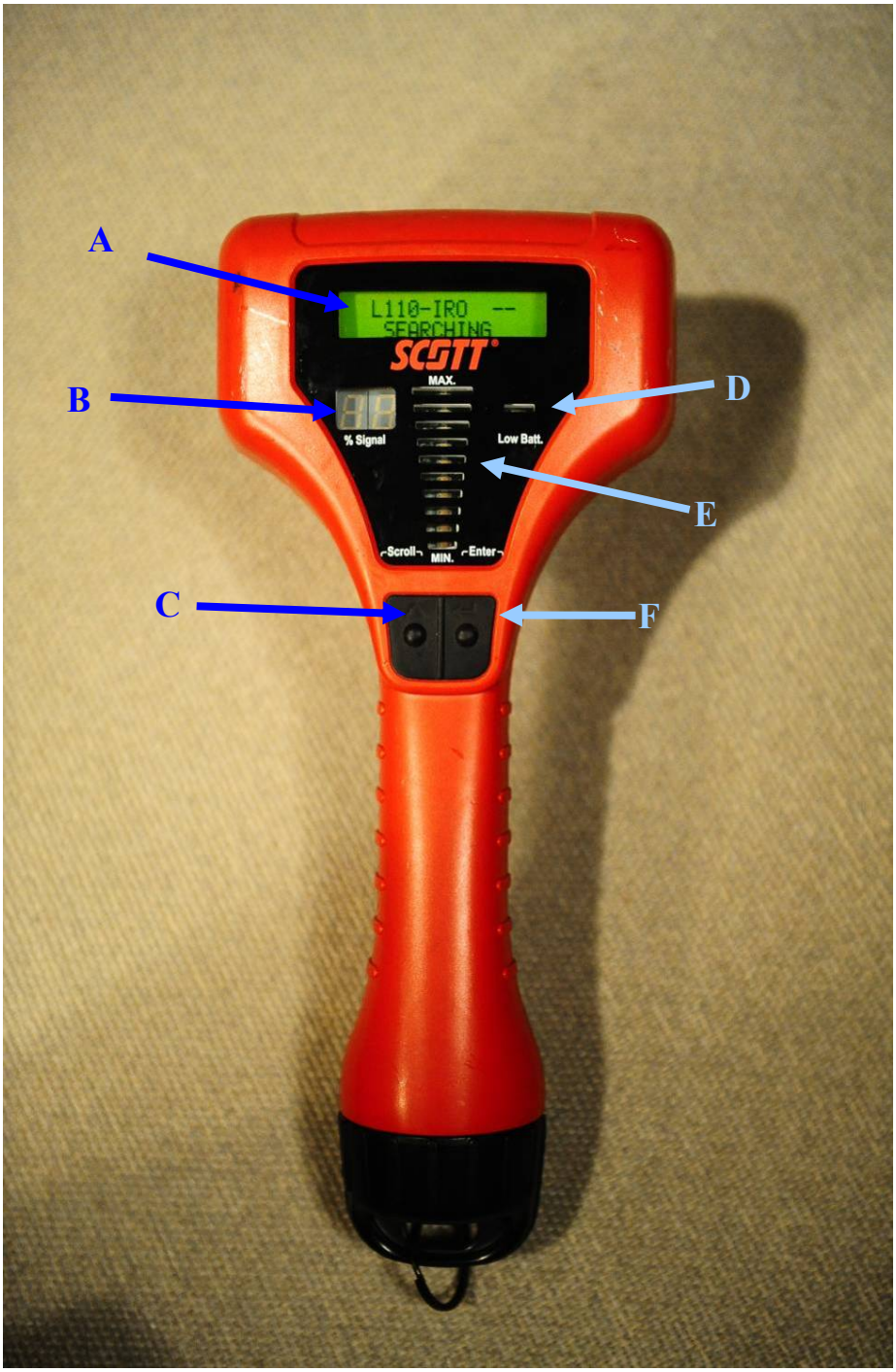

Photo 1

A. LCD Display
B. Numeric Signal Strength Display
C. Scroll Button
D. Low Battery Light
E. Signal Strength Lighted Bars
F. Enter Button

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4. FDNY POLICY FOR PAK-TRACKER OPERATIONS

4.1. Pak-Trackers are currently carried by all ladder, rescue and squad companies. Pak-Trackers shall be brought to the Incident Command Post (ICP) by the FAST unit, rescue and squad companies. A member of the FAST unit will monitor the Pak-Tracker. The rescue and squad Pak-Tracker's will remain at the command post as a backup should the FAST unit be deployed.

4.1.1 Unlike EFAS, the Pak-Tracker does not possess the ability to be updated when a spare mask is put in service. ***Edited for PFS***

4.2 Upon arrival at the scene, the FAST unit shall report in to the ICP with their assigned Pak-Tracker and bring it to their assigned position. A member of the FAST unit other than the member monitoring EFAS shall monitor the Pak-Tracker. This specific Pak-Tracker **must remain in the monitoring mode near the FAST unit's assigned position;** this allows the Pak-tracker to capture both the initial and subsequent PASS alarm activations and ensures continuous monitoring for distress signals.

4.3 When the Pak-Tracker receives an alarm signal, the FAST member monitoring the Pak-Tracker shall immediately notify their company officer with the identity on the LCD display (i.e., the member's unit and assignment). The FAST unit officer shall notify the IC of the activation, and attempt to contact the member to determine whether the signal is for an emergency or an inadvertent activation. If the PASS activation is for a life-threatening emergency, or if no contact can be established, the FAST unit officer shall immediately notify the IC with a "mayday" transmission" as per *Communications Manual, Chapter 9*, and units shall operate as per Department policy in *Firefighting Procedures, Managing Incidents Involving Members in Distress*.

4.4 ***Redacted for PFS***

4.5 At building collapses where members may be trapped beneath debris, a Pak-Tracker may be used from a tower ladder bucket to help identify and locate trapped members. Because of a signal's tendency to pass through holes, voids, and gaps, this tactic could allow members to determine where to begin searching when units are unsure of a trapped member's location. For example, a member using a Pak-Tracker from a high vantage point in a tower ladder bucket could transmit a handie-talkie message to units on the ground stating, "The Pak-Tracker is receiving a strong signal from Ladder 36 Can in the two-three corner of the debris pile." Units on the ground could then begin selected-debris-removal operations in that area.

5. BASIC OPERATION OF THE PAK-TRACKER LOCATOR SYSTEM

5.1 To turn on the Pak-Tracker receiver, press and hold **both** the **"Enter"** (right) and the **"Scroll"** (left) buttons at the same time (Photo 2). The signal-strength indicator will light, and the display will show a "power-up" message.

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Photo 2

5.2 When the Pak-Tracker receives a signal from a PASS device that has been in full-alarm for 10 seconds, the receiver will emit a 2-tone audible alarm, and the LCD display will show the SCBA's identity (**unit** and **member assignment**) and relative signal strength (Photo 3).

Photo 3

This indicates Ladder 110 Irons SCBA. "95" represents the relative strength of the signal.

5.3 While the Pak-Tracker can receive and store up to 36 SCBA identities, the LCD display screen is only large enough to display two lines of information. The limitations of the screen will have the following effects:

- When two PASS Alarms are activated at the same time, both SCBA identities are displayed on the LCD screen.

- When more than two PASS alarms are activated, downward pointing arrows are displayed on the LCD. The left "Scroll" button can then be used to view and cycle through all SCBA identities that have been transmitted. In order to use the scroll feature, press and hold the "Scroll" button for three seconds. After three seconds, the identities will begin to scroll on the LCD display. When the desired identity appears in the top row of the LCD display, release the "Scroll" button.

5.4 After an identity appears on the LCD display, a Pak-Tracker receiver can then be locked onto the PASS signal of an individual SCBA and used as a tracking device to find a member in distress. It is important to understand that **a Pak-Tracker receiver can only lock onto one SCBA at a time**. Once a Pak-Tracker has locked onto the signal of one

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specific PASS alarm, it no longer has the ability to receive any additional PASS alarm signals. A Pak-Tracker is also capable of being unlocked (i.e., returned to "monitoring" mode), in order to monitor for additional transmitting signals, by pressing and holding the "Scroll" button for three seconds.

5.5 A signal from an activated PASS alarm may be evident at a greater distance than the audible PASS alarm. It is important to be aware of this fact, because the monitoring member may receive a signal on the Pak-Tracker without actually hearing the distressed member's audible PASS alarm - the Pak-Tracker may serve as the first and only indication of an emergency in cases when a member is incapacitated and unable to transmit a verbal mayday.

6. OPERATIONS - IDENTIFICATION

6.1 When an SCBA's PASS alarm is activated in the full-alarm mode for ten seconds, the PASS alarm transmits a signal that can be received by the Pak-Tracker handheld receiver. When this occurs, the Pak-Tracker receiver will emit a 2-tone audible alarm and display the identity (**unit** and **member assignment**) of the SCBA.

Note: A ten-second time lag is built into the system in order to minimize inadvertent activations.

6.2 Having a unit monitor a Pak-Tracker serves as a critical safety measure at fires and emergencies. In this capacity, the Pak-Tracker serves as an early-warning detection device that may indicate that an operating member is in distress. In cases when a member is incapacitated or unable to transmit a verbal mayday (e.g., an unconscious member), it is even possible for a Pak-Tracker activation to serve as the only indication of an emergency.

7. OPERATIONS - TRACKING

7.1 Understanding how the transmitting signal from an SCBA PASS device behaves and how the Pak-Tracker handheld receiver displays the strength of a signal are critical to understanding the operation of the Pak-Tracker locator system. Successful operation of the Pak-Tracker depends heavily on the **interpretation of the relative signal strength** displayed on the Pak-Tracker, along with all other available information about the possible location of the distressed member.

7.2 The relative signal strength displayed on the Pak-Tracker's LCD display screen will vary depending on:

- Distance from the SCBA to the Pak-Tracker.
- Path the SCBA signal takes to get to the Pak-Tracker.
- Materials affecting the signal between the SCBA and the Pak-Tracker.
- Orientation of the hand-held receiver.

Note: The Pak-Tracker is very sensitive in responding to small differences in signal strength.

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7.3 The user of the Pak-Tracker must interpret the readings on the display along with other information, such as:

- Training and knowledge in systematic search and rescue techniques.
- Their sense of sight (look where you are going).
- Their sense of sound (listen for an activated PASS device).
- The assignment of the missing member.
- Knowledge of the building layout and building materials.
- Any other pertinent information available on the scene.

7.4 When the Pak-Tracker receives an activated PASS alarm signal from an SCBA, it will sound a two-tone alarm. To lock onto a signal in order to begin tracking a distressed member's location, press the "Enter" button **once**. The LCD display will show that the Pak-Tracker has entered the "searching" mode. If two or more SCBA PASS alarms are transmitting, press and hold the "Scroll" button for three seconds, and continue to hold it until the activated PASS alarm you want to track appears in the top row of the LCD display. To lock onto a selected SCBA: release the "Scroll" button, and press the "Enter" button **once.**

Note: The "Enter" button is a momentary-touch button; the "Scroll" button must be continuously held down. This concept is similar to the door-control buttons used in elevator operations.

7.5 To **unlock** from one SCBA in order to switch to another (to change which SCBA to track), press and hold the "Scroll" button for three seconds, and continue to hold it until the desired SCBA PASS appears in the top row of the LCD display. Release the "Scroll" button and press the "Enter" button **once** to select the activated PASS alarm to track.

7.6 To begin searching, the Pak-Tracker should be held at waist height out in front of the operating member- the top of the hand-held receiver should be pointed toward the target (Photo 4). This is important because the hand-held receiver's sensor captures the distress signal from the **top** of the unit, and the relative signal strength will be greatly affected by the orientation of the hand-held receiver.

Photo 4

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During a search, the row of LEDs and the numerical signal strength shown on the LCD display indicate the relative strength and approximate direction of the signal from the SCBA. Pointing the Pak-Tracker in the direction of the strongest relative signal and moving in that direction should lead to the activated SCBA. When the signal strength rises above the 50-percent level, the row of LEDs will begin to light starting with red at the bottom, yellow in the middle, and green at the top.

7.7 The Pak-Tracker receiver averages four readings per second. When there are features such as doors, hallways, openings, or windows, take readings at each feature to determine where the strongest signal is coming from.

7.8 Use the Pak-Tracker in a sweeping motion, very slowly in a horizontal direction first. Sweep vertically if the signal may be coming from a higher or lower floor in the building.

7.9 Always pause 3 to 4 seconds for a reading. It is best to pause at distinct directional points, (i.e. to the left, in front, to the right). Sweeping too quickly may average a high reading with a low reading resulting in misleading information. Always move toward the **highest** relative signal strength displayed. In general, the closer you get to the SCBA, the higher the relative signal strength. Multiple signal paths are possible. The relative signal strength must be interpreted with all other available information.

7.10 An SCBA signal will pass through some materials, but will not penetrate through other materials.

The signal from the SCBA to the Pak-Tracker will usually pass through:

- Glass
- Light building materials
- Openings such as gaps, holes, stairways, windows, or elevator shafts
- Wood

The signal will reflect and/or not penetrate through:

- Metal, including structural framework
- Large metal objects
- Concrete walls or floors
- Brick or concrete block construction

Note: The signal will attempt to pass around these objects.

7.11 When an SCBA is transmitting a signal and the Pak-Tracker responds, assess the situation first to determine the safest method to approach the search and rescue operation.

7.12 The member operating the Pak-Tracker must be at the front of the search team to prevent signal interference caused by other members being in the way. The transmitter signal will be absorbed by the human body. The other members of the search team must maintain situational awareness and provide for the safety of the member operating the Pak-Tracker.

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7.13 Follow this search-and-rescue process with the Pak-Tracker locator system:

- READ - Hold the Pak-Tracker pointed at features such as doors, windows, or halls. Look for the highest relative signal strength as shown on the display screen.
- INTERPRET - Decide where the strongest signal appears to be coming from and how best to get there.
- FOLLOW - Move toward the strongest signal while continuing to READ, INTERPRET, and FOLLOW.

7.14 To locate an activated SCBA in a building from the street, point the Pak-Tracker at windows and doors to locate the maximum relative signal on the display.

7.15 The Pak-Tracker locator system is highly dependent on the interpretation of the relative signal strength information displayed on the Pak-Tracker, along with all other available information about the possible location of the activated SCBA.

7.16 Continued training and practice in a variety of situations is essential in order to develop the skills necessary to properly interpret the information provided by the Pak-Tracker locator system.

8. INSPECTION

8.1 Inspect and test the Pak-Tracker locator system before each use and at the start of each tour. If any malfunction of the Pak-Tracker locator system is noted during the inspection, place the device out of service, attach an RT-2 indicating the problem and contact MSU for replacement. Each Division has been issued a spare Pak-Tracker. The company shall contact the Division for a spare while awaiting replacement from MSU.

Note: If this inspection is done in direct sunlight it may be necessary to shade the display on the hand-held receiver to be sure the display lights are flashing as described.

1. Visually inspect entire Pak-Tracker body, battery compartment cover, and display for cracks or other damage.
2. Check the optional Pak-Tracker strap handle for weakness.
3. Verify that all fasteners and mounting hardware are present and tight.
4. Check all battery contacts. The contacts must be clean and straight.
5. Verify that a fully-charged battery is properly installed. Refer to the battery charging and battery installation sections of this manual.
6. Turn on the Pak-Tracker by pressing both the “Enter” and “Scroll” buttons simultaneously. Verify that the unit powers up and all lights and displays operate properly.

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7. Battery Life - When the battery in the Pak-Tracker has approximately 20 percent of its life remaining, the "Low Batt" indicator light will glow yellow. If the "Low Batt" indicator lights at any time during the regular operational inspection, replace the battery pack with a fully charged battery pack before proceeding with the inspection. See the battery charging and battery installation sections in this bulletin. After the "Low Batt" indicator light appears, the Pak-Tracker will operate for approximately one hour. If the battery is not changed in that time, the Pak-Tracker will shut down and will not operate until a fully charged battery is installed.

8.2 When any damage is found, remove the unit from service.

9. BATTERY CHARGING FOR THE PAK-TRACKER

9.1 Power for the Pak-Tracker is provided by a rechargeable Nickel-Metal Hydride (Ni-MH) battery pack. The battery pack must be fully charged before placing the Pak-Tracker in service. If the battery or battery charger does not operate as described in these instructions, remove it from service and forward it to the Mask Service Unit by attaching an RT-2 for repair or replacement.

Note: Defective batteries that are placed out of service for any reason shall be forwarded to MSU for disposal. Do not dispose of damaged batteries as ordinary trash.

9.2 Plug the charger's power-supply cord into the charger base. When the charger is connected to a power source, the charging LED will flash once in RED, ORANGE and GREEN -in that order. The charging LED indicator will then go off.

9.3 Identify the location of the three battery contacts on the square end of the battery pack; verify that they are clean and not damaged. If there is any evidence of damage, do not use the battery pack. Refer to the maintenance section of this bulletin.

9.4 The battery pack only slides into the charger when it is oriented in the correct position. Orient the battery with the ridge side up and the triangular side of the battery pack down, with the pull-tab out.

Note: Attempting to slide the battery pack into the charger in an upside-down position will damage the battery and the charger. Do not attempt to force the battery into the charger.

9.5 Slide the battery pack into the charger until the pull-tab end seats in the bracket on the front of the charger. The light on the right-hand side will flash GREEN while the battery is charging.

9.6 When a battery is fully charged, the light will change to solid GREEN. Batteries require approximately two hours of charging prior to initial use. After each use of the Pak-Tracker, the battery should be recharged until the light turns solid GREEN.

9.7 Batteries shall be recharged weekly to maintain a full charge.

9.8 A light that glows YELLOW in the charger base indicates that the charger is in STANDBY mode.

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9.9 A flashing RED light displayed when a battery is placed in the charger indicates a defect in the battery. If this occurs, remove the battery from service by attaching an RT-2 and forwarding the defective battery to MSU. Do not dispose of damaged batteries as ordinary trash.

10. BATTERY INSTALLATION FOR THE PAK-TRACKER

10.1 Install the battery as follows:

10.1.1 Verify that the rechargeable battery pack is fully charged.

10.1.2 Inspect the battery pack before installing. Verify that there is no damage to the outer plastic cover and that the contacts are clean and undamaged. If there is any evidence of damage, do not use the battery pack.

10.1.3 Remove the threaded cover from the bottom of the Pak-Tracker handle by turning it counterclockwise.

10.1.4 The rechargeable battery pack is triangular with a ridge on one side; it must be oriented in the correct position to slide into the Pak-Tracker's handle. Hold the battery pack by the end with the pull-tab and slide the contact end into the handle. There is an arrow under the pull-tab indicating the top side of the battery. When properly oriented, the battery pack will slide easily into the handle. If oriented incorrectly, the pack will not fit into the handle. Do not force the battery into the receiver. Be careful not to press any buttons on the Pak-Tracker while inserting the battery.

10.1.5 Thread the cover clockwise onto the end of the handle. Turn the cover until it stops. The sides of the cover will align with the sides of the handle.

10.1.6 Test the operation of the handheld receiver according to the regular operational inspection section of this manual.

Note: The handheld receiver will not operate if the battery is not properly installed. If the hand held receiver does not operate, or if the battery cover does not fit as described, verify that the battery is properly oriented.

11. CLEANING

11.1 The components of the Pak-Tracker are factory sealed to protect the electronics from dirt and moisture. The unit should be cleaned when necessary using a cloth dampened with a solution of mild detergent and water. Wash the hand strap in a solution of mild detergent and water and dry thoroughly before re-attaching. DO NOT IMMERSE, SPRAY, OR DOUSE THE PAK-TRACKER IN LIQUIDS.

11.2 After cleaning, perform a regular operational inspection of the equipment.

11.3 Inspect the charger according to the instructions provided with the chargers. If any damage is found, remove the equipment from service and tag for repair or replacement.

11.4 Regularly verify that the batteries are fully charged so that the equipment is ready for use.

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12. STORAGE

12.1 All components of the Pak-Tracker Locator System must be completely dry before storage.

12.2 Store the Pak-Tracker in its carrying case.

12.3 When storing the Pak-Tracker for an extended period of time, remove the battery pack to prevent damage to the battery terminals.

13. SCBA IDENTITY VERIFICATION

13.1 Companies shall utilize the Pak-Tracker at multi-unit drills to verify that assigned and spare SCBAs are correctly identified and match the Spare Mask Assignment List.

14. Redacted for PFS

15. PAK-TRACKER PROGRAMMING

15.1 The Pak-Tracker system contains a programming limitation that members must be aware of in order to ensure accurate SCBA identification in emergency situations.

15.2 A Pak-Tracker transmitter is located in each SCBA PASS device. It is programmed to interface with the Pak-Tracker with a **maximum capacity of eight characters** (i.e., letters, numbers, and dashes). This limitation forces a programming modification in FDNY SCBAs where programming exceeds eight characters. In three-digit companies, such as Ladder 175 Roof, the last character will not be shown on the Pak-Tracker's LCD display (e.g., L175-ROO). This is important to understand so that members can properly identify all units and positions on the LCD display. See specific examples below.

15.3 When a PASS device goes into the full-alarm mode for ten seconds, a digital identification signal is transmitted from the PASS device and can be received by the Pak-Tracker handheld receiver. SCBAs are numbered and programmed identically to handie-talkie radio positions.

Examples of eight-digit identities as viewed on the Pak-Tracker's LCD display screen:

1. L1-OFF, L1-LCC, L1-ROOF, L1-OV, L1-IRONS, L1-CAN
2. L105-OFF, L105-LCC, **L105-ROO**, L105-OV, **L105-IRO**, L105-CAN
3. E7-OFF, E7-ECC, E7-NOZ, E7-BU, E7-CONT, E7-DOOR
4. E219-OFF, E219-ECC, E219-NOZ, E219-BU, **E219-CON**, **E219-DOO**
5. **BN1-CHIE**, BN1-AIDE **BN57-CHI**, **BN57-AID**
6. SPARE SCBA'S: BN1-1SP, BN1-12SP, BN57-1SP, **BN57-12S**
7. MARINE: M1-OFF, M1-PILOT, M1-CHFEG, M1-ASTEG, M1-WIPER, M1-FF-6, M1-FF-7
8. HAZ-MAT: HM1-OFF, HM1ENT-1, HM1ENT-2, HM1-BU-1, HM1-BU-2, HM1DEC-1, HMDEC-2, HM1RESCO

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9. SQUAD: S270-OFF, S270-ECC, S270-NOZ**,** S270-BU**,** **S270-CON, S270-DOO**,*S270-7SP, *S270-8SP

10. RESCUE: R1-OFF, R1-LCC, R1-ROOF, R1-HOOK, R1-IRONS, R1-CAN *R1-7SP, *R1-8SP

BY ORDER OF THE FIRE COMMISSIONER AND CHIEF OF DEPARTMENT

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T.B. SCBA, ADDENDUM 9
May 2, 2016

DONNING AND REMOVAL OF THE SCBA FACEPIECE

1. INTRODUCTION

1.1 The helmet, hood and SCBA facepiece function as an ensemble that is designed to encapsulate and protect a members head, neck, face and airway from burns and falling debris. A member is exposed to injury when one component fails or is knocked off. Further, it can be the first link in a chain of events that prevents a member from performing an assigned task, and endangers the lives of their fellow firefighters and the civilians they are charged with protecting. The importance of properly donning this protective equipment cannot be overstated.

2. DONNING PROCEDURE

2.1 Adjust the free end of the helmet chin strap so there is just enough to grab with a gloved hand (approximately one inch).

2.2 Hold the regulator assembly in the left hand with the left thumb on the purge valve.

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2.3 With the head net on the inside, bring the facepiece up to your face.

2.4 Grab the helmet brim with the right hand and remove the helmet over the facepiece and left hand.

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2.5 The chin strap should pass over the facepiece and left hand, and rest on the left forearm.

2.6 Grab the head net with the right hand and pull it over your head while placing your chin in the chin cup. Smooth the net out over the scalp so there are no bumps that will interfere with wearing the helmet.

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2.7 With both hands, tighten the facepiece against the face by pulling the two bottom straps and then the two top straps evenly straight back.

2.8 Inhale sharply to activate the regulator's inhalation valve.

2.9 Pause breathing momentarily and listen for any leaking air. If any is heard, it will be necessary to readjust the facepiece before entering a contaminated atmosphere. If no air is heard, then a proper facepiece seal has been obtained.

2.10 With both hands, pull the Nomex hood over the head net and frame of the facepiece lens.

2.11 Place the left hand back on the regulator with the left thumb on the purge valve

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2.12 Grab the helmet with the right hand and place it over the hood on your head using the left thumb to guide the chinstrap over the purge valve.

2.13 With the left hand, grab the free end of the chin strap and pull it tight.

3. REMOVAL PROCEDURE

3.1 Disconnect the chinstrap buckle and remove the helmet.

3.2 Pull the Nomex hood down around the neck.

3.3 Place thumbs behind the buckle-thumb releases located on each facepiece strap and pull forward until the facepiece is loose.

3.4 With the regulator assembly in the left hand, press the manual shut-off switch to stop air flow.

3.5 While holding the regulator, lift the facepiece up and pull it off of the head.

3.6 Place the nylon head net inside the facepiece lens. Kevlar head nets shall be stored on the inside of the facepiece which will prevent the head net straps from becoming tangled with the buckles.

BY ORDER OF THE FIRE COMMISSIONER AND CHIEF OF DEPARTMENT

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T.B., ADDENDUM 10
August 18, 2022

SCBA IDENTIFIERS

1. DESCRIPTION

FDNY Designation	SCBA Unit Identifier
Material	Photo-luminescent film and leather
Weight	2.5 ounces
Dimensions	3.5 in x 6.5 in

2. USE

2.1 An identifier will be issued to all SCBA -equipped units in Fire and EMS.

2.2 Officer identifiers utilize a glow background with colored lettering and Firefighter identifiers use a colored background with glow lettering. The identifiers color scheme is similar to the helmet frontpiece coloring. (Figure 1 & 2)

2.3 It provides identification of members working in smoke conditions to improve accountability for company officers.

2.4 It offers the Incident Commander better command, control and accountability of units while operating at incidents.

2.5 The identifier must be affixed to the cylinder retention strap on the rear of all SCBAs in service. (Figure 3)

2.6 When a spare SCBA is to be used, members shall remove the identifier from the out-of-service SCBA and attach to the in-service SCBA.

3. MAINTENANCE & REPLACEMENT

3.1 Identifiers may be lightly scrubbed with mild soap and water to remove dirt in order to maximize reflectivity.

3.2 ***Redacted for PFS***

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Figure 1

Figure 2

Figure 3

BY ORDER OF THE FIRE COMMISSIONER AND CHIEF OF DEPARTMENT

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TRAINING BULLETIN
SEARCH 1
October 17, 2013

SEARCH

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GLOSSARY

Flow Path The movement of heat and smoke from the higher pressure within the fire area towards the lower pressure areas accessible via doors, window openings and roof structures. As the heated fire gases are moving towards the low pressure areas, the energy of the fire is pulling in additional oxygen from the low pressure areas. Based on varying building design and the available ventilation openings (doors, windows, etc.), there may be several flow paths within a structure. Any operations conducted in the flow path will place members at significant risk due to the increased flow of fire, heat and smoke toward their position.

Heat Release Rate (HRR) The rate at which energy is generated by the burning of a fuel and oxygen mixture. As the heat release rate increases, the heat, smoke production and pressure within the area will increase and spread along available flow paths toward low pressure areas (open doors, windows and roof openings).

VEIS VEIS (Vent, Entry, Isolate, Search) is the approved tactic when entering a structure through an opening (door or window) to search an area for the location of the fire or to locate possible victims. The priority upon entering the area via a window is to close the door to that room or area in order to isolate that area being searched from the fire area. When entering a fire area via a doorway entrance, the door needs to be controlled until the fire area is further isolated or a charged hoseline is advancing on the fire. By isolating the area, we are controlling the flow path of the fire, heat and smoke towards the ventilation point as well as controlling the air flow from the ventilation point towards the fire area.

Ventilation The controlled and coordinated removal of heat and smoke from a structure, replacing the escaping gases with fresh air. This exchange is bi-directional with heat and smoke exhausting at the top and air flowing in towards the fire at the bottom. The fire will pull the additional air flow into the building towards the fire which can intensify the fire conditions. This exchange can occur by opening doors, windows or roof structures. Coordinated and controlled ventilation will facilitate quicker extinguishment and limit fire spread.

Ventilation Limited Fire A fire in which the heat release rate and fire growth are regulated by the available oxygen within the space.

Ventilation Profile The appearance of the fire building's ventilation points showing the flow paths of heat and smoke out of the structure as well as any air movement into the structure.

Ventilation for Extinguishment The controlled and coordinated ventilation tactic which should coincide with the Engine Company extinguishment of the fire.

Ventilation for Search The controlled and coordinated ventilation tactic performed to facilitate the movement of a firefighter into an area to conduct a search for victims.

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1. INTRODUCTION

1.1 Saving lives is the primary mission of the FDNY. The best lifesaving tactic we have is a systematic search plan, coupled with rapid water on the fire. FDNY staffing and tactics allow for the simultaneous execution of suppression, search, and rescue operations.

"When a fire progresses past the incipient stage, the fire area must be considered an IDLH atmosphere. Every member entering the IDLH must be using all personal protective equipment and a self-contained breathing apparatus. No member shall enter an IDLH atmosphere unless the member teams up with at least one other member and remains within visual or voice contact with that member."

"Two members must team up prior to entering an IDLH (Two-In) and there must be at least two other members outside the IDLH (Two-Out) who are designated as a Safety Team. The members of the Safety Team shall be available to assist the interior team(s) if the need arises. If a member leaves a contaminated area, another member using an SCBA must accompany this member to a safe area."

"If a known life hazard is found and immediate action could prevent the loss of life, appropriate action (rescue activity) may be taken by an individual member. This applies only for a known life hazard, not for standard search and rescue activity. If such action is taken, the Incident Commander must be immediately notified and appropriate adjustments made."

1.2 This training bulletin will make members aware of the various actions involved in a systematic search and the techniques that will help make conducting a search thorough and relatively safe for members.

1.3 There are many different types of structures within the City of New York and in some of these structures the areas of search responsibility differ. However, the information and techniques presented in this bulletin are applicable to any type of structure or occupancy.

1.4 A coordinated, concentrated team effort is required of all units conducting searches to ensure a proper, prompt search and removal of all endangered occupants. Refer to the Firefighting Procedure Manuals for specific areas of responsibility.

1.5 The strategies of search never change in that the FDNY always strives to conduct an immediate primary search, followed by a painstakingly complete secondary search. The tactics used in performing the searches evolve with the changes in construction and fire dynamics. This bulletin will describe the concept of search and offer techniques that can be applied to the vast variety of situations and occupancies found in NYC.

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2. FIRE ENVIRONMENT

2.1 Conducting a search in the modern fire environment has added many challenges to the fire service. The increased use and amount of synthetic contents found in all buildings is one challenge presented. Synthetic materials have a higher heat release rate (HHR) giving off heat more quickly than ordinary combustibles, leading to a more rapid and sudden change in the fire environment. Fires today develop faster, producing thick black smoke, which greatly reduces the searcher's visibility. This is why Thermal Imaging Cameras (TIC) have taken on a greater importance when conducting searches.

2.2 Fires involving modern synthetic contents coupled with new building construction methods that contain the heat and smoke within the fire area, may quickly become a ventilation limited fire that will react rapidly once a door is left open or other parts of the occupancy are ventilated allowing air flow into the fire area. These openings will provide enough air flow that may rapidly expand the fire condition and extension, causing conditions to become untenable in as little as 1 1/2 minutes after entry (ventilation) is made into the fire apartment or area. It is critical for Company Officers to control all ventilation tactics, including doors to and within the occupancy. The tactic of venting as we search can have severe consequences with modern synthetic contents.

2.3 Today's fire conditions lower the survival threshold of civilians as well as decreasing the amount of time needed to safely perform a search without an operating hoseline in place. Bunker gear, while providing better protection, is totally encapsulating allowing members to search deeper into an IDLH. For safety reasons, members need to be constantly aware of the search environment including the status, location and operation of all hoselines.

3. DEFINITION OF SEARCH

3.1 A search is an orderly and systematic examination of a building or area for the purpose of locating persons, or locating fire and extension of fire.

Note: This bulletin will deal primarily with search for persons, in order to save lives.

4. SIZE-UP

4.1 Size-up starts with the receipt of the alarm. The teleprinter or MDT dispatch message shall be checked for Critical Information Dispatch System (CIDS). The information provided by CIDS will enhance operational efficiency by alerting units to dangerous, hazardous or unusual conditions which are not necessarily apparent from the front of the building.

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4.2 Upon arrival, take the time to orient yourself on the fireground. The need to take adequate time to perform a size-up to determine the occupancy type and the expected life hazard, before attempting a search, cannot be over emphasized. All affected areas within the fire building should be searched within the limits of safety.

4.3 Searching members must understand that the degree of aggressiveness incorporated into a search for life must be dependant upon several factors, some of which are:

- What is the structural stability of the building?
- What is the ventilation profile of the fire conditions, (the location and movement of any smoke and fire into and out of a structure)?
- Are there reports of a life hazard?
- What is the stage of the fire development and what will be the effects of any ventilation?
- What is the tenability of fire conditions within the occupancy?
- What is the status of the water supply and the position of charged hoselines?
- What are the rewards and benefits to the searchers in relation to the risk and consequences of their actions?

Members engaged in searches must continually assess these factors by monitoring handie-talkie transmissions and through personal observation.

4.4 Consider how the heat, smoke and fire will extend within the building. Occupant egress from the building (interior stairs, fire escapes, etc.) can be quickly impacted by the fire conditions, negating their use and endangering occupants.

4.5 Members must include the buildings configuration as part of their size-up. The benefits gained by observing construction features of the fire building (types of construction, window layout, presence of window bars, access and egress points from the building, is the building built on a grade, etc.) may give members an idea of the floor layout inside a residential building. This may help members determine how many apartments are on each floor and the floor plan of the apartment (ex. Railroad flats). Prior to reaching the fire floor, knowledge can be gained from conducting a survey of the floor below to determine the interior hallway layout, apartment numbering system, floor plan of the apartment, and closest means of access to a fire apartment. Information from this survey shall be communicated between the Officers and the Incident Commander (IC).

4.6 It is critically important to take into consideration the effects of the wind direction and velocity on fire conditions, especially when windows are open or failed. Direct or gusting wind may suddenly increase the fire conditions and fire growth within the structure. As part of their size-up, members of the outside team must report wind conditions and its affect on the fire and smoke conditions to their Officer and the IC. Alternate strategies and tactics shall be considered when the ventilation profile and interior conditions indicate the potential for a wind impacted fire.

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4.7 Take into account the time of day and consider the following:

- It can be assumed there will be a large number of sleeping occupants in a multiple dwelling at night.
- Commercial buildings may have watchmen or cleaning personnel working after normal business hours.
- Commercial loft buildings may have been converted into residential buildings.
- Office buildings often have cleaning and maintenance people present day and night. Computer personnel are often present 24 hours a day.
- It cannot be assumed no one is present inside taxpayers that have roll down security doors with padlocks in place. Many times people are padlocked in to provide security at night.

4.8 Information about the location of the occupants and reports of any missing occupants must be obtained early in an operation. It is critical to ascertain if all occupants have evacuated or if any occupants are reported trapped or missing. Obtain information on who is missing and their last reported location including the access to their location. Ask occupants if they had anyone visiting and staying with the family. Verify if a report of a trapped victim is a person or a pet.

4.9 Be aware of smoke spread that can be affected by air conditioning systems and vent shafts in kitchens and bathrooms.

4.10 In retail establishments all areas must be searched for occupants with particular attention given to the rear and main selling area. Be aware there may be accommodations in the store for employees to rest or sleep.

4.11 It is important for an engine company to realize that a properly positioned hoseline will contain the fire, possibly saving civilian lives and protecting firefighters who are searching both the fire floor and the floors above.

Note: Only in extreme cases should an engine company become involved in search and rescue without simultaneously stretching and positioning a hoseline.

5. TYPES OF SEARCH

5.1 Upon arrival at the fire building, members must perform search activities with two objectives:

- The location of any life hazard
- The location of the fire

5.2 There are two types of searches for life:

- Primary search
- Secondary search

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6. PRIMARY SEARCH

6.1 A primary search is the immediate search for life. This search is rapid but thorough and systematic. The primary search will be influenced by the fire, heat and smoke conditions in a room or area, and may be prior to the application of water. It should be done quickly, with due regard for your personal safety.

6.2 Usually the 1st arriving ladder company is responsible for the primary search on the fire floor or fire area, and the 2nd arriving ladder company is responsible for the primary search on the floors above.

6.3 The 1st arriving ladder company's priorities are:

- Locate the fire area.
- Control the door to the apartment or area, and any other ventilation points.
- Communicate the fire location to the Engine Officer and the IC.
- Determine if conditions are tenable to support life:
  - If entry can be made and the search conducted without the protection of the hoseline, members may attempt to locate and contain the fire area of origin, and then start the search for life from this point.
  - If untenable, move in behind the engine company advance and search from behind the hoseline.

6.4 The search for life in the areas adjacent to or above the fire area/floor, should start immediately upon entering the area, followed by searching for the extension of fire. Any extension should be immediately reported to the IC.

6.5 Depending on the type of structure, the second arriving ladder company may be assigned to assist the first arriving ladder company with the primary search on the fire floor. In these situations, the IC shall assign additional units to the floor(s) above.

6.6 When both of the assigned ladder companies arrive at almost the same time but out of response sequence, their responsibility for search shall be guided by their response assignment. This avoids confusion and ensures that the fire area and the floors above are covered. If units operate out of the assigned response sequence then the IC must be notified.

6.7 ***Redacted for PFS***

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7. SECONDARY SEARCH

7.1 The secondary search is a thorough and painstakingly complete search for life of all areas that required a primary search. In addition, the secondary search must also include the entire outside perimeter of the building and all shafts, basements, cellars, elevators, roofs, etc. Its purpose is to ensure that no possible victims are overlooked. Time is not as important as accuracy.

7.2 A secondary search shall be completed before any extensive overhauling of the fire area is attempted.

7.3 A secondary search must be performed by a different company than the company which performed the primary search.

7.4 ***Redacted for PFS***

7.5 A plan shall be formulated to determine the extent of search activity based on intelligence gathered at scene and likelihood of building occupants (residents, squatters, construction workers).

7.6-7.10 ***Redacted for PFS***

8. COMMUNICATIONS

8.1 Communication between all members and the need to monitor communications when conducting a search is imperative to improve the safety and efficiency of operations. Effective communications include the following:

- To ensure the safety of the interior team, the outside team must report exterior conditions, including the effect wind is having on the smoke and fire. The exterior size-up must be relayed to their Officer, the IC or Sector Supervisor (if implemented).
- Officers shall communicate with the members of the outside team to determine their location and areas they are searching, and require them to maintain contact with the interior search team to ensure the outside members' safety and team integrity.
- Members conducting searches will maintain situational awareness by monitoring handie-talkie transmissions, especially the status of the water supply and position of operating hoselines.
- ***Redacted for PFS***
- ***Redacted for PFS***

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9. SEARCH TACTICS

9.1 The Ladder Company Officer must supervise searches by controlling both the interior and exterior search teams. This Company Officer is responsible for maintaining the search team integrity. The failure to maintain search team integrity may lead to serious injuries and fatalities during operations. The interior team search is controlled by immediate supervision via verbal communication and the use of the Thermal Imaging Camera (TIC). The exterior team is supervised through functional supervision by tracking the member's progress via handie-talkie reports.

9.2 All search teams must have a plan in order to complete an effective search. A plan will enable members to achieve the main objectives of searching for life hazards and the location of fire. Members shall always remain cognizant of their surroundings by making a mental note of point of entry and any secondary means of egress that are passed during their search.

Members can orientate themselves within the occupancy by:

- Knowing the exposure from which the member entered the building;
- Conducting a survey of the floor below;
- Knowing what floor the member is on, the number of the apartment the member is searching in, and the room the member is searching;
- Noting landmarks (radiators, large furniture, etc.) within the search areas;
- Making a mental note of the floor plan as members move through the search area.

Maintaining situational awareness will enable members to perform a thorough and systematic search, allowing them to maintain contact with other members searching and provide details of their exact location in case the need for assistance should arise.

9.3 There are several methods of performing a search:

- The method for searching the fire area or apartment is to first locate, contain and isolate the fire and then begin the search for life from this point. When entering rooms use either a left- or right-hand search pattern. Work along walls and perimeter furniture as you move toward the fire area. When searching for life, continue with the left- or right-hand search pattern probing toward the center of the floor of the room. When probing with a tool use caution to avoid injuring a victim.
- The method when searching areas adjacent to or above the fire area, is to start the search for life upon entering the area using a left or right-handed search pattern.
- The search rope method should be used in commercial occupancies or when deemed necessary by the unit Officer since it will improve orientation, safety, and provide for a more coordinated search.

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9.4 Prior to forcing an entrance door to a fire occupancy, the Ladder Company Officer shall determine:

- Is there a report of a life hazard?
- Are interior conditions tenable to sustain life or to conduct a search for life?
- Are all members in proper PPE?
- What is the location and status of the charged hoseline?
- Who is the member to remain at the door if the interior search is to be conducted without an operating hoseline in place?
- What will be your area of refuge, if needed?

9.5 Gaining access to the fire area, or area to be searched, will usually be through the main door that the occupants use. If there are indications of fire on the other side of the door, do not stand in front of the door when opening it. Stay to one side, keep low and then open the door. If fire is wrapping around the door jamb as the door is being forced open, a hoseline must be charged and in place at the door before the door is opened. This may also indicate that a window has failed, and that wind is forcing the fire toward the occupancy entry door. The Company Officer shall contact the exterior team for their size-up if it has not been communicated. Evaluate the interior and exterior size-up and determine if an alternate means of attack and access to the fire area is necessary.

9.6 The area in the vicinity of, and behind, the entrance door must be checked as soon as entry is made. People may have tried to reach a means of egress and may be unconscious near or behind the door.

9.7 If a door opens easily at first and then is stopped by something, reach around the door to determine if the obstruction is an unconscious person.

9.8 Upon entering the occupancy, do not let a door lock behind you. Upon entering any IDLH area, all searches shall be conducted with members at the floor level.

9.9 When unable to enter due to severe fire conditions, probe the area in the vicinity of the door with a hand or tool before closing the door. Maintain control of the door. Once the engine company has a charged hoseline and is ready to advance, move in behind the nozzle team to start the search for life.

9.10 Door Control: The opening or forcible entry of the entrance door to the fire area is not just a point of access or egress. But equally important, it is a ventilation point creating a flow path for fire, heat and smoke. This ventilation point allows both the heat and smoke to flow from the fire area and provides a fresh in-flow of air at the floor level from the exterior to the interior of the fire area.

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The contemporary contents of today's occupancies burn quickly and become ventilation limited. These fire conditions lack sufficient oxygen to further expand the fire. The inward flow of air from the door opening may be enough to cause a rapid expansion of fire conditions and limit the time for an effective search. It is critical to the safety of the occupants and the members conducting searches, that we control the entrance doors until a charged hoseline is in position to operate.

9.10.1 A determination must be made as to whether the door will remain open or closed while the search is being conducted. The determining factor is whether or not the engine company has a charged hoseline and is ready to advance into the fire area/occupancy.

a. If the engine has a charged hoseline, the door to the fire area will be left open. A member of the ladder company shall chock open the door to facilitate the advance of the hoseline.

b. If the engine does not have a charged hoseline at the door to the fire area, the door should be closed after the search team enters. Before entering, the Ladder Company Officer shall communicate the identity of the fire apartment to the IC and Engine Officer. A firefighter of the interior team must be positioned at the door inside the fire area to maintain control of the door until a charged hoseline is ready to advance through that door. The Ladder Company Officer and the other member of the interior team will search the fire area. The interior team shall leave the hydraulic forcible entry tool outside the doorway to indicate the apartment they are searching. The Ladder Company Firefighter at the door will:

1. Maintain control of the apartment door to control the flow paths of heat and smoke. Control of the fire apartment door can be accomplished by positioning a member inside the door with door closed, but not locked. The door can be ajar with the dead bolt extended, preventing the door from completely closing.
2. Make sure the door doesn't lock behind the interior team.
3. Monitor conditions in the immediate entrance area that may affect the safety of the interior search team.
4. Monitor handie-talkie transmissions to maintain situational awareness, especially reports of water problems, and wind conditions and its effect on other ventilation points, to ensure the safety of the members searching the fire area.
5. Act as a beacon to guide the searching members back to the door, if necessary.
6. If members are forced to evacuate, account for the interior team and close the door after all members have exited the apartment.

Note: The door should be closed after the search team enters to prevent the creation of a flow path from the fire area towards the door and eventually into the public hallway and stairwell. A wind condition created by a failed or open window may increase the negative effects of flow paths within the fire area.

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The Ladder Company Officer must notify the Engine Officer and the IC of the decision to close the door.

Once the engine company reaches the apartment door with a charged hoseline, the Engine Officer must notify the Ladder Company Officer of their readiness to enter the apartment and that the apartment door will be opened. The door should not be opened until the Ladder Company Officer acknowledges and approves.

9.10.2 Attempt to locate and confine the fire to the area of origin until the hoseline is in position to reduce the number of people endangered. Once the fire area has been determined, it should be confined by:

- Closing an open door to the fire apartment, to gain control of the public hallway and stairs.
- Closing the door to a fire room to prevent a flow path for the fire toward the apartment door when the hoseline enters the apartment.

Note: The water extinguisher may enable members to get close enough to close an apartment or room door, thereby confining the fire.

9.11 Ventilate, Enter, Isolate, Search (VEIS):

This is an approved tactic whenever a member enters a window (vent opening).

Ventilate: Open or remove the window to be entered.

Enter: Member enters via the window. This open window is now a flow path for the smoke, heat and fire.

Isolate: The room entered by closing the door to eliminate the flow path.

Search: Conduct a search of the room.

When entry is to be made through a window:

- Prior to entering a window to perform a search, member shall notify their officer. All horizontal ventilation tactics, whether Ventilation for Extinguishment or Ventilation for Search, require communication with, and coordination by, the Ladder Company Officer operating inside the fire area to be vented.
- Be cautious when breaking glass since an unconscious person may be lying on the other side.
- Before entering, probe for possible victims, and then check the floor for stability.
- Before entering an apartment clear out the entire window. Removing it will provide a larger and better means of egress if conditions deteriorate.
- Immediately upon entering the room from a window, members should make a quick check/sweep of the floor in the hall outside the door for any victims before closing the door. Once this door has been closed, a more detailed search may be permitted. The completely removed window will adequately vent the room and the possibility of pulling fire toward the vented room will have been negated by the closed door.

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9.12 When unable to enter through the window due to severe conditions, probe the floor area immediately inside the window with your hand or with a tool.

9.13 When a known life hazard exists and entry through a door or window to the area to be searched is not possible because of fire, it may be advisable to seek another or alternate means of entry. An example of alternate means of access is breaching a wall to enter the fire area or room from an adjoining apartment.

9.14 The public hallway and the entire staircase up to the bulkhead door must be examined for those civilians who unsuccessfully attempted to use the interior stairs to escape from the fire or smoke.

10. SEARCHING ABOVE THE FIRE

10.1 Gaining access to the floor above in many types of structure can be extremely difficult and can place members in a dangerous position. Initially, this may not always be attainable, but an attempt should be made while always keeping safety in mind. Company Officers must evaluate the risk of going above a fire without a protective hoseline and determine the benefits and consequences. A thorough size-up of the conditions on the fire floor shall be performed before going above the fire. When deciding whether to go above, consider the following:

- What is the location of the fire?
- Do they have control of the door to the fire area?
- Do they have a charged hoseline on the fire floor?
- Is the hoseline advancing into the fire area?
- Are there water problems?
- Is there a need for protection with a hoseline above the fire floor?

Note: When assigning an Engine Company to stretch a hoseline to the floor above the fire, the IC shall give that Engine Company's identity to the units operating on that floor.

10.2 Prior to proceeding above the fire, notification must be made to officers on the fire floor. Acknowledgement of this message must be received before proceeding above. This is necessary to ensure that the officers of units operating on the fire floor will know who must be notified of any situation necessitating their withdrawal from the floor above.

10.3 Once determined that access to the floor above can be safely attained, get up and off the stairs immediately.

10.4 Means of access to the floor above are:

- Interior stairs;
- Fire escapes;
- Via ladders (Portable, Aerial or Tower ladder).

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10.5 Upon reaching the floor above, the officer must consider forcing a door to an apartment other than the one directly over the fire, to provide an area of refuge in the event the conditions deteriorate. If an area of refuge is to be made, ensure that the door is closed and unlocked, so as not to create an additional flow path for smoke, heat and fire.

10.6 When conducting a primary search above the fire, it is vital that members continually assess their location in relation to both your primary and secondary means of egress in the event that conditions deteriorate requiring an evacuation. Situational awareness is crucial to the safety of all members, especially those operating above the fire. The progress of the hoselines on the fire floor below must always be monitored and used as the indicator governing how far the searching members will continue to advance on the floor above the fire.

Note: Water problems (burst length), should be transmitted as an **Urgent** handie-talkie message. The IC shall ensure that members operating above the fire are aware of the problems on the fire floor. If there is any indication of a delay in putting water on an **uncontrolled** fire, all members operating above the fire should seek refuge by returning to the fire floor or floor below. This must be done to prevent the search team from being trapped by extending fire conditions. They may resume operations on the floor above once the water problem on the fire floor has been resolved. Searching for fire extension is not a valid reason to remain above an **uncontrolled** fire.

11. USE OF THERMAL IMAGING CAMERA

11.1 The Thermal Imaging Camera (TIC) is a valuable tool that can be used for many operations. TICs may be especially helpful in the low visibility environment of today's structural firefighting. TICs provide a pictorial representation of temperature differences that are unaffected by smoke. Basic knowledge of thermal imaging, understanding the functions and use combined with disciplined tactical applications are essential in utilizing the TIC to its fullest potential.

11.2-11.6 ***Redacted for PFS***

12. SEARCH TIPS

12.1 Always be alert for sounds of a trapped victim (e.g., coughing, moaning, or crying).

12.2 Sweep beds and couches from front to back. If a person is found on a bed, give an extra sweep as there may be more than one person on the bed.

12.3 Check the areas between the bed and the wall, and between 2 beds pushed together.

12.4 Check all rooms, closets and bathrooms thoroughly.

- A locked bathroom door is usually an indication that someone is inside.

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- If a room has a padlock on it, don't assume it is unoccupied. Children are sometimes locked in when parents leave.

- When forcing an apartment entrance door, if the night latch chain is in place, this indicates a strong possibility that victims will be present.
- Ensure all interior walls of a closet are touched when searching the closet floor. This will ensure the search reaches the back of the closet. Many times children will hide from the fire deep inside the closets.

12.5 Look under beds and behind furniture for trapped victims.

- Try to avoid moving furniture, as it may hide a victim or block a doorway to an adjoining room by doing so.
- To find out whether there is a victim under a bed, probe with an arm, tool, or insert a leg under it and sweep gently back and forth.

12.6 Be sure not to pass the upper levels of double and triple-bunk beds, which are well above the floor. The extremely low level of the mattress on the lower part of the bunk bed will alert you to search higher.

12.7 Narrow tapered legs (with wheels) will probably indicate a crib.

12.8 Thoroughly search all piles of clothes, draperies, or bed linens. The removal and dropping of window draperies may have covered a victim.

12.9 Check all dresser drawers, toy chests, refrigerators, and closets for victims. Children often seek refuge in such places.

13. RESCUE OF VICTIMS

13.1 Remove the most seriously exposed victim first.

13.2 Victim removal should, when possible, be via the safest route available.

13.3 When victim removal occurs before fire suppression, the thermal and toxic exposure to the victim should be considered when choosing victim removal routes. Consideration should be given to a removal route that does not pass the fire compartment along the path of travel. This route may differ from the path taken by the firefighters who commenced the search. Alternate removal pathways may reduce the victim's exposure to both toxic gases and heat during removals.

13.4 There are many factors that can impact and influence removal decisions. These factors include any obstructions encountered, exterior conditions, access points, window size, and occupant size. Whether the removal will be via a ground ladder, fire escape, tower ladder or aerial ladder will also impact and influence removal decisions.

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13.5 Attempt to remove a victim via the safest route available. The preferential order of

- Interior Stairs
- Horizontal Exits
- Fire Escape
- Ladders
- Life Saving Rope

13.6 In the past, many victims located during primary searches were found under windows and behind doors. Today, a high percentage of the fire victims located during primary searches are found either in a bedroom or in an area that is in close proximity to where the fire originated.

- Since 1990, the number of victims that have been found in the path of egress has declined significantly. This is largely due to the toxicity of modern fires.
- Recent data trends indicate the majority of fire victims have been found by the inside team. The search conducted by the inside team is a critical component of search operations.
- Members should be aware that many fire victims have been found in the apartment or occupancy directly above the fire in non-fireproof multiple dwellings, on the top floor of non-fireproof multiple dwellings, and in hallways and stairways in fireproof multiple dwellings. These areas are of particular importance during search operations.
- A victim located in a bedroom during a search with a closed door between them and the fire has a much higher likelihood of survival than a victim located with an open bedroom door.

13.7 Members must communicate that they have located a victim by transmitting signal 10-45, the location of the victim and if assistance is needed.

13.8 Ambulatory victims are those that can assist themselves in their own removal. They may hesitate or want to return for valuables, pets, etc. Members must be firm, authoritative and direct these victims to a place of safety before returning to complete the search. Ambulatory victims should be removed or directed from IDLH areas. The IC should be notified of any ambulatory victims that are evacuated from the IDLH area.

13.9 Non-ambulatory victims cannot assist in their own removal. They may be aged, infirmed, obese, small children or unconscious. Members may require assistance and should use their handie-talkie or notify nearby members for assistance. Whenever any member removes a non-ambulatory victim, the victim must be removed to a non-IDLH area. When required, the rescuer shall provide medical treatment until the arrival of a CFR Engine or EMS. Keep the IC aware of the location of any victim.

13.10 A search is not complete just because a victim is found and removed. There may be other victims within the occupancy and all rooms must be searched. The IC needs to ensure that all areas are properly searched.

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14. CONCLUSION

14.1 This bulletin is not to be considered all encompassing or meant to cover every possible situation. However, the material included has been learned from many years of experience and should prove valuable to members.

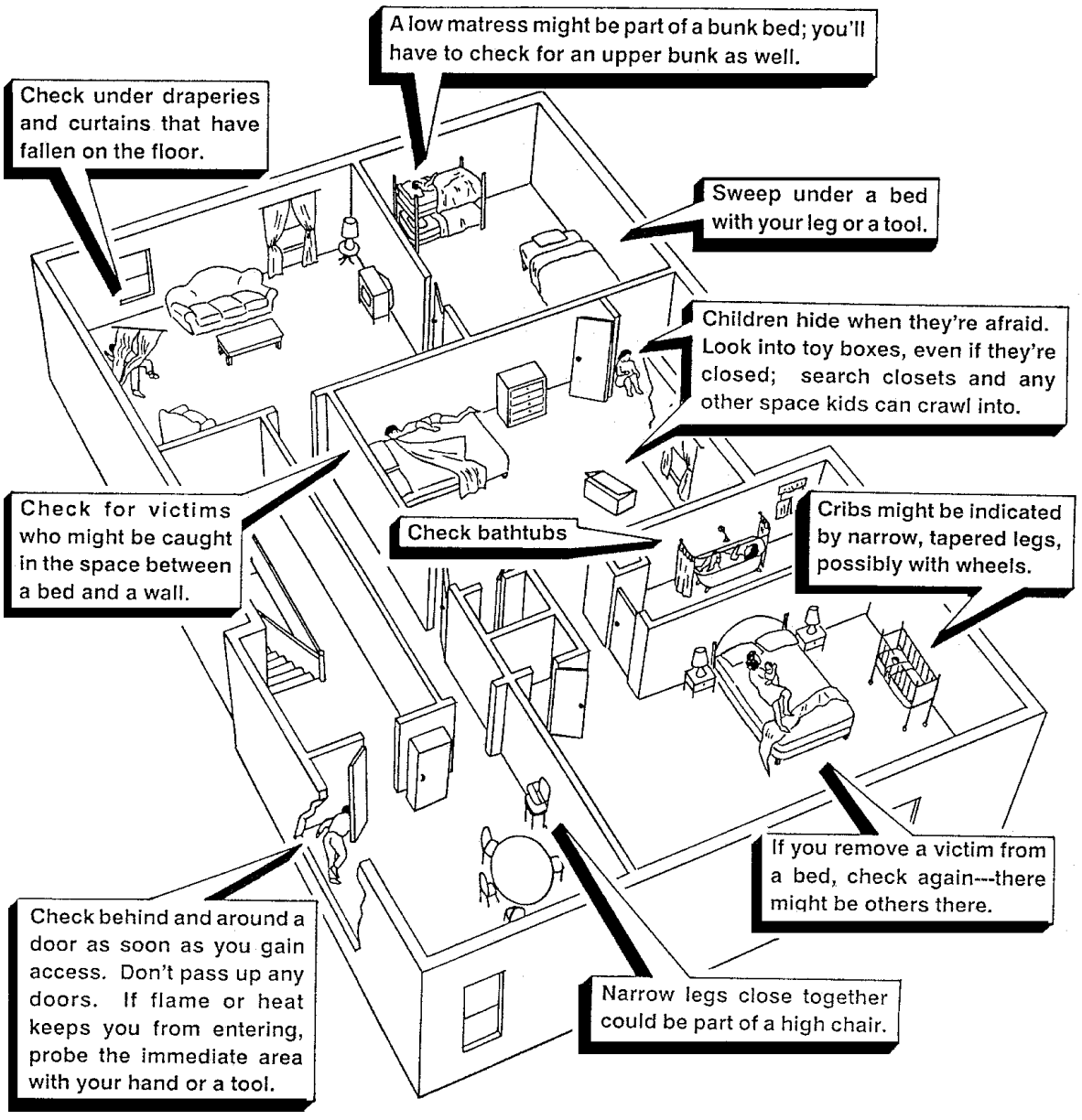
within their response area. Knowledge of building layouts and occupancies can be a firefighter's greatest asset when conducting searches.

14.2 It is of the utmost importance that all members are familiar with the types of buildings

BY ORDER OF THE FIRE COMMISSIONER AND CHIEF OF DEPARTMENT

REFERENCE 1

FIGURE 1
Key Points for Searching



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TOOLS
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TRAINING BULLETIN
TOOLS 1
August 12, 2022

PRESSURIZED WATER EXTINGUISHER

1. DESCRIPTION

1.1 Weight is approximately 30 lbs.

1.2 Water 2½ gallons.

1.3 Operating Pressure: 100 psi @ 70 degrees F.

1.4 Water expelled in 55 seconds.

1.5 Stainless Steel Cylinder Material.

1.6 Plated Brass Valve Material.

1.7 Stainless Steel handle/Lever Material.

Note: 1. In freezing weather, the extinguisher should be placed in an apparatus cab or other warm area if the unit will be operating for an extended period.

2. The water extinguisher is a pressure vessel and shall be hydrostatically tested at 5-year intervals or at any time an extinguisher shows evidence of corrosion or mechanical damage.

2. OPERATION

2.1. Extinguisher is maintained upright.

2.2. Pull the ring pin.

2.3. Grasp the hose near the nozzle with one hand, and squeeze discharge lever with your other hand.

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2.4. Direct the **straight stream** at the base of the fire. A gloved finger placed lightly over the nozzle tip can help produce a fine spray. This spray pattern is often useful at fires to obtain maximum cooling effect and extended the application time.

Note: Using the extinguisher with a finger over the nozzle should only be used at very small or smoldering fires where there is no detectable thermal draft created by the fire. Thermal draft may cause the spray to become steam and possibly burn the user or others in close proximity.

3. USES

3.1 Portable fire extinguishers are intended as a first line of defense to cope with fires of limited size (NFPA 10, 1.1.1)

3.1.1 Pressurized water extinguishers can be used on Class A fires to:

A. Control mattress fires, chair fires, small trash fires, etc.

B. Control a smoldering fire in wall and ceiling bays (especially if line is on another floor or remote).

C. Reduce fire in the vicinity of the apartment door so that it may be closed.

D. Extinguish incipient fires in window frames and under eaves.

3.1.2 Cool a burned victim or member.

3.1.3 Temporarily protect members operating in fire conditions.

Note: Water extinguishers should never be used on or about energized electrical fire situations to avoid electrical shock injury.

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4. INSPECTION

4.1 The pressurized water extinguisher shall be inspected at the beginning of each tour and after each use. Inspection shall include:

4.1.1 Any signs of leakage, corrosion, or physical damage.

4.1.2 Signs of or exposure to excessive heat, flame, or fire.

4.1.3 Condition of the cap and collar threads.

4.1.4 Visually examine the discharge hose and nozzle, to ensure it's free from damage and unobstructed.

4.1.5 Serviceability of the gasket.

4.1.6 Check hydrostatic test date. If is greater than 5 years, extinguisher must be placed out of service. (Photo 1)

4.1.7 Ensure pressure gauge pointer needle indicates within the green operable range. (Photo 2)

4.1.8 Lift extinguisher to determine its fullness.

Note: Pressurized water extinguishers placed out of service should be properly tagged with an RT-2 and sent to Technical Services for replacement.

Photo1

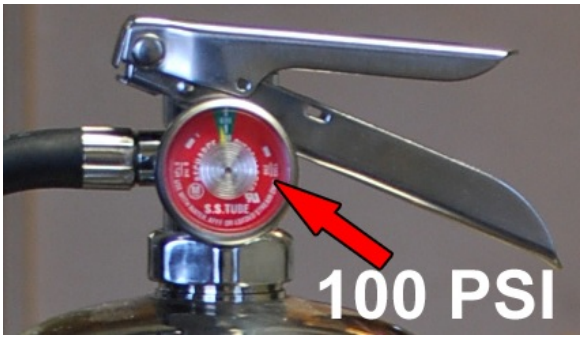

Photo2

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5. RECHARGING

5.1 Invert the extinguisher and point the nozzle in a safe direction.

5.2 Squeeze the lever to release residual air pressure then check the extinguisher gauge to verify all pressure is removed.

5.3 Inspect extinguisher (Refer to section 4 above).

5.4 Remove the head assembly. Closely examine all components to ensure they are not damaged cracked or worn.

5.5 Wash all parts with water. Rinse hose and nozzle.

5.6 Fill the extinguisher with clean potable water to the inside mark.

5.7 Replace the head assembly, and properly snug it down.

5.8 Attach nozzle of extinguisher to apparatus air outlet.

5.9 Depress the extinguisher operating lever and slowly pressurize the extinguisher to 100 PSI. (Photo 2)

5.10 Release lever and remove nozzle from apparatus air outlet.

5.11 Reference the extinguisher pressure gauge to check for proper charge.

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6. SAFETY

6.1 To prevent injury, always ensure all pressure is properly relieved from extinguisher prior to attempting recharge.

6.2 Eye protection should be worn when recharging extinguisher.

6.3 Regulated extinguisher pressurization source should never be set higher than 125 PSI.

6.4 Never stand directly in front of extinguisher gauge or stand over the valve during pressurization.

6.5 The apparatus has a one-way valve in the airline to prevent water from entering the brake system.

6.6 Fire extinguishers are mechanical devices that require appropriate care to function properly.

6.7 The operation, inspection, and recharge of the water extinguisher shall be done as directed in this Training Bulletin.

Note: Pressurized water extinguishers can be dangerous (see Reference # 1).

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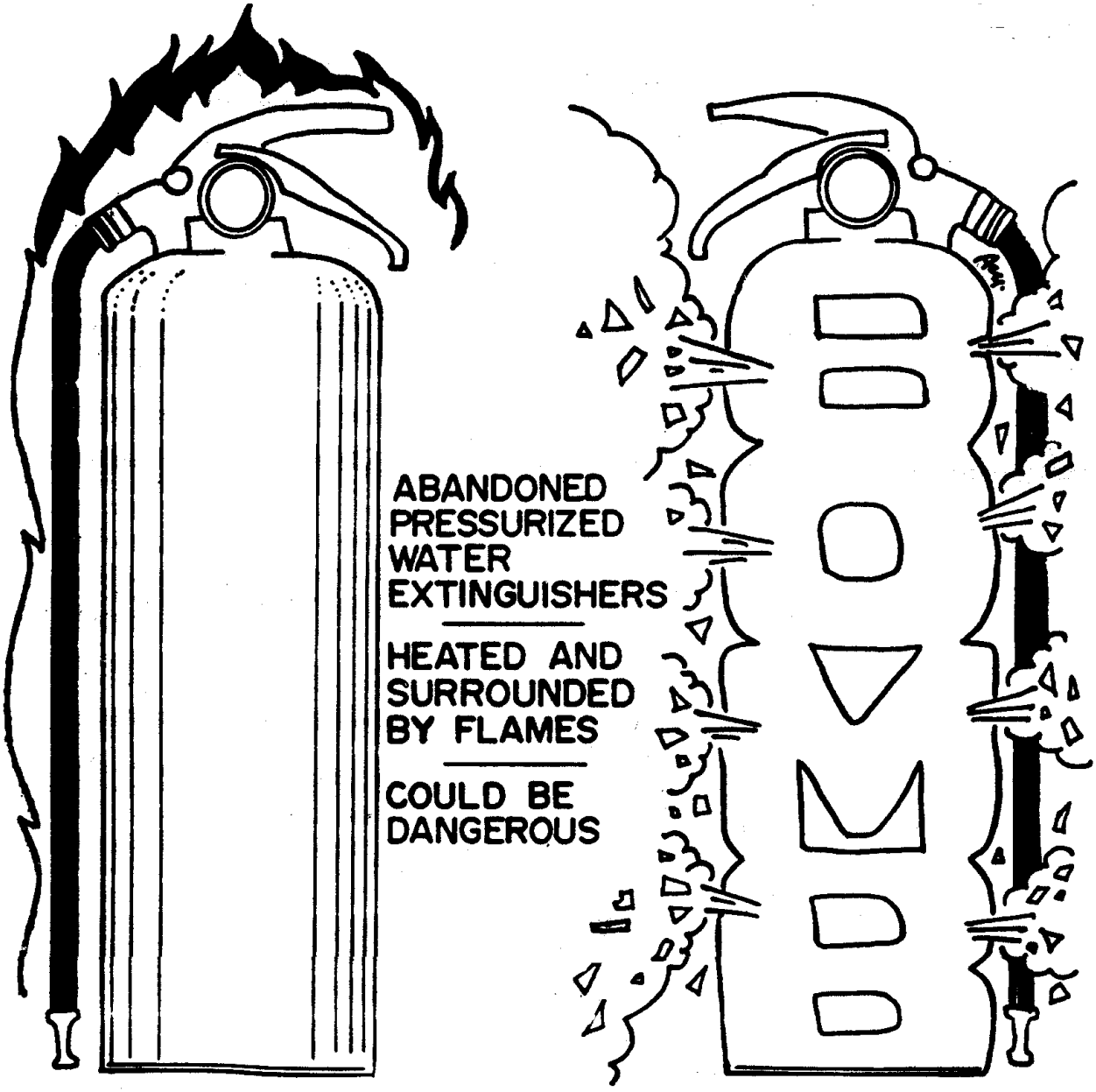
Reference #1
(Formerly Safety Tip 113)



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TRAINING BULLETIN
TOOLS 2
December 7, 2010

KO CURTAIN

1. DESCRIPTION

FDNY Designation	KO Curtain
Material	Hot-Stop 1500 L. The curtain and ropes have been tested to 2000 degrees F. The KO Curtain survived 50 mph winds and 60 minutes of fire exposure.
Weight	26.5 Pounds
Dimensions	8' x 6'
Ribs	Five High Tempered Aluminum Bars
Ropes	Four 3/8 inch diameter, 15 foot long fire-proof ropes. One at each corner of the curtain.
Clips	Four stainless steel clips at ends of each rope. Clips are connected to form loops at top and bottom of curtain.

2. USE

2.1 To cover a window when the wind is blowing fire back into the fire occupancy. An open door with wind driven fire indications will make it impractical to advance a handline down the hallway to the fire occupancy. A 2 ½" handline will not provide sufficient cooling of the hallway to protect exposed members. Once the KO Curtain is in place, the negative effects of the wind will be diminished, allowing members to advance a handline toward the fire area as directed by the Incident Commander. Testing conducted by the FDNY and National Institute of Technology (NIST) showed an immediate 50% decrease in temperatures and significant flame reduction when the KO Curtain is deployed, but there will be an increase in the smoke condition produced by the fire.

3. MAINTENANCE

3.1 The KO Curtain shall be inspected weekly during MUD and after each use. The inspection will include removing the curtain from the carrying sleeve and unfurling it. Inspect the deployment ropes, the 5 aluminum bars embedded in the curtain and all stitching.

3.2 If there is any doubt as to the serviceability of the KO Curtain, the officer on duty shall place the curtain out of service and obtain a replacement in accordance with Department policy and procedures.

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4. REPACKING PROCEDURE

4.1 Place the curtain on a flat surface with reflective stripes up and ropes unclipped.

4.2 Ropes are loosely coiled and placed as shown and clipped together. (Figure 1)

4.3 Curtain is rolled from bottom to top, bottom ropes encapsulated within the roll. (Figure 2)

4.4 Top ropes are placed 5-10" from the top edge of curtain, and roll is completed.

4.5 Curtain is placed into carrying case.

Figure 1

Figure 2

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5. DEPLOYMENT

5.1 The KO Curtain in the fully deployed position. (Figure 3)

Figure 3

6. *Redacted for PFS*

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TRAINING BULLETIN
TOOLS 3
December 18, 2018

FIRE WINDOW BLANKET

1. DESCRIPTION

FDNY Designation	Fire Window Blanket
Material	Hot-Stop 1500L (Natural color)
Weight	Approximately 40 lbs.
Dimensions	10'W x 12'L

2. USE

2.1 To cover a window when the wind is blowing fire back into the fire occupancy. An open door with wind driven fire indications will make it impractical to advance a handline down the hallway to the fire occupancy. A 2 ½" handline will not provide sufficient cooling of the hallway to protect exposed members. Once the Fire Window Blanket is in place, the negative effects of the wind will be diminished, allowing members to advance a handline toward the fire area as directed by the Incident Commander. Testing conducted by the FDNY and NIST (National Institute of Technology) showed an immediate 50% decrease in temperatures and significant flame reduction when the Fire Window Blanket is deployed, but there will be an increase in the smoke condition produced by the fire

2.2 The Fire Window Blanket may be used as pre-deployment option to cover a window prior to it failing in order to prevent a wind-driven fire.

2.3 ***Redacted for PFS***

3. DEPLOYMENT

3.1 ***Redacted for PFS***

3.2 The blanket is large enough to cover at least two windows if necessary. The bottom of the blanket is weighted to facilitate positioning

3.3-3.4 ***Redacted for PFS***

3.5 Due to the length of the top supporting straps, the blanket can be lowered from two floors above, if the IC deems this necessary.

3.6-3.7 ***Redacted for PFS***

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4. REPLACEMENT

4.1-4.3 ***Redacted for PFS***

4.4 Under no circumstances is the Fire Window Blanket to be deployed for drill purposes. Each Division has been issued Training Fire Window Blankets for drill. Repeated use of the Fire Window Blanket for drill can cause unnecessary damage.

4.5 ***Redacted for PFS***

4.6 Fire Window Blanket shall be inspected weekly. If the inspection reveals holes, tears or damage to the straps, the blanket shall be placed out of service
Redacted for PFS

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DEWALT 9” SAW

Figure 1

1. DESCRIPTION

1.1 The Dewalt 9” saw is issued to all Ladders companies for use as a second forcible entry saw.

1.2 This saw is particularly useful for situations when cutting operations are necessary in a smoke filled, oxygen deficient atmosphere where the gasoline powered forcible entry saw may stall.

1.3 This saw is powered by a 60-volt, 9 amp/hr battery. Two batteries are supplied to each unit along with a battery charger.

1.4 This saw has a 5 position, rotatable blade guard. (Figure 2 - #9 & #14)

1.5 Depressing the trigger engages the saw to maximum RPM. This saw does not have a variable speed feature. However, for safety purposes it has a trigger lock.

1.6 The blade used on the saw is a 9-inch Diamond Blade that has the same operational characteristics as the 12-inch Diamond Blade used on the portable power saw. See TB Tools 9, Appendix 1 for additional information concerning these blades.

2. OPERATING FEATURES

2.1 The Dewalt saw may be used for forcible entry on various types of metal objects such as padlocks, roll-down gates, rebar, security gates, and chain link fences.

2.2 The Dewalt saw is not to be used for roof cutting operations due to its lack of power, shallow cutting depth and limited run time.

2.3 The Dewalt saw with the Diamond Blade may be used on steel/sheet metal up to 1/8” thick or metal rods up to 1” in diameter.

2.4 The Diamond Blade is effective for cutting stucco, metal, brick and concrete.

2.5 The Diamond Blade can cut wood, but it is not effective and not recommended.

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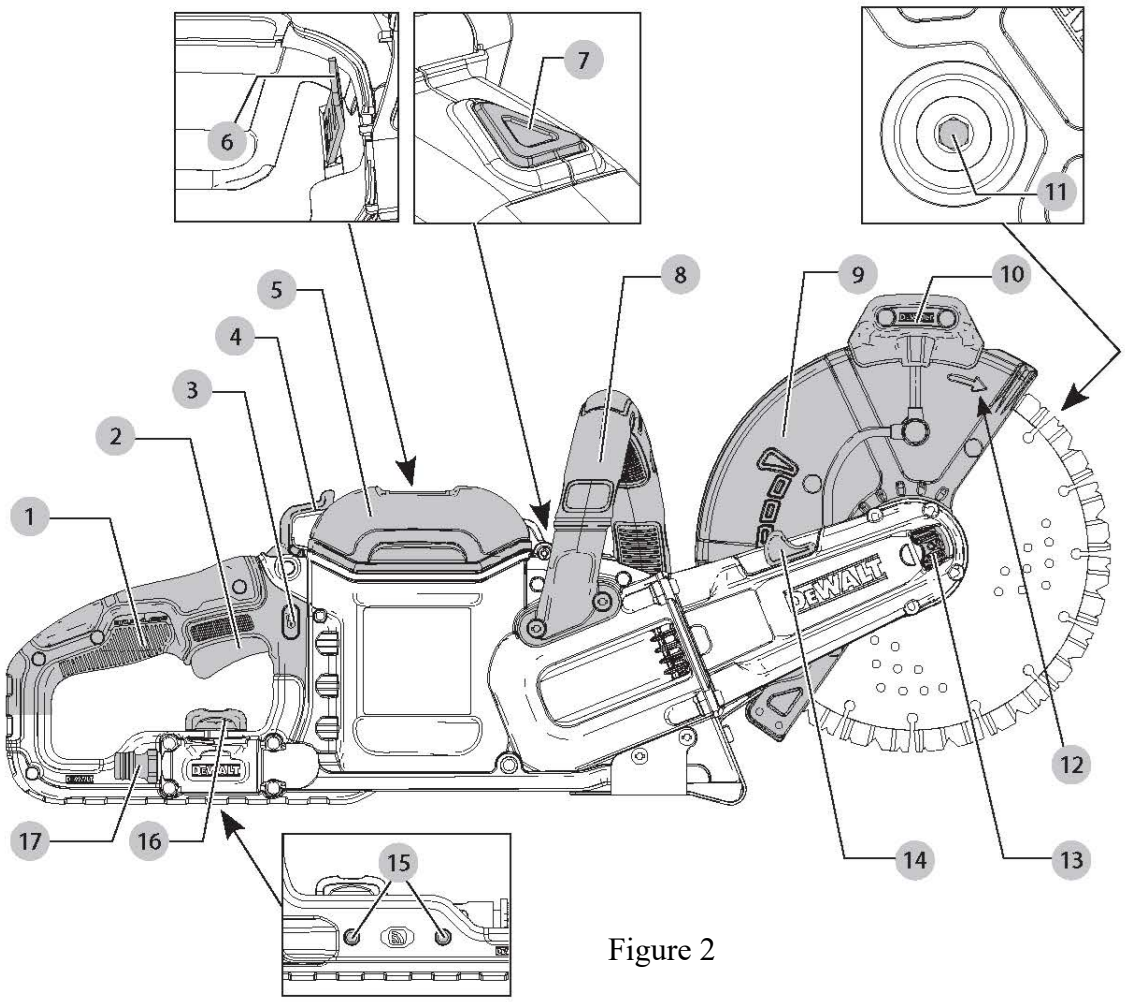

Figure 2

1 Rear handle
2 Trigger switch
3 Lock-off button
4 Battery door latch
5 Battery door
6 1/2" (13 mm) wrench and storgage
7 Heavy load indicator LED
8 Front handle
9 Guard
10 Guard rotation handle
11 Arbor screw
12 Blade rotation indicator
13 Spindle lock button
14 Guard rotation release lever
15 Tool tag mounting holes
16 Water valve
17 Water inlet

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2.6 The Dewalt saw has the following advantages:

2.6.1 It is compact and lightweight.

2.6.2 It will not stall in smoke-filled, oxygen deficient atmospheres.

2.6.3 There is no priming required, nor is there any pull cord to start the saw. Therefore, it may provide for a faster operation in certain situations.

2.7 The Dewalt saw has the following disadvantages:

2.7.1 Its work time is limited, as the 9-amp/hr battery may only last approximately 15-20 minutes, depending on material being cut.

2.7.2 It has less power than gasoline powered saw.

2.7.3 It does not have a variable speed capability. Once the trigger is depressed, the saw will operate at full RPM's.

3. OPERATION OF THE SAW

3.1 Ensure the battery door is closed and the door latch is fully engaged. (Figure 2 - #4 & #5)

3.2 Only when a member is ready to begin a cutting operation should they disengage the trigger lock. (Figure 2 - #3)

3.3 This saw does not have a variable speed feature. Depressing the trigger engages the saw to maximum RPM. Thus, applying varying degrees of pressure placed on the material to be cut is necessary during saw operations. For example, when initially beginning a cut only slight pressure should be used in order to establish a groove for the blade to cut into.

3.4 When beginning a cut, pull the trigger back fully and continuously hold the trigger as this will run the saw at maximum RPM. Then, applying slight pressure, contact the material to be cut and maintain slight pressure until a groove is made. Finally, apply additional pressure as needed to make the cut, and move the saw along the cut line that was established.

3.5 Do not apply excessive pressure during saw operations as doing so may damage the blade.

3.6 Remove the blade from the cut prior to releasing the trigger. This will decrease the possibility of the blade binding or becoming stuck in the cut.

3.7 It is important to remove and clear your fingers from the trigger, allow the blade to come to a complete stop and then engage the trigger lock in all situations when the saw is not being utilized. This includes situations when the saw is moved to another location, the saw is placed on the ground, or whenever the saw will be left unattended.

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3.8 This saw will automatically stop during an operation if the tool is overloaded. There is a triangular light (Figure 2 - #7) which will illuminate as a warning of an overload condition. If this condition occurs, release the trigger, reposition the blade and continue to cut using less pressure.

3.9 This saw will automatically stop during an operation if the battery pack reaches its maximum thermal limit. If this occurs, allow the battery to cool down or replace the battery.

4. SAFETY

4.1 Always engage the trigger lock button (Figure 2 - #3) when not using the saw. When a battery is installed, the saw has power and touching the trigger will begin blade movement if the trigger lock is not engaged.

4.2 Members shall use extreme caution to not accidentally touch the trigger when they are removing the saw from a compartment, carrying the saw, or standing by with the saw.

4.3 At all times when a member is holding the saw, the member's fingers must remain clear and off the trigger with the trigger lock engaged, until the saw is in position to begin a cutting operation.

4.4 The trigger lock shall always be engaged when the saw is not being utilized.

4.5 The battery must be removed when servicing the saw. This includes changing the blade, cleaning the saw, inspecting the saw, or whenever the saw will be sent to tool room.

4.6 If the material being cut moves or shakes, stop cutting and properly secure the material, when possible.

4.7 Member should never hold by hand any material that is being cut.

4.8 Members should never cut any material that in size or hardness exceeds the cutting capacity of the tool.

4.9 Use of the Dewalt saw from a ladder (except Tower Ladder Basket) is not recommended if there is another alternative.

4.10 Only members who have demonstrated an ability to use the saw and who have been thoroughly trained in its operation should be permitted to operate the saw during fire operations.

4.11 "GUNNING" the saw while the Operator is either "standing by" or moving to a new point of operation shall not be permitted.

4.12 Whenever possible, an officer should be present to supervise cutting operations and to assure compliance with safety procedures.

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4.13 The Dewalt saw is intended to be used primarily for forcible entry operations that typically occur at ground level (cutting padlocks, roll down gates, etc.). In most of these situations the saw can be safely operated by a single member. Therefore, a Saw Operating Team will not be required, unless deemed necessary by the officer supervising the operation.

4.14 In addition, a Circle of Danger will not normally be required for typical forcible entry operations at the ground level unless the officer supervising the operation deems it necessary.

4.15 When an officer decides to have cutting operations performed with this saw on an exterior portion of the building above ground level, (e.g., 2nd floor window bars), the area beneath the cutting operation shall be kept clear to prevent injuries from falling objects and tools.

5. ROUTINE MAINTENANCE

5.1 The saw and the blade shall be inspected each tour.

5.2 Ensure the blade is not deformed, bent, chipped, cracked or worn out. Do not use a blade if any damage is found. Cutting with a damaged blade may cause further damage to the blade and serious injury to a member.

5.3 After use and prior to storage, the saw should be cleaned by using a clean dry cloth. Solvents should not be used for cleaning.

5.4 TB Tools 9, Appendix 1 contains complete information about the proper procedures for both use of the Diamond Blade and maintenance of the blade.

6. BATTERY CHARGING

6.1 Both batteries should be checked at the start of each tour for their charge status. The charging unit indicator lamp will confirm battery status when inserted. A fully charged battery should be in the saw and the spare battery kept in the charger.

7. *Redacted for PFS*

BY ORDER OF THE FIRE COMMISSIONER AND CHIEF OF DEPARTMENT

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TRAINING BULLETIN
TOOLS 9
October 22, 2019

PORTABLE POWER SAWS

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1. ***Redacted for PFS***

2. DESCRIPTION

2.1 ***Redacted for PFS***

2.2 Blades:

The saw uses a variety of cutting blades and discs. High engine speed and the availability of special blades enable the operator to cut almost any material encountered at fires or emergency operations. See Appendix 1 (Blades) for blade types.

2.3 Fuel:

2.3.1 Fuel tank is sufficient for 20 to 30 minutes of continuous operation. A gasoline oil mixture is used for engine fuel and lubrication.

2.3.2 Only Pre-Mixed 2-Cycle Engine Fuel (supplied by Bureau of Logistics) is to be used for portable power saws. ***Edited for PFS***

3. MAINTENANCE PROCEDURES

3.1 ***Edited for PFS***
Checks to be done at the beginning of each tour and at multi-unit drill (MUD). When the saw has been used every effort should be made to restore the saw to serviceable condition as soon as possible.

3.1.1 The following is a list of routine field maintenance that can be performed by units

A. Change the blades

B. Refuel the tank

C. Adjust tension of belt (See Appendix 3 for adjustment procedure)

D. Clean exterior of the saw

3.2 Testing the saw

3.2.1 Move saw to a safe area.

3.2.2 Check all nuts, bolts (including arbor bolt), and screws for tightness.

3.2.3 Check fuel level.

3.2.4 Shake saw vigorously to insure gasoline and oil is mixed.

3.2.5 Place the saw on a flat surface holding it firmly in a level position.

3.2.6 Proper foot placement. (See Appendix 3 for starting procedures).

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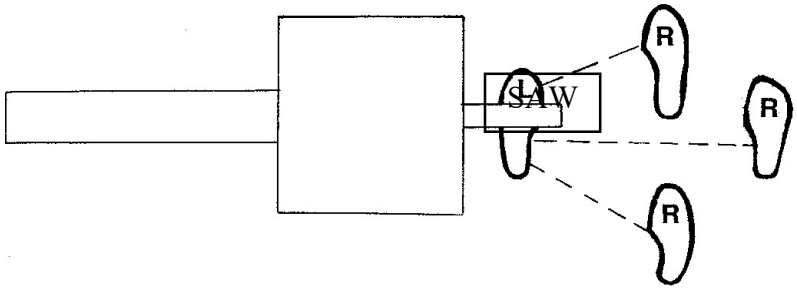
A. Stepping down, place the left foot in the handle. Members should take care when inserting their foot into the handle so not to damage the trigger. Using the left foot in the guard permits the operator to move the other foot back, right or ahead, for the purpose of maintaining or recovering balance.

B. Note: With the problem of large boots not fitting into the handle, members have the option of placing their right foot onto the lip of the right side of the handle. If this method is employed the carrying handle should be held down with the right hand. An additional option is to insert a tool through the handle and step on the same prior to starting the saw. Regardless of which method is used, the saw handle must be held by hand prior to starting the saw.

Figure 1



3.3-3.4 ***Redacted for PFS***

4. SAFETY PRECAUTIONS AND PROCEDURES

4.1 ***Redacted for PFS***

4.2 Have a plan of action **before starting saw**; plan should include:

4.2.1 Location and sequence of cuts and openings.

4.2.2 Wind direction. Consider its effect on exposures and members.

4.2.3 A safe means of egress.

4.3 Only members who have demonstrated an aptitude and who have been thoroughly trained in its operation should be permitted to operate the saw during fire operations.

4.4 SAW OPERATING TEAM

4.4.1 Whenever possible, a team of two members shall perform cutting operations. Members shall be equipped with:

A. Complete PPE.

B. Gloves and protective goggles shall be worn. Goggles shall be attached to saw carrying handle for easy access.

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4.4.2 The firefighter who operates the saw (Operator) will be assisted and/or guided by another member. The Officer in charge of the operation should select the best method compatible with circumstances existing at the time.

4.4.3 The following offer additional protection for Operator:

A. The member assigned as a guide may hold the metal snap portion of the life belt, or safety harness worn by the operator, for the purpose of guidance and control during operations.

B. In addition the member assigned as the guide may use the carrying sling as a safety harness to guide and assist the Operator. (See Appendix 2 for converting sling to safety harness.)

4.4.4 Actions of the member acting as a guide are very important. The member should be in position to accomplish the following:

A. Watch front, rear and either side.

B. Give hand signals to the Operator.

C. Guide Operator in movement to the rear.

D. Guide must be able to coordinate movements with those of the Operator (i.e. Operator will not stumble over guide's feet, especially in rearward movements.)

4.4.5 The member acting as a guide can stand to the rear of the Operator and grasp the guide device with one hand. In this position the member can face in the same direction as the Operator, and can turn sideways to watch the rear.

4.4.6 A physical communication system between the Guide Man and the Operator will be as follows:

A. One slap on the back of Operator .....Stop Cut.

B. Two slaps on the back of Operator .....Cut.

C. Three slaps on the back of Operator .....Shut Down Saw.

4.4.7 As the saw cuts towards the Operator, the Operator's feet must be kept clear of the blade's path of travel. The technique of backing up and cutting should be practiced in quarters (without the saw being started) to improve teamwork between the operator and the member acting as a guide.

4.5-4.6 ***Redacted for PFS***

4.7 CIRCLE OF DANGER

During roof or floor cutting operations, everyone in the vicinity of a saw in operation shall observe, "as near as possible and practical, a 20 foot radius Circle of Danger." This circle shall be measured in all directions **from the point where the blade of the saw is in operation.**

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4.7.1 Only the Officer, the Operator and the member designated as the guide may enter this circle. All persons directly to the rear of the operating saw blade must be warned away, as the saw may throw debris 20' feet or more.

4.7.2 The Operator shall not bring a "live saw" (i.e. a saw with engine running) into a position that puts other members within the Circle of Danger.

4.7.3 All members in the immediate area of cutting operations shall wear full PPE. This also applies while testing the saw in or around quarters, or using the saw at drills or training. For safety, eye shields must be in the down position.

4.7.4-4.7.6 ***Redacted for PFS***

4.8 MOVING WITH THE SAW

4.8.1 Caution with the saw is essential, particularly under heavy smoke conditions and on icy or slippery surfaces. **Before moving from one position to another, disengage the clutch, release trigger, and place blade on flat surface to stop the blade from spinning**. Keep the blade on the surface and roll the saw to the next assignment. The member assigned as a guide holds onto the Operator. They then proceed in unison. This is an awkward position and debris, hose lines or obstructions may be in the way. The Operator, after maneuvering over these obstacles, must always return the saw blade to surface as soon as possible.

4.8.2 This method has been chosen to prevent the operator from carrying a "live saw" (and possibly accidentally running into someone). If saw rolls into a hole while traveling in this position, the blade will go over the edge and the operator will immediately know he must stop. This situation can then be investigated before advancing.

4.8.3 **The saw shall always be shut down when unattended.** The saw shall be shut down when moved to distant areas of operation, (i.e., level to level).

4.9 If conditions permit, scrape gravel and debris from the path to be cut, in order to reduce the danger of injury from flying chips and loose materials.

4.10 To prevent accidents caused by moving belts, gears, blades, etc., it is imperative that Operator and Guide have their PPE completely buttoned up and close fitting.

4.11 "GUNNING" the saw while the Operator is either "standing by" or moving to a new point of operation SHALL NOT BE PERMITTED. Gunning engages the centrifugal clutch and causes the blade to spin, thus increasing the possibility of injury.

4.12 The saw cut should be only as deep as necessary. Deep cuts may weaken supporting beams and lead to collapse. The experienced Operator will know when a beam is being cut by the sound and feel of the saw.

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4.13 Side pressure or twisting of the blade when operating should be avoided. The saw should never be forced. If too much pressure is applied to the blade, the hazard of blade breakage or blade shattering is increased. A blade which breaks or shatters during cutting operations may cause serious injury to the Operator, or to others in the area. Carbide tips have been known to come loose during operations.

4.14 OTHER THAN HORIZONTAL SURFACE

4.14.1 ***Redacted for PFS***

4.14.2 Except as described in Tower Ladders Operations, chapter 3 section 3.5, power saw should not be used on a peaked roof due to the following:

A. Limited maneuverability.

B. Member is working in a position where balance is critical.

C. Little possibility of having another member back up the operator.

D. Relatively small opening required, can be readily made with an axe.

Note: Use of power saw from ladder (except Tower Ladder Basket) is not recommended if there is another alternative.

4.15 When working in enclosed unventilated spaces safety requires members to consider the following:

4.15.1 Not starting or running the saw in suspected explosive atmospheres.

4.15.2 Not restarting the saw in a small enclosed space after refueling.

4.15.3 Refueling in a safe area away from operational site.

4.16 When necessary to refuel the saw, comply with the following:

4.16.1 Saw should never be refueled while running.

4.16.2 Tilt saw away from engine, use a small funnel carried with gas can, to prevent spillage on hot engine housing.

4.16.3 When engine is hot use extreme caution refueling.

4.17 Take care to prevent sparks from the saw's operation from contacting flammable material. Use a tarpaulin, a blanket or a coat, if necessary, to protect flammable material that can't be moved or to shield a trapped victim (auto victim, etc.).

4.18 Never cut boards or beams which are supporting the Operator’s (or other persons) weight. Personnel must stay outside of the cut. Be aware of a previously damaged or cut roof.

4.19 ***Redacted for PFS***

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5. GENERAL OPERATING PROCEDURES:

5.1 Before starting cutting operations, survey the area to determine an escape route.

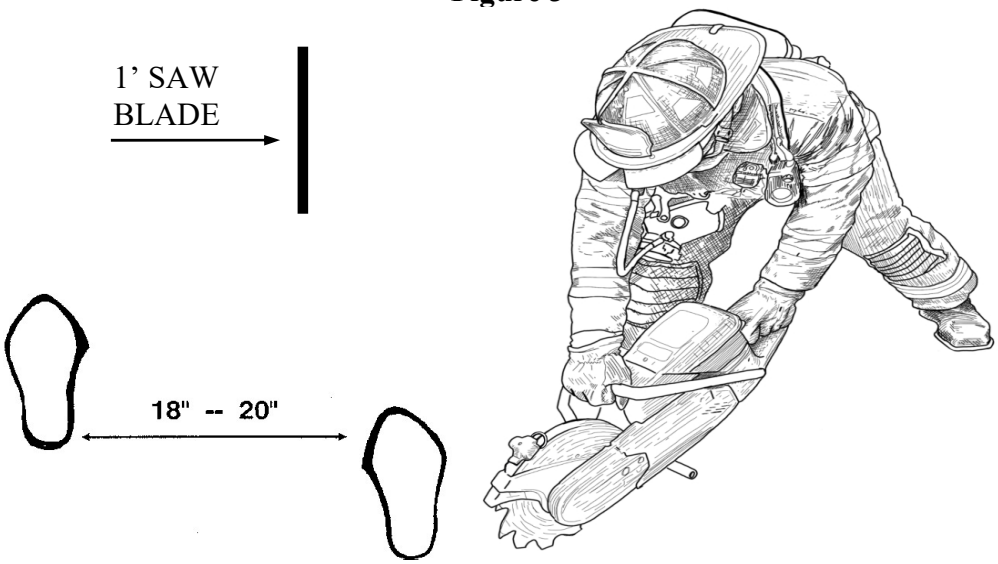
5.2 Preferably, saws shall be started in a smoke free area close to the point of operation.

5.3 After the engine has started, lift the carrying handle with one hand while pressing down on the control handle with the other hand, so the blade comes off the surface first.

5.4 **With the exceptions of starting and completing a cut, do not lift the saw with the blade turning**

5.4 The stance for normal cutting should be the "BOXER STANCE". Operator draws saw toward space between his feet.

Figure 3



BOXER STANCE (Either foot may take a forward position)

The Boxer Stance illustrated has the following advantages:

A. The Operator works from a balanced position.

B. The saw is held at the best angle for cutting.

C. Resting of the elbow on the thigh helps to lessen fatigue by absorbing some of the weight of the saw.

5.5 Whenever Operator cannot assume "Boxer Stance" the following needs must be considered:

A. To maintain balance.

B. To guard against cutting feet.

C. To find a "firm side" stance and cut so that blade will be drawn to either side of Operator's feet.

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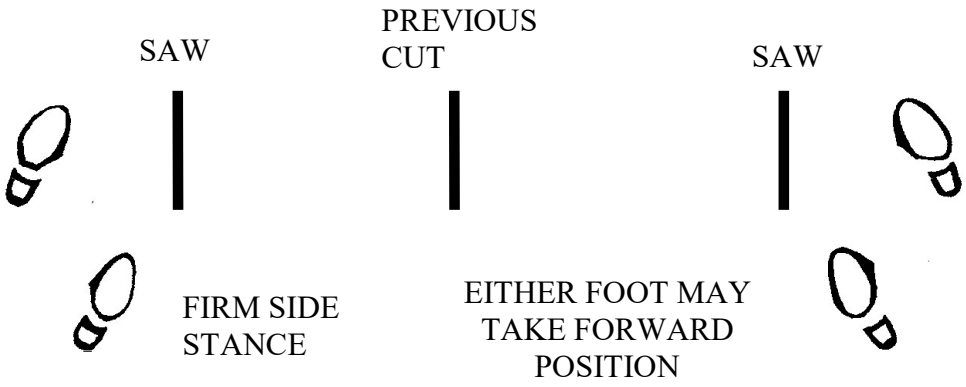
Figure 4



5.6 INITIAL CUT

5.6.1 Refer to the Appendix 1 (Blades) for saw speed during initial cutting operations when using various blades.

5.7 Continue cutting using the appropriate blade in the manner described until the initial cut is completed. Step in the direction of the next cut, and start the new cut in a like manner. Continue successive cutting until all cuts have been made. The Operator's feet should never be placed between two cuts, or between one cut and an unsupported end.

5.8 When a cut has been completed, stop the blade by lifting the spinning blade from the cut, releasing the trigger and placing the blade on the surface being cut.

6. TYPICAL OPERATIONS

6.1 ROOF CUTTING:

6.1.1 The vertical venting of structures involving the opening of bulkhead doors, skylights and scuttles are methods to be used before beginning the slower work of roof cutting.

6.1.2. When it has been determined that a roof opening is necessary to relieve fire conditions, a cut shall be made at a hot spot. The hot spot can be determined by:

A. Soft spots or tar bubbles.

B. Melting snow or ice.

C. On a wet roof, steam or dry area.

D. A sense of touch including soil pipes, vent pipes.

6.1.3 Other methods used to determine location of roof cut are:

A. Knowledge of fire location gathered on travel to roof.

B. Looking over roof edge.

C. Handie-talkie communications.

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6.1.4 The saw is designed that whenever possible, roof boards and coverings shall be cut in one operation. Sometimes the cut section can be lifted in one piece. When this cannot be accomplished, remove the roof covering first, then the roof boards. Practical experience dictates that the roof covering be removed first, then the roof boards. When many layers of roof covering are encountered, the saw blade may bind. If opening the cut sections is difficult use the point of the halligan to get the pull started.

6.1.5 Generally, beams run the short side of the building, usually from side to side and 16" on center. The roof boards are nailed to the beams and run perpendicular to them, usually from front to rear. Therefore, the more beams involved in the roof opening, the harder it will be to remove the cut section because of the nails.

6.1.6 If excessive resistance to the saw is encountered, the cut may be on the beam. Sparks are a good indication that cut is on beam. Move the saw to the inside of the cut, permitting a cut clear of the beam and making the section easier to remove.

6.1.7 If resistance is met when cutting perpendicular to the roof beams, lift the saw, continue to cut, but avoid a deep cut into the beams.

6.1.8 Fresh smoke coming from the area of the saw blade and a slowing of the blade usually indicates too deep a cut through heavy material. (Excessive friction heats the wood being cut and causes smoke.) When this occurs, remove the saw from the cut, rev the saw up to maximum RPM and begin a slightly shallower cut. If this procedure does not work, check the blade.

6.1.9 ***Redacted for PFS***

6.1.10 The size and location of opening will depend on fire conditions. A suggested method to make an expandable opening "Coffin Cut" is as follows:

A. Assume wind is blowing in direction indicated.

B. Cut (1) approximately 3' feet.

C. Cut (2) knock out corner cut for tool insertion.

D. Cut (3) approximately 6' feet.

E. Cut (4) to (7) approximately 3' feet.

Note: See Figure 5.

F. Leave removed pieces of roof section next to opening to warn operating force.

G. If larger opening is needed, additional opening can be made in like manner. (Continuation of cut in desired direction)

H. Make sure that roof is not opened before cut is completed.

I. Push down ceiling to complete ventilation.

Figure 5 (not to exact scale)

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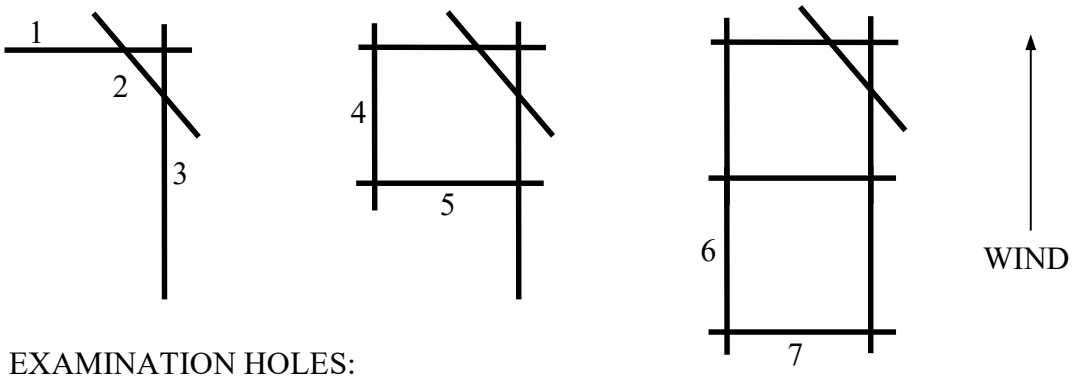


6.2 EXAMINATION HOLES:

6.2.1 **Method A (From Floor Below)**

A. Examination of the cockloft is preferably performed through the top floor ceilings. Pulling ceilings is faster and less damaging.

B. When other than exploratory hole is made, a hose line should be in readiness.

C. At times it may be necessary to initiate interior ventilation to maintain satisfactory operating conditions.

Method B (From Roof)

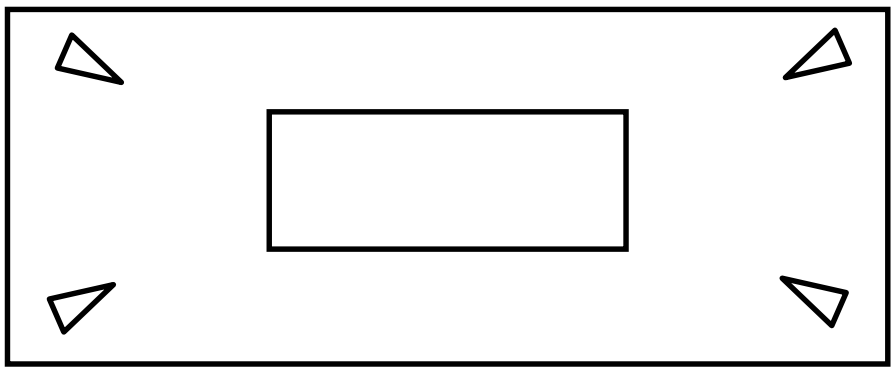
A. If above method is too difficult, examination can be accomplished by cutting triangular openings in the roof. (Size of saw blade)

B. Cockloft conditions may be observed by opening the returns between the roof and the top floor ceiling. (Returns are side walls of the hatchway, such as skylights, scuttles, etc.)

C. CAUTION should be exercised when choosing returns to be opened. Returns remote from fire should be avoided as this action could unnecessarily spread the cockloft fire.

6.2.2 Under certain conditions a series of triangular examination cuts around the perimeter of a fire in a cockloft may also be used in conjunction with handlines equipped with a bent tip. This procedure may extinguish a cockloft fire or limit its extension.

Figure 6



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6.2.3 Follow current practice concerning the direction of streams, namely: to direct a stream downward through a roof opening while an interior attack is in progress (or contemplated) is not sound firefighting.

6.3 ***Redacted for PFS***

7. *Redacted for PFS*

BY ORDER OF THE FIRE COMMISSIONER AND CHIEF OF DEPARTMENT

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BLADES

1. INTRODUCTION

1.1 The power saw may be used with either a carbide tip blade or a diamond blade.

2. CARBIDE TIP BLADE

2.1 The carbide tip blade is for use on the roof saw. Carbide tip blades will cut through gravel and tar covered roofs, wood flooring, light sheet metal and similar material. The carbide tip blade shall not be used on metal security doors, auto bodies, metal window bars, and case-hardened locks, etc. The operational life span of the blade is short and dislodged carbide tips becoming airborne have caused injury to members.

2.2 To begin the cut (after starting the saw) lean forward and squeeze the throttle to bring the blade up to full RPM before contacting the surface with the blade. Let the blade lower itself into the material to be cut. Then move backwards guided by another member designated as a guide. Do not over-extend yourself. Do not reach forward past the point of good balance. A slight back and forth motion of the saw will widen the cut and help prevent binding of the blade. Maintain the saw at full RPM while cutting.

2.3 Place the carbide tip blade out of service and send it to the Fire Tools an Equipment Unit for exchange, along with an RT-2 when:

2.3.1 Eight (8) or more tips are broken or missing from the 24-tooth blade.

2.3.2 Three (3) or more tips are broken or missing from the 12-tooth blade.

2.3.3 The blade is cracked.

2.3.4 The center hole wears out of round.

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3. **COMBINATION METAL/CONCRETE** (DIAMOND BLADE, PHOTO 1)

Photo1

3.1 This blade is a diamond brazed saw blade for use on the forcible entry saw. This single blade will replace both the aluminum oxide abrasive disc used for metal cutting and the silicon carbide abrasive disc used for concrete cutting.

3.2 Diameter: 12 inches

3.3 Recommended RPM: 2,500-5,400 RPM

3.4 Arbor: 7/8”

3.5 Diamond Percentage: 85% on the cutting edge.

3.6 Has proven to cut case hardened locks, chain link fence, rebar, security gates, car doors, stucco, concrete, stone, brick and many other metal and concrete objects. The blade can also cut bulletproof glass and plastic pipe. The blade can cut wood; however, this is not recommended.

3.7 The blade is made from solid steel with no welds. This reduces injuries from shattered blades and segments.

3.8 Can be used for both wet and dry cutting.

3.9 Generates 90% less sparks than abrasive discs.

3.10 One blade should outlast 150 quality abrasive discs.

3.11 Electroplate swirl design helps prevent binding.

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3.12 The blade is designed with air flow technology to dissipate heat and prevent warping and wobbling. When the saw is in operation, frequently back the saw out of a cut so that air can cool the blade. If the operator feels excessive wobbling during use, discontinue use and inspect blade as per section 3.14.

3.13 If a blade begins to heat up and glow red during use, discontinue using that blade until it has cooled down. Inspect the blade as per section 3.14 prior to its reuse. To reduce the likelihood of an overheated blade during prolonged cutting, use a gentle stream of water (such from the water extinguisher) on the blade at the point of contact with the material being cut.

3.14 The blade shall be inspected for visible cracks or chips and insufficient amount of diamonds on its cutting edge. The arbor bolt shall be inspected for tightness, tighten if required. If blade wobbles after tightening arbor bolt, the blade shall be removed from the saw, placed on a flat surface and checked for warping or bending. If blade is cracked, chipped, warped or bent, it should be exchanged as outlined in Section 4.

3.15 The blade is bi-directional. It will cut effectively when used in either direction. The blade should be flipped after use to ensure even wear and maximum exposure of diamonds on the blade's edge. (Disregard any directional arrows on earlier versions of this blade.)

3.16 If the blade becomes glazed over and cuts ineffectively, it can be cleaned by running the blade through an abrasive material such as concrete. This will expose more diamonds on the blade's edge.

3.17 To begin a cut using the Diamond Blade, bring the blade into contact with the material to be cut. Then, run the engine at a speed such that the material to be cut does not get caught in the spacing at the outer edge of the blade and cause the blade to bounce or bind. The speed is gradually increased as the blade cuts into the material. This provides a groove to guide the blade. Then work at full throttle and allow the blade to cut the material. Do not apply excessive pressure as doing so may damage the blade.

3.18 Return the blade to the Fire Tools and Equipment Unit when the blade does not perform as expected.

Note: Review Sections 3.15 & 3.16 prior to replacing blade.

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4. PROCEDURE FOR EXCHANGING DIAMOND BLADES

4.1 Damaged blades will be exchanged on a one-for-one basis.

4.2 The blade and RT-2 along with a Fire Tools and Equipment Requisition Form (located on Intranet under "Forms") shall be forwarded to the Fire Tools and Equipment Unit. They may be contacted at (718) 391-9405 for further assistance.

BY ORDER OF THE FIRE COMMISSIONER AND CHIEF OF DEPARTMENT

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TRAINING BULLETIN
TOOLS 10
April 8, 2010

HURST TOOL

1. INTRODUCTION

1.1 The Hurst Tool System is a high powered, self-contained, hydraulic spreading and pulling device carried by all ladder companies, rescue companies and squad companies. The system consists of a power unit, cutters, spreaders, rams, a hand pump and low pressure hoses that may be used for vehicle rescue, structural collapse, urban search and rescue, and industrial rescue. Refer to the specific Operating Instruction Manual for each tool's general and technical specifications.

2. INSPECTIONS – DAILY/AFTER EACH USE

2.1 Check fuel level.

2.2 Check engine oil level.

2.3 Check hydraulic fluid level.

2.4 Inspect carefully for hydraulic leaks.

2.5 Inspect hoses and couplings for wear and damage (bulging and or swelling at fittings and spring reinforced areas).

2.6 Check control valves for easy operation and for free return to the neutral (center position).

2.7 Be certain all parts are clean.

2.8 Check blades for damage.

2.9 Check that all fasteners (nuts, bolts, screws, and retaining rings) are in place and securely fastened.

2.10 Check for wear or damage of all parts.

2.11 After a complete inspection of the Hurst Tool System, start the power unit and operate the spreaders, cutters and rams to ensure proper working order.

3. STORAGE

3.1 When storing the Hurst Tool System provide adequate space to prevent damage to hoses, hose connectors and all components.

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3.2 Inspect all mounting brackets and holders in apparatus compartment for damage.

3.3 When storing the Honda Mini Mate Power Unit on the apparatus, the fuel valve lever **MUST** be in the **OFF** POSITION.

4. OUT OF SERVICE

4.1 When placing any component of the Hurst Tool System out of service, notify Technical Services at 718-391-9405 during normal business hours, Monday through Friday.

Note: No exchanges will be made on Weekends or Holidays. Notification shall be made on the next business day.

BY ORDER OF THE FIRE COMMISSIONER AND CHIEF OF DEPARTMENT

TRAINING BULLETIN TOOLS 10
DATA SHEET 1
April 8, 2010

X-TRACTOR CUTTERS

1. TOOL SPECIFICATIONS

1.1	Model No	362R314
1.2	Weight	39 lbs.
1.3	Length	28.2 in.
1.4	Width	11 in.
1.5	Height	7.28 in.
1.6	Cutting Force	up to 72,000 lbs.
1.7	Cutter Opening	6 in.
1.8	Maximum Operating Pressure	5,000 psi

2. FEATURES / BENEFITS

2.1 Curved blade pulls material to the back of the blade for strong, fast cutting action.

2.2 Dead man control valve reverts back to the neutral position if the user's hand slips from the control.

2.3 Dual pilot check valve sustains necessary load requirements if the flow of hydraulic fluid is interrupted.

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TRAINING BULLETIN TOOLS 10
DATA SHEET 2
April 8, 2010

X-TRACTOR II CUTTERS

1. TOOL SPECIFICATIONS

1.1	Model No	362R356
1.2	Weight	39 lbs.
1.3	Length	28.2 in.
1.4	Width	11 in.
1.5	Height	7.28 in.
1.6	Cutting Force	up to 72,000 lbs.
1.7	Cutter Opening	6 in.
1.8	Maximum Operating Pressure	5,000 psi

2. FEATURES / BENEFITS

2.1 Curved blade pulls material to the back of the blade for strong, fast cutting action.

2.2 Dead man control valve reverts back to the neutral position if the user's hand slips from the control.

2.3 Dual pilot check valve sustains necessary load requirements if the flow of hydraulic fluid is interrupted.

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TRAINING BULLETIN TOOLS 10
DATA SHEET 3
April 8, 2010

HURST MOC II CUTTER

1. TOOL SPECIFICATIONS

1.1	Model No	362R392
1.2	Weight	47 lbs.
1.3	Length	30.9 in.
1.4	Width	9.06 in.
1.5	Height	8.9 in.
1.6	Cutting Force	up to 152,870 lbs.
1.7	Cutter Opening	7 in.
1.8	Maximum Operating Pressure	5,000 psi

2. FEATURES / BENEFITS

2.1 Star control valve permits tool actuation from almost any gripping position.

2.2 Dead man design control valve reverts back to the neutral position if the user's hand is released from the control.

2.3 Hose exit directs the hydraulic hose out of the tool handle and away from the work area.

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TRAINING BULLETIN TOOLS 10
DATA SHEET 4
April 8, 2010

HURST MOC ULTRA CUTTERS

1. TOOL SPECIFICATIONS

1.1	Model No	362R428
1.2	Weight	46 lbs.
1.3	Length	29.64 in.
1.4	Width	10.04 in.
1.5	Height	7.6 in.
1.6	Cutting Force	up to 195,126 lbs.
1.7	Cutter Opening	5.2 in.
1.8	Maximum Operating Pressure	5,000 psi

2. FEATURES / BENEFITS

2.1 Star control valve permits tool actuation from almost any gripping position.

2.2 Designed with unprecedented cutting forces; can cut up to 1.6 inch steel bar.

2.3 Hose exit directs the hydraulic hose out of the tool handle and away from the work area.

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TRAINING BULLETIN TOOLS 10
DATA SHEET 5
April 8, 2010

HURST ML -28 DEFENDER SPREADER

1. TOOL SPECIFICATIONS

1.1	Model No	362R397
1.2	Weight	48 lbs.
1.3	Length	30.5 in.
1.4	Width	13.77 in.
1.5	Height	8.46 in.
1.6	Spreading Force	up to 44,000lbs.
1.7	Pulling Force	up to 20,000lbs.
1.8	Spreading Distance	28 in.
1.9	Maximum Operating Pressure	5,000 psi

2. FEATURES / BENEFIT

2.1 Can be used to crush, spread, pull, lift, pinch and pry objects.

2.2 Interchangeable tip system accepts a variety of spreader tip configurations.

2.3 Star grip control valve permits tool actuation from almost any gripping position.

2.4 Dead man design control valve reverts back to the neutral position if the user's hand is released from the control.

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TRAINING BULLETIN TOOLS 10
DATA SHEET 6
April 8, 2010

HURST MLT -32 SPREADER

1. TOOL SPECIFICATIONS

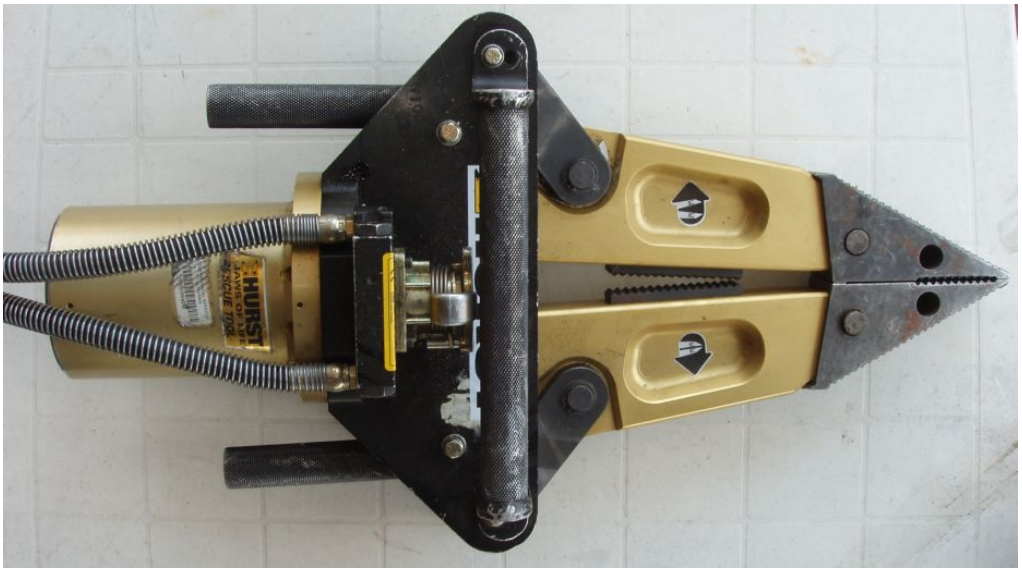
1.1	Model No	362R346
1.2	Weight	59 lbs.
1.3	Length	15.5 in.
1.4	Width	8.25 in.
1.5	Height	27.5 in.
1.6	Spreading Force	up to 31,500lbs.
1.7	Pulling Force	up to 16,500lbs.
1.8	Spreading Distance	32 in.
1.9	Maximum Operating Pressure	5,000 psi

2. FEATURES / BENEFITS

2.1 Can be used to crush, spread, pull, lift, pinch and pry objects.

2.2 Interchangeable tip system accepts a variety of spreader tip configurations.

2.3 Dead man control valve reverts back to the neutral position if the user's hand slips from the control.



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TRAINING BULLETIN TOOLS 10
DATA SHEET 7
April 8, 2010

HURST MLT - 40 SPREADER

1. TOOL SPECIFICATIONS

1.1	Model No	362R320
1.2	Weight	62 lbs
1.3	Length	15.5 in.
1.4	Width	8.25 in.
1.5	Height	33.25 in.
1.6	Spreading Force	up to 18,900lbs.
1.7	Pulling Force	up to 12,100lbs
1.8	Spreading Distance	40 in.
1.9	Maximum Operating Pressure	5,000 psi

2. FEATURES / BENEFITS

2.1 Can be used to crush, spread, pull, lift, pinch and pry objects.

2.2 Interchangeable tip system accepts a variety of spreader tip configurations.

2.3 Dead man control reverts back to the neutral position if the user's hand slips from the control.

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TRAINING BULLETIN TOOLS 10
DATA SHEET 8
April 8, 2010

HURST MOC COMBI-TOOL

1. TOOL SPECIFICATIONS

1.1	Weight	47 lbs.
1.2	Length	34.01 in.
1.3	Width	9.26 in.
1.4	Height	7.54 in.
1.5	Cutting Force	up to 120,272 lbs.
1.6	Cutter Opening	12.23 in.
1.7	Pulling Force	17,535 lbs.
1.8	Spreading Force	up to 43,388 lbs.
1.9	Spreading Distance	16.72 in.

2. FEATURES / BENEFITS

2.1 Star control valve permits tool actuation from almost any gripping position.

2.2 Dead man design control valve reverts back to the neutral position if the user's hand is released from the control.

2.3 Hose exit through the rear tool handle and away from the work area.

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TRAINING BULLETIN TOOLS 10
DATA SHEET 11
April 8, 2010

MINI MATE SIMO POWER UNIT

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1. TOOL SPECIFICATIONS

1.1	Model No.	363R217
1.2	Weight	60.4 lbs.
1.3	Length	18.11 in.
1.4	Width	12.4 in.
1.5	Height	17.5 in.
1.6	Maximum Operating Pressure	5,000 psi
1.7	Fluid Reservoir	0.92 Gal.

2. FEATURES / BENEFITS

2.1 Powered by a 3 horsepower, 4-stroke Honda motor.

2.2 Two tool simultaneous use with no loss of individual tool power.

2.3 Separate pressure / dump valve for each tool port.

2.4 Reservoir sight glass for ease in monitoring Hurst fluid level.

3. OPERATION

3.1 To start unit, place pressure / dump valve in the dump (horizontal) position.

3.2 Fuel valve must be placed in the on position.

3.3 Place choke lever in the closed position.

3.4 Make certain the engine throttle is in the max position.

3.5 Place the on / off switch in the on position.

3.6 Pull the starter cord. Once the engine starts, gradually move the choke lever to the open position.

3.7 After connecting tools, place pressure / dump valve in the pressure (vertical) position.

3.8 To shut down unit, place pressure / dump valve in the dump position.

3.9 Disconnect tools.

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3.10 Turn the on / off switch to the off position.

3.11 When storing the Honda Mini Mate Power Unit, on the apparatus the fuel valve lever MUST be in the OFF POSITION.

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TRAINING BULLETIN TOOLS 10
DATA SHEET 12
April 8, 2010

JL - 4G-SI SIMO VALVE POWER UNIT

1. TOOL SPECIFICATIONS

1.1 Model No 363R164
1.2 Weight ..... 87 lbs.
1.3 Length ..... 18.9 in.
1.4 Width ..... 17.71 in.
1.5 Height ..... 19.69 in.
1.6 Maximum Operating Pressure ..... 5,000 psi
1.7 Fluid Reservoir ..... 2 gal.

2. FEATURES / BENEFITS

2.1 Powered by a 6.75 horsepower, 4-stroke Briggs and Stratton engine that is fueled by straight gasoline.

2.2 Two tool simultaneous use with no loss of individual tool power.

2.3 Separate pressure / dump valve for each tool port.

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TRAINING BULLETIN TOOLS 10
DATA SHEET 15
April 8, 2010

HURST JL – 20 STANDARD RAM

1. TOOL SPECIFICATIONS

1.1	Model No	257R095
1.2	Weight	18.1 lbs.
1.3	Length Retracted	15 in.
1.4	Length Extended	22 in.
1.5	Width	3.13 in.
1.6	Height	7 in.
1.7	Spreading Distance	7 in.
1.8	Opening Force	up to 15,708 lbs.

2. FEATURES / BENEFITS

2.1 Hard chrome plated, solid steel piston rod provides high tensile strength.

2.2 Investment cast, steel ram feet have a durable gripping surface to minimize slippage.

2.3 Dead man design control valve reverts back to the neutral position if the user's hand slips from the control.

2.4 Dual pilot check valve prevents ram from retracting under load if hydraulic fluid flow is interrupted.

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TRAINING BULLETIN TOOLS 10
DATA SHEET 16
April 8, 2010

HURST JL – 30 STANDARD RAM

1. TOOL SPECIFICATIONS

1.1	Model No	257R097
1.2	Weight	24.4 lbs.
1.3	Length Retracted	23 in.
1.4	Length Extended	36 in.
1.5	Width	3.13 in.
1.6	Height	7 in.
1.7	Spreading Distance	13 in.
1.8	Opening Force	up to 15,708 lbs.

2. FEATURES / BENEFITS

2.1 Hard chrome plated, solid steel piston rod provides high tensile strength.

2.2 Investment cast, steel ram feet have a durable gripping surface to minimize slippage.

2.3 Dead man design control valve reverts back to the neutral position if the user's hand slips from the control.

2.4 Dual pilot check valve prevents ram from retracting under load if hydraulic fluid flow is interrupted.

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TRAINING BULLETIN TOOLS 10
DATA SHEET 17
April 8, 2010

HURST JL – 60 STANDARD RAM

1. TOOL SPECIFICATIONS

1.1	Model No	257R099
1.2	Weight	36.4 lbs.
1.3	Length Retracted	35 in.
1.4	Length Extended	60 in.
1.5	Width	3.13 in.
1.6	Height	7 in.
1.7	Spreading Distance	25 in.
1.8	Opening Force	up to 15,708 lbs.

2. FEATURES / BENEFITS

2.1 Hard chrome plated, solid steel piston rod provides high tensile strength.

2.2 Investment cast, steel ram feet have a durable gripping surface to minimize slippage.

2.3 Dead man design control valve reverts back to the neutral position if the user's hand slips from the control.

2.4 Dual pilot check valve prevents ram from retracting under load if hydraulic fluid flow is interrupted.

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TRAINING BULLETIN TOOLS 10
DATA SHEET 18
April 8, 2010

HURST T - 41 TELESCOPIC RAM

1. TOOL SPECIFICATIONS

1.1	Model No	257R137
1.2	Weight	38.3 lbs.
1.3	Length Retracted	18.7 in.
1.4	Length Extended	41.3 in.
1.5	Width	4.4 in.
1.6	Height	9.25 in.
1.7	Spreading Distance	22.6 in.
1.8	Opening Force	piston 1 up to 29,830 lbs. / piston 2 up to 14,830 lbs.

2. FEATURES / BENEFITS

2.1 Hard chrome plated, solid steel piston rod provides high tensile strength.

2.2 Investment cast, steel ram feet have a durable gripping surface to minimize slippage.

2.3 Dead man design control valve reverts back to the neutral position if the user's hand slips from the control.

2.4 Dual pilot check valve prevents ram from retracting under load if hydraulic fluid flow is interrupted.

2.5 This ram should not be used with the Hurst hydraulic hand pump.

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TRAINING BULLETIN TOOLS 10
DATA SHEET 19
April 8, 2010

HURST T - 59 TELESCOPIC RAM

1. TOOL SPECIFICATIONS

1.1	Model No	257R139
1.2	Weight	49 lbs.
1.3	Length Retracted	24.6 in.
1.4	Length Extended	59.1 in.
1.5	Width	4.4 in.
1.6	Height	9.25 in.
1.7	Spreading Distance	34.5 in.
1.8	Opening Force	piston 1 up to 29,830 lbs. / piston 2 up to 14,830 lbs.

2. FEATURES / BENEFITS

2.1 Hard chrome plated, solid steel piston rod provides high tensile strength.

2.2 Investment cast, steel ram feet have a durable gripping surface to minimize slippage.

2.3 Dead man design control valve reverts back to the neutral position if the user's hand slips from the control.

2.4 Dual pilot check valve prevents ram from retracting under load if hydraulic fluid flow is interrupted.

2.5 This ram should not be used with the Hurst hydraulic hand pump.

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TRAINING BULLETIN TOOLS 10
DATA SHEET 20
April 8, 2010

HURST LOW PRESSURE HOSES

1. TOOL SPECIFICATIONS

1.1 Length ..... 16 ft. and 30 ft.

1.2 Weight ..... 6 lbs / 16 ft, 14 lbs. / 30 ft.

1.3 Maximum Operating Pressure ..... 5,000 psi

2. FEATURES / BENEFITS

2.1 The hoses are constructed of a thermoplastic inner tube wrapped with an aramid fiber reinforced polyurethane jacket.

2.2 The hoses are equipped with spring guards at both ends to prevent kinking.

2.3 The hoses have a minimum burst pressure of 20,000 psi for a built in 4 to 1 safety factor.

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TRAINING BULLETIN
TOOLS 20
March, 1987

MAXI-FORCE AIR BAGS

1. INTRODUCTION

1.1 The Maxiforce air bag system is a valuable tool in rescue and extrication operations. When inflated with air, they are designed to lift and move heavy loads. They are relatively simple to assemble and operate, requiring only an inch of space for insertion.

1.2 The Maxiforce air bags can be used in a variety of ways. They are excellent for moving and lifting cylindrical and odd shaped objects. They can be used to lift collapsed floors, beams, and fallen trees and poles. With vehicles, they can be used in lifting the steering columns, doors, a door post, pedals or the dashboard. They can be used on elevator doors, subway trains and iron bars. The air bags work well with other extrication tools such as the Hurst tool, power saw, cutting torch or air chisel.

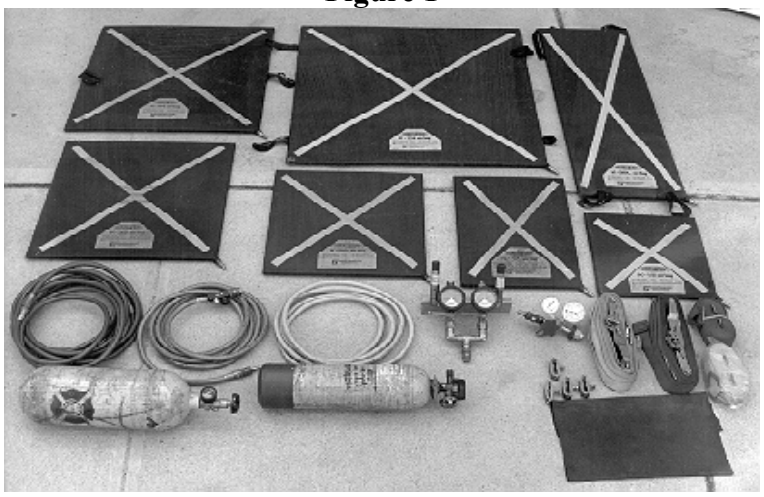
1.3 The Maxiforce air bags work on a simple proven law of physics. For each pound per square inch (psi) of air pumped into an air bag, the force is multiplied over the bag's entire surface, creating lifting force.

2. COMPONENTS

2.1 BAGS (See Fig. 1.)

2.1.1 There are 7 bags in the system, ranging from a 12-ton bag (the smallest) to a 74-ton bag (the largest). Lifting height runs from 8" (the smallest) to 20 inches (the largest). The bag's rated tonnage is based on its capacity to lift that tonnage one (1) inch. For example: 12 ton bag will lift 12 tons 1"; 74 ton bag will lift 74 tons 1".

Figure 1



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2.1.2 The air bags are constructed of neoprene rubber reinforced with steel. They are similar to a steel belted radial tire.

2.1.3 The surface design is of a non-slip type and provides abrasion protection.

2.1.4 A light reflective label on one side of the bag shows its maximum tonnage and lifting height. Units should paint the lift capacity and lift height on the bags in addition to the label. After a period of time the label wears off. (See Fig. 2)

Figure 2

2.1.5 The bright yellow "X" is used for positioning the center of the bag under a load for maximum stability and lifting height.

2.2 PRESSURE REGULATOR (see Fig. 3)

2.2.1 The pressure regulator must be used whenever a high pressure air source is used.

2.2.2 The parts of the regulator are:

A. High Pressure Air Inlet.
D. Pressure Regulator Knob.
B. High Pressure Gauge.
E. Knurled Knob-Controlling Air Supply Connection.
C. Pressure Gauge.
F. Air Supply Nipple Connection.

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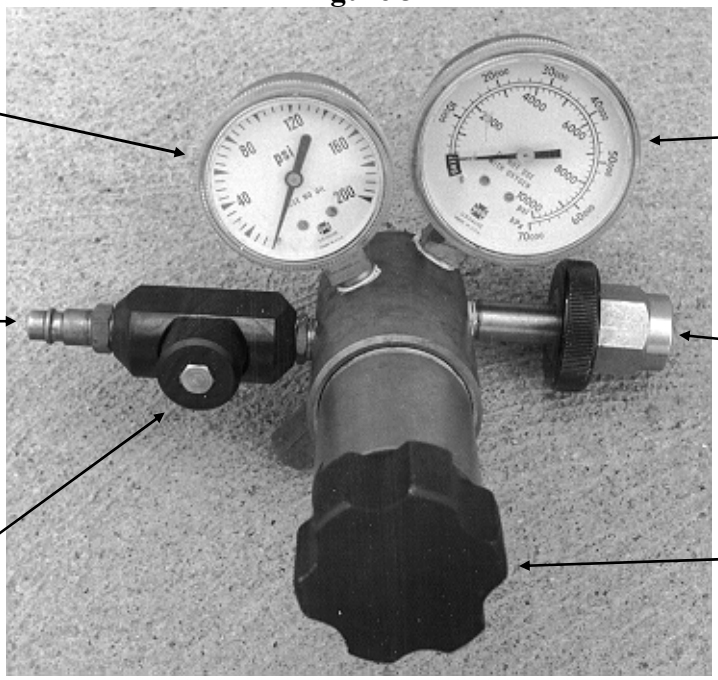
Figure 3

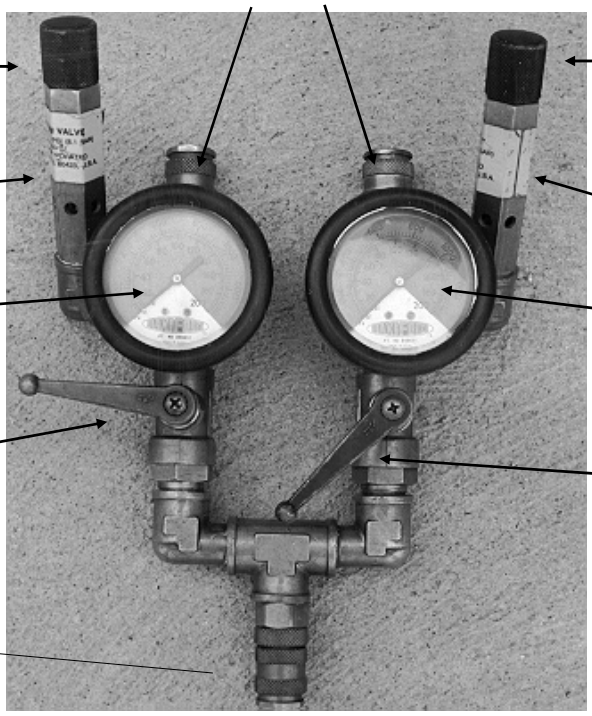


2.3 DUAL COMBINATION CONTROL VALVE & SAFETY RELIEF (CVSR) (See Fig.4.)

2.3.1 The parts of the CVSR are:

A. Air Inlet.
B. Control Valve Lever.
C. Operating Gauge.
D. Safety Relief Assemblies.
E. Safety Relief Control Knobs.

Figure 4



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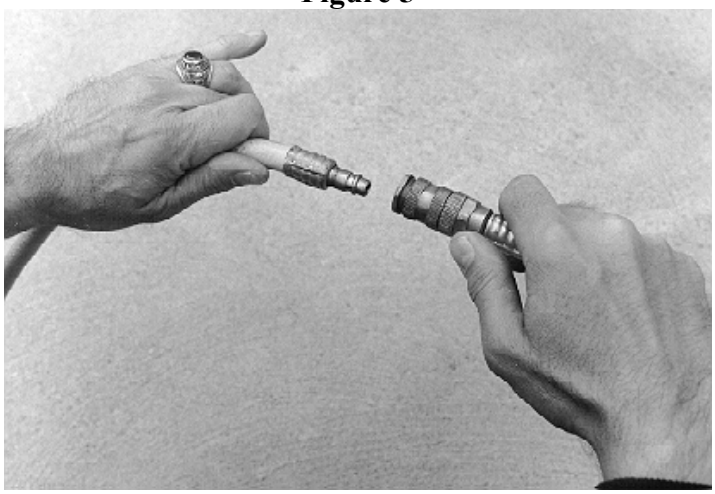
2.4 AIR SUPPLY HOSES

2.4.1 Two (2) Red Air Supply Hoses 16 feet in length.

2.4.2 One (1) Yellow Air Supply Hose 16 feet in length.

2.4.3 Additional lengths of hose can be used to allow safe remote operation of the air bags. All bags, air supply hoses, and regulators are equipped with heavy duty quick connectors of a special size to prevent improper connection. (See Fig. 5.)

Figure 5



2.5 SCBA CYLINDERS

2.5.1 Steel SCBA cylinders are used to operate the air bags.

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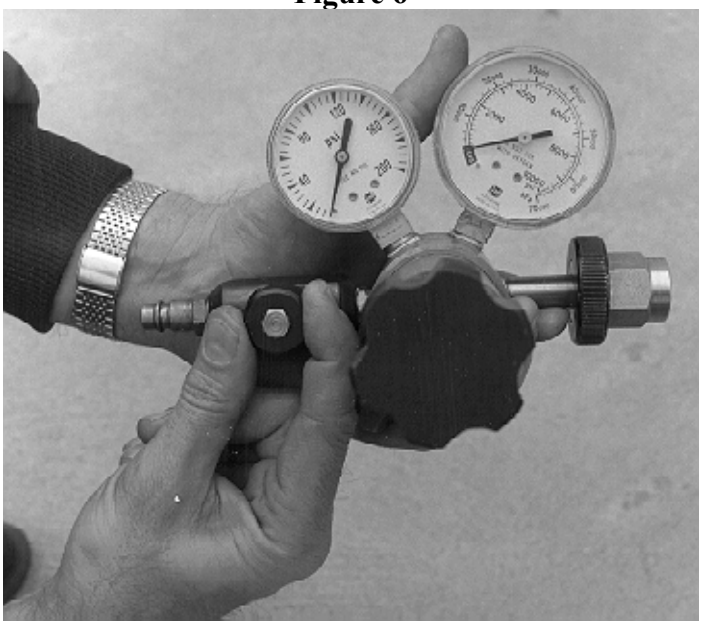
3. ASSEMBLY

3.1 TO SET THE PRESSURE REGULATOR

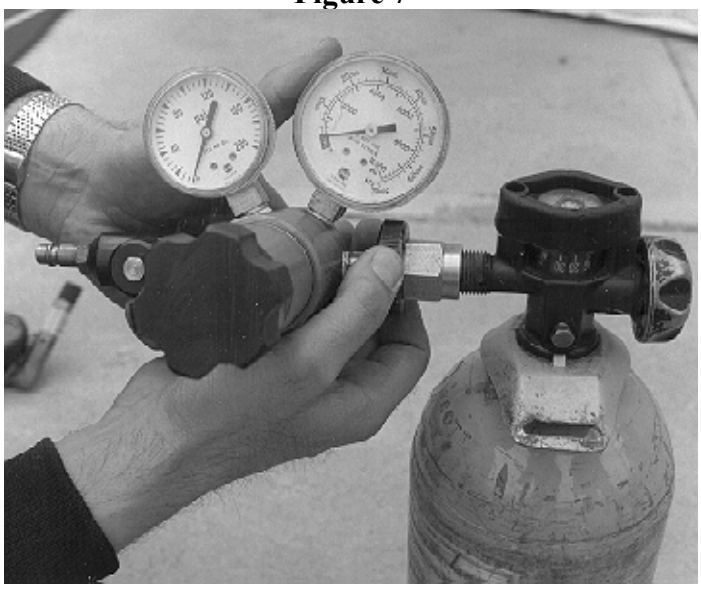
3.1.1 Close regulator air supply by turning the small knurled black knob clockwise. (See Fig. 6)

Figure 6



3.1.2 Connect regulator to a high pressure air source. (See Fig. 7)

Figure 7



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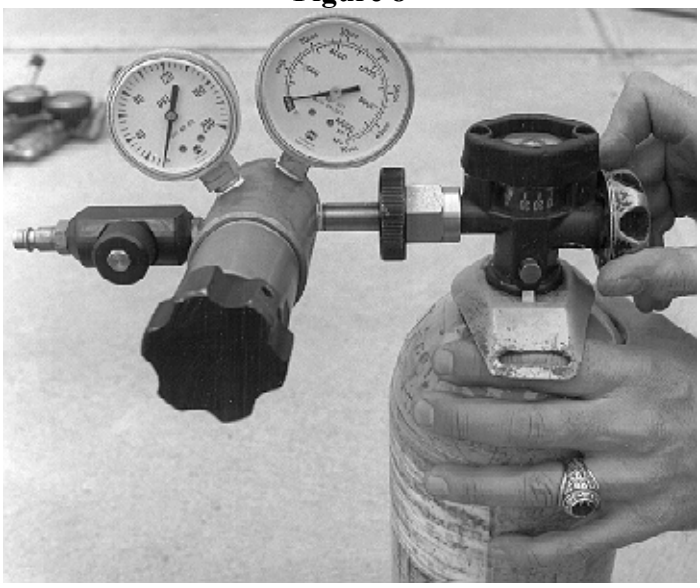
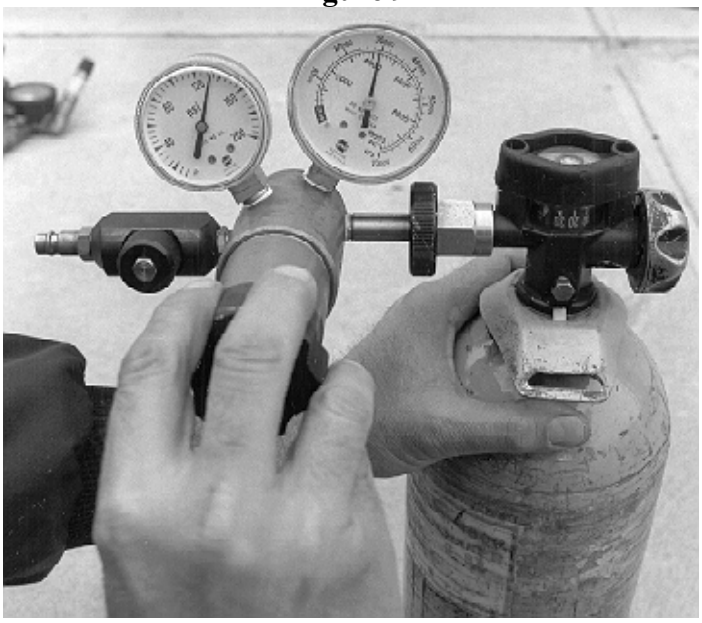
3.1.3 Open air source slowly and watch the gauge. The high pressure gauge should reflect the air source pressure. (See Fig. 8)

Figure 8



3.1.4 Set the low pressure gauge to 135 psi by turning the pressure regulator knob clockwise. (See Fig. 9)

Figure 9



NOTE: When the high pressure gauge falls below 200 psi, change the air cylinder.

NOTE: Always open the high pressure air source slowly. Failure to do so may damage the regulator diaphragm. Make sure all valves are in the closed position before you turn on your air source. This will reduce the risk of any uncontrolled lift.

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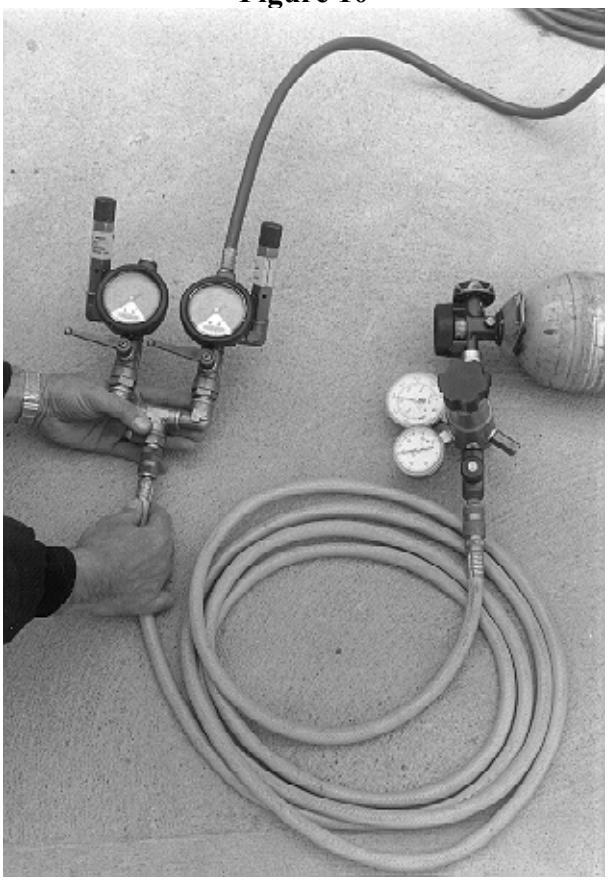
3.2 DUAL COMBINATION CONTROL VALVE AND SAFETY RELIEF (CVSR)

3.2.1 The control valves are quarter turn ball valves which work independently.

3.2.2 Check both control levers to make sure they are in the closed position (perpendicular to air supply line.) Connect one of the red air supply hoses to the pressure regulator and to the control valve and safety relief inlet. The other red air supply hose is connected to one of the air outlets. (See Fig. 10)

Figure 10



3.2.3 Return to the regulator and fully open the knurled knob air outlet valve, counterclockwise. This will bring the air up to the control valve safety relief.

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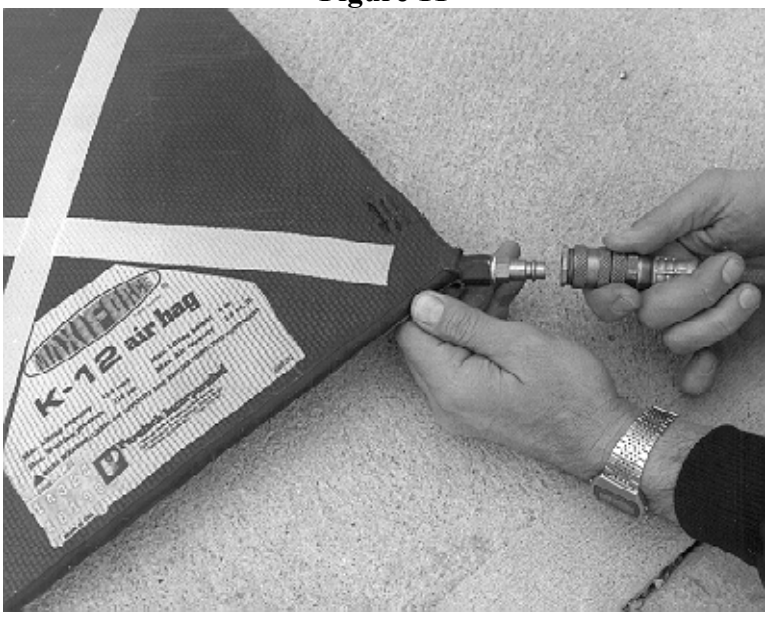
3.2.4 Select a bag size capable of lifting the load and connect an air supply hose to the inlet nipple protruding from the corner of the bag. (See Fig. 11.)

Figure 11



3.2.5 Connect the air supply hose to the outlet connection on the dual CVSR. Both safety relief valves must be closed. (See Fig. 12)

3.2.6 Be sure to engage the dual locking mechanism located on the female connections and CVSR. Simply insert the male into the female and then rotate the serrated knob at the base of the female connection (clockwise) until it is snug. Give both hoses a "tug", to make sure they are securely joined.

3.2.7 Place the bag under the load with the air inlet nipple pointing out. Place the bag as close to the load as possible to maximize the contact area between the bag and the load.

Note: Always have the bag connected prior to placing it under or between a load to minimize the operator's exposure to the load area and to eliminate the possibility of the operator placing the bag with the air inlet under the load.

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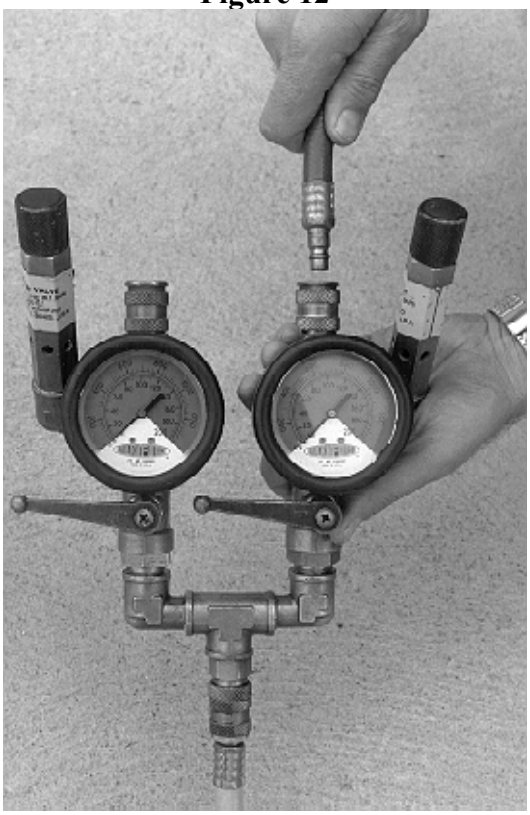
Figure 12



4. INFLATION AND DEFLATION OF THE BAGS

4.1 Open the control valve lever by slowly moving it parallel to the air line. The bag will gradually inflate. The speed of inflation is controlled by this lever.

NOTE: Inflate the bags slowly to minimize the chance of the load shifting.

4.2 As the bag is being inflated, note the gauge reading on the control valve safety relief. The gauges read the internal air pressure of the connected bag. Maximum internal air pressure for the bag when used for lifting purposes is 118 psi. The safety relief valve will prevent over-inflation. Air pressure in excess of the 118 psi limit will be expelled from the opening at the base of the control valve safety relief. Normally, inflation should be just enough to lift the load as far as needed.

4.3 When the gauge reading reaches the vicinity of the red mark, the safety relief will open (at 118 psi) and start venting. At this time, close the control lever to conserve the air supply. If the desired lift is reached before the bags reaches maximum pressure, simply close the control lever.

NOTE: Stabilize and shore a load before placing bags into position. Build shoring in stages as load is being lifted. Always exercise care to avoid injury in the event of a drop or load shift

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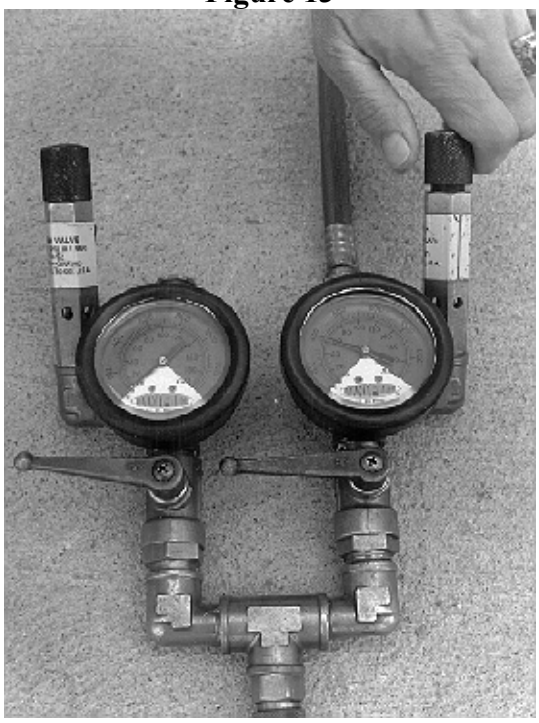
4.4 To deflate the bag with the control valve safety relief, close the control levers. Then, slowly turn the knurled knob on the top of the safety relief counter-clockwise. The lowering speed must be adjusted by the operator. (See Fig. 13.)

Figure 13



NOTE: The bags are designed to inflate and deflate slowly to prevent the load from being thrown off-center.

4.5 Two separate shut-off control devices are provided to be used where it may be necessary to inflate several bags. (See Fig. 14.) The shut-off device is placed on the nipple of the lifting bag. As soon as the bag is inflated to the required height, the knurled knob can be turned clockwise closing off the flow of air to the bag. That bag will now remain inflated. The air hose can be disconnected and attached to another bag.

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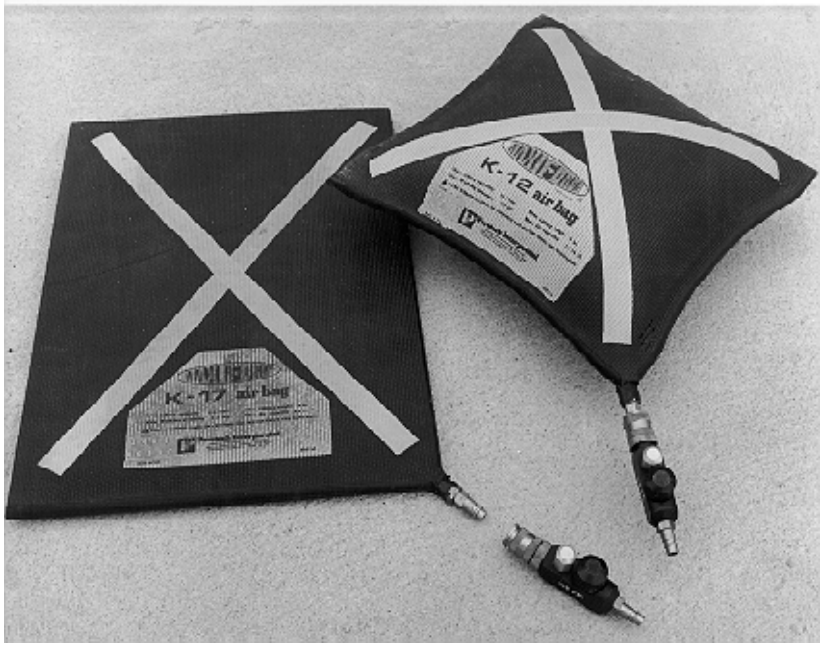
Figure 14



5. CHANGING AIR CYLINDERS

5.1 Air cylinders can be changed during operation or when pressure falls below 200 psi.

5.2 To change cylinder:

5.2.1 Stop operation.

5.2.2 Block or shore the lift.

5.2.3 Make sure all air inlet and outlet valves on cylinder, pressure regulator, and control valve and safety relief are in the fully closed position. This will isolate the bag from the air supply and will prevent bags from deflating.

5.2.4 Disconnect the air outlet hose from the pressure regulator.

5.2.5 Bleed the regulator using the knurled knob.

5.2.6 Disconnect the regulator from the air cylinder.

5.2.7 Connect the pressure regulator to a new cylinder.

5.2.8 Re-connect the air outlet hose to the pressure regulator.

5.2.9 Resume operations.

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6. OPERATIONAL GUIDELINES

6.1 Personnel should wear protective clothing.

6.2 Only trained members should be allowed to operate the system.

6.3 Before raising an object, determine the desired height or load movement and obtain blocks or shoring before the bags are inflated.

6.4 When using an air bag, inflate at a slow rate and maximize the surface contact area of the bag. This may require either blocking up the bag before inflating or using two bags, one on top of the other. If necessary to block up a bag, 3/4" plywood, 3 layers thick, glued and nailed or screwed together is recommended. Plywood will not split or crack under loads as it has elasticity.

6.5 The bags should only be inflated half to three quarters of their rated height capacity. The "pillowing effect" should be avoided. This can cause the load to shift with possible dangerous results.

6.6 During inflation, stand to one side and clear all personnel from the vicinity. Do not stand in front of the opening where the bag has been placed, there is a possibility of the bag being pushed out by the load shifting.

6.7 Never work under a load unless it is blocked or shored. As the load is being moved or lifted, always block or shore the load. Remember that although a bag does not need a smooth surface, blocks and shoring do.

6.8 Avoid inflating bags against sharp objects or on a surface heated to over 220 F. If necessary, insert a flexible insulated pad (heavy canvas, leather, rubber) or 3/4" plywood between the hot or sharp surface and the bag, in order to protect the bag.

6.9 Two bags may be used safely from one control valve safety relief device.

6.9.1 This allows for a greater lift height.

6.9.2 It allows lifting the same load at two separate points to maximize surface contact.

6.9.3 Never stack more than two bags on top of each other and always place the smaller bag on top of the larger one.

6.9.4 When stacking bags, generally inflate the bottom bag first.

6.9.5 Remember that when stacking you cannot add together the tonnage of the two bags to get the total lifting weight. The tonnage of the smaller bag is the maximum that can be lifted.

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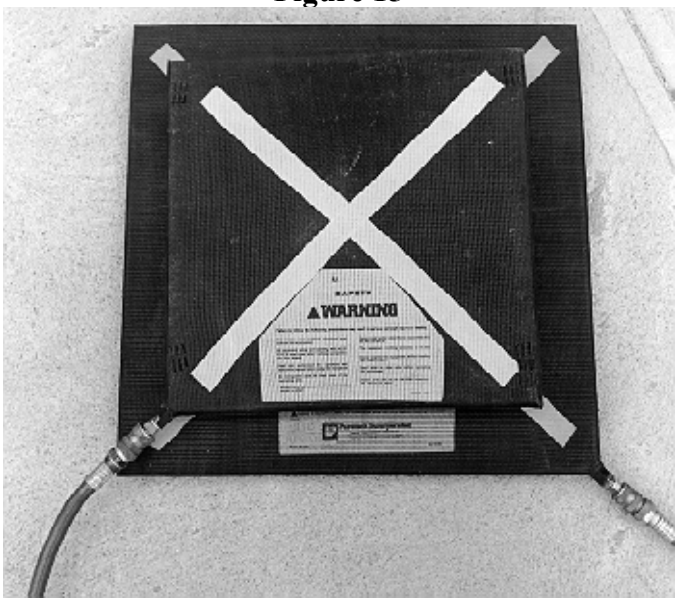
6.9.6 The lifting capability is reduced by 50% to obtain maximum lifting height. Example: a 30 ton bag with a maximum lifting height of 10 inches will lift 30 tons 1 inch, but will lift 15 tons to a height of 10 inches.

6.9.7 Do not operate bags, hoses, valves or regulators that are damaged or improperly assembled.

6.9.8 It is recommended that the bags be stored in a horizontal position to reduce stress.

6.9.9 It is important to center the bags on top of each other when stacking them. (See Fig. 15) Blocking or shoring should be centered as much as possible. Do not place wood between the bags.

Figure 15



6.9.10 To insure proper inflation of the correct bag (when two bags are stacked) always refer to the bag by the color of the supply hose; e.g. when you want the bottom bag inflated, say "raise the yellow bag" when the yellow supply hose is connected to the bottom bag. This is extremely important when the operator of the control valve and safety relief cannot see the bags or cannot distinguish which line is connected to what bag.

6.9.11 Have one firefighter on the far side of the lift to observe any shift or reaction. The firefighter should be equipped with a handi-talkie.

7. *Redacted for PFS*

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TRAINING BULLETIN
TOOLS 24
August 13, 2013

CHAIN SAW OPERATIONS

1. INTRODUCTION

1.1 Chain saws can save time and energy. They are also extremely dangerous. The safety and operational procedures of this training bulletin are to be enforced.

2. POLICY

2.1 Except for pier fire operations, the chain saw is not to be used for the ventilation or overhauling of structural fires.

2.2 The chain saw may be utilized at emergencies or non-structural fires only if the safety and operational procedures outlined in this bulletin are followed.

2.3 Members are to adhere to AUC 301 "Tree Emergency Operations" while operating at such incidents.

2.4 While operating the chain saw, the operator and control person shall wear the following NFPA compliant and FDNY approved protective equipment: Long sleeve work duty shirt or bunker coat, helmet, eye protection, ear protection, saw protected gloves, bunker boots, and saw protected chaps.

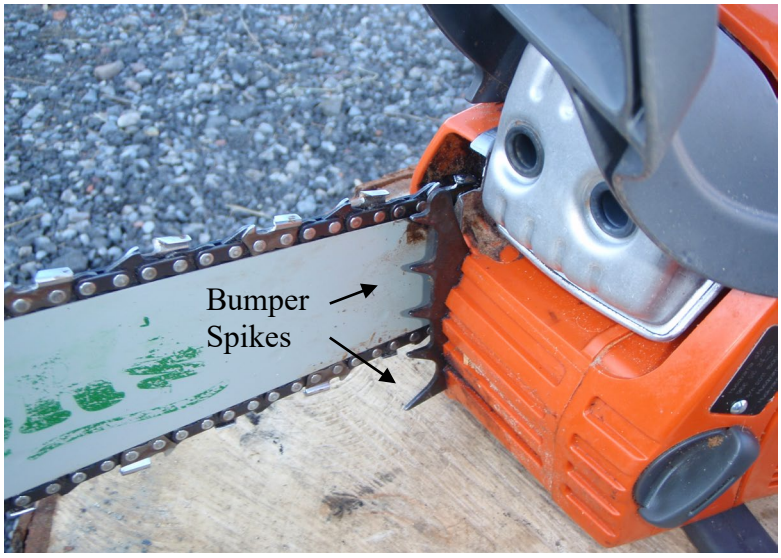

Figure 1

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3. GENERAL RULES

Refer to manufacturer's manual for starting and stopping instructions specific to the model saw.

3.1 Starting stance (Figure 2)

3.1.1 Hold saw down on a clear level surface with the bar and chain clear of any obstructions.

3.1.2 Keep body to the left of the chain. Never straddle the saw or lean across chain.

3.1.3 Hold the front handlebar on top behind the hand guard with left hand.

3.1.4 Pull starter grip straight up with right hand.

Figure 2

3.2 Always hold the saw firmly with both hands while the engine is running. Keep your left hand on the front handlebar and your right hand on the rear handle so that your entire body is to the left of the cutting line. (Figure 2) Never use a cross-handed grip or any stance which would place your body and arm across the chain line.

3.3 Proper grip is to be used at all times, fingers encircling the handle with the thumb wrapped around the opposite side from the fingers. (Figure 3)

3.4 Warm up the chain saw prior to any cutting.

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Figure 3

3.5 Operating stance (Figure 4A & 4B).

3.5.1 Weight balanced on both feet - both feet on solid ground.

3.5.2 Left arm is to be kept in the "straight arm" position with elbow straight to withstand any kickback force.

3.5.3 Body always to the left of the chain line.

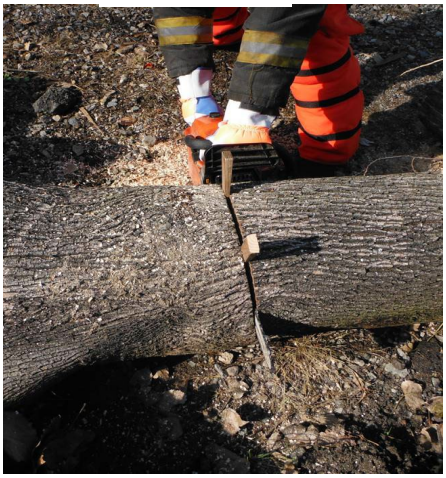
3.5.4 Proper grip maintained as outline in sections 3.2 and 3.3

3.5.5 Do not overextend or cut while off balance.

3.5.6 Do not attempt cutting above chest height.

Figure 4A

Figure 4B



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3.6 Properly position yourself for cutting. Hold saw near log and throttle up to full speed just before allowing chain to touch wood.

3.7 Maintain steady footing while gripping the saw firmly with both hands. When operating on slopes, the chain saw operator must always stand on the uphill side of the tree/log when cutting.

3.8 Start cuts with "bumper spike" against the wood and keep it there. Let the chain saw do the cutting. While firmly holding the saw, use the bumper spike for leverage as you slowly rock the saw in upward motions. (Figure 1)

3.9 Do not force the chain saw. If you have to force the saw, stop until you find out what is prohibiting you from cutting. Exert moderate feed pressure to help the chain cut the wood.

3.10 While cutting downward you will experience a pulling reaction. When the saw breaks through the wood the pull will cease. Operator must be ready to stop pushing down on the saw and hold the saw nose up. (Figure 4C)

3.10.1 Pull-in:

A. Pull-in occurs when the chain on the bottom of the bar is suddenly stopped. The chain on the bottom of the bar stops when it is pinched, caught or encounters a foreign object in the wood. The reaction of the chain pulls the saw forward and may cause the operator to lose control.

B. Pull-in frequently occurs when the bumper spike of the saw is not held securely against the tree or limb and when the chain is not rotating at full speed before it contacts the wood.

Warning: Use extreme caution when cutting small size brush and saplings which may easily catch the chain and pull you off balance.

C. To avoid pull-in:

1. Always start a cut with the chain rotating at full speed and the bumper spike in contact with the wood.

2. Pull-in may also be prevented by using wedges to open the kerf.

Note: The kerf refers to the space left behind the cutting blade as it cuts.

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Figure 4C

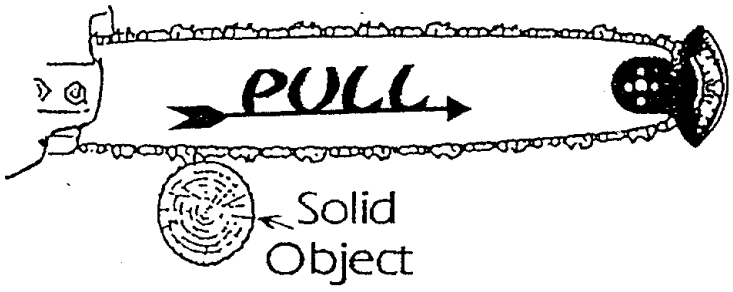
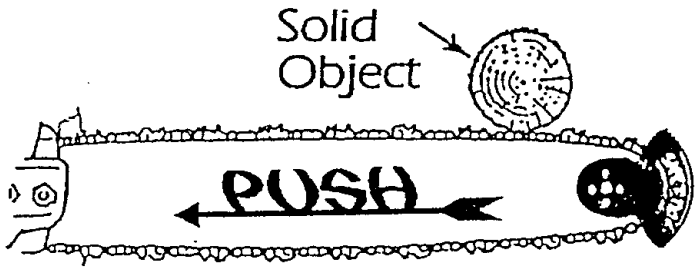


Figure 4D



While cutting downward you will experience a pulling reaction. During upward cutting a pushing reaction will be felt.

3.11 When cutting on the underside of a log or limb with the top of the saw blade, the saw will naturally be pushed out of the cut towards the operator. To compensate for this force, keep your left arm stiff and maintain constant pressure against log with the saw. (Figure 4D).

3.11.1 Pushback:

A. Pushback occurs when the chain on the top of the bar is suddenly stopped when it is pinched, caught or encounters a foreign object in the wood. The reaction of the chain drives the saw straight back toward the operator and may cause a loss of saw control. Pushback frequently occurs when the top of the bar is used for cutting.

B. To avoid Pushback:

1. Be alert to forces or situations that may cause material to pinch the top of the chain.

2. Do not cut more than one log at a time.

3. Do not twist the saw when withdrawing the bar from an underbuck cut because the chain can pinch.

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3.12 Beware of "hidden" pressure points; cut slowly to avoid binding saw in these instances. Watch the kerf space for any decrease in size; this will warn you prior to binding.

3.13 Do not hit the ground with the blade of the saw, even momentary touching will dull the chain to some degree.

3.14 When finished using the saw, slowly loosen both, the fuel cap and the oil cap to relieve the pressure. After refilling, tighten both caps.

4. SAW OPERATION

4.1 Size-up the job before starting and take your time, do not rush.

Sizing Up Operations Prior to Cutting:

4.1.1 Check area for power lines, vehicles, trapped victims or possible tree shifting.

4.1.2 Remove all surrounding obstacles, undergrowth, vines, shrubs, etc.

4.1.3 Where is the tree/log lying? Is it on a slope? Is it hung up in other trees? Does the tree need to be secured before cutting?

4.1.4 What caused the tree to fall?

4.1.5 Do you have adequate tools and enough staffing to complete the job?

4.1.6 Size-up should continue throughout the job as you plan out each move. Always keep evaluating the scene.

4.2 After receiving instructions, control person and saw operator are to don protective equipment including eye and hearing protection prior to starting the cutting operation.

4.3 Plan Cut:

4.3.1 Operator must have a clear understanding of goals.

4.3.2 Ensure safe retreat path is present.

4.3.3 Clear the cutting area to provide for good footing.

4.4 A circle of danger of a radius of at least 10' will be established before the commencement of cutting. The saw operator and control person will be the only personnel in this area during cutting. Officer is to monitor conditions and relay orders received from the officer in command. If possible, the officer is positioned as to permit visual contact with the control person.

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4.5 The noise level of a chain saw, in conjunction with the hearing protection being worn, makes voice communication very difficult. Hand signals must be established between operator, control member and officer.

4.6 The control member should be positioned as to permit easy visual contact with the operator maintaining a safe distance from the saw. The control member must maintain a sufficient distance from the member using the saw, to prevent any possible contact with the saw. The possibility of kickback or movement of the operator must be taken into consideration. The control member must not remove cutting debris while the operator is cutting. Anytime the control member approaches the immediate cutting area, the operator must first apply the chain brake and signal the control member to approach. When possible, the control member is to maintain a visual contact with the officer.

4.7 Members outside the circle of danger are to be deployed as required. Duties may include: monitoring incident for changing condition, relief, assist in refueling, pedestrian and crowd control.

4.8 One of the primary reasons for the establishment of a circle of danger is to reduce the exposure of members to high noise levels. Long or continuous exposure to noise levels associated with chain saw operations may cause permanent hearing impairment. Hearing protection devices must be worn during operational and training sessions by members within circle of danger.

4.9 Debris from cutting operation should not be removed from work area until saw operator indicates it is safe to do so. Always clear immediate work area before continuing operations, eliminating tripping hazards.

4.10 Saw refueling area is to be located outside the circle of danger.

4.11 Officer is to rotate personnel to reduce individual exposure to high noise levels and prevent operator fatigue.

5. OPERATIONAL PRECAUTIONS

5.1 Prior to cutting, examine the area. Note branches or other objects which may spring back to their normal position when freed. Precautionary measures must be taken to avoid injury or damage.

5.2 Do not attempt cutting an object which has fallen against a structure and is now supported by it.

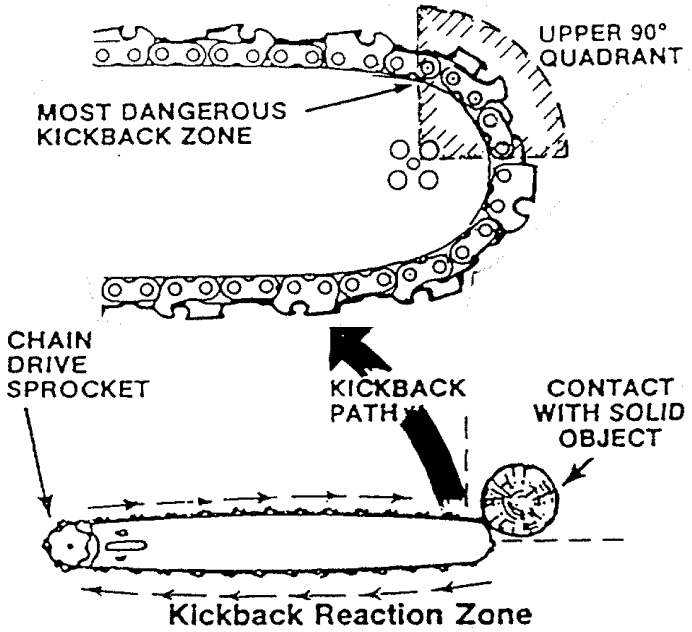
5.3 If a branch, tree section or other object is hanging, leaning or otherwise damaged, members are to prevent access to the danger area by unauthorized persons. If practical, the object should be stabilized by lashing or shoring. Cutting it down is not to be attempted.

5.4 Be aware of the consequences of the cut. Cut may cause shifting, rolling or dropping of object.

5.5 Prior to cutting operations, members are to survey area for electrical wires in contact with tree. TREES ARE GOOD CONDUCTORS OF ELECTRICITY.

5.6 Kickback potential of the chain saw is very dangerous. Never make plunge cuts with the tip of the blade. Never use the tip of the saw blade for cutting. This practice can cause a violent, uncontrollable kickback. (See figure 5).

Figure 5



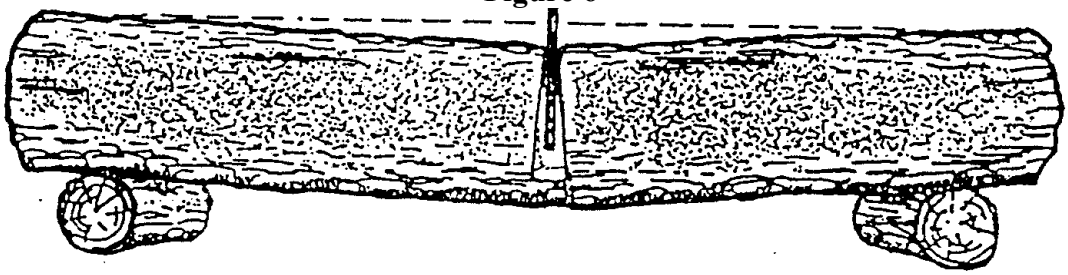
5.7 Pinching top of guide bar in a cut could cause recoil of the saw. Saw engine could be propelled either to or away from the operator. (Figure 6)

5.8 Sand, dirt, cement and metal objects can be found in trees and can dull a sharp chain in seconds. Check trees for such hazards prior to cutting. A dull chain saw is an extremely dangerous tool, as it causes the operator to exert excessive force to compensate for slow cutting.

5.9 Never operate a chain saw while in an uncomfortable position.

5.10 Trees knocked over may have their trunks fractured or split. Be cautious when cutting as they can "jump" when partially cut due to undetectable tension.

Figure 6



6. ***Redacted for PFS***

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7. SAFETY REQUIREMENTS

7.1 Saw is to be operated only by members trained in its proper use.

7.2 Saw shall not be operated from a ladder.

7.3 While operating the chain saw, the operator and control person shall wear the following NFPA compliant and FDNY approved protective equipment: Long sleeve work duty shirt or bunker coat, helmet, eye protection, ear protection, saw protected gloves, bunker boots, and saw protected chaps.

7.3.1 Chaps must be worn over either long pants or bunker pants. Chaps **shall not** be worn over shorts.

7.3.2 Bunker coat and/or long sleeve shirt shall be worn to protect against flying debris, insect bites, poison ivy, etc.

Warning: Bunker coat, bunker pants, and firefighting gloves are NOT saw protected and will NOT prevent the chain saw blade from inflicting severe injury.

7.4 The kickback potential is very real. Members are not to tamper with or remove manufacturer safety devices.

7.5 Saw is not to be used in situations where the vision of the operator is limited.

7.6 Never attempt cutting a tree which is in contact with live electrical wires. TREES DO CONDUCT ELECTRICITY.

7.7 Always hold running saw with both hands. Never overreach or operate saw above your shoulders.

7.8 Use a sharp chain.

7.9 Rotate saw operators, never permit a fatigued member to operate the saw.

7.10 When transporting, refueling or performing maintenance, the saw must be in the "OFF" position.

7.11 Keep chain of saw away from all parts of body while motor is running.

7.12 Avoid fuel or skin contact with the hot muffler.

7.13 Never cut while wearing loose clothing such as torn or hanging bunker coat stripes.

7.14 Use saw protected gloves when operating saw and handling chain.

7.15 Operate only in well-ventilated areas.

7.16 Always hold saw with two hands properly positioned when engine is running.

7.17 Be sure chain stops when throttle is released. If the chain continues to spin at idle place saw out of service.

7.18 Once cut is started do not slow down and then accelerate, saw may pull you off balance.

7.19 Do not leave saw unattended while running.

7.20 Maintain correct chain tension. (See operators manual).

7.21 Whenever opening up the fuel tank, always loosen the cap slowly and wait for the tank pressure to be equalized before removing cap. This will prevent the spurting of fuel.

7.22 Do not rev the saw until you are ready to make the cut.

7.23 Do not walk through unstable areas cluttered with brush, logs, vines or heavy underbrush with a running chain saw. Carry the saw with the guide bar to the rear when climbing uphill and to the front when going downhill. Keep the safety brake engaged when traversing uphill, downhill or on uneven surfaces.

7.24 When the operator is not actively cutting, the safety brake must always be applied.

7.25 Beware of unnatural forces and pressure being exerted on limbs and trunks, especially when operating with ice storm damage.

7.26 The term "Feathering" refers to increasing and decreasing pressure on the throttle trigger. This technique should be applied just prior to finishing each cut, this will help the Operator maintain control of the saw as the chain breaks clean.

7.27 When operating a chain saw, secure or remove your handie-talkie as to avoid the potential for the radio to swing into the cutting space or become tangled on debris.

8. MAINTENANCE

8.1 General

8.1.1 ***Redacted for PFS***

8.1.2 When repairs to the saw are required, unit is to forward it to the Technical Services Division with Form RT-2.

8.1.3 Saws are to be examined and tested weekly. Schedule is to be established by the company commander

- Two persons at all times. A two member team consisting of the saw operator and control person is required whenever chain saw operations are being conducted.

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- Test to be performed in a protected area. A circle of danger of a radius of at least 10' will be established before the commencement of testing.

- Operating members must wear all required NFPA protective equipment whenever testing or operating chain saw.
  - Helmet
  - Eye Protection
  - Hearing Protection
  - Bunker Boots
  - Saw Protected Gloves - NFPA approved protective gloves that are specifically designed to prevent serious injury by causing the chain saw blade to bind and stop if contact is made. Members must wear saw protected gloves whenever testing or operating chain saw. Saw protective gloves are not approved for firefighting purposes.
    Note: Firefighting gloves are not approved for chain saw operation.

  - Saw Protective Chaps - NFPA approved leg protection specifically designed to prevent serious injury by causing the chain saw blade to bind and stop if contact is made. Members must wear Chaps whenever testing or operating chain saw. Chaps must be worn over either long pants or bunker pants. Chaps shall never be worn over shorts. Bunker gear is **not** saw protected.
    How do chain saw chaps protect the user when a chain saw strikes chain saw chaps? Kevlar fibers first resist the cut, and then are pulled into the chain saws drive sprocket, slowing and quickly stopping the chain (approximately five seconds or less). If the chap surface or pad is cut, it cuts the Kevlar fibers. If another cut occurs it will only pull out the Kevlar strands that have been previously damaged, resulting in increased chance of injury.

8.2 Bar and Fuel Oil

8.2.1 Bar oil levels are to be checked prior to cutting operations and replenished as required during cutting. The chain saw should never be operated without chain and blade being oiled. It is unsafe and can cause damage to saw.
If saw is not oiling the bar, first check reservoir for oil and, if necessary, remove the bar and clean debris from oiling grooves and ports in bar.

8.2.2 Only Pre-Mixed 2-Cycle Engine Fuel (supplied by Bureau of Logistics) is to be used for chain saws. Replacement cans of Pre-Mixed 2-Cycle Engine Fuel can be ordered from the Bureau of Logistics using the Fire Tools and Equipment Requisition Form (23-BS-3). ***Edited for PFS***

8.2.3 Bar oil is to be requisitioned from the Bureau of Logistics using the Fire Tools and Equipment Requisition Form (23-BS-3).

8.2.4 Fuel and bar oil levels are to be examined and replenished at the weekly inspection of the saw.

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8.3 Filters

8.3.1 Air filter shall be examined and cleaned after each cutting operation. If replacement is required, saw will be forwarded to the Technical Services Division. Clean air filter after each use. Place choke to on position before cleaning. Do not remove filter until first brushing off sawdust. Remove filter and blow out carburetor housing and filter being careful not to get any sawdust into carburetor barrel. Replace filter and cover. Then tighten filter cover housing nut.

8.4 Chain

8.4.1 Chains requiring re-sharpening are to be forwarded with RT-2 to the Technical Services Division.

8.4.2 Replacement chains may be requisitioned by forwarding form 23-BS-2 to Technical Services Division, when forwarding chain for sharpening.

8.4.3 To replace the chain or bar assembly on all chain saws, the chain brake has to be in the off position before removal of side cover. Check that the chain brake is in the off position by moving the front hand guard towards the front handle. Failure to do so will prevent you from reinstalling cover and the saw will have to be sent out for repairs.

8.5 General Maintenance

8.5.1 Brush off sawdust and oil accumulations after each use. Clean off the outer casing first. An air compressor can be used to blow off sawdust (wear eyeshields and follow the precautions of Safety Bulletin 51).

8.5.2 Blow out cooling fins around engine with air. Wipe saw down with rag to remove any excess oil. Replace the bar and adjust to proper tension. Check for sharpness and broken teeth.

8.5.3 Do not attempt to make adjustments to the carburetor or automatic chain oiler. These settings are only to be adjusted by trained mechanics.

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BY ORDER OF THE FIRE COMMISSIONER AND CHIEF OF DEPARTMENT

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TRAINING BULLETIN
TOOLS 26
September 18, 2018

HYDRA RAM

1. DESCRIPTION

1.1 The Hydra Ram is a hydraulically operated forcible entry tool. It requires no priming and will extend to ¾ of an inch per stroke to a maximum opening of 4 inches. The maximum force is 10,000 pounds. There are no hoses attached to it. The tool weighs 12 pounds and is 13 inches long, has an adjustable shoulder strap, and a storage case.

2. USES

2.1 Its main purpose is for forcible entry of outward and inward opening doors.

2.2 Other applications can be to provide an opening from the side of a vehicle hood or trunk for placement of an extinguishing agent.

2.3 The Hydra Ram can be used under water.

2.4 Whatever procedure is used safety must be the first consideration.

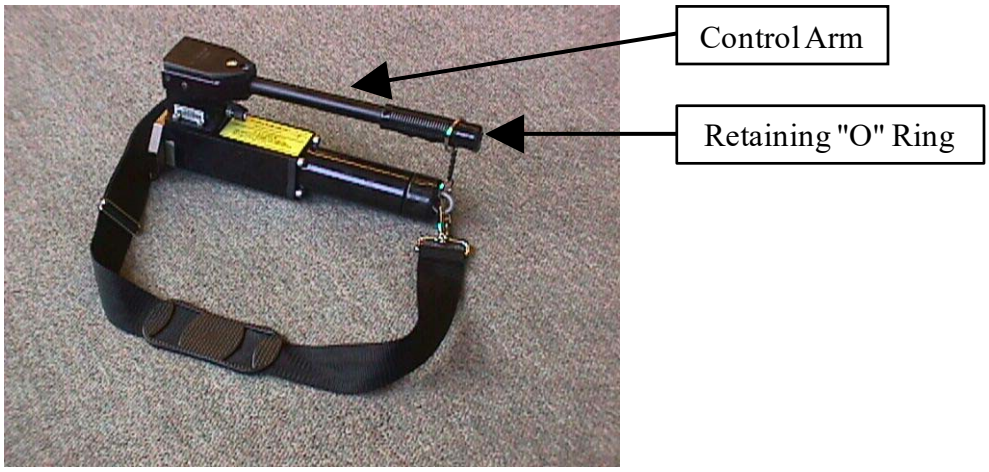

Figure 1

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3. OPERATION

3.1 If necessary, use a Halligan to help make the initial purchase.

3.2 Good control and a firm grip are essential when operating the Hydra Ram. Always position yourself in a fashion that would protect you in the event that the tool slips out from the work. Always maintain control of door or object being forced.

3.3 The tool is designed to operate in any position.

3.4 When the operation is completed, bleed the system by placing the operating arm in the down position, attach the retaining "O" ring (Fig. 1) and depress the pressure relief valve (Fig. 2) until the working piston is totally retracted. The pressure relief valve must be released quickly in order for it to re-seat itself correctly. If the working piston (Fig. 3) does not retract by itself apply steady pressure. As soon as possible clean and lubricate the working piston so that it will retract on its own.

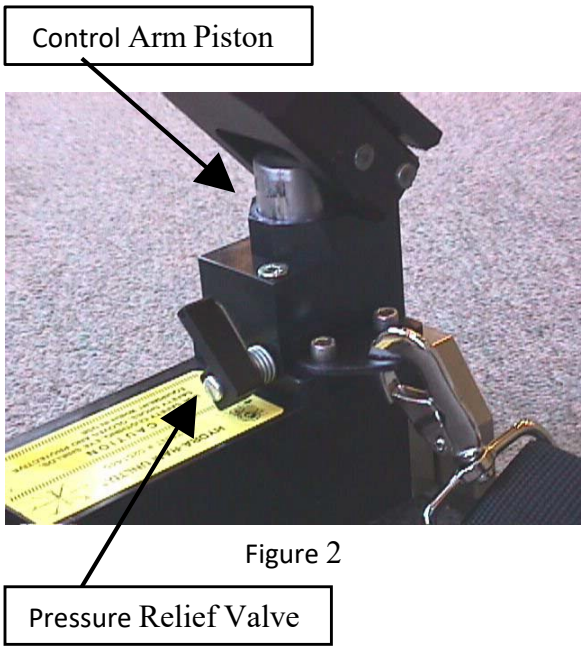


Figure 2

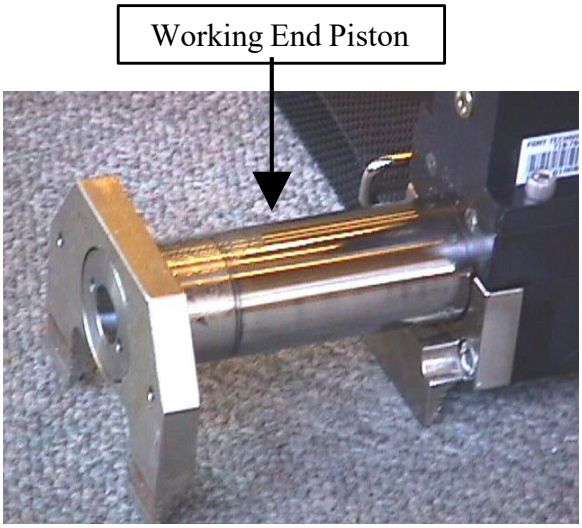


Figure 3

4. SAFETY

4.1 Use full firefighting gear with eye shields down or safety goggles when operating Hydra Ram.

4.2 Never strike the Hydra Ram with a tool to gain a purchase.

4.3 Once the Hydra Ram reaches its maximum opening of 4 inches and resistance is felt, discontinue pumping. Any excessive pumping may cause the piston to over-extend and rupture the seal, resulting in loss of fluid under pressure. If the 4-inch opening is not enough, retract the piston and place an axe head or other substantial spacer flat on the door to provide additional opening distance.

5. MAINTENANCE

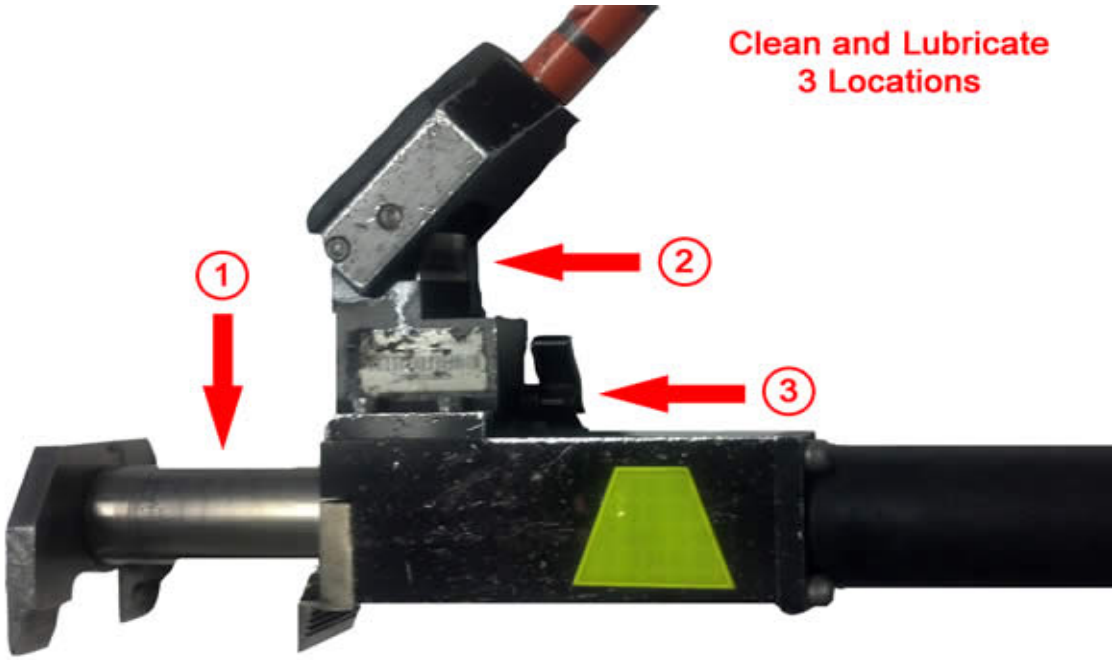
5.1 Do not take the Ram apart or make any adjustments. The Ram requires no replenishment of fluids and will provide good service when maintained according to this document.

5.2 The Ram does **not** use Hydraulic Fluid, which can be injurious to skin. The Ram uses Propylene Glycol, which will not cause injury to your skin.

5.3 After each use the tool should be inspected for damage, tested for leaks, cleaned and lubricated.

5.4 Testing for leaks - After fully extending the working piston, the operating arm should not be able to move except for when the relief valve is depressed.

5.5 Cleaning and lubricating - The entire tool can be cleaned with soap and water, including the pistons. It is important that all dirt be removed from the pistons prior to lubricating. Both the piston under the operating arm and the working end piston should be lubricated with "3 In 1" oil (available from Fire Tools and Equipment Unit). Do not use spray type lubricants such as WD40 as they can damage the rubber seals. The working piston should be extended and retracted several times, lubricating each time.



5.6 When not in use the Hydra Ram should be kept in the storage case.

5.7 The Hydra Ram can be affected by storage at or near areas of the apparatus where heat comes in contact with the tool. The heat dries out the pistons and seals.

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5.8 The Hydra Ram should **not** be stored on the floor of the apparatus near heating vents.

BY ORDER OF THE FIRE COMMISSIONER AND CHIEF OF DEPARTMENT

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TRAINING BULLLETIN
TOOLS 27
March 18, 2022

OPERATION OF THERMAL IMAGING CAMERAS

1. INTRODUCTION

1.1 ***Redacted for PFS***

1.2 The thermal imaging camera is a valuable tool that can be used for many operations. TICs may be especially helpful in the low visibility environment of structural firefighting. TICs provide a pictorial representation of temperature differences that in many instances are unaffected by smoke. Basic understandings of thermal imaging, fully understanding the functions of the specific TIC in use, combined with disciplined tactical applications are essential in utilizing this tool to its fullest potential.

1.3 TICs provide a new perspective of the fire ground that may be beneficial. When the images presented are properly interpreted, operators may utilize the information to assist in making decisions especially in the instances of firefighting, firefighter accountability and directing interior operations. The company officer, being empowered to direct, may be best suited to carry and operate the TIC.

1.4 The following companies are equipped with TICs and shall carry and operate them at structural fires and applicable emergencies:

1.4.1 1 Thermal Imager assigned to each:

A. Battalion Vehicle

B. Engine Company

C. Ladder Company

1.4.2 ***Redacted for PFS***

1.5 The TIC is a tool and shall be used as an adjunct to, not a replacement for the established firefighting procedures and practices already in use.

2. OPERATING THEORY

2.1 TICs detect infrared (IR) energy and electronically process it and display it into a viewable image.

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2.2 Vision in Smoke

2.2.1 Visible light is blocked by the solid carbon particles in smoke.

2.2.2 IR wavelength is most often unaffected by smoke.

Example: During interior firefighting operations, vision may be greatly reduced, however heat penetrates through the smoke within the structure. The presence of heat may be felt when operating in limited visibility.

2.3 A thermal image is a pictorial representation of temperature differences represented by:

2.3.1 **BLACK and WHITE** are relative to the overall image being viewed.

2.3.2 **BLACK** indicates the presence of the least amount of heat or the coolest object in the scene.

Example: The wall with a handprint may appear cooler than the hand. It may not be really cold just colder than the hand and the "thermal signature" the hand left behind.

2.3.3 **WHITE** being the presence of the most heat in the scene.

Example: A handprint on the wall may appear **WHITER** than the surrounding area. It does not mean it is on fire, it only means that it is hotter than the rest of the area being viewed.

2.3.4 Shades of **GRAY** represent the temperature range between **BLACK** and **WHITE**.

2.3.5 These shades of **BLACK, WHITE**, and shades of **GRAY** and their differences in colorization are known as Thermal Contrast.

2.4 ***Redacted for PFS***

2.5 **Contrast –** There must be thermal contrast, or a temperature difference for the thermal imager to display an image.

2.6 **LOW Contrast -** May occur in cooler areas where images may be difficult to view due to the lack of heat present, and all objects being close in temperature. The overall area being viewed may have little or no contrast and appear darker.

2.7 **HIGH Contrast -** The more heat present, both generated and subsequently absorbed by objects, the clearer and sharper the image will appear. This is true until the area being viewed reaches the point of thermal saturation. This occurs when everything in the viewing area is heated to temperatures beyond the capabilities of the TIC being used. The overall area being viewed will lose all contrast and appear whiter and featureless.

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2.8 **Changing Thermal Contrast**
Thermal imaging cameras "thrive" on heat. As conditions change from cooler to hotter and back to cooler, the image viewed and displayed by the TIC may also change. This is known as changing thermal contrast. This changing thermal contrast may be an indication of fire being in close proximity. Operators using TICs must be aware of changing thermal contrast and constantly be monitoring for the change from LOW Contrast (cooler/darker) to HIGH Contrast (hotter/whiter).

2.9 To compensate for changing thermal contrast TICs change modes by shuttering and shifting or adjusting from a LOW HEAT/ High Sensitivity mode to a HIGH HEAT / Low sensitivity mode. In the HIGH HEAT / Low sensitivity mode the thermal imagers dynamic range expands allowing it to compensate for higher temperatures thus enabling the user to distinguish objects and people more easily in high heat environments. A HIGH HEAT / Low sensitivity indicator or icon will appear on the display.
Refer to TB Tools 27, Data Sheet 1 for specific camera indicators or icons.

2.10 **Convected Heat**
When using a TIC, convected heat movement may appear as WHITE swirling waves or smoke. Because heat rises, most often it will appear when viewing the ceiling area. However, it may also appear from the floor area when entering or operating above the fire. Because heat travels from hot to cold, when searching for fire location or extension, operators should make every attempt to detect the presence of convected heat along with its direction and velocity earlier rather than later. This movement may give the operator an indication of the location of the fire. The movement of convected heat should be looked for initially at the entrance to the occupancy and periodically thereafter.

2.11 Fire service TICs are used in a wide variety of thermal environments and are generally designed to detect radiant thermal energy. This energy is radiated from solid surfaces, particulates, and some gases. A characteristic of the radiating surfaces and gases called *emissivity* affects how the thermal radiation intensity relates to the actual temperature in a way that can make the surface or gas appear to have a temperature that is different from reality.

2.12 A TIC may not provide an accurate or reliable indication of the thermal conditions when attempting to locate fire or extension in any enclosed area. These areas may include but are not limited to cocklofts, ceilings, walls, floors and voids, balloon framed construction, ductwork, pipe recess, construction void, compactor shaft or chute and chimneys, It is also common to find any of these areas heavily insulated

2.13 ***Redacted for PFS***

2.14 TICs typically sense energy radiated from a surface of a solid. The unknown thickness or density and layers of the materials used in building construction and renovations, i.e., wood, brick, plaster, lath, plywood, sheet rock, ceiling tiles, tin, and floor coverings i.e., ceramic tile or carpeting, are all good insulators or poor conductors of heat. The apparent temperature displayed by the TIC may not be representative of the true magnitude of the heat source and it may not be detected. Significant fire and heat may be extending into this space.

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2.15 Heavy fire in the cellar may not be detectable from the floor above by relying solely on a TIC. Likewise, heavy fire in a cockloft may not be detectable from below or from the roof by relying solely on the TIC.

2.16 ***Redacted for PFS***

2.17 When searching for life, it must be understood that the contents of the occupancy may conceal a victim.

Note: Members are reminded that the TIC is a tool and shall be used as adjunct to, not a replacement for the established firefighting procedures of opening up to check for concealed fire and extension or performing a thorough primary and secondary search.

3. TACTICAL APPLICATIONS

3.1 **Thermal imaging cameras shall be carried and used at all structural fire operations by all units equipped with this tool.**

3.2 ***Redacted for PFS***

3.3 **Initial Size-Up**

3.3.1 Occupants at open windows who are obscured by smoke

3.3.2 Fire location

3.3.3 Fire extension

3.4 ***Redacted for PFS***

3.4.1-3.4.4 ***Redacted for PFS***

3.5 **Interior Search, Rescue and Firefighting Operations**

3.5.1 Operators of TICs should remember to stay low and scan slowly, when necessary. Operators should utilize a six (6) sided method of scanning to compensate for the narrow, approximately 50 degree field of view of the TIC.

3.5.2 Begin by looking straight up overhead at the ceiling (1), slowly lower the TIC to find the seam of the ceiling and the wall in front of you (2). Then follow the seam around left (3) and right (4) or right and left to estimate the size of the room eventually lowering the thermal imager scanning the floor area (5) and remembering to look to the rear (6).

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3.5.3 Objectives:

A. **Search for Life**

1. Firefighters – accountability - Members who are operating/missing

2. Civilians - Location, Route of removal

B. **Search for Fire**

1. Location

2. Size

3. Extension

C. **Structural Considerations**

1. Construction features and hazards

2. Avenues of extension

3.6 **Fire Suppression Operations**

3.6.1 Expedite interior handline placement.

3.6.2 While operating interior handlines or exterior Tower Ladder/Master Streams, the TIC may assist in proper; a) Direction, b) Application, c) Effectiveness.

3.6.3 Using the TIC from the bucket can provide an invaluable tool for directing the stream and getting water on the main body of fire.

3.7 **Roof Operations**

3.7.1 Firefighter accountability while operating

3.7.2 Ventilation – Location

3.7.3 Extension

3.7.4 Navigation & Safety

3.8 **Overhaul Operations**

3.8.1 Location

3.8.2 Extension

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3.9 **Odor of smoke/evaluation for fire**

3.9.1 Chimneys

3.9.2 Flues

3.9.3 Ductwork fires

3.9.4 Brush Fires – Location & Hot Spots

3.10 **FAST Truck Operations**

3.10.1 Monitor exterior changing conditions.

3.10.2 Follow hoselines.

3.10.3 Locate missing or downed members.

3.10.4 Image obstructions and entanglements

3.10.5 Locating alternate means of egress

3.11 **Emergencies**

3.11.1 **Electrical**

A. Overheated:

1. Motors

2. Circuits

3. Ballast

3.11.2 Exterior Search Operations

A. Person in water (surface)

B. Person in woods

C. Victim ejected from a vehicle

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3.12 ***Redacted for PFS***

4. LIMITATIONS

4.1 Thermal imaging does not see through clear glass or plastic. These materials may act as a mirror to IR.

4.2 Shiny surfaces will reflect IR creating a mirror effect. The actual source of the image may be opposite the reflected surface.

Example: Glass, waxed floors, tiled walls, some painted or polished surfaces or water on the floor.

4.3 Thermal imaging will not "see" through water.

4.4 Average field of view of thermal imagers is approximately 50 degrees horizontally.

4.5 Focal point of a TIC is approximately 3 feet from the camera lens. Operators viewing objects within 3 feet may be too close. As a result, objects within 3 feet may be blurry, out of focus or featureless. To help prevent this, operators should scan an area before entering or advancing.

4.6 Depth perception in TICs is rarely represented in a 1:1 ratio and may vary from camera to camera. Specific camera familiarization is essential.

4.7 Steam and condensation or fogging on the SCBA facepiece, display screen and camera lens may distort the clarity of the image that is displayed and cause it to be featureless. If there is fogging or condensation build up on the SCBA facepiece, it probably exists on the camera lens and display also. Wiping all 3 places, SCBA facepiece, the display screen and camera lens, (wipe, wipe, wipe) may greatly improve the clarity of the image. This may have to be done repeatedly before image clarity is improved.

4.8 Although the thermal imager is shielded to prevent radio frequency interference (RFI), electromagnetic radiation (radio transmissions) may cause interference.

5. FUNCTIONAL CHECK, INSPECTION, MAINTENANCE AND REPAIR

5.1 Functional Check, Inspection and Maintenance of the TIC shall be made:

5.1.1 Immediately after the 0900 and 1800 hour roll calls

5.1.2 After each use

5.2 Functional Check shall include the following in accordance with the associated TB Tools 27 Data Sheet 1:

5.2.1 Turn the camera ON

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5.2.2 Check for proper warm up and electronic self-test.

5.2.3 Verify that the camera is functioning properly by placing the TIC close to your face and viewing your outstretched hand or another firefighter.

5.2.4 Verify POWER/BATTERY LEVEL

5.2.5 Verify proper function of all buttons and switches.

5.2.6 Verify that all LEDs and ICONS are properly displayed and functioning.

5.3 **Inspection** of the TIC shall include but not be limited to:

5.3.1 Retractor and carabiner functional and the attachment point on TIC.

5.3.2 Proper FDNY Bureau of Logistics and company identification, camera make, model and warning labels intact.

5.3.3 Physical, heat and/or chemical damage.

5.3.4 Mechanical hardware to ensure screws, fasteners, bumpers or guards are not loose or missing.

5.3.5 Display screen and front lens for the effects of chemical, heat, and/or physical damage, i.e., cracks, excessive scratching, breaks and condensation.

5.3.6 Batteries and terminals for leakage, damage, and discoloration.

5.3.7 Battery compartments and terminals for damage or condensation and proper cover placement and fastening devices.

5.4 **Maintenance**

5.4.1 Although TICs are manufactured for a structural firefighting environment, they are sensitive electronic equipment and should be treated with as much care as possible.

5.4.2 The TIC shall NEVER be taken apart.

5.4.3 TIC maintenance performed at the company level shall consist of:

A. Battery charging.

B. External screws should be examined for tightness.

C. The TIC is water-resistant, not waterproof. NEVER submerge the camera.

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D. Clean and inspect all external surfaces by wiping with a solution of mild detergent and warm water after each use.

E. Dry with a soft, lint free cloth to avoid scratching the optical surfaces.

5.5 **Repair/Replacement**

5.5.1 Notify the Fire Tools and Equipment Unit (Tool Room) (718) 391-9405 for further instructions on replacement or pick-up when:

A. The TIC does not meet the inspection as described or does not operate properly.

B. Battery chargers or other components are defective.

C. Battery operational/charging time is not consistent with TB TOOLS 27 DATA SHEET 1.

5.5.2-5.5.3 ***Redacted for PFS***

BY ORDER OF THE FIRE COMMISSIONER AND CHIEF OF DEPARTMENT

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TRAINING BULLETIN
TOOLS 37
October 17, 2017

FLOOR JACK

1. DESCRIPTION

FDNY Designation	Floor Jack
Make	OTC Aluminum Racing Jack
Maximum Capacity	2 Tons (4000 pounds)
Lifting Height	Minimum 3 ½ inches to a Maximum 18 inches
Features	Low profile, quick lifting (five pumps to achieve max height), two piece side mounted handle, roller instead of front wheels.

2. INTRODUCTION

2.1 Floor jacks provide a system for lifting a desired load. Requiring minimal space, the floor jack is versatile and easily stored. Floor jacks are effective and relatively easy to operate. Although floor jacks can't be used all the time, they do provide a simple solution for many situations.

3. POTENTIAL USES

3.1 Floor jacks can be used for a variety of vehicle lift operations and tactics.

4. OPERATING INSTRUCTIONS

4.1 Close the release valve by turning the handle completely clockwise.

4.2 Position the jack for the lifting operation.

4.3 Pump the jack handle until the saddle touches the lifting point. Check the placement of the jack; the load must be centered on the jack saddle.

4.4 Pump the handle to the desired height to finish the lift. Do not attempt to raise the jack beyond its travel stops.

4.5 Place cribbing under the vehicle at points that will provide stable support. SLOWLY lower the vehicle onto the cribbing by turning the handle counterclockwise.

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5. SAFETY PRECAUTIONS

5.1 Examine the area around the vehicle, in particular, the lift point. Use floor jack when vehicle is on relatively flat, level surface. If the surface is not flat, consider other lifting devices.

5.2 Prevent the vehicle from shifting during the lifting process. Utilize chocks or cribbing and if the situation permits, set the parking brake and engage the transmission.

5.3 Because the floor jack uses a single-point lift, ensure that it is placed in a manner that lifts but does not rock. There are some fairly common lift points that can be utilized, such as the frame rails and main structural components.

5.4 If using the floor jack on rough or soft surface (grass, dirt, rocks, etc.) provide a suitable base of support.

5.5 Use cribbing during the lift in case of equipment or setup failure. Place cribbing at typical points that are suitable to support the load.

5.6 During the lifting process, do not get under the vehicle until the vehicle has been cribbed. Similar to air bag operations, tighten the cribbing against the load and slowly lower the floor jack to place the load substantially on the cribbing.

BY ORDER OF THE FIRE COMMISSIONER AND CHIEF OF DEPARTMENT

NOLAN ATS-1 EMERGENCY RAIL CART

1. INTRODUCTION

1.1 The Nolan ATS-1 Emergency Rail Cart is a lightweight aluminum cart that can be used to transport tools, equipment and patients on tracks used by the NYC Transit, Amtrak, Long Island Railroad, Staten Island Rapid Transit, Metro North, and PATH transit systems.

1.2 The rail cart consists of 2 base sections, each weighing 48 lbs, 2 handles to push or pull the rail cart along the tracks, 1 connector plate, cargo net with tie-downs, 2 red cam buckle straps and 2 yellow ratchet straps for securing rail cart to apparatus. All components are packaged together on a modified hand truck for storage in quarters and transportation to incident. (Photo 1)

Photo 1

2. STORAGE AND TRANSPORTATION

2.1 ***Redacted for PFS*** .

2.2 When rail carts are transported to an incident, the following procedures shall be followed:

- Make sure the components are secured to hand truck.
- Place entire package on back step of apparatus. (Photo 2)
- Secure with two yellow ratchet straps provided. (Photos 3-4)
- Tighten straps with ratchet.

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Note: Proper usage of the yellow ratchet straps is essential to getting the rail cart to location safely. Straps must be initially positioned to allow for free use of ratcheting mechanism. This will enable member to properly tighten the straps securing the unit to the apparatus.

Photo 2

Photo 3

Photo 4

2.3 Hook upper strap with carabiners on grab handles. Hook lower strap with carabiners on lower tow loops (Photo 3).

2.4 To tighten yellow straps, pull release lever on ratchet handle and tighten ratchet. To lock ratchet, pull release lever and bring ratchet handle to nested position. (Photo 4)

2.5 Any engine company may be special called to transport a rail cart from the quarters where it is stored to the scene of an incident. Laminated instruction cards outlining rail cart transportation and use are attached to the rail cart hand truck.

3. ASSEMBLY OF RAIL CART

3.1 Place each half of rail cart on track with the wheels on the rail cart positioned close to the operator, with the operators facing each other. (Photo 5)

3.2 Insert handles into sockets on each half of rail cart sections, then secure with hitch pin clips. (Photo 6)

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Photo 5

Photo 6

3.3 Using handles for leverage, have each member place one foot onto rail cart and raise front to an approximate 45^0 angle, so that each connection point joins to one another. (Photo 7)

3.4 Raise one section slightly higher than the other until pin seats into slot. (Photos 7-8)

Photo 7

Photo 8

3.5 Slowly lower halves until they join together and lie flat onto tracks and the rail cart is in position for use. (Photo 9-10)

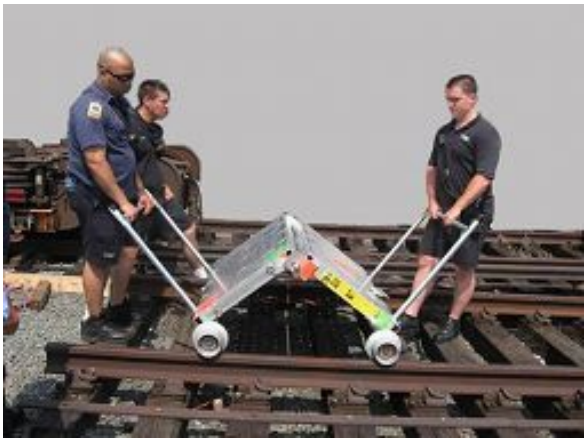

Photo 9

Photo 10

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3.6 One wheel is provided with a wheel lock (slide bolt). A red square is painted on the surface corner of the rail cart to denote the location of the wheel lock. (Photo 11) Once assembled, the member can use the wheel lock to secure rail cart from rolling.

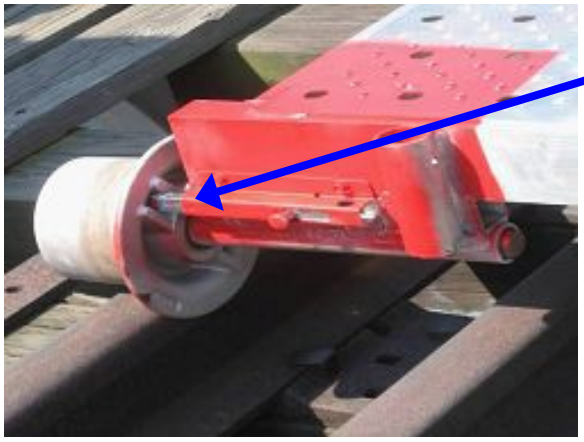

Photo 11

3.7 Two rail carts can be connected together using the connector plate. (Photo 12-13)

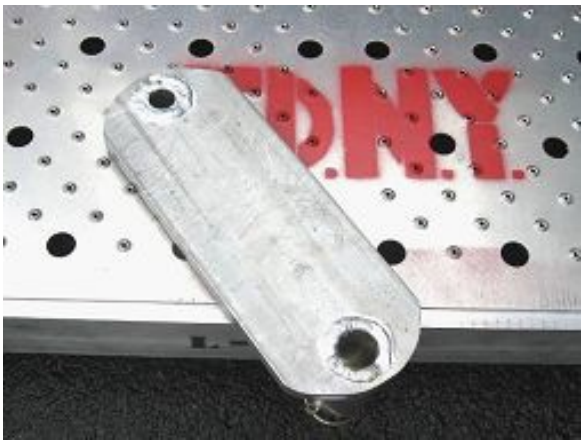

Photo 12

Photo 13

3.8 Tools, equipment or non-ambulatory victims may be secured to the rail cart using supplied elastic cargo net, red cam buckle straps, or utility rope utilizing clips positioned around the rail carts edge. (Photos 14-17)

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Photo 14

Photo 15

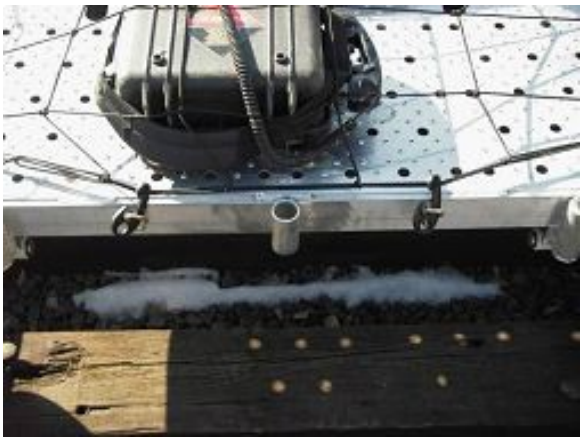

Photo 16

Photo 17

4. DEPLOYMENT

4.1-4.2 ***Redacted for PFS***

4.3 Deployment of rail carts needs to be part of a carefully developed plan. For example, setting up a rail cart prematurely on tracks being used for the evacuation of ambulatory civilians may hinder operations. Likewise, rail carts cannot be moved both ways on the same tracks simultaneously. The operational plan needs to consider how many rail carts and what equipment needs to be transported to the incident scene. When all rail carts have been moved to the scene, they can then be used in reverse order to remove non-ambulatory victims.

4.4 Avoid allowing equipment to extend beyond the sides of the cart to prevent contact with tunnel walls or the third rail. Likewise, stretchers and stokes baskets should extend over the front and rear of the cart, instead of the sides.

4.5 When there is a heavy load or when used on a steep grade, the cart should be pushed by or pulled by two (2) or more members. Utility ropes and/or straps may be used to increase control.

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4.6 A connector plate is supplied to join two carts together. Joining carts together with connector plate might be useful at large incidents.

5. REMOUNTING RAIL CART ONTO HAND TRUCK

5.1 Rail cart sections are color coded for mounting back onto hand truck. Hand truck has a specially designed "step plate" to accommodate the cart sections.

5.2 Place rail cart sections on hand truck as per color coding (Photo 18):

5.2.1 First, match orange marking on diamond plate of cart section to orange marking painted on hand truck – make sure diamond plate is facing the hand truck and marked side-beam (orange and green) is facing up.

5.2.2 Place second cart section onto the hand truck with diamond plated in and the painted side-beam facing up. Correct placement will have all color coding matched up – orange on cart section to orange on hand truck and cart section(orange and green) to cart section(orange and green).

5.2.3 To ensure proper nesting of two cart sections onto the hand truck, the wheel of the inner section (green marking) must be lifted while the outer section is seated.

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5.3 Secure to hand truck with red cam buckle straps. (Photo 19)

Photo 18

Photo 19

5.4 Place handles between hand truck and cart sections. (Photo 20)

5.5 Tie handles to cart, using slack from red retraining straps. (Photo 21)

Photo 20

Photo 21

6. *Redacted for PFS*

7. SAFETY

7.1 Operating on rail tracks is inherently dangerous. Use of rail carts, while necessary, has the potential to increase this danger.

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7.2 The wheel lock must be engaged when the cart is left unattended. This is especially important when a cart is operated on a grade, is loaded with patients, or carrying equipment.

Note: ***Redacted for PFS*.**

8. ***Redacted for PFS***

BY ORDER OF THE FIRE COMMISSIONER AND CHIEF OF DEPARTMENT

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COMPANY JOURNAL
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June 11, 2019

GUIDE TO COMPANY JOURNAL ENTRIES

1. PURPOSE

The company journal records chronologically the day-to-day events of a unit. In it are entered vital particulars of alarms, collisions, deaths, injuries, other matters requiring an entry for proper record keeping. Therefore, it is incumbent upon all members to exercise the utmost care in the maintenance, use and preservation of this journal.

The purpose of this guide is to:

1.1 Set up simple standardized procedures for company journal entries, making them as concise, yet as informative as possible.

1.2. Assure entries which will aid in the continuity of supervision providing incoming officers with a chronological resume of activities since the last working tour.

1.3 Increase the efficiency of all units.

2. GENERAL INSTRUCTIONS

2.1 Entries shall be neat, accurate and properly indexed. Entries by member on housewatch shall be in blue or black ink. Entries by other members shall be in red ink. No line shall be left blank between entries. Each line shall be started at left in a uniform manner.

2.2 Entries omitted shall not be forced. They shall be made at time of discovery of omission by member responsible for entry and include full particulars that would have been made in omitted entry.

2.3 Entries by members, other than member on housewatch, are to begin with rank and surname, thereby eliminating signature. However, this shall not apply to roll call entries.

2.4 When member, other than member on housewatch, makes an entry in a unit to which they are not assigned, member shall write unit number after their name. Members making entries in a company journal shared by two (2) or more companies shall write number of their unit after their respective names.

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2.5 When articles are received or delivered the housewatch entry shall begin with the word "received" or "delivered."

2.6 In quarters housing two (2) or more companies the officer in command of each unit shall write a separate roll call.

2.7 At the beginning of each calendar day, immediately following 2400 hours and before taking over of housewatch duties, the day and date shall be written across the page on line directly below last entry of the previous calendar day. Also, on same line in "Time Column" 0001 shall be written.

2.8 Members beginning housewatch duties at time of a roll call shall not make an entry of that fact until particulars of roll call have been duly entered by the officer in command.

2.9 Entries of members reporting for duty shall be limited to one such member per line.

2.10 Incoming member reporting for duty and finding unit out of quarters shall record entry in company journal. Officer on duty shall call the roll, make entry of departure and proceed as per Section 11.1.6, Regulations. Particulars of roll call shall be duly recorded upon return from operations.

2.11 Civilian employees of the Department shall make entries in their own handwriting in company journal when entering and leaving quarters.

2.12 Members returning from alarms during their assigned housewatch tour shall record return as "RESUMING HOUSEWATCH".
If return is beyond their assigned housewatch tour, the relieving housewatch shall record return as "ASSUMING HOUSEWATCH".

2.13 Military Time shall be used when making entries except that the terms 9x6 and 6x9 shall be used to designate tours of duty.

2.14 If a unit is required to respond to an alarm while the officer is in the process of writing the roll call, members shall be permitted to make necessary entries in company journal e.g. OT entries.
The officer shall when returning to quarters from the response, continue the roll call. Members are not to skip any lines when making their entries.

2.15 Entries concerning events or conditions requiring notifications shall include the name, rank/title and unit of persons(s) notified.

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3. LAYOUT OF JOURNAL

3.1 Pages 500 running backward to 498 shall be ruled and indexed to record chief's visits in accordance with Regulations.

3.2 Pages 497 running backwards to 495 shall be ruled and indexed to record company drills, using the following columnar headings: Date; Training Subject; Conducted By; Groups on Duty.

3.3 In quarters where a Battalion Depot (mask cylinders) is located, the company journal shall be ruled and indexed for entries by MSU members and chief officers on page 494 running backwards as necessary, using the following headings: Date, Cylinders Exchanged, Cylinders Found, Officer Notified, Inspected By.

3.4 Individual Page.
Across top of first line shall be legibly written the complete date - viz: - Monday, Month Day, Year.

1st column from left (time column) shall be used to record time of each entry. No mark other than time shall be entered in this column.

2nd column shall be known as "Flagging Column" and used to rapidly locate and emphasize entries of an unusual or serious nature or entries of special interest that affect the administration of the unit. The use of "Flagging Code Letters" shall be limited to those specified in this guide.

Where the journal supplied does not have a flagging column, unit commanders shall cause a red line to be drawn 3/8" to the left of the existing red line to provide for such column.

3rd column shall be used to record the complete journal entry.

Rear pages of company journal shall contain a record of chief's visits and company drills. All other records, statistics, etc., shall be maintained in Office Record Journal. The receipt and dispensing of fuel etc., shall be recorded in company journal chronologically at time of this activity.

3.5 Inside the front cover affix a current accurate company roster made in accordance with Specimen Roster on page 17 of this booklet.

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RECEIPT OF ALARM SIGNALS

RCA	Received Computer Alarm	RTS	Received Time Signal
RCTS	Received Computer Test Signal	R Vbl A	Received Verbal Alarm
RPA	Received Phone (Telephone) Alarm	RVA	Received Voice Alarm
RRA	Received Radio Alarm		

5-7. ***Redacted for PFS***

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