

Community Safety Leadership

Is this on your agenda?

Firefighter Safety: An Ongoing Concern



Executive Summary

Firefighter safety is a continuing concern within the American fire service. While some improvements have been made since the late 1970s, on average more than 94 firefighters have been killed annually in the line of duty since 1990.

This issue of the Community Safety Leadership series is designed to increase awareness of the hazards faced by firefighters while traveling on the street responding to, or returning from, an emergency and at the fire scene. It also underscores the fact that safety in the fire service requires the personal commitment of everyone involved.

This particular guide was prepared by VFIS Education and Training Services of the Emergency Services Consulting Group, a subsidiary of VFIS – the nation's leading insurance provider for emergency service organizations. This document is appropriate for all levels of personnel in the fire service. Chief officers will benefit by obtaining insight into the types of hazards in order to develop risk management strategies; company officers will benefit by understanding the types of hazards their crews will be presented with; and firefighters will benefit by understanding their personal responsibility to safety. We wish to thank VFIS for their work in preparing this guide. ■

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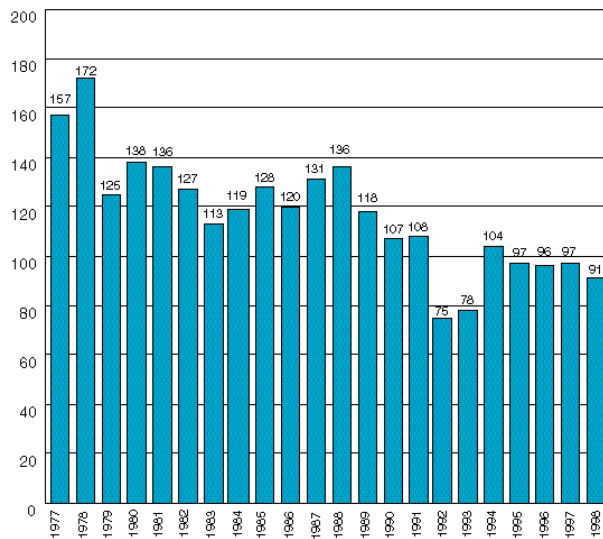
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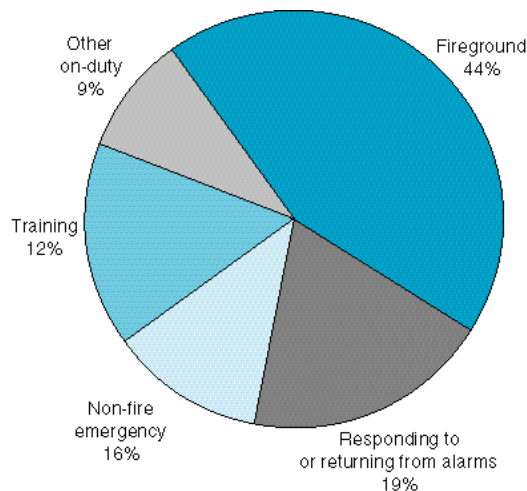
Need for Increased Safety

Firefighter safety is an ongoing concern. The following chart illustrates the number of firefighters killed in the line of duty between 1977 and 1998.

On-Duty Firefighter Deaths: 1977 - 1998

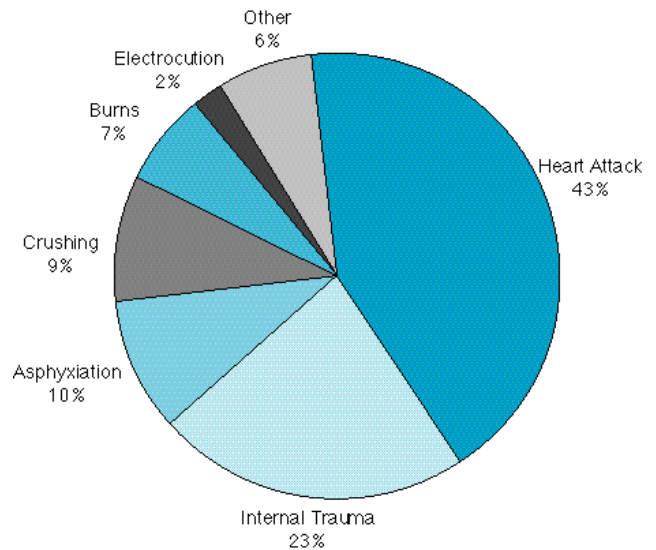


In 1998, (latest statistics available), nearly two-thirds of all firefighters killed were operating either on the street (responding/returning) or at the scene (fireground operations). Other types of duty where firefighters were killed included non-fire emergencies such as EMS or non-fire hazardous material incidents, training activities, and other miscellaneous duties. The percentage of firefighters killed by each type of duty in 1998 is illustrated on the following chart.



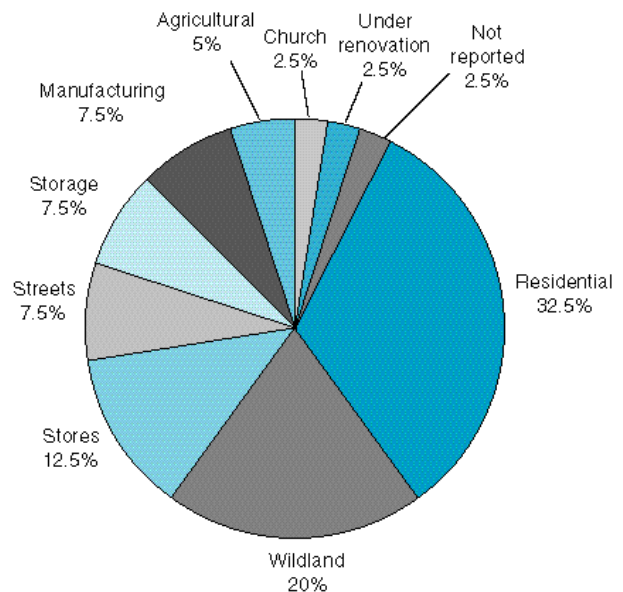
Heart attacks accounted for nearly half of all on-duty firefighter deaths in 1998. Internal trauma accounted for the second largest percentage (23%). The balance was distributed fairly evenly among the other injuries such as electrocution, burns, asphyxiation, crushing, or other.

Firefighter Deaths by Nature of Injury - 1998



Nearly one-third (32.5%) of all firefighter deaths in 1998 occurred at residential property incidents. Wildlands ranked second (20%) and stores, accounting for 12.5%, were third.

Fireground Deaths by Fixed Property Use - 1998



In 1998, more than 87,500 firefighters were injured. About half of these injuries occurred on the fireground. A significant number of injuries also happened during non-fire emergencies and on-duty activities not otherwise classified. The number of firefighters injured in 1998 by type of duty is identified on the following table.

| FIREFIGHTER INJURIES - 1998 | |
|------------------------------------|---------------------------|
| Type of Duty | Number of Injuries |
| Fireground | 43,080 |
| Non-Fire Emergency | 13,960 |
| Other On-Duty | 16,355 |
| Responding To/ Returning From | 7,070 |
| Training | 7,055 |
| TOTAL INJURIES | 87,520 |

WORK, LIFESTYLE AND HEALTH

Firefighters work in a changing and sometimes adverse environment. Essentially there are two settings within which they operate — the emergency scene and the street, where a majority of deaths and injuries occur. Working within these dangerous and challenging environments requires that each firefighter make a personal commitment to safety.

Lifestyle/Fitness: Many occurrences and activities within the fire service place strain on the body. For example, rising from sleep to respond to an alarm in the middle of the night places extreme stress on a firefighter’s heart and vascular system. But lack of exercise, eating high-calorie, high-fat foods, and smoking can also make a firefighter susceptible to heart attacks and other related medical problems. That is why it is important that all emergency service personnel work to alleviate these hazards.

Focus on Health: Rapid changes in the level of physical exertion, hard physical work for extended periods, and mental stress from being exposed to a wide variety of disasters and/or tragedies, place unusual physical stress upon a firefighter. It is therefore imperative that firefighters work to maintain a good physical condition in order to stay in shape.

Within recent years serious attempts have been made to assist firefighters in achieving and maintaining a healthy lifestyle and condition. Many fire service organizations have introduced physical fitness equipment and programs that either permit or require firefighters to exercise while on duty. Other efforts have required an annual medical evaluation as set forth within the NFPA 1582, Standard on Medical Requirements for Firefighters. Still other programs include a comprehensive immunization program against communicable diseases such as hepatitis B to which firefighters can become exposed. Firefighters should refer to NFPA 1581, Standard on Fire Department Infection Control Program, for specific information on this program.

At the Emergency Scene

Over half of all firefighter injuries occur on the fireground. Firefighters often seem to operate with tunnel vision; they are concentrating so much on a particular aspect of the fire that more obvious and dangerous conditions or situations escape their attention. Tunnel vision kills firefighters. Examples of tunnel vision include:

- Making a direct attack on a storage magazine of high explosives that is heavily involved with fire.
- Working on a roof over a fire where the roof is beginning to become “spongy” or noticeably sags.
- Making a direct attack on a working fire from an area adjacent to the fire building while the wall above the crew begins to bow or lean outward.
- Making an interior attack on a well-involved structure fire where the fire is extending over and behind the attack crew.
- Standing upright at the door of a fire building while the opening begins to first “suck” smoke and then puff smoke rapidly in advance of a potential backdraft.

It is imperative that all firefighters on the fireground carefully observe the entire scene, not just the obvious. Firefighters need to use all of their senses and training while working at the scene of all emergencies.

PERSONAL PROTECTIVE CLOTHING

There is no such thing as a routine fire. Protective clothing and equipment is a firefighter's first defense against injury from the associated heat, smoke, and other toxic materials generated by an incident. Therefore, firefighters working in hazardous areas should use every safety component and procedure available to them.

The proper use of personal protective equipment (PPE) is essential. Chapter 5 of *NFPA 1500, Standard on Fire Department Occupational Safety and Health Program*, addresses protective clothing and equipment. Not only should you have the proper protective clothing and equipment, it is essential that you wear them properly. In other words, *always wear the right gear and wear the right gear right!*

While the need for protective clothing and equipment varies based on the type of hazardous situation encountered, the protective ensemble generally includes:

- Structural firefighting coat
- Structural firefighting pants
- Protective hood
- Helmet, including face protection
- Foot protection
- Gloves
- Personal Alert Safety System (PASS)
- Self-contained breathing apparatus (SCBA)
- Protective eyewear (glasses or goggles)

Other clothing and equipment are identified for emergency service personnel working in or near firefighting operations, emergency medical operations, hazardous chemical emergency operations, and wildland firefighting.

All firefighters should be trained in the care and maintenance of protective clothing and equipment. You'll want your gear to be in peak condition when it is needed.

OPERATING AT THE SCENE

Activity at an emergency scene is, at best, a form of rapidly changing but controlled confusion. Many different activities are being undertaken simultaneously by a number of emergency service personnel, often within a very adverse environment. Safety while operating at emergency scenes is critical to a firefighter's well-being. Major considerations for operating safely at emergency scenes include:

- Incident management
- Personnel accountability
- Staffing
- Rehabilitation

Incident Management: Management of emergency incidents is an essential component of firefighter safety. There are systems for this purpose currently in use, including the Incident Command System (ICS), the Incident Management System (IMS, an updated version of ICS), and Fireground Command (FGC). Essentially, any of these systems comply with current standards. The point is, no matter which system you choose, use it consistently on all emergency incidents.

Personnel Accountability: A major aspect of incident scene safety is the development, adoption and use of an accountability system. (See Section 6-3 of NFPA 1500.) This system provides for the tracking, inventory and rapid accounting of all members operating at an emergency incident. Every firefighter on the scene must actively participate in this system — it is each firefighter's responsibility.

A number of different personnel accountability systems exist. They range from PASSPORT systems to DOG-TAG systems, to ID CARD bar code systems, all of which provide a method for tracking all on-scene personnel. Whichever system you use, it is only as effective as the extent of the participation by individual firefighters.

Another important device was designed to complement personnel accountability systems. It is known as a Personal Alert Safety System (PASS). A PASS sounds an alarm in the event of an emergency situation or non-movement of a firefighter for a specified period of time.

Staffing: There are two primary aspects of fire-ground staffing that are directly related to firefighter safety. They include:

2 In/2 Out Rule

Under the provisions of both OSHA regulations and NFPA standards, a minimum of four personnel should be on the scene of an incident before initiating interior fire operations. Interior attack crews should always operate with not less than two personnel, and, when a two-person crew is operating inside, another two-person crew, fully equipped, is ready for the immediate rescue of the inside crew. The regulations do provide that, if there is an immediate life hazard, an initial attack crew can notify other responding personnel and initiate an interior attack before a second crew is established. This is an exception to the standard not the norm.

Each department should have a written policy regarding the minimum number of personnel who should be on the scene before initiating an interior attack. The policy should comply with both the OSHA and NFPA requirements and be closely integrated with the rapid intervention team concept reviewed below.

Rapid Intervention for Rescue of Members

Section 6-3 of NFPA 1500 states that a department shall provide for the rescue of members at emergency incidents, if the need arises. A rapid intervention team (RIT) should consist of at least one two-person crew expressly dedicated to rescuing firefighters in the event they become trapped or are "in trouble." The team should be fully equipped, including SCBA, and any other specialized rescue equipment required for the type of situation being handled.

There is a provision during the initial attack stage of an incident that the members of the RIT can be assigned other non-critical duties that can be put aside immediately in the event the rescue of members becomes necessary.



Many departments have integrated the *2 in/2 out rule* and the *RIT* requirement since both are directly related to firefighter safety and rescue. In either case, it is imperative that a department develop, adopt, and utilize a policy that provides a RIT at all emergency incidents.

Rehabilitation: The rehab of firefighters while they are on the scene of emergencies is an important consideration in protecting them from undue physical stress and potential safety hazards. An effective program should include, at minimum, the following:

- A departmental policy that identifies a systematic approach for the rehabilitation of firefighters when operating at emergency incidents. The policy should identify mandatory thresholds for firefighter rehab consistent with the type of incident, the environment, and other related conditions at the scene. The department also must ensure the policy is enforced at all emergency incidents.
- A location at emergency scenes where firefighters can get out of the elements, whether they are heat, humidity, cold, or precipitation.
- Availability of drink and food at rehab. Drinks should be limited to water or activity fluids with electrolyte solutions. Food should emphasize fruit and other nutritious items; preferably not fast foods heavy in fat content.

Availability of medical monitoring of firefighters at the rehab location at a minimum level of basic life support care.

- Release of firefighters to resume emergency operations only after medical clearance.

CRITICAL INCIDENT STRESS DEBRIEFING

Critical Incident Stress Debriefing (C.I.S.D.) is a process designed to ensure the mental and physical health and safety of firefighters. Critical incident stress can be triggered by, for example:

- A major tragedy with many people injured or killed.
- A series of relatively minor emergency incidents that have cumulative stress effect.
- An incident involving serious injury or death to a department member.
- An incident where the patient may resemble a family member or a firefighter's child.
- A new or different type of emergency incident, usually one with catastrophic results.

At minimum, every department should have a written policy that establishes a program designed to relieve critical incident stress, as well as criteria for implementing the program. Many areas and/or departments around the country have established C.I.S.D. teams to assist firefighters, either individually or collectively. These teams range from individuals trained to assist fellow firefighters in the same department or company, to regional

C.I.S.D. teams, ready to travel to a location where firefighters have experienced a catastrophic event.

Safety on the Street

The street is a very dangerous environment for firefighters. Every year, one-quarter of all firefighters killed in the line of duty are killed while operating on the street. Another 5,000 to 6,000 firefighters are injured each year from these types of incidents. In addition, the National Highway Safety Administration reports over 60 members of the public are killed each year by emergency vehicles, most while responding to or returning from emergency calls.

This is why the laws regarding emergency vehicle operation are so critical.

There are three principles of law that specifically affect emergency vehicle drivers:

- Emergency vehicle drivers are subject to all traffic laws unless a specific exemption is provided.
- Exemptions for emergency vehicle drivers apply only when the emergency vehicle is responding to a true emergency.
- Emergency vehicle drivers can be found criminally or civilly liable if involved in an accident, even if they are operating under the provisions of an exemption.



While some differences exist, most states address the driving of emergency vehicles — and the driving of privately owned vehicles (POVs) while responding to emergencies — in similar ways. You are encouraged to obtain, read and understand these laws.

RESPONDING TO THE STATION

A number of firefighters who respond to the station from their POV's, are injured or killed each year. If a firefighter is involved in an accident on the way to the station, he/she will not only be unavailable to respond to the emergency; instead the firefighter becomes the focus of another emergency.

Members of an emergency service organization who respond in their POVs should understand that most states do not classify POVs as emergency vehicles. This means an individual responding to the station in his/her POV does not have any exemption under state law to violate any driving law. Each state has provisions for the mounting and using of "red" or "blue" lights on a POV.

RESPONDING FROM THE STATION

Driving an emergency vehicle to an emergency is a major responsibility. The lives of firefighters riding on or in the apparatus, as well as members of the driving public, are in the care of the emergency vehicle driver. If an accident occurs, a court will usually judge the actions of an emergency vehicle driver based on two primary considerations.

- Was the emergency vehicle responding to a true emergency?
- Did the emergency vehicle driver exercise due regard for the safety of others?

If the answer to both is yes, the emergency vehicle driver has demonstrated a responsible and professional attitude through his/her action(s).

True Emergency: The question of whether an emergency call is a true emergency has become a critical issue with respect to judging the actions of an emergency vehicle driver. The definition of a

true emergency, as it relates to an emergency vehicle driver is:

A situation in which there is a high probability of death or serious injury to an individual, or significant property loss, and the action by the emergency vehicle operator may reduce the seriousness of the situation.

Emergency Vehicle Driving Laws: Traffic laws affecting emergency vehicle operation typically address four separate but interrelated issues:

- The application of the federal commercial driving license (CDL) law as it applies to the drivers of emergency vehicles that are classified as commercial (greater than 26,000 lbs.) vehicles.
- Exemptions which, under certain conditions and in certain states, are granted to emergency vehicle operators.
- Requirements for members of the public and their actions when an emergency vehicle approaches.
- Requirements for emergency service personnel operating POVs while responding to an emergency.

If emergency vehicle drivers are to understand the intricacies of driving under emergency conditions, they must know what qualifications, certifications, and/or licenses they must have to operate an emergency vehicle within the state. They must know the legal rights they have as the driver of an emergency vehicle, and what the requirements are for members of the public when they become aware of an approaching emergency vehicle.



EMERGENCY RESPONSE PROCEDURES

Before responding to an emergency incident it is essential that the driver (and occupants/riders) follow an established procedure.

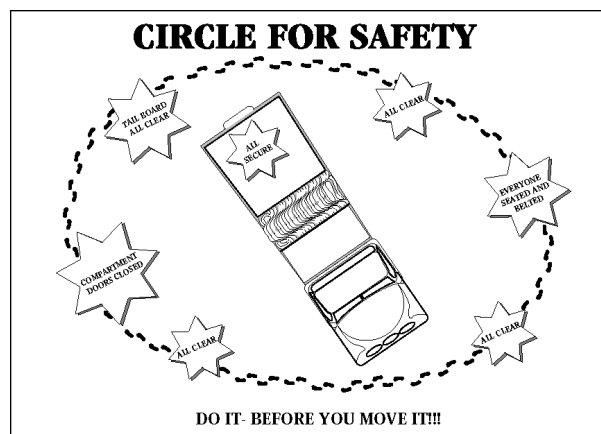
Effective Start-Up Procedures: The four steps of an effective start-up procedure are:

Circle of Safety Inspection — Always circle the emergency vehicle before starting and moving it for any reason. The emergency vehicle driver has sufficient time to do this activity while other crew members are “bunkering out” or obtaining additional incident information.

Adjustment of Cab Features — Upon entering the cab, ensure that the driver’s seat is properly adjusted, mirrors are positioned, and controls are in the proper operating position.

Wearing of Occupant Restraints — The emergency vehicle driver must have his/her occupant restraint secured and must be sure that all crew members are secured. The vehicle should not be moved unless all occupants are seated and properly belted.

Receive Signal Before Moving — The emergency vehicle driver should receive a signal from either the officer or one of the crew members prior to moving the vehicle. Crew members should use an audible buzzer if they are not directly visible by either the officer or the driver.



Finally, the driver must understand that being given the right-of-way and having the right-of-way are two entirely different situations. This principle must be reinforced each time an emergency incident response is undertaken. Right-of-way can't be forced or assumed; it must be given by the other driver(s). If not given, the emergency vehicle driver does not have the right-of-way.

Space Management: Establishing a cushion of safety on all sides of an emergency vehicle is essential to safe operation. The following are major areas of concern:

Following Distance — Total stopping distance consists of perception distance, reaction distance, and braking distance. Most authorities recommend a four-second rule as an acceptable following distance at speeds of 40 mph or less and 5 seconds for speeds 40 mph or greater.

Rate of Closure — Emergency vehicle drivers should be aware of their rate of closure on other vehicles and pedestrians at all times. This is to maintain a safe following distance as defined. There are many reasons people may not yield to emergency vehicles even when all warning devices are operating. Some examples include:

- Emergency vehicle drivers outrun the siren's effectiveness
- Field of view is blocked
- Direction of the sound of the siren is misinterpreted
- Hearing-impaired driver
- Inattentive driver (loud music, cellular phone, kids, stress)
- The rate of closure by an emergency vehicle is too fast and doesn't allow the civilian driver to perceive the presence of the emergency vehicle

Blind Spots Alongside — Because of the size and configuration of most emergency vehicles, blind spots along both sides are normal and to be expected. An emergency vehicle driver must be aware of these areas and recognize that side-view mirrors often will not allow full visibility. Other crew members can assist the driver in viewing these difficult areas.

Traffic Closure From Behind — It is important to regularly watch vehicles behind the emergency vehicle. Often curious drivers will follow the emergency vehicle or use it to “break” traffic in an effort to move more quickly down the street or highway. Signaling any intent to turn, pass or stop is extremely important so as to keep the civilian driver(s) from following too closely or colliding with the emergency vehicle.

Speed Management: There are two primary rules regarding speed management. While they may seem extreme, it is essential that an emergency vehicle not lose control because of excessive speed. The rules are:

- Emergency vehicles must not be driven in excess of the posted speed limits regardless of any traffic law exemption.
- Emergency vehicles must not exceed cautionary speeds.

Basic Maneuvers: A competent emergency vehicle driver understands and properly completes all of the basic driving maneuvers necessary to operate the emergency vehicle he/she is certified to drive.

Steering - Whether the driver is steering an emergency vehicle during a non-emergency, responding to an emergency or making an evasive maneuver, certain habits should be followed:



- Use both hands on the steering wheel. Exceptions include operating another device on the vehicle such as shifting or turning on the windshield wipers.
- Keep arms inside the vehicle. Do not engage in other activities such as drinking, eating, or smoking.
- Maintain hands in the “3 and 9 o’clock” position.

Braking & Stopping — Effective braking is essential to safe operation of an emergency vehicle. The intent is to stop the vehicle in as short a distance as possible without losing control. In a vehicle with hydraulic brakes, this involves firmly pumping the brake pedal and releasing it prior to the locking of wheels. Air brakes require firm and steady pressure without pumping. Anti-lock braking systems (ABS), whether installed in conjunction with a hydraulic or air system, should be used in accordance with proper procedures.

Backing Up — Backing up accounts for a disproportionate number of minor low-speed accidents. Here are a few guidelines:

- Park so as to minimize the need for backing.
- Give audible notice that backing will occur.
- Use a spotter located at the left rear of the vehicle.
- Understand hand signals and audible signals.
- Use side mirrors whenever backing.
- Check the front corners of the vehicle, especially if the vehicle is turning while backing.
- Maintain speed control.

Lane Changing — Lane changing on multi-lane roads can usually be accomplished with little difficulty provided some basic rules are followed. The key is to *plan ahead, signal your intention, practice space management and make the change of lanes smoothly*. These principles should also be applied when merging onto a high-speed highway (entrance ramp) or leaving the highway (exit ramp).

Turning — Two basic principles need to be followed but are often ignored or violated: *Always signal before turning and, whenever possible, turn from one proper lane into another proper lane.*

Negotiating Intersections — Intersection procedures are extremely important. Many accidents involving emergency vehicles occur at intersections. Careful consideration should be given to establishing policies for addressing both controlled and uncontrolled intersections.

Uncontrolled intersection: Any intersection that does not have a control device (stop sign, yield sign, or traffic signal) in the direction of travel of the emergency vehicle is an uncontrolled intersection. Any intersection where the traffic signal is green for the emergency vehicle should also use the guidelines listed below. In this case, emergency vehicle drivers should:

- Scan the intersection for possible hazards. Observe traffic in all four directions — left, right, front, and rear.
- Slow down and cover the brake pedal with the driver's foot.
- Change the siren cadence not less than 200 feet from the intersection.
- Avoid using the opposing lane of traffic, if at all possible.

Controlled intersection: Controlled intersections require emergency vehicle drivers to do the following.

- Scan the intersection for possible hazards as well as driver options.
- Begin to slow down well before the intersection and cover the brake pedal with the driver's foot.
- Change the siren cadence not less than 200 feet from the intersection.
- Scan the intersection for possible passing options.
- Avoid using the opposing lane of traffic, if at all possible.
- **Come to a complete stop.**
- Establish eye contact with other vehicle drivers, have partner communicate all is clear and reconfirm all other vehicles are stopped.
- Proceed one lane of traffic at a time. Treat each lane as a separate intersection.

Operating Under Adverse Conditions: Civilian drivers usually choose when and under which conditions they drive. Unfortunately, the emergency vehicle driver must operate whenever an incident occurs. Many times this involves

adverse conditions. Typically, adverse conditions are classified in terms of how they affect traction and vision. If these conditions cannot be adequately handled or if other unexpected situations occur, the emergency vehicle driver may need to initiate crash avoidance procedures.

Traction Implications — The traction of an emergency vehicle is adversely affected by a variety of environmental conditions. These may include rain, snow and ice, high winds and/or leaves on the roadway. Whenever conditions have caused reduced traction, the emergency vehicle driver must reduce speed and steer, accelerate, or brake smoothly and evenly.

Vision Implications — Conditions that affect the vision of the emergency vehicle driver include night driving, precipitation, the vehicle, and the condition of the driver. Whenever conditions have limited vision, the emergency vehicle driver must reduce speed and steer, accelerate, or brake smoothly and evenly.

DRIVER OPERATOR TRAINING

One way to reduce the number of accidents, deaths and injuries incurred as firefighters respond to or return from emergency incidents is to ensure driver proficiency through a comprehensive emergency vehicle driver training program. Such a program should include four parts:

Classroom Instruction: A minimum of eight hours of classroom training is recommended. It should address the potential emergency vehicle driver's attitude and knowledge about how to drive while responding to an emergency as well as his or her understanding of the emergency vehicle driver's responsibility during non-emergency situations. Classroom instruction topics should include, at minimum, the following:

- Personnel selection
- Necessity of SOP/SOGs*
- Legal aspects
- Vehicle dynamics
- Inspections and maintenance
- Emergency vehicle operations/safety

*Standard Operating Procedures/Standard Operating Guidelines

Competency Course Completion: The successful completion of a competency course is designed to introduce the trainee to the specific emergency vehicle he/she will be driving. It should also identify the strengths and weaknesses of the trainee and allow him/her to build confidence. Some of the specific tasks that should be measured by competency course training are use of mirrors, turning, blind (right) side and rear positioning, backing and braking and stopping.

Street and Highway Driving: At least 8 hours of supervised, behind-the-wheel driving should be required. This includes actual driving, not pumping or other "operator" training. Street and highway driving should begin after the trainee has successfully completed the competency course. It should include, at minimum, the driving requirements and patterns as specified within Section 2-3 of NFPA 1002, Fire Apparatus Driver/Operator Professional Qualifications. This may require more than 8 hours for some trainees.

Hands-on training should also include an understanding of the vehicle's characteristics, including weight distribution, turning radius, and visibility limits, among others. During familiarization with the vehicle, the prospective driver should operate each vehicle he is expected to drive on a competency course as well as on the highway. After all elements of the recommended program have been satisfactorily completed, the trainee may, with close supervision, begin driving to emergencies.

Testing for Proficiency: A written test should be administered relating to the topics discussed in the classroom. Each candidate should demonstrate a successful score before starting hands-on training.

Only after successfully completing a recognized comprehensive driver training program should a member of an emergency service organization be permitted to drive under emergency conditions. His or her proficiency at driving an emergency vehicle should be maintained and tested on a regular basis. Driving under both emergency and non-emergency conditions, in-service training with both classroom and hands-on sessions, and regular retesting should be required to maintain the desired proficiencies

VEHICLE OPERATING PROCEDURES

It is critical that a department have standard operating procedures (SOPs) or guidelines (SOGs), relating to emergency vehicle operation. This is so that:

- All personnel understand what is expected or required of them.
- Intended compliance with all necessary requirements is identified.
- Preplanned and agreed upon actions are written.
- A resource document upon which to base training is written.

Legal requirements, liability exposure, and/or governmental regulatory responsibilities also play a role in their use and adoption. Developing and implementing SOGs now is also proactive. It is always easier to write, adopt, and implement guidelines prior to an incident involving an emergency vehicle or driver.

Fire Apparatus Safety

While firefighters do not fight fires on every emergency incident, they do respond on some type of fire apparatus to all calls for assistance. In 1998, more than a thousand firefighter injuries involved fire department emergency vehicles. About half of all injuries occurred while responding to or returning from an incident involved strains, sprains and muscular pains. Thus, the importance of fire apparatus safety.

DESIGN FEATURES OF APPARATUS

The design of fire apparatus is a key element of firefighter safety. The primary questions surrounding the apparatus include:

- Is it designed for safety?
- Is it designed for everyone to be seated and belted?
- Is it designed for people to stand?
- Is it designed to carry equipment inside the cab?
- Does the design promote safe operating procedures by firefighters when working on and around the vehicle?



Storing often-used heavy equipment in the storage area located above the pump requires climbing up on top of the vehicle and then handing the equipment down to another firefighter. This type of situation obviously increases the opportunity for injuries related to climbing, falling or lifting. Converting to a hose loading procedure with the apparatus moving forward instead of backing up is another example of a change in operating procedures that can reduce the potential for firefighter injuries.

NFPA Standards for Apparatus: Several NFPA standards reference apparatus design and/or operation:

- NFPA 1901, Standard for Automotive Fire Apparatus, provides minimum standards, many of which address safety issues for pumper, initial attack, mobile water supply, aerial ladder and elevating platform, and specialized apparatus.
- NFPA 1906 establishes standards for wildland fire apparatus.
- NFPA 1500, Standard on Fire Department Occupational Safety and Health Program, identifies, among many subjects, a number of recommendations for the safe operation of fire apparatus.

Ergonomic Considerations: Within recent years the term “ergonomics” has become a subject of increasing attention. Its importance is reflected by the number of strain and sprain injuries experienced by firefighters. “Ergonomics” as applied to the fire service is defined as *designing and fitting tools, equipment, and activities to firefighting personnel rather than fitting the personnel to the activity*. Here are some guidelines:

• ***Is equipment easy to reach for an average-sized person?***

A review should be made of the location of equipment mounted on apparatus to determine if it is easy to reach by the majority of your personnel. This is especially true for equipment that is used regularly or is heavy or awkward to handle.

• ***Is there good access to the equipment?***

Equipment located behind other equipment or in a location that requires twisting or reaching can result in injuries, especially when a firefighter is under pressure to get the equipment quickly.

• ***Is heavy equipment carried low?***

Having to reach high or to have equipment handed down from above is difficult. But when the piece of equipment is heavy, it becomes a potential injury-causing activity. Heavy equipment should be positioned low in order to facilitate easy access and lifting without excessively straining a firefighter’s back.

• ***Are there steps and pull/grab rails? How well are they placed?***

When it is necessary for a firefighter to mount, dismount, or climb on a fire apparatus are there steps and pull/grab rails for the firefighter to use? Are the steps and pull/grab rails appropriately located so as to make the mounting or climbing easy.

A practical rule of thumb with respect to ergonomics is that whenever people reach above their shoulders, below their knees, or are required to twist in order to complete a task, the chances of injury greatly increase.

The New Jersey Municipal Excess Liability Joint Insurance Fund (MEL) and the New Jersey League of Municipalities would like to thank VFIS for writing this sixth Community Safety Leadership (CSL) booklet. As a leading risk management provider for emergency service organizations, VFIS has worked with fire and emergency service leaders to help set the standard for innovative safety and risk control programs, including:

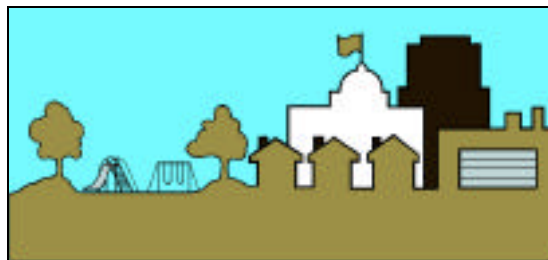
- Firefighter Safety
- Fireground Safety
- Hazard Identification Assessments
- Fleet Safety Program Development and Training
- Emergency Vehicle Response Safety
- Personal Protective Equipment Safety
- NFPA Safety and Health Audits
- Developing and Implementing SOPs/SOGs

Nine Easy Ways To Make Safety a Priority

Your municipality can reduce its accident rate by:

- Requiring that a formal safety program be in place and that its status be a recurring item on the governing body's regular workshop agenda;
- Committing to making municipal safety - for both residents and workers - a priority;
- Comparing your safety record to other towns;
- Determining how your safety program is structured and how it can be improved;
- Tracking your safety record to see if it's improving;
- Requiring monthly meetings of your community safety committee, focusing on public safety as well as municipal employee safety;
- Publishing the safety committee's minutes and distributing them to the governing body;
- Communicating potential hazards with your work force and encouraging them to share this information with you as well;
- Having a mechanism in place for employees and residents to report unsafe conditions and a procedure for remedying them on a priority basis.

If you want to serve on the steering committee or have questions regarding the CSL Program or suggestions for improving it, please contact the MEL at 201-587-0555. ■



Community Safety Leadership

Is this on your agenda?

Municipal Excess Liability Joint Insurance Fund

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