they become scratched, cloudy, opaque, and can be rendered unserviceable in a very short period of time. In many instances, the faceshield is lifted so that the wearer can see what he is doing, leaving the eyes unprotected and exposed to the dangers of flying debris. Goggles and other primary eye devices are more easily protected from damage and also provide specific protection for the wearer's eyes. There are numerous products on the market to protect the goggles from damage when stored on the helmet. Users desiring to keep goggles or eye protection stored on top of the helmets should consider one of these devices. The SCBA facepiece can provide both primary eye protection and full-face protection.

A.7.21.1 The use of PPE to limit noise exposure should be considered as an interim approach until the noise levels produced by vehicles, warning devices, and radios can be reduced. Protective ear muffs are recommended for fire fighters due to the difficulties of proper fit and insertion of ear plugs. Studies in some jurisdictions have indicated that the most harmful noise exposure can come from radios that are turned up loud enough to be heard over the noise of engines and warning devices. Ear muffs are available that provide effective sound attenuation and rapid donning. They should also be provided with built-in speakers and volume controls for radio and intercom communications. Ear muffs should be worn by operators of noisy equipment (in excess of 90 dBA) at the scene of incidents as well as during response. In some jurisdictions, traffic regulations could limit the use of hearing protection by drivers.

The fire apparatus standards require the noise level at any seated position to be a maximum of 90 dBA when measured as specified in the standard, without any warning devices in operation, as the vehicle proceeds at a speed of 45 mph (72 km/hr) on a level, hard, smooth surface road. However, it is recommended that the specifications for new fire apparatus provide maximum sound requirements that would allow members to ride in those vehicles without using hearing-protective devices. A maximum limit of 85 dBA without audible warning devices and 90 dBA with warning devices in operation is recommended. Interior noise levels should be measured with the vehicle in motion at the speed that produces the highest noise level, up to 55 mph (80 km/hr). All windows should be closed, and the noise level should be measured in each passenger area.

A.7.21.2 When operating in situations where other protective clothing and equipment are necessary, such as in structural fire fighting, the interface between hearing protection and other necessary protection might not be adequately addressed by currently used devices. For example, ear muffs might not interface with helmets, and foam plastic ear plugs could be dangerous in a fire environment due to the potential for melting. In addition, a reduction in hearing capability in an emergency operations setting could create additional hazards. Effective hearing protection should also be used during non-emergency activities such as equipment checks and engine warm-ups. Attention should be given to correcting the deficiencies through the advent of improved protective devices and through the use of alternate or improved procedures that create less noise.

A.7.21.3 An effective hearing conservation program should address the regular audiometric testing of members to identify hearing loss, the development and implementation of steps to prevent further hearing loss by members exhibiting such loss, and the ongoing identification and reduction or elimination of

potentially harmful noise sources in the work environment. The standards for hearing conservation included in 29 CFR 1910.95, "Occupational Noise Exposure," should be used as a basic minimum approach to this problem.

Any approach to hearing conservation should address personal protective devices, audiometric testing, and the reduction of noise exposure that can be achieved by modifying existing equipment or changing procedures. Examples of modifications would include moving siren speakers and air horns down onto front bumpers, responding with windows closed, and installing sound-attenuating insulation in cabs of fire apparatus. The noise produced by audible warning devices should also be evaluated to determine the most effective balance between warning value and harmful characteristics. Some studies indicate that high-low alternating-tone sirens and lower-pitch air horns could be more effective warning devices and less damaging to hearing.

A long-term approach to hearing conservation should deal with the purchase of apparatus and equipment that is less noisy by design, with noise standards included in the specifications. Improved radio equipment that produces higher clarity of sound with less output volume should also be considered.

For more information on fire department hearing conservation programs, consult the US Fire Administration publication FA-118, *Fire and Emergency Service Hearing Conservation Program Manual.*

▲ A.8.1.1 The National Wildfire Coordinating Group (NWCG) is an operational group that coordinates programs of the participating wildland fire management agencies and is comprised of representatives of the US Forest Service, four Department of Interior agencies (Bureau of Land Management, National Park Service, Bureau of Indian Affairs, and the US Fish and Wildlife Service), the Intertribal Timber Council, 50 state forestry agencies and Puerto Rico (through the National Association of State Foresters), the US Fire Administration, and the Federal Emergency Management Agency (FEMA).

The NWCG has several sources of information regarding wildland fire-fighting operations, safety, and training, including the NWCG-NFES No. 1077, *Incident Response Pocket Guide*, NWCG-PMS 410-1, *Fireline Handbook*, and NWCG-PMS 310-1, *Wildland Fire Qualification System Guide*. For a complete list of NWCG publications, see https://www.nwcg.gov/.

A.8.1.5 The incident commander should automatically integrate fire fighter safety and survival into the regular command functions. When this integration occurs, the incident commander promotes fire fighter welfare by performing the standard job of command. Under fire conditions, the incident commander is at an extreme disadvantage to perform any additional tasks. The safety plan for the incident commander has to be the regular command plan.

Due to the high number of fire fighter injuries and deaths attributable to lack of or poor implementation of the safety function on the incident scene, the incident commander should recognize the importance of integrating the safety function into the incident command structure as described in NFPA 1561.

A.8.1.7 Due to the high number of fire fighter injuries and deaths attributable to lack of or poor implementation of incident management, incident managers should be familiar with

the use of incident management teams or incident command team as described in NFPA 1561.

A.8.1.8 The following explains the responsibilities of the incident commander:

- The incident commander should always integrate fire fighter health and safety considerations into the command process. This integration ensures that safety will always be considered and will not be reserved for unusual or high-risk situations when the incident commander is under a high degree of stress. An incident action plan that addresses fire fighter safety should be a routine function of command.
- Early evaluation enables the incident commander to (2)consider current conditions in a standard manner and then predict the sequence of events that will follow. The consideration of fire fighter safety should be incorporated into this evaluation and forecasting.
- (3)Effective communications are essential to ensure that the incident commander is able to receive and transmit information, obtain reports to maintain an awareness of the situation, and communicate with all component parts of the incident organization to provide effective supervision and controls.
- Strategic decisions establish the basic positioning of (4)resources and the types of functions they will be assigned to perform at the scene of a fire or emergency incident. The level of risk to which members are exposed is driven by the strategy; offensive strategy places members in interior positions where they are likely to have direct contact with the fire, while defensive strategy removes members from interior positions and high-risk activities. The attack plan is based on the overall strategy and drives the tactical assignments that are given to individual or groups of companies/crews and the specific functions they are expected to perform. Risk identification, evaluation, and management concepts should be incorporated into each stage of the command process.
- (5)Tactical level management component people are command agents and are able to both monitor companies/crews at the actual location where the work is being done (geographic) and to provide the necessary support (functional). The incident commander uses a tacticallevel management unit as off-site (from the command post) operational/communications/safety managerssupervisors. The incident commander uses the incident organization along with communications to stay connected. Some incident management systems identify tacticallevel management components such as a division or a group for a functional position within the system, whereas other systems use the term sectors for either geographical or functional areas. As incidents escalate, the incident management system should be utilized to maintain an effective span of control ratio of not greater than 1 to 7 with an optimum ratio of 1 to 5.
- (6)The incident commander should routinely evaluate and re-evaluate conditions and reports of progress or lack of progress in reaching objectives. This process will allow the incident commander to determine if the strategy and attack plans should be continued or revised. The failure to revise an inappropriate or outdated attack plan is likely to result in an elevated risk of death or injury to fire fighters.

Effective command and control should be maintained from the beginning to the end of operations, particularly if command is transferred. Any lapse in the continuity of command and the transfer of information increases the risk to fire fighters.

A.8.2.3 The intent of the use of "clear text" for radio communications is to reduce confusion at incidents, particularly where multiple agencies are operating at the same incident.

A.8.2.4 Examples of emergency conditions could be "evacuate the building/area," "wind shift from the north to south," "change from offensive to defensive operations."

Examples of situations where the term "mayday" should be used include a lost or missing member, an SCBA malfunction or loss of air, a member seriously injured or incapacitated, a member trapped or entangled, or any life-threatening situation that cannot be immediately resolved.

When a fire fighter experiences a life-threatening situation, he or she must quickly and efficiently be able to take the steps necessary to survive and alert rescuers. This is the time when an individual fire fighter will be tested on his or her knowledge of self-survival techniques. Paramount to surviving such an experience is being able to communicate the emergency to rescuers. The terms used to communicate these needs must be chosen carefully. The terms used must be easily understood over the radio in times when operational noise is high. The terms used must also be recognizable as an emergency call for assistance by those on the incident. All persons, regardless of language accent, must easily be able to annunciate the terms used. And finally, the terms used must be short with two syllables maximum to allow for a simple single inflexion of the voice to recognize the term.

"Mayday" satisfies all of the above demands for a term that can be used to communicate a fire fighter's need for immediate assistance. "Mayday" is approved for fire service use by the National Search and Rescue Committee and is currently being used by most fire departments in the United States. Most importantly, "mayday" is easily remembered and understood over the radio when operational noise challenges radio communications.

The concern over "mayday" causing confusion with aeronautical and nautical emergencies is unfounded. In April 2002, Dr. Burton A. Clark, EFO, CFO, Management Science Program chair at the National Fire Academy, and operations chief for DHS/FEMA during national disasters wrote to Rear Admiral Ken Venuto (USCG), chairman of the National Search and Rescue Committee, requesting clarification on the use of "mayday." In August 2002, Captain Steve Sawyer (USCG) returned a letter to Dr. Clark stating, "Your recent letter inquired about use by fire departments of the term "mayday" over ground fire radios when the life of a fire fighter is in danger. Use of "mayday" under such circumstances is permissible under US law and regulations. The radio frequencies concerned are different from the aeronautical and maritime frequencies, so use of the term should not cause confusion. Further, any effective means of calling for help is authorized under both national and international radio regulations for true distress situations. Within the letter Captain Sawyer gives further insight on the appropriate use of "mayday." On page 2 of the letter it states, "Mayday' is recognized nationally and internationally as a signal meaning life is in danger and immediate assistance is required, although federal regulations only

mention its use for ship aircraft. The above guidance is based on review of the regulations and consultation with experts of the Coast Guard, FCC, International Civil Aviation Organization, and others. We trust that this explanation will help not only for your local training and operations; you may also find it useful seeking to update relevant guidance in NFPA or other standards, as appropriate."

In addition to "emergency traffic" and "mayday," the fire department can use additional signals such as an air horn signal for members to evacuate as part of their standard operating procedures. Some fire departments have developed an evacuation signal that consists of repeated short blasts of apparatus air horns. The sequence of air horn blasts should not exceed 10 seconds in length, followed by a 10-second period of silence, and it is done three times (a total air horn evacuation signal including periods of silence lasts 50 seconds). When this evacuation signal is used, the incident commander should designate specific apparatus to sound the evacuation signal using air horns. The apparatus used should not be in close proximity to the command post, if possible, thus reducing the chance of missing any radio messages.

During fire fighter rescue operations, the incident commander should consider implementing the following:

- (1) Requesting additional resources
- (2) Including a medical component
- (3) Utilizing staging for resources
- (4) Committing the RIC team from standby mode to deployment
- (5) Changing from strategic plan to a high-priority rescue operation
- (6) Initiating a PAR (personnel accountability report)
- (7) Withdrawing companies from the affected area
- (8) Assigning a rescue officer
- (9) Assigning a safety officer
- (10) Assigning a backup rapid intervention crew/company
- (11) Assigning an advanced life support (ALS) or basic life support (BLS) company
- (12) Requesting additional command level officers
- (13) Requesting specialized equipment
- (14) Ensuring that dispatch is monitoring all radio channels
- (15) Opening appropriate doors to facilitate egress and access
- (16) Requesting additional vertical/horizontal ventilation
- (17) Providing lighting at doorways, especially at points of entry

A.8.2.5 Some fire departments can also wish to be provided with reports of elapsed time-from-dispatch. This method can be more appropriate for fire departments with long travel times where significant incident progress could have occurred prior to the first unit arrival.

A.8.2.5.1 Common procedure is for the dispatch center to announce "incident clock is 10 minutes," "incident clock is 20 minutes," "incident clock is 30 minutes," and so forth.

A.8.3.1 The incident commander has the ultimate responsibility for the safety and survival of all fire department members operating at an incident. Crew Resource Management (CRM) provides a basis for improving the following:

- (1) Communication
- (2) Situational awareness
- (3) Decision-making
- (4) Teamwork

- (5) Workload management
- (6) Error management

A.8.4.1 The incident commander has the ultimate responsibility for the safety of all fire department members operating at an incident and for any and all other persons whose safety is affected by fire department operations. Risk management provides a basis for the following:

- (1) Standard evaluation of the situation
- (2) Strategic decision making
- (3) Tactical planning
- (4) Plan evaluation and revision
- (5) Operational command and control

A.8.4.2.1 The risk to fire department members is the most important factor considered by the incident commander in determining the strategy that will be employed in each situation. The management of risk levels involves all of the following factors:

- (1) Routine evaluation of risk in all situations
- (2) Well-defined strategic options
- (3) Standard operating procedures
- (4) Effective training
- (5) Full protective clothing ensemble and equipment
- (6) Effective incident management and communications
- (7) Safety procedures and safety officers
- (8) Backup crews for rapid intervention
- (9) Adequate resources
- (10) Rest and rehabilitation
- (11) Regular evaluation of changing conditions
- (12) Experience based on previous incidents and critiques

When considering risk management, fire departments should consider the following Rules of Engagement after evaluating the survival profile of any victims in the involved compartment:

- (1) We will risk our lives a lot, in a calculated manner, to save SAVABLE LIVES.
- (2) We will risk our lives a LITTLE, in a calculated manner, to save SAVABLE property.
- (3) We WILL NOT risk our lives at all for a building or lives that are already lost.

A.8.4.3 The acceptable level of risk is directly related to the potential to save lives or property. Where there is no potential to save lives, the risk to fire department members should be evaluated in proportion to the ability to save property of value. When there is no ability to save lives or property, there is no justification to expose fire department members to any avoidable risk, and defensive fire suppression operations are the appropriate strategy.

△ A.8.4.5 A safety officer should be established at all major incidents and at any high-risk incidents. The safety officer should be assigned to operate under the incident commander. Depending on the specific situation, this assignment could require one or more members. If the fire department's safety officer is not available or does not have the expertise necessary for the incident, the incident commander should assign one or more members that have the expertise to assume this responsibility. All members should be familiar with the basic duties and responsibilities of a safety officer.

A.8.4.7 Atropine auto-injectors are used in the military and have been purchased by many fire departments. Fire depart-

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ments that have auto-injectors available for their members need to provide training on the use of the auto-injector.

A.8.5.1 A standard system to account for the identity and assignment of each member could be relatively simple when all members arrive as assigned crews on fire apparatus. The identity of each crew member should at least be recorded in a standard manner on the vehicle, and each company officer is responsible for those members. In fire departments where members arrive in their own vehicles or assemble at the scene, a system is required to record the identity of each member arriving and to organize them into companies or groups with appropriate supervision. This requires a standard system of "reporting in" at the incident and becoming part of the organized system of operations.

A.8.5.10 The personnel accountability system is a method of maintaining constant awareness of the identities and location of all personnel involved in emergency operations. The personnel accountability system philosophy starts with the incident command system principles of company unity and unity of command. These duties can be fulfilled initially maintaining company accountability by documenting the situation status and resource status on the tactical worksheet. Other methods include command boards, apparatus riding lists, company personnel boards, and electronic bar-coding systems. These components can be used in conjunction with one another to facilitate the tracking of personnel by both location and function. The components of the personnel accountability system should be modular and expand with the size and complexity of the incident.

At major incidents, this function should be separate from the role of the incident commander. The function of personnel accountability should be assigned to an accountability officer (resource status and situation status) who is responsible for maintaining the status of all assigned resources at an incident. As the incident escalates, this function would be placed under the planning section.

A.8.5.11 These accountability supervisors should work with the incident commander and the division or group supervisor to assist in the ongoing tracking and accountability of members.

A.8.6.1.3 The limitation of emergency scene operations to those that can be safely conducted by the number of personnel on the scene is intended to reduce the risk of fire fighter death or injury due to understaffing. While members can be assigned to and arrive at the scene of an incident in many different ways, it is strongly recommended that interior fire-fighting operations not be conducted without an adequate number of qualified fire fighters operating in companies under the supervision of company officers.

It is recommended that a minimum acceptable fire company staffing level for companies responding to any type of fire should be four members responding on or arriving with each engine and each ladder company. The minimum acceptable staffing level for companies responding in high-risk areas should be five members responding or arriving with each engine company and six members responding or arriving with each ladder company. These recommendations are based on experience derived from actual fires and in-depth fire simulations and are the result of critical and objective evaluation of fire company effectiveness. These studies indicate significant reductions in performance and safety when crews have fewer members than the above recommendations. Overall, fivemember crews were found to provide a more coordinated approach for search and rescue and fire-suppression tasks.

During actual emergencies, the effectiveness of companies can become critical to the safety and health of fire fighters. Potentially fatal work environments can be created rapidly in many fire situations. Proper training and skills can make a difference in the need for additional personnel and in reducing the exposure to safety and health risks for fire fighters where a situation exceeds their capabilities.

A.8.6.4 For additional information, see 29 CFR 1910.134, "Respiratory Protection."

A.8.6.5 All members operating in the IDLH should use a hose line or a search rope as a point of reference for exit.

A.8.6.8 Studies have shown that the severity of incidents involving ARFF can rapidly escalate to catastrophic proportions. If fire-fighting and rescue operations are to be effective, fully assembled ARFF companies should be on-scene within the time requirements as specified in NFPA 403. Experience has shown that it is extremely difficult to assemble personnel who are responding from separate locations for individual ARFF companies within these time constraints. It is strongly recommended that the minimum ARFF company staffing level be three on-duty members responding on or with each ARFF vehicle.

It is also recommended that structural fire apparatus responding in support of ARFF operations should be staffed in accordance with A.8.6.1.3. (See also NFPA 1710.)

A.8.6.9 If advanced life support personnel are available, this level of service would be preferred. Basic life support is the minimum acceptable level.

 Δ A.8.6.14 Consideration for rescue of members working over, in, and around water should be addressed by the incident commander and safety officer within the incident action plan.

A.8.6.15.1 Examples include protective shields, mechanical/ human barriers, or alerting techniques that are distinguishable and effective under the conditions.

A.8.6.15.5 It is recommended, based on known voltage, to stay away from such energized sources as described in 8.6.15.1 per the following distances in Table A.8.6.15.5.

A.8.6.15.9.1 Examples of procedures for isolating personnel from energized equipment include protective shields, mechanical/human barriers, and alerting techniques that are distinguishable and effective under the conditions.

Table A.8.6.15.5 Distance from Energized Sources

	Distance				
Voltage	ft	m			
0-50,000	10	3			
50,000-200,000	15	4.5			
200,000-500,000	20	6.1			
500,000-750,000	35	10.7			
750,000-1,000,000	45	13.7			

Sources: 29 CFR 1926.1407-1411, "Power Line Safety"; ASME B30.5a, Standard on Mobile and Locomotive Cranes.

A.8.6.15.9.5 Marking and labeling around the main service panels might assist in locating shutoffs. Attempts to secure the main electrical service and PV System Disconnect will lower the hazard, but personnel should consider the rooftop array as still energized. Systems equipped with module-level controls provide a higher degree of safety and will shut down each module and render it safe/de-energized. Contacting qualified PV installers might be required to safely shut down a damaged system.

A.8.7.4 Figure A.8.7.4 shows the concept of emergency incident hazard control zones. The hot zone is the area presenting the greatest risks to members and will often be classified as an IDLH atmosphere. The hot zone can include no-entry zones. Examples of no-entry zones could be holes in floors, explosive devices, crime scenes, and so forth.

The warm zone is a limited-access area for members directly aiding or in support of operations in the hot zone. Significant risk of human injury (respiratory, exposures, etc.) can still exist in the warm zone.

The cold zone establishes the public exclusion or clean zone. There are minimal risks for human injury and/or exposure in this zone.

It might not always be possible or practical to mark the emergency incident hazard control zones with colored tape, signage, or other appropriate means, depending on the nature or location of the incident, available resources, and so forth. If possible, these emergency incident hazard control zones should be clearly marked. Other means of marking emergency incident hazard control zones can include flashing beacons, streets, fences, and so forth. It is essential that the perimeters of these zones are communicated to all members at the incident and that they are aware of these zones and their implications.

When colored tape is being used to mark control zones, it is recommended that the following tape colors be used:

- (1) No-entry zone: red/white chevron
- (2) Hot zone: red
- (3) Warm zone: yellow
- (4) Cold zone: green

A.8.7.4.1 A hot zone can include the area where exterior fire control activities are taking place. A hot zone can also include a no-entry zone (marked with red and white chevron tape or





other means). No personnel should enter the no-entry zone due to imminent hazard(s) or the need to protect evidence. Examples of no-entry zones could be holes in floors, explosive devices, crime scenes, and so forth. Examples of the PPE are SCBA, flash hood, and so forth.

A.8.7.4.1.1 The hot zone is an area with greater potential for risk of injury or exposure. Members entering the hot zone without an assigned task are placing themselves at greater risk for no reason. In addition, they can be increasing the risk of others operating within this zone by creating some confusion.

A.8.7.4.2 Examples of significant risk of human injury include respiratory and exposures.

N A.8.7.4.2.1 The warm zone is the portion of the emergency scene where the contaminants might have been transported by the firefighters as they leave the hot zone with contamination. In many respects, the risk to responders is equal to that in the hot zone, and the need to wear PPE continues. Until the contaminants have been removed from the PPE or the contaminated PPE removed from the firefighters, the precautions used in the hot zone must continue to be used.

A.8.7.4.4.1 Any emergency incident hazard control zone can include a no-entry zone. In the event that personnel are exposed to a no-entry zone, appropriate contamination reduction strategies for the hazards encountered should be utilized.

A.8.7.4.4.2 The intent of arranging three horizontal strands of yellow barrier tape spaced 18 to 24 in. (460 to 610 mm) apart and securely fixed to supports is to create a "picket fence" visual appearance to better warn members of the no-entry zone.

A.8.7.4.4.3 Examples of ways to illuminate no-entry zones include orange cones with flashing strobe lights, glow sticks securely attached to barrier tape, and auxiliary scene lighting devices (e.g., box lights, portable flood lights).

A.8.7.4.4.2 One and a half (1.5) times the height of the building is considered the minimum; however, unreinforced masonry construction (URM) can represent hazards to fire fighters at distances greater than 1.5 times the height of the building.

A.8.8.2 The assembling of four members for the initial fire attack can be accomplished in many ways. In their response plan, the fire department should determine the manner in which they plan to assemble members. The four members assembled for initial fire-fighting operations can include an officer, chief officer, or any combination of members arriving at the incident. For career departments, the four members should arrive in tandem if on separate units.

If members are going to initiate actions that would involve entering a structure because of an imminent life-threatening situation where immediate action can prevent the loss of life or serious injury and four members are not yet on the scene, the members should carefully evaluate the level of risk that they would be exposed to by taking such action. If it is determined that the situation warrants such action, incoming companies should be notified so that they will be prepared to provide necessary support and backup upon arrival.

A.8.8.2.4 The following examples show how a department could deploy a team of four members initially at the scene of a structure fire, regardless of how the team members are assembled:

Shaded text = Revisions. Δ = Text deletions and figure/table revisions. • = Section deletions. N = New material.

- (1) The team leader and one fire fighter could advance a firefighting hose line into the IDLH atmosphere, and one fire fighter and the pump operator become the standby members.
- (2) The team leader could designate the pump operator to be the incident commander. The team leader and one fire fighter enter the IDLH atmosphere, and one fire fighter and the pump operator remain outside as the standby members.
- (3) Two fire fighters could advance the hose line in the IDLH atmosphere, and the team leader and the pump operator remain outside as standby members.
- △ A.8.8.7 The difficulty in rescuing a downed member or member in trouble cannot be overstated. While one crew/ company might suffice at a single-family dwelling, the act of rescuing a member who is lost, trapped, or missing will become increasingly difficult at a large commercial building or highrise building.

The ability to rapidly deploy a rapid intervention crew/ company from the command post to an area remote from the location of the command post can adversely affect the successful rescue of a member. Consideration should be given to assigning a RIC to each point of crew entry at a commercial building.

A.8.9.1 Having a preplanned rehabilitation program that is applicable to most incident types is essential for the health and safety of members. The rehabilitation plan should outline an ongoing rehabilitation for simple or short-duration incidents as well as a process to transition into the rehabilitation needs of a large or long-duration incident.

A.8.9.1.1 Rehabilitation operations include work cycles using SCBAs during active fire-fighting operations and overhaul operations.

A.8.10.1 Fire department members should not enter an environment where there is ongoing violence, or the threat of violence such as persons with weapons, without coordination with law enforcement personnel. This does not necessarily limit the ability of cross-trained fire/law enforcement personnel or specialty trained EMS personnel from entering a violent scene to assist the law enforcement or fire department responders.

A.8.10.3 Such situations include but are not limited to civil disturbances, fights, violent crimes, drug-related situations, family disturbances, deranged individuals, and people interfering with fire department operations.

A.8.10.3.1 The Firefighting Resources of California Organized for Potential Emergency (FIRESCOPE) has developed ICS-701, *Emergency Response to Tactical Law Enforcement Incidents*, which might be useful in developing a standard operating procedure in this area.

A.8.10.5 Incidents that appear routine in nature can, after the arrival of responding crews, turn into a violent or hostile environment. A standard communication phrase, known only by communications personnel and other responders, can warn others to the dangers of the situation without triggering violence or hostilities.

A.9.4 This could be done as shown in the *Manual on Uniform Traffic Control Devices (MUTCD).*

A.9.4.1 In most cases, the primary traffic threat will be upstream; however, first-arriving responders might find that the

primary traffic threat is other than upstream (intersections, on and off ramps, steep grades, etc.).

When resources are available, responders should establish a temporary traffic incident management area (TIMA). A TIMA is defined as an area of a highway where temporary traffic control (TTC) is imposed by authorized officials responding to a road user incident, natural disaster, hazardous material spill, or other unplanned incident. The TIMA extends from the first warning device (such as a sign, light, or cone) to the last TTC device, or to a point where vehicles return to the original lane alignment and are clear of the incident. The *MUTCD*, Chapter 6I contains detailed guidance on the recommended size of a TIMA, depending upon road configuration, vehicle speed, and weather conditions.

A.9.4.2 In accordance with *MUTCD*, the use of emergency-vehicle lighting (such as high-intensity rotating, flashing, oscillating, or strobe lights) is essential, especially in the initial stages of a traffic incident, for the safety of emergency responders and persons involved in the traffic incident, as well as road users approaching the traffic incident. Emergency-vehicle lighting, however, provides warning only and provides no effective traffic control. The use of too many lights at an incident scene can be distracting and can create confusion for approaching road users, especially at night.

A.9.4.5 Warning signs should be placed in accordance with the *MUTCD*, depending upon the severity of the incident and anticipated on-scene time, with the intent of providing early warning to the motoring public so as to provide for proper reaction time to safely traverse the TTC zone created around an emergency scene.

Minor Traffic Incidents. Minor traffic incidents are typically disabled vehicles and minor crashes that result in lane closures of less than 30 minutes. On-scene responders are typically law enforcement and towing companies, and occasionally highway agency service patrol vehicles. [**MUTCD:**6I.04.01]

Diversion of traffic into other lanes is often not needed or is needed only briefly. It is not generally possible or practical to set up a lane closure with traffic control devices for a minor traffic incident. Traffic control is the responsibility of on-scene responders.

Intermediate Traffic Incidents. Intermediate traffic incidents typically affect travel lanes for a time period of 30 minutes to 2 hours, and usually require traffic control on the scene to divert road users past the blockage. Full roadway closures might be needed for short periods during traffic incident clearance to allow traffic incident responders to accomplish their tasks. [MUTCD:6I.03.01]

The establishment, maintenance, and prompt removal of lane diversions can be effectively managed by interagency planning that includes representatives of highway and public safety agencies. [**MUTCD:**61.03.02]

Major Traffic Incidents. Major traffic incidents are typically traffic incidents involving hazardous materials, fatal traffic crashes involving numerous vehicles, and other natural or manmade disasters. These traffic incidents typically involve closing all or part of a roadway facility for a period exceeding 2 hours. [**MUTCD**:6I.02.01]

A road closure can be caused by a traffic incident such as a road user crash that blocks the traveled way. Road users are

usually diverted through lane shifts or detoured around the traffic incident and back to the original roadway. A combination of traffic engineering and enforcement preparations is needed to determine the detour route, and to install, maintain or operate, and then to remove the necessary traffic control devices when the detour is terminated. Large trucks are a significant concern in such a detour, especially when detouring them from a controlled-access roadway onto local or arterial streets. [**MUTCD:**6I.02.03]

During traffic incidents, large trucks might need to follow a route separate from that of automobiles because of bridge, weight, clearance, or geometric restrictions. Also, vehicles carrying hazardous material might need to follow a different route from other vehicles. [MUTCD:6I.02.04]

Some traffic incidents such as hazardous material spills might require closure of an entire highway. Through road users must have adequate guidance around the traffic incident. Maintaining good public relations is desirable. The cooperation of the news media in publicizing the existence of, and reasons for, traffic incident management areas and their TTC can be of great assistance in keeping road users and the general public well informed. [**MUTCD:**6I.02.05]

The establishment, maintenance, and prompt removal of lane diversions can be effectively managed by interagency planning that includes representatives of highway and public safety agencies. [**MUTCD:**61.02.06]

Figure A.9.4.5 shows the different traffic areas while operating at a roadway incident.

Table A.9.4.5 shows the minimum distances used for each area within the operation at a roadway incident.

A.9.4.9 Members who operate on roadway incidents should be provided with garments that ensure proper conspicuity enhancement consistent with the requirements in the *Manual* on Uniform Traffic Control Devices.

A.9.4.10 Proper training in traffic control can be obtained from local or state highway departments, law enforcement, and other agencies involved with controlling the roadway traffic. The AHJ should participate in local or regional traffic incident management committees. The fire department should also be familiar with the National Traffic Incident Management Coalition's *National Unified Goal*.





A Table A.9.4.5 Warning Device Placement

-	Advance Warning Area			Transition Area Activity Area		Termination Area				
	Advance Warning Sign Minimum Distance (ft)				stance (ft)	Recommended Lengths (ft)				
Speed (mph)	A	В	С	Cumulative Total	Shoulder Taper	Taper	Distance Between Tapers (Longitudinal)	Buffer (Longitudinal)	Downstream Taper	Cone Spacing (ft)
25	200	200	200	600	45	125	250	155	50-100	25
35	350	350	350	1050	85	245	490	250		35
45	500	500	500	1500	180	540	1080	360		45
55	1000	1500	2640	5140	220	660	1320	495		55
65	1000	1500	2640	5140	260	780	1560	645		65

For S.I. Units, 1 mph = 1.6 km/hr, 1 ft = 0.3 m.

Source: US DOT Second Strategic Highway Research Program (SHRP2) Traffic Incident Management Training.

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A.10.1.1 Where health, safety, building, and fire codes are not legally applicable to fire department facilities, steps should be taken to ensure that equivalent standards are applied and enforced. In the absence of local requirements, the provisions of NFPA 1, NFPA 70, NFPA 101, NFPA 5000, the Uniform Plumbing Code, and the Uniform Mechanical Code should be applied. In addition, the workplace safety standards specified in 29 CFR 1910, "Occupational Safety and Health Standards," or an equivalent standard should be applied. Applicable requirements of the Americans with Disabilities Act should be met.

For a more thorough overview of safety and health considerations that should be addressed at fire department facilities, see FA-168, Safety and Health Considerations for the Design of Fire and Emergency Medical Service Stations.

A.10.1.3 As new stations are constructed or existing stations are renovated, a separation between the apparatus floor and living quarters should be provided.

A.10.1.5 The operation of a fire department requires the storage and indoor operation of fire apparatus that are generally housed in an enclosed building. The need to keep the apparatus and other vehicles ready for immediate service and in good operating condition, which requires the indoor running of vehicles for response and routine service/pump checks, makes storage in an enclosed area, such as an apparatus bay, necessary. The exhaust from all internal combustion engines, including diesel and gasoline-powered engines, contains over 100 individual hazardous chemical components that, when combined, can result in as many as 10,000 chemical compounds. A large majority of these compounds are today listed by state and federal regulatory agencies as being cancer causing or suspected carcinogens. The target components listed by NIOSH/OSHA consist of both hydrocarbon carbon components and compounds, which are produced as both gasphase and particulate-phase compounds. The gases and particulates, which are viewed by NIOSH and OSHA as life threatening, consist of a cancer-causing substance known as polynuclear aromatic hydrocarbons (PAHs). Gases in diesel exhaust, such as nitrous oxide, nitrogen dioxide, formaldehyde, benzene, sulfur dioxide, hydrogen sulfide, carbon dioxide, and carbon monoxide, can also create health problems. According to NIOSH, human and animal studies show that diesel exhaust should be treated as a human carcinogen (cancer-causing substance). In accordance with the NIOSH Pocket Guide to Chemical Hazards, as it pertains to diesel exhaust, NIOSH recommends that occupational exposure to carcinogens be limited to the lowest feasible concentration. NIOSH uses OSHA's classification, outlined in 29 CFR 1990.103, "Definitions," which states in part, "Potential occupational carcinogen means any substance, or combination or mixture of substances, which causes an increased incidence of benign and/or malignant neoplasm, or a substantial decrease in the latency period between exposure and onset of neoplasm in humans or in one or more experimental mammalian species as the result of any oral, respiratory or dermal exposure, or any other exposure which results in the induction of tumors at a site other than the site of administration." This definition also includes any substance that is metabolized into one or more potential occupational carcinogens by mammals.

A.10.1.8 As part of the fire station inspection program, the areas around the pole hole and the padding at the bottom of the pole should be regularly checked to ensure the safety of members using the pole.

A.10.3 In some jurisdictions, fire department facilities are maintained by other agencies. In these situations, fire departments should develop a process to expedite requests for repairs or modifications to the facility to address safety or health concerns.

- **NA.10.4.1(1)** Such systems can be set automatically to activate louder during the day and quieter at night.
- NA.10.4.1(4) This feature allows only members of the dispatched needed company to be alerted.
- **NA.10.5.2.1** The transition area (yellow) should function as an air-lock vestibule between zones.
- **NA.10.5.5** Ice machines should not be exposed to residual diesel exhaust and off-gassing of contaminated equipment and PPE.

A.11.1.5 If any member, either career or volunteer, reports for duty under the influence of alcohol or drugs, or any other substance that impairs the member's mental or physical capacity, this situation cannot be tolerated.

Evidence of substance abuse could include a combination of various factors such as slurred speech, red eyes, dilated pupils, incoherence, unsteadiness on feet, smell of alcohol or marijuana emanating from the member's body, inability to carry on a rational conversation, increased carelessness, erratic behavior, inability to perform a job, or other unexplained behavioral changes.

The possibility of liability exists if a member who is under the influence of alcohol or drugs is allowed to remain on duty, to operate or drive vehicles or equipment on duty, or to drive a private vehicle from the duty site. A member who is believed to be under the influence of alcohol or drugs cannot be allowed to operate equipment or drive a vehicle, including a private vehicle, until the condition of the member has been determined and verified.

A.11.2.1 Fire departments should consider use of the recruiting, mentoring, and training process found in the physical performance requirements referenced in the IAFF/IAFC Candidate Physical Ability Test (CPAT) Manual.

A.11.4.1 The health data base for a fire department should include the reports of regular physical evaluations, injury and illness reports, health exposures, and any supporting information that could be useful in tracking, analyzing, or predicting the health effects of various events on individuals or the group. This process should comply with the medical record-keeping requirements of 29 CFR 1910.120, "Hazardous Waste Operations and Emergency Response."

A.11.4.3 This information should be managed in a manner that respects the confidentiality of doctor-patient relationships. Electronic data processing is often employed to facilitate management of such a data base.

A.11.4.4 The fire department should try to obtain autopsy or other medical information for all deceased employees or former employees. This information could be useful in establishing relationships between occupational factors and resulting fatalities at some time in the future. Autopsies for fire fatalities should be conducted and recorded according to a standard protocol.

A.11.5.1 Where fire department members routinely respond to emergency medical incidents, the fire department should consult with medical professionals and agencies on measures to limit the exposure of members to infectious and contagious diseases. This should include the provision and maintenance of equipment to avoid or limit direct physical contact with patients, when feasible.

A.11.6.3 A fire department physician should have specific expertise and experience relating to the needs of fire department members and a thorough knowledge of the physical demands involved in emergency operations. If possible, the fire department physician should be a specialist in the field of occupational medicine.

A.11.6.4 Depending on the size and the needs of a fire department, the fire department physician might or might not be required on a full-time basis. A fire department should have a primary relationship with at least one officially designated physician. This physician can serve as the primary medical contact and, in turn, deal with a number of other physicians and specialists. A large fire department can designate more than one fire department physician or might determine that a relationship with a group practice or multiple-provider system is more appropriate to its needs. In any case, the option to consult with a physician who is particularly aware of the medical needs of fire department members and who is available on an immediate basis should exist.

 Δ A.12.1 A unique understanding of the fire service and its inherent dynamics, as well as advanced knowledge about trauma and addictions, is required of behavioral health specialists and clinicians to effectively address fire department members' behavioral issues and maintain overall behavioral health and wellness. The intrinsic value to the first responders of the availability of such behavioral health specialists trained in the unique cultural aspects of the fire service is essential to the success of the program. Such training should include regular opportunities for experiential learning such as ride-alongs and/or participation in live simulated training exercises, which help familiarize the behavioral health specialist with the daily working environment of the fire service.

Current research with first responders has shown that developing an understanding of how the body and brain respond to stress is essential. Developing coping mechanisms that support the unique behavioral health need and challenges of first responders maintain ongoing personal behavioral health is a core component of this program. Providing first responders with techniques to help mitigate the impacts of traumatic exposures is critical to long-term personal health, interpersonal dynamics, and overall organizational health. The term *resiliency* is used to address this multifaceted approach for overall health and well-being.

A behavioral health and wellness program can encompass all or some of the following services:

- (1) Acute stress
- (2) Traumatic exposures
- (3) Post-traumatic stress (PTS)
- (4) Depression
- (5) Grief
- (6) Family situations
- (7) Line-of-duty death (LODD) support services
- (8) Stress management
- (9) Substance use

- (10) Health and wellness concerns
- (11) Resiliency

A behavioral health and wellness program can utilize all or some of the following delivery methods to reach members:

- (1) Peer support program
- (2) MAP or EAP behavioral health problem identification, assessment, and grief counseling
- (3) Treatment and/or referrals to outside agencies, as appropriate
- (4) Family support and outreach
- (5) Follow-up services and case management
- (6) Leadership development
- (7) Executive coaching
- (8) Coaching for supervisors dealing with troubled employees
- (9) Workplace mediation
- (10) Conflict resolution
- (11) Health and psychoeducational materials/activities
- (12) Management of behavioral health care under insurance plans
- (13) Department diversity training
- (14) Officer and department-wide training
- (15) Chaplain services for spiritual needs
- Δ A.12.1.1 Basic levels of assistance as enumerated in the standard should be available at the first step of access. The objective should be to provide these services in a manner that facilitates ease of access and usage, minimizes delays and obstacles, and encourages proactive utilization. Members and their families should be informed about the program, its services, and how to access its resources, both at the time that they enter the organization and regularly throughout their tenure. The behavioral health program should also serve as a resource for identification of and access to other important community resources such as self-help groups (e.g., Alcoholics Anonymous, Alanon, and Alateen), community health resources, parenting resources, and so forth. The behavioral health program should collaborate with the fire department's program to address occupational exposure to atypically stressful events (see Chapter $1\overline{3}$).

The fire department behavioral health program does not need to be operated or financed by the fire department. Many community/county/state mental health agencies provide such services and these can be available without charge or at reduced fees. Labor and employee organizations can also sponsor and/or operate such programs. The fire department needs to have the ability to identify when pertinent problems exist and be able to provide confidential referral for professional services when indicated. Program standards developed by the Association of Labor-Management Administrators and Consultants on Alcoholism (ALMACA) and the Employee Assistance Professional Association (EAPA) recommend the following:

- (1) The physical location at which services are provided should facilitate easy access while ensuring confidentiality.
- (2) Medical and disability plans should be reviewed to ensure that plans provide adequate coverage for alcohol, substance, and mental health needs (including access to outpatient, intensive outpatient, partial hospitalization, inpatient and residential care, and day treatment options).
- (3) Staff of the fire department behavioral health program should be sufficiently familiar with medical and disability

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benefit plans to facilitate adequate advising regarding the extent, nature, and cost of the recommended treatment and the reimbursement available.

Primary staff for the program should possess the following:

- (1) Appropriate managerial and administrative experience in a clinical setting
- (2) Skill in clinical interviewing, diagnostic assessment, treatment planning, grief counseling, case management, and referral/care coordination for behavioral health problems and disorders
- (3) A Ph.D. or Master's degree in the field of psychology, clinical social work, mental health counseling, or psychiatric nursing
- (4) An active license in good standing in the state in which services will be delivered, as well as appropriate training and certification with respect to any direct clinical or counseling services relevant to the behavioral health issues in the fire service

Primary staff training should include regular opportunities for experiential learning such as ride-alongs and/or participation in live simulated training exercises, which help familiarize the behavioral health specialist with the daily working environment of the fire service.

Active and appropriately prepared peer personnel are often critical to the success of a fire service behavioral health program. These personnel serve most effectively as a bridge between the distressed member and professional services. They can serve valuable roles in outreach, referral, connection, awareness, and support for those who could benefit from support but might be unaware of its availability or benefits, are resistant to seeking help, or are uncertain about the confidentiality of services. With proper training, peer personnel can help coworkers evaluate situations, consider alternatives, and access resources. Preparation should include training regarding resources, protocols, and procedures related to the peer support program, as well as active listening skills, assessment, outreach, and referral skills. Preparation should emphasize boundaries between peer roles and staff responsibilities, especially with respect to counseling and intervention.

Peer personnel should operate in regular consultation with a licensed mental health provider, ideally the behavioral health specialist. It is important that members and their families are informed about the program and the services it offers and are continually updated on its existence, availability, and confidentiality. Information about the program should be made available to all new members and their families.

 Δ A.12.1.2 Referrals for specialty care should be made whenever a member or family requires treatment beyond primary counseling. Specialists receiving referrals should be fully licensed and certified to provide care consistent with appropriate standards (e.g., American Society of Addiction Medicine for alcohol and substance use treatment; American Association for Marriage and Family Therapy for family and relationship issues; American Psychiatric Association, American Counseling Association, and National Association of Social Workers for the treatment of mental disorders) and current guidelines for evidence-based practice in the treatment of clinical diagnoses (e.g., published reviews of the Cochrane Collaboration).

NA.12.1.2.2.1 Confidentiality of all behavioral health data is critical to the success of the program. Members need to feel

assured that the information provided to the clinicians and peer support personnel will not be inappropriately shared.

A.12.1.2.3 Adherence to federal regulations regarding confidentiality of alcohol and other drug abuse records is required of programs receiving federal funds, directly or indirectly.

Compliance with all aspects of the Health Insurance Portability and Accountability Act (HIPAA) is also required.

A.12.1.3 Referrals for specialty care should be made whenever a member or family requires treatment beyond primary counseling. Specialists receiving referrals should be fully licensed and certified to provide care consistent with appropriate standards (e.g., the American Society of Addiction Medicine for alcohol and substance abuse treatment; the American Association for Marriage and Family Therapy for family and relationship issues) and current guidelines for evidence-based practice in the treatment of clinical diagnoses (e.g., published reviews of the Cochrane Collaboration).

A.12.1.4 Policies should recognize the impacts of addictions on job performance, safety, and quality of life and emphasize the need for proactive efforts in treatment and rehabilitation.

Responsibilities of management, member organizations, and members as they relate to the policy should be clearly delineated.

Prerogatives of management and responsibilities of member organizations should not be altered or abridged by the policies enacted. Participation in assistance programs should not affect future service or career advancement. Joint sponsorship by management and member organizations is highly desirable, and cooperative action in administration of the policy is encouraged.

A.12.2.1 Components of a prevention and health promotion program should focus on cardiac risk reduction, smoking/ tobacco cessation, blood pressure regulation, strength and aerobic physical fitness training, nutrition, stress management, diabetes prevention, metabolic syndrome prevention, weight management or control, shift work and sleep hygiene, infectious disease and control, and so forth, and should provide education and counseling for the purpose of preventing health problems and enhancing overall well-being.

The wellness program should also include education, resources, and counseling on a variety nonclinical issues relevant to member wellness and maintaining a balanced life, including, but not limited to, balancing emergency service work with marriage and family obligations, interpersonal communication skills, financial literacy, career/vocational guidance, and retirement planning.

A.12.2.2 The fire department should develop a policy on the use of tobacco products for all members. The fire department should also develop a policy on the acceptance of new members into the fire department with regard to the use of tobacco products.

N A.12.2.3.4 Research indicates that firefighters are at a high risk for sleep deprivation, fatigue, and sleep disorders. Firefighters who grapple with their "internal body clock" or circadian rhythm due to shift work or other long work hours and are sleep deprived often struggle with memory, focus impairment, irritability, depression, and relationship/social problems. In turn these can lead to an increased risk of accidents and injuries. These studies also note that firefighters face potential

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health problems, including a higher risk of ulcers, insulin resistance, metabolic syndrome, heart disease, and cancer. Strategies to consider to combat acute and chronic sleep and circadian rhythm disorders include the following:

- (1) Strategic caffeine use
- (2) Taking naps
- (3) Proper sleep hygiene
- (4) Identification and treatment of sleep disorders

A.13.1 Substantial research has been conducted and reported since the last revision of this standard, respecting occupational exposure to potentially traumatic events and interventions directed toward mitigating their impact. Certain well-engrained approaches, most specifically critical incident stress debriefing (CISD), have not been shown to be effective in controlled studies and have been reported to have resulted in paradoxical, adverse outcomes for at least some participants. A number of authoritative guidelines now recommend against routine debriefing. Accordingly, this revision specifically deletes reference to CISD/CISM (critical incident stress management) as a required or desirable intervention and shifts its emphasis toward the use of professional services.

NA.13.1.1.2 The training of the behavioral health specialist should include regular opportunities for experiential learning such as ride-alongs and/or participation in live simulated training exercises, which help familiarize the behavioral health specialist with the daily working environment of the fire service.

A.13.1.2 Over the past 10 to 15 years, fire departments across the country have realized that some of the components and their implementation of the early critical incident stress management (CISM) programs have not met the needs of fire department members or responders from other emergency service departments and organizations.

Current approaches integrate information about the brain and brain trauma, understanding how repeated exposure to traumatic events can erode mental and physical resilience and accumulates over time, affecting each person differently, and how to empower each individual to manage his or her own symptoms.

Some examples of potentially traumatic events are as follows:

- (1) Line-of-duty deaths
- (2) Suicide of a colleague
- (3) Serious work-related injury
- (4) Multicasualty/disaster/terrorism incidents
- (5) Events with a high degree of threat to the personnel
- (6) Significant events involving children
- (7) Events in which the victim is known to the personnel
- (8) Events with excessive media interest
- (9) Events that are prolonged and end with a negative outcome
- (10) Any significantly powerful, overwhelming distressing event
- (11) Administrative betrayal
- (12) Forced retirement

A behavioral health program for potentially traumatic events should include the following:

(1) Selection of highly respected and trusted members to serve on the peer support team, along with the department's behavioral health specialist

- (2) Department-wide education on the program prior to implementation to include training for new members
- (3) Trained chaplains who can recognize signs of distress and use a nondenominational approach to persons needing emotional or spiritual support.
- (4) Regularly scheduled peer team meetings for ongoing education and incident review

Interventions should focus specifically on those directly exposed to the traumatic event. Not all members who respond to an event are exposed to the trauma, and if participating in the intervention, might be unnecessarily exposed to the details of the trauma and subsequently negatively impacted.

The fire department's written policy should indicate the responsibilities of the organization, its officers, and its members in ensuring that the impact of occupational events is systematically anticipated and considered. The policy should enhance support from officers, supervisors, and peers and full integration where indicated with the department's behavioral health assistance (*see Chapter 12*).

Research shows the importance of recognizing the long-term impacts of repeated exposure to stress and the need to educate organization members to recognize the signs of cumulative exposure. It is also critical to note that EMS providers, whether in a stand-alone EMS agency or part of a combined service, suffer at an even higher rate than many fire fighters. With the increasingly larger role the fire service plays in the delivery of EMS services, the data and consequences should not be ignored. Industry agencies are beginning to recognize and provide active support for stress-related issues.

A.13.1.3.2 Examples of licensed mental health providers include psychiatrists, psychiatric nurse practitioners, advanced practice psychiatric registered nurses, clinical psychologists, licensed clinical professional counselors, licensed mental health counselors, and clinical social workers.

- **N A.14.1** Cancer has become one of the leading causes of lineof-duty deaths (LODDs) of fire fighters. Cancer rates of fire fighters have risen dramatically in correlation with the increase in toxicity of smoke. Smoke from a fire always contains contaminants, which are harmful to health when these toxins enter the body via mouth, respiratory tract, mucous tissue or skin. Research has shown that contaminants including volatile organic compounds (VOCs) and polycyclic aromatic hydrocarbons (PAHs) settle on protective equipment and do not break down, leading to longer exposure times through off-gassing and an increased rate of various health problems. VOCs and PAHs are persistent toxins and remain constant in the air and on protective equipment. Additional hazards at the fireground might be caused by hazardous materials such as asbestos or flame retardant materials found in the products of combustion.
- **N A.14.4.2** Prolonged incidents such as wildland fire-fighting operations, widespread natural disasters, acts of terrorism, or other occurrences in which emergency operations are segmented into extended work periods might not be conducive to the decontamination of equipment or personnel when moving from one geographic location to another during the course of the work period. In such instances, the fire department should make every reasonable effort to decontaminate personnel and equipment at regular intervals or during rehabilitation periods. All personnel and PPE should be decontaminated at the end of every work period before being released from emergency operations.

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