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Occupational Safety and Health Administration (OSHA)
Docket Office
U.S. Department of Labor
Room N-2625
200 Constitution Avenue, NW
Washington, DC 20210

Re: Docket No. OSHA-2007-0073

On behalf of the nearly 350,000 members of the International Association of Fire Fighters (IAFF), we submit these comments in response to the 05 FEB 2024, Occupational Safety and Health Administration (OSHA) request for information (RFI). The IAFF strongly supports OSHA's proposed Emergency Response Standard (ERS) and believes that the regulations it contains will make emergency responders safer, improve the relationship between emergency response employees and their employers, and save the lives of emergency responders everywhere.

Time and again, IAFF members have experienced fireground deaths and injuries that were completely preventable. For years, the federal government has failed to develop comprehensive, enforceable safety standards to protect the IAFF's frontline members. We have seen firsthand the devastating impact that the current patchwork of emergency responder safety standards – or lack thereof – has had on emergency response employees' health and well-being.

We have carefully reviewed the materials in the RFI and developed the following comments in consultation with our membership. This document outlines areas where the IAFF broadly supports the proposed rule, where further clarification may assist in the implementation of the rule, and where language could better align with the terminology familiar to emergency responders. More importantly, we strongly support the need to protect our members on the fireground, on the fire line, and at the scene of emergencies. We appreciate this opportunity to

elaborate on the areas where the IAFF supports OSHA's efforts to keep fire fighters safe and healthy, and where we feel that more work may be needed to support our members.

Towards this end, we have captured our comments related to the proposed rule according to each paragraph as outlined by OSHA in the proposed standard. Additionally, we have added our responses to OSHA's questions that reflect the perspectives of the fire service.

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I. Response to Request for Information (RFI)

The IAFF appreciates the opportunity to comment on this RFI on behalf of our members and in the interest of the health and safety of all emergency response personnel. Because the RFI asks for commentary on the broad issues within the existing Fire Brigades Standard (29 CFR 1910.156), the following comments have been grouped into major categories. Our response examines elements of the proposed ERS.

Based on this opportunity for comment, we want to emphasize a critical area for further review:

"*Responses to the RFI generally supported the need for continued rulemaking; therefore, the agency worked with the National Advisory Committee for Occupational Safety and Health (NACOSH) to assemble a subcommittee of emergency response community representatives to develop draft regulatory language through a process akin to negotiated rulemaking. To ensure a draft standard would incorporate best practices and the latest advances in technology, OSHA invited emergency response stakeholder organizations to provide subject matter experts to consult with and participate on the Subcommittee. The Subcommittee comprised a balanced group of subject matter experts representing labor and management, career and volunteer emergency service management associations, other Federal agencies and State plans, a national consensus standard organization, and general industry skilled support workers. NACOSH unanimously recommended that OSHA proceed with the rulemaking to update its emergency response standard and endorsed the draft regulatory language developed by the Subcommittee.*"

This language suggests that the draft standard was created without referring to applicable industry standards. Industry standards, such as those created and maintained by the NFPA, **were** considered by the emergency response community subcommittee in the creation of the ERS. While there is a notation on p. 7775 that "national consensus standard organizations" were included in the creation of the ERS, it is essential that the phrase "industry standards" is included in the paragraph quoted above to reflect the fact that the subcommittee did not view industry standards as "optional." Indeed, the text of the ERS reflects the necessity of complying with industry standards by, amongst other things, referencing and incorporating NFPA standards throughout the proposed regulation. We suggest that OSHA edits the sentence quoted above to read: "To ensure a draft standard would incorporate best practices**, industry standards**, and the latest advances in technology where applicable…" (emphasis added).

II. Background and Need for the Standard

Fatality and Injury Analysis

It is commendable that OSHA has made notations to several NFPA standards in these sections. Similarly, OSHA also includes injuries and fatalities that are the result of overexertion. However, there is no reference to the effects of adequate staffing in

reducing the likelihood of overexertion, injuries, and deaths when responding to emergency incidents. Research that discusses fire fighter exertion during critical fireground tasks was performed in coordination with the National Institute of Standards and Technology (NIST) fireground studies and should be considered by OSHA.[1]

Neither the fatality, nor the nonfatality sections, specifically address fatalities and injuries that are a result of patient or bystander assault and battery. There is a mention in Table VII-A-5 (p. 7776), but this is an important consideration. As the industry transitions away from accepting assault and battery of responders as "part of the job," it is essential federal departments and agencies begin to acknowledge this threat to worker safety and well-being. The ERS must reflect these increasing threats to our nation's emergency responders. We suggest that these sections should be revised to address our members' safety. Additionally, this paragraph provides an overview of injuries and fatalities that fire fighters and EMS providers often experience. However, it does not include verbal or physical assaults. It should not be assumed that this fits into the mentioned results. OSHA should edit this paragraph to note our members' exposure to verbal or physical violence.

Health Effects of Emergency Response Activities (Exposures, Other Contaminants, and Substances)

Fire fighters are exposed to a multitude of health risks, on the job, and within firehouses, agency facilities (e.g., training towers), and stations. While the focus in this ERS centers on exposure to hazardous substances through equipment contamination, the reality extends far beyond this scope. Inside firehouses, fire fighters may encounter various contaminants, including but not limited to asbestos, mold, vehicle exhaust fumes, and contaminated drinking water. These toxins and toxicants can both exist within the fire station, on the fire line, during training exercises, and may be unintentionally brought back to the fire station following an exposure or potential exposure on scene or pre/post incident. These additional exposures, coupled with multiple potential routes of exposure within the station, on the fireground, and/or at agency facilities, underscores the complexity of occupational health risks faced by fire fighters beyond the immediate hazards encountered during emergency response operations. This section should be updated to comprehensively encompass these additional exposures and routes of exposure to expand beyond equipment contamination.

National Consensus Standards

In addition to the listed standards, we suggest that OSHA evaluates and includes the following NFPA Standards:
- NFPA 1900 Standard for Aircraft Rescue and Firefighting Vehicles, Automotive Fire Apparatus, Wildland Fire Apparatus, and Automotive Ambulance.
- NFPA 1750 Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Providing Fire and Emergency Services to the Public. (NFPA 1710 has been incorporated into this document.)

- NFPA 1900 will address vehicle safety concerns in a similar manner to the consideration given to the need for NFPA 1910.
- Similarly, NFPA 1750, specifically the 1710 portions, which will address minimum safe staffing requirements. 1710 and 1720, are mentioned later in the document on page 63/7836, but on page 63 it is noted that they, "are not formally incorporated into the proposed standard."

Given that adequate staffing and timely response have been shown to reduce physical strain on responders and improve the efficiency of their operations,[2] which further reduces physical strain and benefits members of the public experiencing emergencies, we encourage OSHA to formally incorporate mandatory minimum staffing requirements into the proposal. As such, requiring minimum staffing is not far-reaching and would be aligned with the NFPA consensus standards (NFPA 1710) referenced in the proposed standard, section 5.2.3.

Organization of the Workplace Emergency Response Team, Workplace Emergency Response Employer, or Emergency Service Organization: Paragraph (c)

The IAFF views the safety of both public sector and industrial emergency response employees – whether fire suppression, rescue, and hazardous material response are part of their core job functions or ancillary – as paramount. We do recognize the need for consistent safety standards across different employment contexts, and we also acknowledge that there are differences in these workplaces that impact efficacy of response. We primarily represent ESOs and so our comments are reflective of the majority of our membership.

Paragraph C of the proposed ERS highlights the general requirements for occupational safety and health standards, which should encompass all emergency responders that fall under the ESO. While we understand the differences in WEREs and ESOs, it is essential for us to examine the areas where WERE preparedness can impact the performance and operational effectiveness of ESOs. Therefore, we propose that OSHA evaluates the impact of the following:

- Safety: Both WERE and ESO responders encounter similar risks, including exposure to hazardous materials and carcinogens, structural and wildland fires, and emergency medical situations. Additionally, if WEREs perform emergency response as an ancillary duty and not as part of their core responsibilities, it is imperative that they receive adequate initial and ongoing training to remain proficient in response. Competence decreases over time, and a lack of skill proficiency creates unsafe operating conditions for responders and victims alike.[3]

- Training and Equipment: Industrial fire fighters require the same level of training and access to appropriate equipment as ESO responders. In fact, industrial fire fighters may need a higher level of equipment and training to maintain preparedness for the various hazards unique to their manufacturing plant, facility,

or other workplace. Discrepancies in standards can lead to gaps in preparedness and response capabilities.

- Health Monitoring: The health risks associated with emergency responses, such as exposure to toxic substances and high-stress situations, necessitate consistent health monitoring and support systems for all responders.

- Operational Consistency: Uniform standards facilitate coordinated responses during large-scale emergencies involving multiple agencies and jurisdictions.

The IAFF strongly advocates for the protections afforded to ESO responders under the proposed ERS. We contend that the preparedness of WEREs does have an impact on ESOs particularly when it comes to safety, training, health, and operations. We support policies that ensure that all fire fighters and emergency medical personnel, whether in public or private sectors, receive the same protections and support, thereby enhancing overall emergency response effectiveness and safety.

Establishing the organization's emergency response program (ERP): Paragraph (c)(1) and (2)

An emergency response program is critical for ensuring safety at the scene of an incident. While no plan can account for all possible outcomes, a predeveloped written program affords the opportunity to reduce the loss of life and property.

We support and acknowledge the importance of a written ERP. The IAFF agrees there is a need to properly document and assess the efficacy of these programs. This also ensures the continuity of operations and allows the ability to assess the adequacy of response capabilities. Failure to conduct thorough and appropriate pre-plans of known hazards within an ESO's response area has been a common factor in many fire fighter line of duty deaths **(see Table 1. Fatalities Reported (NIOSH) Related to Lack of Pre-Incident Planning on p. 18 of this document).** The 2007 Super Sofa fire in Charleston, SC, claimed the lives of nine (9) fire fighters and is one such example of the consequences of failing to develop a well-rounded emergency response plan. In this case, responding fire fighters knew the building's truss roof, high fire load due to home furnishings, and potential water supply limitations would have made the fire more dangerous. Failures to account for these known challenges in advance were frequently cited as a major contributing factor to this historic and tragic incident.

In addition, there are unique challenges that fire service members face. Fire fighters typically work in buildings that our employers do not own. An effective Fire Prevention and Code Enforcement Program is critical to ensure that a fire fighter's employer can ensure a reasonably safe environment in the buildings in which fire fighters work.

Based the interests of all emergency responders, we encourage OSHA to consider referencing NFPA 1730 - Standard on Organizing and Deployment of Fire Prevention Inspections and Code Enforcement, Plan Review, Investigation, and Public Education

Operations, as well as NFPA 1300 - Standard on Community Risk Reduction and Community Risk Reduction Plan Development. Both standards are applicable to this proposed paragraph.

Establishing the organization's emergency service capabilities: Paragraphs (c) and (d)

In the fight to save lives, fire fighters are facing more dangerous conditions than ever before due to changes in construction, building materials, evacuation procedures, and preparedness attitudes. The IAFF recognizes the need for the critical activities captured in the ERP given the evolving conditions of the fire service, under paragraph (d). Based upon the language in the proposed rule, IAFF recommends that OSHA further clarify the meaning of "vulnerability analysis" (p. 7810). Given the multidisciplinary nature of emergency response and the related scientific study of hazards, it is important that WEREs and ESOs have a clear and complete understanding of vulnerabilities within their response areas and other high-hazard facilities. We appreciate that this is a priority and encourage a proactive approach, but it is important to ensure that terminology is applied in such a way that aligns with the mental model of emergency responders and their employers. In the present state, the language of "vulnerability analysis" remains unclear, as there are multiple types of vulnerability indices within the FEMA and emergency response domains, as they apply to community risk reduction.[4]

For this reason, we have reviewed the proposed standard and have found that the terminology used in the proposed rule may be unclear to fire service members and leadership. We propose that OSHA changes the language to align with that familiar emergency responders (e.g., community risk reduction), or that OSHA provides further clarification to ensure understanding. Additionally, it would be helpful to cite related FEMA documents here that could support model plans for smaller departments, or departments without access to full-fledged planning and technical divisions, such as a vulnerability hazard framework.[5]

We recognize the need to balance the appropriate level of guidance, based on the idea that municipalities and resource rich departments may have access and guidance from dedicated staff and stakeholders and may already have more sophisticated or developed plans that expand beyond the scope of this proposed rule, and we do not anticipate changing this process to make planning less rigorous for these areas where vulnerability analyses may be conducted in collaboration with multiple disciplines (e.g., emergency management, law enforcement, etc.) and staff.

Despite this, we also understand that the variation in WERE and ESO structures requires careful consideration for the workload of conducting these analyses. For this reason, we have suggested that there is a minimum or baseline set of criteria for determining the focus of the vulnerability analysis. As part of preparedness efforts, OSHA should put in place a coordinated, multiagency plan for monitoring vulnerability that includes the following:

For Community
- Prevention/risk reduction
  - Commercial Structure and Occupancy (e.g., schools, hospitals, universities, etc.)
  - Residential Housing
    - Type
    - Age
    - Population Demographics
      - Growth
      - Under Age 5
      - Over Age 65
      - Populations with Disabilities
      - Population below the poverty level
      - Overcrowding of single-family occupancies
  - Demand
    - Historic
    - Current
    - Anticipated
  - Transportation Nexus
  - Geography
  - Infrastructure
  - Environmental factors
  - Hazards
  - Community specific target occupancies

Industrial
- Prevention/risk reduction
  - Facilities
  - Personnel
  - Transportation Nexus
  - Demand
    - Historic

- ▪ Current
- ▪ Anticipated
  - ○ Hazards
  - ○ Impact Analysis

OSHA should re-evaluate the NFPA standards and incorporate standards that address community vulnerability assessment as part of their scope and or design. Such standards include, but are not limited to, NFPA 3000 which includes language related to risk evaluation for hostile events and NFPA 1300 which is the standard on community risk assessment and reduction planning.

Team member and responder participation: Paragraph (e)

The IAFF strongly supports the inclusion of comprehensive employee participation throughout all sections of the proposed Emergency Response Standard (ERS). This inclusion is pivotal for fostering a safe and collaborative work environment where responders can report unsafe conditions and actively contribute to various aspects of the organization's operations and development.

Comprehensive employee participation should encompass:

1. Safety and Reporting: IAFF specifically recommends the creation of a joint health and safety committee that oversees all aspects of the ERS implementation/execution in the last paragraph of this section. **In this case, we define "joint" to include labor or employee representative groups, should one exist.** To that end, the IAFF recommends that OSHA include language in the Emergency Response Standard that directs covered employers to create an "emergency response standard committee," composed of employee and employer representatives, that receives feedback from employees on the implementation/execution of the Emergency Response Standard and recommends revisions to the employer's implementation of the regulations.

   We suggest that there is a balanced approach in which employees can provide information and the input related to awareness of potential concerns or hazards, but that this input is evaluated in context by command and leadership to ensure safe operations and working conditions. Ensuring that responders can report unsafe work conditions without fear of retaliation is essential. Therefore, when an unsafe act or hazard is reported, we advocate that the act in question will be evaluated, a solution will be identified, and training will be developed and implemented in response to the evaluation, to ensure safety moving forward. This empowers employees to speak up about potential hazards, but still allows for effective operational communication, leading to a safer work environment for everyone. Employees should also be encouraged to provide feedback based on near misses and other real-world

examples that occurred during emergency response activities, as we have captured in the post incident analysis comments later in this document.

2. Facility Advancements and Construction: Employee input is invaluable in planning and implementing facility advancements and construction projects. Their firsthand experience and insights can significantly improve the functionality and safety of new and existing facilities.

3. Emergency Response Plan (ERP) Development: Including employees in the development of ERPs ensures that the plans are practical, effective, and reflective of real-world scenarios. Their participation helps create more robust and comprehensive response strategies.

4. Standard Operating Procedures (SOP) Development: Engaging employees in SOP development ensures that procedures are clear, practical, and based on frontline experience. This leads to more efficient and effective operations.

5. Medical and Health Physicals: Involving employees in the design and implementation of medical and health physical programs ensures that these programs address the specific needs and concerns of responders, promoting better health and well-being. However, we also emphasize that all relevant stakeholders, including medical professionals, should be involved in this process. We believe it would be a failure to hold individual members or emergency responders responsible for educating healthcare professionals on the occupational risks of fire fighters; this surveillance is critical to ensuring that members receive quality care to ensure that they are able to perform and protect themselves.

Research by Thomas Weber on cooperative labor and management partnerships in the fire service highlights the significant benefits of such collaboration.[6] Based on his work and the related work of others, we recognize that employee participation leads to:

1. **Improved Service Quality:** Fire departments using cooperative labor/management teams report better service delivery, reduced conflicts, and increased organizational effectiveness.

2. **Enhanced Workplace Culture:** Transforming adversarial relationships into collaborative ones fosters a more positive and productive work environment.

3. **Greater Efficiency and Innovation:** Joint problem-solving and decision-making result in more efficient use of resources and innovative solutions to challenges.

The IAFF firmly believes that fostering a collaborative environment where employees are actively involved in safety reporting, facility planning, ERP and SOP development, and health programs leads to a more resilient and responsive emergency services

organization. By emphasizing the value of employee input across all sections of the ERS, we can enhance both the safety and effectiveness of our emergency response capabilities.

In conclusion, the IAFF endorses comprehensive employee participation throughout all sections of the ERS. Empowering responders to contribute to safety, operational decisions, and organizational development ensures a stronger, safer, and more effective emergency response workforce. To that end, the IAFF recommends that OSHA include language in the Emergency Response Standard that directs covered employers to create an "emergency response standard committee," composed of employee and employer representatives, that receives feedback from employees on the implementation/execution of the Emergency Response Standard and recommends revisions to the employer's implementation of the regulations.

Creation of a risk management plan: Paragraph (f)

We support OSHA's efforts to facilitate risk management strategies that require the identification, assessment, and mitigation of potential hazards that emergency responders are required to demonstrate awareness of, as currently written in the ERS. Based on the language contained in paragraph (f), we know that our members and their agencies could face difficulties in correctly interpreting and navigating the process for creating the written risk management plan.

Consequently, we propose that OSHA more narrowly defines the language to support the development of such a risk management plan. For example, the components of the plan set forth in the standard require the following:

> *"…evaluation of the likelihood of occurrence of a given hazard and the severity of its potential consequences…"*

This is easily done for certain situations (e.g., wildland fires, hazardous materials, Swiftwater rescue), but not for other incidents that are more routine (e.g., vehicle extrications). These hazards have varying degrees of probability based on the time of day, traffic conditions, weather conditions, and other related variables. We do not argue that this is important, but it may be infeasible for some departments or agencies to completely implement the rules based on the language in the ERS.

It is essential that OSHA amend the guidance for the ERS to adequately capture the concept that a risk assessment and subsequent response plan can be conducted in a fiscally responsible manner and without needing to contract with a consulting company. A fire fighter's basic training, on-the-job experiences, and understanding of their department's capacity for response should equip fire department administrators and officers with the necessary skills to identify risk and hazard features, even from a vehicle window, and then return to the station headquarters, etc. to develop response plans. More specifically, preplanning requires no hard costs (outside of labor), as most of it can be completed while on duty, using tools already available to the majority of career

departments. Most importantly, maintaining situation awareness is part of regular duties at any rank. Every incident or call requires an assessment to determine the best course of action. Decades ago, we had paper handoff information that was passed along and maintained. Technology has now evolved to a point where it is possible to digitalize this information at no or very low additional cost.

Furthermore, there exists the possibility that depending on the prevalence of risk and hazards within a community that generalized plans could be made with adjustments for specific addresses. For example, in rural areas the prevalence of ammonium nitrate storage on farms is likely to be high, the location in relation to structures will be varied, but the explosion potential remains the same. As such, plans would minimally include fire with and without exposure to ammonium nitrate storage containers, and release of ammonium nitrate gas. However, a fire at an ammonium nitrate storage and distribution facility should have a more focused plan with specific details for hazard management and mitigation. In the absence of a robust planning and prevention division, the ERS, and/or supporting documents, should provide guidance related to how fire departments can prioritize risk and hazards assessment and planning, so adoption does not appear to imply immediate compliance. See paragraph (m) below for additional comments on pre-incident planning.

Based on the information captured, we suggest that OSHA takes a three-pronged approach to classifying risks as mentioned in the United States Fire Administration (USFA) publication on risk management. This classifies the control strategies into three main categories: administrative, engineering, and personal protection. While this is not as comprehensive as predicting risks for every hazard identified, there are some situations in which the likelihood of a risk cannot be calculated due to a lack of available data or the inability to collect data for addressing the specific hazard. By focusing on identifying hazards and categorizing the major control measures we can support departments in understanding the relationships between various components within the ERS. This is a more feasible approach for all departments and agencies. While we support the use of statistics and data to predict the likelihood of risks, the reality is that there is sometimes not enough information available to calculate or predict the frequency of some emergencies, and thus, this language may harm departments attempting to do the analysis with the data available.

The key here is to align SOPs, documentation, dispatching, equipment, and with risks that particular agencies, departments, and communities face. Frequency calculations may not always be the best source of prediction as there are consequences for high-risk, low-frequency events like the West Texas explosion and East Palestine train derailment. Additionally, there are many factors that can contribute to the misidentification or miscalculation of these events. Instead, we propose that OSHA requires analysis or a risk matrix of department or agency procedures that identify gaps in response across those three key areas: administration, engineering, personal protection, as recommended by the USFA.

Table 1. USFA Risk Management Control Measures[1]

These controls ...	Consist of ...	And are intended to ...
Administrative	Guidelines, policies and procedures established to limit losses. Examples: ❯ Standard operating procedures. ❯ Training requirements. ❯ Safe work practices. ❯ Regulations and standards.	Make the task safe for the worker.
Engineering	Engineered systems that remove or limit hazards. Examples: ❯ Apparatus design. ❯ Mechanical ventilation. ❯ Lock-out and tag-out of electrical hazards.	Make the task safe for the worker.
Personal protection	Equipment, clothing and devices designed to protect the worker. Examples: ❯ Helmets. ❯ Gloves. ❯ Self-contained breathing apparatus (SCBA). ❯ Tools.	Make the worker safe from the hazards.

In addition to the aforementioned language, we find it critical to highlight that the majority of fire fighting injuries and fatalities are a result of human error.[7] Based on this statistic, it is important to understand where human error might impact fire and emergency service operations within the risk management plan. Examples of these areas can include, but are not limited to the following:

Table 2. Areas Identified as Contributing to Human Error in Workplace Accidents

Area	Examples
Job tasks	Distractions, lack of time, inadequate procedures, poor lighting or extremes of temperature
Human performance	Physical ability, competency, fatigue, stress, or drugs
Organizational	Work pressure, long hours, or insufficient supervision
Workplace	Poor equipment design and/or workplace layout

To incorporate an understanding of human performance and its impacts on safety, we must address the areas of concern within the organization. Traditionally, fire and emergency services have not been capable of sufficiently addressing the organizational impacts of safety. Efficient and effective risk management frameworks should be built around the concept of a "Culture of Safety," which is part of an overarching concept of a "Just Culture."[8,9] A strong employee-employer relationship is a key factor that leads to

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[1] https://www.usfa.fema.gov/downloads/pdf/publications/risk_management_practices.pdf

successful implementation of a Culture of Safety. The formation of committees with *equal representation* of management and labor representatives creates an environment of transparency, open dialogue, cooperation, and success. Bidirectional communication during non-emergency hours builds trust and fosters a safer environment during times of emergencies.[10]

"Just Culture" promotes a balanced approach to addressing errors and incidents, recognizing the importance of both individual accountability and systemic factors. By creating an environment where fire fighters and EMS personnel feel safe to report mistakes without fear of punishment, "Just Culture" encourages learning from failures and implementing preventative measures to enhance overall safety.[11,12,13] This provides an opportunity for management and labor to work collaboratively and promotes transparency, does not excuse reckless or egregious behavior, and ultimately strengthens organizational resilience in the face of challenges.

There are two key components to Culture of Safety/Just Culture. The first is a culture of safety acknowledges that people make mistakes and are inherently good.[14] The second is that any member can report conditions that are unsafe to their leadership without fear of retaliation. Culture of Safety/Just Culture meets all the objectives of a General Risk Management Framework and can be applied to fire, rescue, technical, and EMS responses, as well as routine day-to-day operations.[15] Based upon this concept and the available scientific literature, we recommend that OSHA provides language that supports fire fighters to communicate within their chain of command when they notice something important that could potentially influence the outcome of an incident. We suggest that there is a balanced approach where the company or command officer maintains situation awareness but decides based upon the input of their employees who provide awareness, particularly in the cases where the incident commander is reaching task saturation.

Additionally, we suggest that OSHA considers the impact of introducing a safety officer role to support incident command. When reviewing the literature and related information about LODDs and injuries, tunnel vision, a lack of situation awareness, etc. are often cited as critical factors contributing to dangerous and fatal outcomes. A safety officer role would increase situation awareness and reduce some of the challenges associated with task saturation on the fireground.

It is crucial for employers to prioritize workplace safety and compliance by developing and implementing effective risk management plans tailored specifically to the fire service. We encourage OSHA to address these failures in the standard, as the risk management plan currently does not address all of these failures in the current form.

Responder medical and physical requirements: Paragraph (g)

Implementing robust medical surveillance programs is essential for safeguarding employee health while ensuring the protection of their personal health information. These programs not only monitor and manage potential workplace health risks but also

provide early detection of some occupational diseases, ensuring timely medical intervention. By prioritizing employees' well-being, companies can enhance productivity and reduce absenteeism, creating a healthier and more engaged workforce.

Regular health surveillance for fire fighters is paramount due to the occupational hazards fire fighters routinely face. Exposure to harmful substances like smoke, toxic gases, and carcinogens found in building materials, incident sites, and structures has led to significant occupationally acquired health risks over time, as documented in the scientific literature within the proposed rule. Organizations such as the International Agency for Research on Cancer (IARC) and the National Institute for Occupational Safety and Health (NIOSH) have recognized firefighting as a profession associated with elevated risks of cardiovascular disease, cancer, and respiratory illnesses.

Supporting this concern, government standards emphasize the necessity of medical surveillance for fire fighters to ensure their health and well-being. By implementing such standards, early detection of health issues like respiratory conditions, cancer, and cardiovascular disease, which have been linked to fire fighting activities, can be identified and treated. Through regular health surveillance mandated by this proposed standard, potential health problems can be identified earlier, leading to timely intervention and improved health outcomes.

We encourage a structured requirement in which annual physicals are completed, but that protect and serve the best interests of emergency responders. We suggest that this includes, with the agreement of the representatives of fire fighters, the ability for responders to receive care from their own physicians, with a letter or form of documentation furnished that suggests they have met the medical requirements to continue working as an emergency responder.

IAFF recognizes the impact of medical surveillance on our members and its role in keeping them safe and healthy. Towards this end, we emphasize the importance of balancing both responsible and ethical medical practices, while also protecting the privacy of our members. The contents of such evaluations should be kept confidential, including evaluations related to behavioral health. Moreover, strict adherence to healthcare privacy laws and secure handling of personal health information build trust between the workforce and management, demonstrating a genuine commitment to their safety and privacy. Investing in comprehensive medical surveillance is a win-win, promoting a healthier workforce and proactively addressing the leading causes of death in the fire service. Lastly, assurances must be given by all employers that any conditions found in any of their employees during these proposed medical surveillance programs will never be used for disciplinary, retaliatory or otherwise any other negative purposes.

Training Requirements: Paragraph (h)

Changes in the construction industry have led to composite materials that burn hotter and faster than ever before. Fire fighters realistically must only take one course (~4 hrs) in fire behavior from Fire fighter I to Fire Officer IV (NFPA 1021; IFSTA).

The IAFF strongly supports Paragraph (h) of the proposed ERS, emphasizing the importance of ongoing training and continuing education for fire fighters and EMS providers, which includes members of WEREs that perform firefighting, rescue, technical response, and/or EMS as an ancillary duty. Continuous education is vital for maintaining the proficiency and professionalism of fire and EMS service personnel. Domains like aviation, software engineering, and the military have all identified how costly it is to design poor systems or ineffective training. More importantly, as shown in the figure below, it is critical to address multiple aspects of training in order for effective transfer of training to occur. The training design, characteristics of individual learners, and work environment all play a role in how successfully fire fighters are able to understand and implement the things they have learned in training on the fireground, fire line, or incident scene.
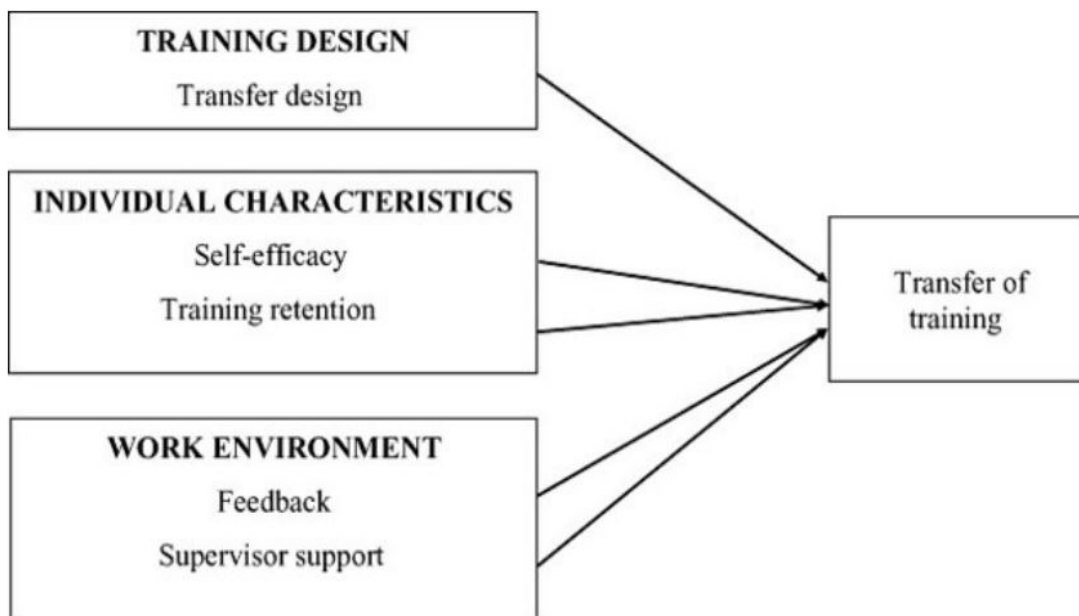
Figure 1. Velada, R., Caetano, A., Michel, J. W., Lyons, B. D., & Kavanagh, M. J. (2007). The effects of training design, individual characteristics and work environment on transfer of training. International journal of training and development, 11(4), 282-294.

The IAFF strongly recommends OSHA require training based on the department or agency's hazard assessment and the particular response area. For example, the Newark Port Authority is one of the largest ports in the United States. It maintains no fire response capabilities and relies on municipal fire departments to respond and mitigate any hazard, including shipboard fires. Despite this reliance, neither the Newark Port Authority nor the Newark Fire Department provided any training to the members of the department on responding to shipboard fires. Departments must be responsible for properly preparing their members for effective response to emergencies based on the target hazards in the area.

Many certifications and recertifications are time-intensive due to the specialized nature of emergency response and the need to assess specialized skills. The nature of shift work can make it challenging to adjust staffing for dedicated training hours, often requiring staff members to complete training during overtime. Coordinated exercises may require personnel of all ranks to be available while still managing operations, necessitating some members or units to be put out of service for training.

With these challenges in mind, initial certifications and recertifications should be collaboration between all stakeholders, including labor, management, state agencies, and tribal rules and regulations regarding continuing education and recertification/licensure. The NFPA standards can serve as a recommendation for these negotiations, considering the needs of the fire department and the community. NFPA standards do not fully consider the staffing requirements to run a training division or the time demand on all responders.

Regarding training leadership and supervisors (e.g., company, line, and command officers), we suggest that minimum qualifications for specific jobs or ranks should be determined through labor-management discussions based on the department's and community's needs. The transfer of training literature discusses the impact of the work environment on effective training. Supervisor support and feedback are critical areas for increasing the efficacy of training, resulting in a reduction of injuries and LODDs.

In conclusion, the IAFF strongly endorses Paragraph (h) of the ERS, advocating for continuous education and a joint employer-employee proactive approach to training. This ensures that all fire fighters are equipped with the necessary knowledge and skills to perform their duties safely and effectively, enhancing the overall safety and efficiency of emergency response operations.

Facility preparedness activities: Paragraph (i)

IAFF appreciates OSHA's efforts to consider station design as an area that impacts fire fighter health, wellness, and safety. Properly separating the PPE and properly decontaminating it is a critical strategy to reducing exposures.

In addition to requirements related to smoke and carbon monoxide monitoring, OSHA should add criteria related to monitoring for radon in fire and EMS stations and, if present, reducing indoor radon to a level equal to or less than 2.0 pCi/L with an objective of achieving outdoor levels of 0.4 pCi/L.[16]

OSHA should consider referencing NFPA 1730 - Standard on Organizing and Deployment of Fire Prevention Inspections and Code Enforcement, Plan Review, Investigation, and Public Education Operations, As well as NFPA 1300 Standard on Community Risk Reduction and Community Risk Reduction Plan Development. Both standards are applicable to this proposed paragraph.

The IAFF encourages OSHA to require fire stations to meet minimum codes requirements with a focus on active fire suppression systems and inter-connected detection and notification systems. Recent incidents in fire stations in Los Angeles and in Maine highlight the dangers of undetected and unsuppressed fires to personnel who may be sleeping.

Equipment and personal protective equipment (PPE) requirements: Paragraph (k)

Proper selection and maintenance of personal protective equipment (PPE) is critical for ensuring the safety and well-being of fire fighters and EMS personnel. PPE serves as a vital last line of defense against workplace hazards, including but not limited to chemical exposure, thermal injuries, physical injuries, and infectious diseases. As a result, PPE selected and provided by employers for use by fire fighters and EMS personnel must be appropriate for the hazards they face. Regular maintenance of PPE is essential to ensure that it functions effectively and provides the intended level of protection. Furthermore, maintenance practices, such as cleaning, inspection, and replacement of worn or damaged components, help to extend the lifespan of PPE by preventing potential equipment failures. By investing time and resources in maintaining PPE, employers reinforce the resilience of their workforce and demonstrate their commitment to protecting their workers to the greatest extent possible. We emphasize that existing NFPA "guidelines" do not equate to "regulatory authority" in all states in the U.S., hence incorporating the multiple NFPA Standards on Selection, Care, and Maintenance of PPE will provide vital guidance to employers and fire fighters and are an essential component of an OSHA Emergency Response Standard.

However, in the effort to advance protections for fire fighters, there remain multiple gaps in PPE performance and PPE performance standards outlined by the NFPA. These gaps must be addressed via research to advance the state of the science as opposed to application of existing test methods and standards. For example, there is currently no NIOSH-certified respiratory protection for wildland fire fighters, and existing NIOSH methods for certification of respiratory protection devices referenced in NFPA standards rely on a single gas challenge approach. Basic physical and chemical principles indicate that a single gas challenge approach is insufficient to gauge the efficacy of filter cartridges against the complex chemical mixtures in smoke. Hence, a smoke challenge approach is needed in the development and certification of filtration-based wildland respiratory protection, and the development of a smoke challenge must be driven by scientific research. Gaps are not limited to wildland respiratory protection and must be addressed across the spectrum of PPE utilized by fire fighters and EMS personnel, including the elimination of hazardous substances in PPE.

Vehicle preparedness and operational requirements: Paragraph (l)

This document captures information relevant to fire apparatus (NFPA 1910), but because this standard seeks to make all fire personnel safer, it would be more appropriate to reference NFPA 1900, which is the new consolidated standard. In

addition to structural apparatus and marine vessels, 1900 also incorporates wildland apparatus and ground ambulances.

There are numerous cities and municipalities who keep apparatus in service even when failing safety inspections. This is mostly due to poor budgetary planning. Departments need to financially plan capital investment with a replacement schedule for apparatus, ambulances, and other vehicles. Additionally, this extends beyond structural fire fighting operations and extends to the wildland fire fighting and ambulance fleet. The most recent report from the Office of the Inspector General indicated that approximately only 6% of wildland vehicles were operationally safe.[17] Based upon these statistics, there is a critical need for "daily operator vehicle checks" and "wheel and tracked vehicle compliance inspections," to be done by certified mechanics and overseen by fleet managers, "safety inspections by supervisors with the fleet manager", and "demobilization inspections" which are done after the apparatus is released from the incident with repairs and maintenance to be safe to operate before they are allowed to return home. Developed, standardized, and established policy and procedure with minimum standards for agencies to adhere to should be included in this proposed rule.

Additionally, most often, custom built municipal fire engines are built with reinforced roll over protection systems (ROPS). That said, wildland fire engines are not built with rollover protection as part of the structural integrity. For the safety of the firefighting crews, all wildland fire engines should meet or exceed the same ROPS standards of the municipal fire engines. Alternatives exist including, but not limited to, the installation of Roll Tech seats.

More importantly, there have been documented situations and accidents in which vehicles and apparatus that are not safe to drive are still used in the fleet, resulting in severe injuries and fatalities. One of the more recent examples of this is a fatal crash in Boston, MA, that killed a 30-year veteran of the fire service, Lt. Kevin Kelley. Investigators found brake failure caused by improper maintenance was partly to blame, and the accident exposed major flaws in the department's vehicle maintenance program, flaws that put the safety of fire fighters and the public at risk[18,19]. This accident also injured three other fire fighters and five civilians, including multiple children.

As another example, the Ponca City, OK fire department has an aerial apparatus that failed its performance inspection, but administration has ordered it to remain in-service in the event it may be needed for a rescue. This aerial failed to sustain the required load in testing, yet the department is deploying it in the event it may be needed to sustain the load of a fire fighter and civilian. These events must cease, departments must plan appropriately for apparatus maintenance and replacement.

Numerous states follow, and/or have codified, the GSA Federal Specification for the Star-of-Life Ambulance (KKK-A-1822, aka the K-spec) for the design of ambulances. However, at its root, this is a purchase specification and not an evidence-based consensus standard. NFPA 1917 (soon to be part of NFPA 1900) meets the minimum objectives of the K-spec, builds on safety, and is an evidence-based broad-based

consensus industry standard. OSHA should insist that ambulances meet the objectives of NFPA 1917. As a note, EMS-only advocacy organization may propose a Ground Vehicle Standard (GVS) maintained by the Commission on Accreditation of Ambulance Services (CAAS). The GVS is a duplicative standard that was not created using a broad-based consensus, it replicates some aspects of the K-spec, and eliminates others to give more flexibility to managers and owners. Additionally, we encourage OSHA to address all possible aspects of this with a lens towards the emergency responders. Ultimately, CAAS is the furthest document from a broad-based consensus document. There are no fire service representatives, and the voting members are all affiliated with private EMS, management, or government administrators. CAAS allows an employee to be a voting member. Other standard writing organizations do not allow staff to influence their documents.

Ambulances are intended to transport critically ill and injured patients from the scene to a definitive care facility. Although a seemingly common-sense decision, there is no clear guidance that prohibits the transport of fuel cans, motorized hydrant pumps, small engine equipment, or contaminated equipment. OSHA should craft language that prohibits using ambulances for equipment shuttles or to participate in a department's comprehensive hydrant service and maintenance program. The language should also specify that patients contaminated by hazardous, non-infectious materials, be de-contaminated before they are transported. However, the language should not be so prescriptive to interfere with the expedient transport of ill or injured fire fighters or civilians from the scene of a fire where adequate decontamination measures are unavailable.

OSHA should also require ambulances to have a side door in the patient care compartment of ambulances. Ambulance patient care compartments have rear doors to load the stretcher and a side door on the passenger side of the vehicle. This side door allows for a secondary means of ingress and egress for EMS providers, whether they be multi-role fire fighters or single-role EMS providers. As such, it enhances safety if the ambulance needs to be evacuated and contributes to crew efficiency and effectiveness of operation so EMS providers will not compromise functional space while trying to exit or enter the ambulance. Although seemingly a standard part of the ambulance, there have been attempts by purchasers and manufacturers to eliminate the side door of the ambulance because the framing of the door in a customized modular patient care compartment adds time to the manufacturing process and cost. However, these should not be considerations when supporting provider safety, efficiency, and effectiveness.

Pre-incident planning requirements: Paragraph (m) and (n)

Pre-incident planning may present an opportunity for improved fire fighter training and education, as well as important implications for communicating safety and emergency information to multiple stakeholders, including citizens and business owners. IAFF recognizes the importance of pre-incident planning requirements and acknowledges the importance of planning practices. Despite the reliance on the NFPA 1660 standard, there is no standard configuration for pre-incident planning and the NFPA standard

lacks scientific evidence to support the presentation of information in a way that aligns best with human cognition in emergency response. Based on this, we suggest that departments approach pre-incident planning with a lens towards what is needed for the end-user. There is presently a lack of consideration of end-user (e.g., fire fighter, incident commander) requirements and therefore, most pre-incident planning programs face challenges related to widespread adoption among fire service members.

To illustrate the critical need for effective PIPs, there have been numerous fatalities attributable to a lack of sufficient pre-incident planning. The table below shows incidents that cited a lack of sufficient PIPs as one of the failure points leading to fire fighter fatalities:

Table 3. Fatalities Reported (NIOSH) Related to Lack of Pre-Incident Planning[2]

Incident	Date	State	Number of Fatalities
Wall Collapse	February 21, 2006	AL	2
Floor Collapse	August 27, 2006	NY	2
Awning Collapse	December 30, 2006	TX	1
Furniture Store	June 18, 2007	SC	9
Millwork Fire	March 7, 2008	NC	2
Wall Collapse	July 6, 2008	TX	1
Commercial Fire	August 18, 2008	NY	2
Fertilizer Plant	April 7, 2013	TX	9
Structural Collapse	October 12, 2015	KY	2
Strip Mall	April 30, 2016	NC	1
Structural Collapse	March 22, 2018	PA	2

Knowing the location of the hazard is a step but also understanding the location of the fire fighting infrastructure to assist in the response is critical. This table above was adapted from multiple sources, including the NFPA 1660 standard (formerly NFPA 1620), Kapalo et al.'s work on pre-incident planning (i.e., some of the only documented formal studies on pre-planning effectiveness), and the Oshkosh Fire Department.[20] Pre-incident planning should focus on presenting information in a way that best supports incident commanders and emergency responders in understanding critical cues on the fireground and in the response area.

As a general note, OSHA does not include scientific data in the standard related to pre-incident planning practices. We want to highlight this to point out that there are studies that describe the human factors elements associated with pre-incident planning effectiveness. Mental imagery processes are considered a factor in action planning, object recognition, spatial reasoning, and problem-solving. Although mental images are not stored in our brains as literal pictures, humans do tend to represent mental images

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[2] From NFPA 1620 and available NIOSH data

that preserve the spatial and functional relationships within a 3D space cognitively. When fire fighters conduct pre-planning inspections, there is an opportunity for us to look at the ways the buildings and structures are represented as mental imagery and spatial knowledge, to enhance fire fighter safety and effectiveness. First-due fire fighters tend to report that visual information may create overload, primarily due to their specific roles and tasks. Company/line and command officers tend to indicate a need for summarized visual information, without too much clutter.

Additionally, IAFF recognizes that effective pre-incident planning programs are an information source that can be used to document occupational exposures (in addition to other materials such as incident reports, etc.). When properly prepared, PIPs present documented information that can be combined with other department documents and reports to help fire fighters understand potential health and safety risks and to document any substances on scene.

Incident Management System (IMS) creation: Paragraph (o)

Effective management of resources is a critical component of operational effectiveness and safety. An individual may possess the training, skills, and ability of a fire fighter, EMS provider, or a rescue technician. However, their job function within the IMS (IC) should dictate the safety zone level. Using some of these criteria may possibly provide a more defined role for the skilled support worker (SSW). Additionally, based on this and the recommendations of NFPA, we contend that Unified Command may represent a more comprehensive approach to this section. NFPA 3000 refers to Unified Command because the response encompasses Fire, EMS, Law Enforcement, potentially Emergency Management and Recovery/victim support.

Incorporating the National Wildland Coordinating Group (NWCG) positions, (i.e., FFT1, FFT2, ENGB) may help define the role and functional area of assignment under the IMS by OSHA. Including structural fire fighter certifications that align, (FO1 vs ENGB) to NWCG may also provide for more positional capabilities when managing a W/UI environment. Unified command is also applicable here.

Work zones of any emergency response type fall into the three categories of hot, warm, and cold. These zones typically describe the level of the IDLH environment along with establishing the areas of safety that correlate with the specific work zone. In this section, the definition provided for skilled support worker (SSW) suggests that members that do not meet the criteria to be a fire fighter, EMS provider, rescue technician, or those that are noted in the examples, could be used to support emergency operations in the hot and/or warm zones. *OSHA should consider a more refined or narrow definition of skilled support personnel to avoid civilian staff being trained to perform exterior critical emergency incident tasks such as pumping or driving emergency vehicles, stretching hose lines, or other emergency incident tasks that are best suited for trained responders*. These zones are also discussed in NFPA 3000 and would further reinforce their use here. Adding NFPA 3000 as one of the standards also reinforces the concept of "all-hazards."

Included below, we have referenced the standards relevant for inclusion:

Standards relevant for major fires
- NFPA 1021 Standard for Fire Officer Professional Qualifications
- NFPA 1500 Standard on Fire Department Occupational Safety and Health Program
- NFPA 1521 Standard for Fire Department Safety Officer
- NFPA 1561 Standard on Emergency Services Incident Management System and Command Safety
- NFPA 3000 Standard for an Active Shooter/Hostile Event Response (ASHER) Program
- FIRESCOPE Incident Command System Publication: Field Operations Guide, ICS-420-1, (latest edition)
- FIRESCOPE Incident Command System Publication: Structure Fire Operations, ICS-500, (2015)
- FIRESCOPE Incident Command System Publication: Fire fighter Incident Safety and Accountability Guidelines, ICS 910, (2013)
- National Wildfire Coordinating Group, Incident Response Pocket Guide
- Cal/OSHA Title 8 Regulations

Creation of emergency incident protocols/SOPs: Paragraphs (p) and (q)

Establishing and training on department standard operating procedures (SOP) is a critical component to consistent and safe operations. Jurisdictions must also ensure the SOPs are established with clear objectives and the ability of officers to make tactical decisions based on conditions present, and must ensure that SOPs are tailored to the staffing employed by the department, agency, etc. They must also be updated regularly based on new information and experience. Even routine operations require guidance from established practices, we recommend referencing the NFPA 1500 standard.

To provide more context regarding incident command and tactical priorities, we present a view of the traditional model of decision-making on the fireground and on the fire line. In the past the fire service has focused on these three areas. This model is not necessarily incorrect; however, the presentation of this model can be misleading. For example, each area of the triangle is the same, leading to the belief that each area is equally important in every incident. While all these factors are important, they may be prioritized differently depending on the given situation. Life safety is always most important, but there are instances where fire control may not be weighed as heavily as the other areas.

Figure 2. Redrawing of Brunacini's Original Model of Decision-Making Priorities

Figure 4 (below, based on Brunacini's original strategic decision-making model) addresses the need for dynamic decision-making when it comes to tactical priorities. We included this below to show the relationships between the various aspects of this OSHA standard and how SOPs are developed in the context of supporting decision making, and we believe OSHA could leverage this to better explain the different paragraphs within the proposed rule. The strategic decision-making model provides fire and emergency services with a clear evaluation and action system, removing uncertainty from initial emergency operations. This model standardizes the decision-making process into a consistent sequence: first, we identify the incident's key critical factors, and then we base all actions on our assessment of those factors. By continually reassessing these factors, we ensure the plan remains current and our emergency responders stay safe.

Figure 3. Redrawing of Brunacini's Strategic Decision-Making Model

The table below outlines the definitions for each of the terms in the figure, demonstrating the flow of information. SOPs, while generally implemented after the Incident Action Plan has been developed, can also be used for post-incident analysis. In this case, the SOP may inform the IAP, which leads to a difference in the interpretation of the critical fireground factors. We illustrate these relationships to demonstrate how different aspects of this proposed rule are influenced in dynamic and evolving fireground situations and emergencies.

Table 4. Model Dimensions and Definitions from Brunacini's Strategic Decision-Making Model

Model Dimension	Definition
Critical Fireground Factors	List of basic items that the fireground incident commander (FGC) must consider when evaluating tactical situations
Risk Management Plan	Rescue, Fire Control, Preservation of Property
Strategy	Offensive or Defensive (Based on Critical Fireground Factors)
Incident Action Plan	The IAP describes how the tactical priorities will be completed. The FGC will give orders to later arriving companies.
Tactical Priorities (SOPs)	Task and tactical-level priorities are typically driven by department SOPs.

The goal of this section is to demonstrate the impact and importance of considering the factors within this standard, using a more holistic approach. By focusing on where the risk management plan would influence the rest of the incident response activities, it is important to better understand the impact of these models that influence decision-making.

Post-incident analysis: Paragraph (r)

IAFF recognizes the importance of including members throughout PIAs. If deficiencies are found, a written plan to address these issues indicates that the department recognizes the issue and has a plan for implementing mitigation strategies and solutions. This documentation is important for internal members, but also encompasses the involvement of other critical external stakeholders, including citizens or government representatives.

More importantly, IAFF recognizes the critical need to leverage trusted sources of information that are tailored to the needs of the fire service and high-performing organizations. Based upon this, we suggest using language from the military (e.g., U.S. Army) and related fire-service organizations (e.g., NWCG) to generally format post-incident analysis in a standardized way. Labor-management is critical to ensure that individuals are not solely blamed, and that deficiencies and lack of resources or training are adequately addressed. Therefore, we recommend the 4-question approach and language for inclusion in the standard, which is also provided to wildland fire fighters in their NWCG Incident Response Pocket Guide (IRPG)[21,22]:

1. What was the original plan?
   • Evaluate the mission's objectives.
   • Assign key tasks.
   • Envision the desired outcome ("What right looks like").

2. What transpired in reality?
   • Gather factual information.
   • Consolidate various perspectives to construct a unified understanding of events.

3. What were the underlying causes?
   • Conduct a thorough analysis of causation.
   • Concentrate on the "what" rather than the "who."
   • Gradually refine explanations of the occurrences.

4. What lessons can we learn for the future?
   • Address weaknesses by focusing on areas within our control.
   • Maintain and reinforce strengths to ensure continued success and a well-rounded approach to After-Action Reviews (AARs).

This approach is currently leveraged by the U.S. military, wildland fire fighters, and other agencies in their post-incident reviews. We believe that post-incident analyses should be conducted to effectively address resource management, training, code violations or code deficiencies, and safety[23]. We do not believe in a punitive process (e.g., facilitated learning analyses that are used as justification for punishing specific individuals). Instead, we argue that including employees and supervisors in PIAs is critical to the success of future incident management.

Program analysis & evaluation: Paragraph (s)

IAFF recognizes that a comprehensive evaluation program is critical to the success of emergency response. Program implementation requires effective evaluation of the program as well, it is not enough to merely collect data, the analysis of the program should contribute towards evaluating its intended outcomes and impact. The goal of program analysis is to identify strengths and weaknesses in programs, determine whether program goals are being met, and assess the overall effectiveness of interventions. Program analysis findings help inform decision-making processes, guide program improvements, and contribute to the development of evidence-based practices in program management and policymaking.

Based upon this, we suggest that OSHA adds the following terms to this paragraph for clarity:

- Evaluation: The purpose of evaluation is to assess the effectiveness of a specific program or model and to understand the underlying reasons for its success or shortcomings. The overarching objective is to enhance the quality and performance of programs.
- Monitoring: The principal purpose is to systematically monitor the progress of program implementation through periodic data collection. Its aim is to provide timely insights into the progress or challenges faced during the implementation phase.

Monitoring and evaluation are both geared toward improving performance and achieving objectives. Additionally, it is critical to adopt best practices for engaging stakeholders in this process. To address this, the CDC has developed a program evaluation model.[24] We suggest incorporating language from this model to best serve the fire service communities in effective program evaluation. The minimum criteria for program evaluation should include the following:

1. What is the subject of evaluation? (In other words, what program is being assessed and where is it implemented?)
2. Which components of the program are considered when assessing its performance?
3. What benchmarks or criteria must the program meet to be deemed successful?
4. What evidence or data is utilized to gauge the program's performance?

5. What conclusions can be drawn about the program's effectiveness by comparing the evidence with predetermined standards?
6. How will the insights gained from the evaluation be leveraged to enhance the efficacy of initiatives?

Based on this approach, we believe that this will ensure a minimum standard for effective program analysis. However, we think that this paragraph should be extended from merely an analysis to an evaluation. Analysis of data is only effective if it can be thoroughly implemented to support fire fighter safety and health more broadly.

III. Closing

In this document, we addressed the needs of our members by pointing out areas that require further emphasis or areas that are critical. IAFF supports OSHA in the effort to make fire fighters and emergency responders safer and healthier so that they can take care of themselves and the people they serve. For too long, local, municipal, and county governments have neglected our emergency responders, citing fiscal responsibility as one of the reasons for a lack of effort. By proactively addressing the needs of fire fighters and emergency responders, OSHA is striving to create an environment that facilitates the health and safety of the emergency response workforce.

Improving existing safety standards can significantly enhance labor-management relationships by fostering a culture of trust and collaboration. When management prioritizes worker safety, it demonstrates a commitment to the well-being of the workforce, which increases morale and job satisfaction, two areas that employers are currently struggling to maintain under current labor conditions. Clear safety protocols and transparent communication about these standards can reduce workplace accidents and injuries, leading to fewer disputes and grievances, and ultimately fewer lives lost. This proactive approach to safety helps build mutual respect and cooperation, as fire fighters and EMS personnel deserve to feel valued and protected. Ultimately, better safety standards create better and safer communities.

Edward A. Kelly
IAFF General President

Note: We have included answers to OSHA's specific questions/requests for additional input in the Appendix of this document.

IV. Appendix: IAFF's Responses to "C. Questions in the Summary and Explanation"

Note: All questions related to volunteers have been removed from our responses.

(a)-1 OSHA seeks additional information and data on how emergency response activities contribute to cardiovascular disease.

Firefighting activities involve sympathetic arousal, heavy strenuous work, and dangerous environmental conditions that can lead to hyperthermia and dehydration with considerable associated cardiovascular strain on fire fighters. The risks surrounding cardiovascular health in emergency response are grounded in diverse lines of evidence, including physiological studies of fire fighters during strenuous emergencies, epidemiologic studies linking cardiovascular disease (CVD) risk to specific types of duty, as well as autopsy data confirming the presence of underlying heart disease in almost all victims suffering from cardiac events in the line of duty.

In susceptible individuals with underlying structural heart disease (most often coronary heart disease (CHD) and left ventricular hypertrophy (LVH)), the cardiovascular strain associated with firefighting may trigger a sudden cardiac event through several biological pathways[25]. Electrical, mechanical, and biochemical dysfunction of the cardiac muscle during firefighting can cause fatal arrhythmias. Changes in electrolytes and exposure to environmental conditions (such as gaseous and particulate toxicants in smoke) may also increase susceptibility to arrhythmias, particularly in those with LVH and other forms of cardiomegaly.

Additionally, the proposed rule discusses cardiovascular stress and strain without addressing crew size and staffing. Small crew size equates to high heart rates and cardiac stress for prolonged periods of time, yet this does not appear to be one of the factors considered in the proposed rule. Care should be taken to re-evaluate and revise this paragraph to include insufficient and small crew sizes as a factor of cardiovascular strain. In addition to the documents referenced in the proposed rule, we have included relevant sources of information for review that also encompass cardiac risks of EMS professionals, who are included as a subpopulation in the proposed rule[26].

(a)-4. OSHA is seeking input regarding what types and levels of search and rescue services and technical search and rescue services should be included or excluded from the rule, and the extent to which those inclusions or exclusions should be specifically listed.

There are multiple characteristics of technical rescue incidents that increase their relative risk:

      a. They are low-frequency events, and because of their low frequency, personnel do not have a large set of experiences to draw on.

b. Technical rescue operations often involve great heights, great depths, and/or complex machinery.

c. Complex mechanical systems may react to input in non-linear ways, where cause and effect are not obvious. Some examples of this include industrial machine malfunctions that result in injuries, construction "struck by or caught in" incidents, tunnel collapses, etc.

Technical rescue incidents typically involve basic categories: trench, confined space, rope, structural collapse, and Swiftwater rescue. In many cases, these events are a combination of categories that involve many different tactics to effectively respond to a technical rescue incident. To illustrate this more tangibly, most confined space incidents also require the use of rope systems. The general approach to each of the technical rescue types follows the same basic framework, and like all fire/rescue incidents, all actions for technical rescue incidents must be based on clear objectives and ongoing risk analysis.[27]

Personnel must remember that these incidents are high-risk/low-frequency incidents and will place initial responders under stress, which will have an impact on their decision-making. However, it is imperative that the rescuers, not the victim(s), dictate the terms and tempo of the rescue using a rational risk-based approach.

(a)-5. OSHA is seeking input whether the agency should consider developing a separate rule for protecting workers involved in the clean-up of disaster sites, and associated recovery efforts? Why or why not?

Disaster sites, whether resulting from natural or human-error incidents present unique and highly hazardous conditions. These environments often contain toxic substances, unstable structures, and damaged infrastructure not typically encountered by fire fighters. A separate rule would recognize and address the unique hazards associated with disaster cleanup. Also, the scope and scale of disaster cleanup sites can exceed common fire fighter responsibilities and exposures.

A separate OSHA rule should establish standards for training, equipment, and health monitoring that are specifically designed for the extended duration and complexity of disaster recovery scenes.

The aftermath of disasters can expose workers to a wide range of physical, chemical, biological, and psychological hazards. Long-term health effects, including respiratory issues, cancer, and mental health challenges, have been and continue to be documented among workers involved in past cleanup efforts at the 9/11 World Trade Center site. Additionally, long term health effects often don't show up for many years, long after the incident has occurred, and the fire fighter has retired. A separate rule should include post-retirement healthcare monitoring requirements. For example, in the East Palestine, OH train derailment incident, fire fighters and contractors and the

potential long term health effects from prolonged exposure to vinyl chloride and other chemical vapors.

(a)-6. OSHA is seeking input on whether the agency should consider excluding other activities besides those in 29 CFR 1910.120 (Hazardous Waste Operations and Emergency Response (HAZWOPER)), 29 CFR 1910.146 (Permit-Required Confined Spaces in General Industry.

Any decision to exclude certain activities should be based on a thorough risk assessment (IDHA) considering the frequency and severity of hazards associated with those activities. If the risks to emergency responders are minimal or adequately covered by other standards, exclusions may be justified. Examples to consider include:

- Activities strictly related to medical services and first aid might be excluded if they do not involve exposure to hazardous conditions beyond those typical of medical facilities, assuming these activities are covered under health and medical services regulations.

- Maintenance activities that do not expose workers to emergency response-level risks and are considered part of regular, routine operations could be considered for exclusion, provided they do not involve entry into hazardous areas or the handling of emergency situations.

(e)-1. OSHA is considering adding to both paragraphs (e)(1) and (2) a requirement to permit employee representatives to be involved in the development and implementation of an ERP, and to paragraph (e)(4) a requirement to allow employee representatives to participate in walkaround inspections, along with team members and responders, and is seeking input from stakeholders on whether employee representative involvement should be added to paragraph (e).

Incorporating employees and their representatives into the development and implementation of an Emergency Response Plan (ERP) can be highly beneficial for several reasons, especially in the context of labor-management cooperation and its positive impacts on workplace collaboration, safety, and efficiency.

- Expertise and Knowledge: Employees, particularly frontline workers like fire fighters, possess invaluable expertise and firsthand knowledge about the potential hazards associated with their jobs. Their participation ensures that all relevant risks are identified and addressed comprehensively in the ERP.

- Ownership and Buy-in: Involving employees and their representatives in the ERP process fosters a sense of ownership and buy-in among the workforce. When employees are actively engaged in developing and implementing safety protocols, they are more likely to adhere to them consistently. This

sense of ownership can lead to higher levels of compliance and a stronger safety culture within the department.

- Enhanced Understanding and Awareness: Participation in the ERP process enhances employees' understanding and awareness of emergency procedures and protocols. By actively contributing to the development and implementation of the plan, employees gain a deeper understanding of the rationale behind safety measures and are more likely to internalize and apply them effectively during emergency situations.

- Improved Program Success: Employees and their representatives have the most to gain from a successful ERP and the most to lose if the program fails. By involving them in the process, organizations can tap into their insights and perspectives to design a more effective and responsive plan. This increases the likelihood of program success and ensures that the ERP meets the specific needs and challenges faced by the department.

- Collaborative Problem-Solving: labor management partnerships promote a collaborative approach to workplace problem-solving, emphasizing mutual respect and cooperation between employers and employees. Involving employees and their representatives in the ERP process aligns with this collaborative ethos, enabling stakeholders to work together to identify, assess, and mitigate potential risks effectively.

Overall, leveraging the expertise and insights of employees and their representatives in the development and implementation of an ERP not only enhances the plan's effectiveness but also strengthens employee engagement, fosters a culture of safety, and ultimately contributes to improved emergency response capabilities within the department.

More importantly, from OSHA's current documentation and guidance regarding information on emergency action plans, it is important that diverse stakeholders (e.g., management workers, local health departments, public safety officials) are included in the planning process, engage with the planning activities frequently, review progress, and allocate appropriate levels of resources to ensure planning success. Emergency responders should be included in planning processes and workers' input should be included in ERPs. We support and advocate for written plans regardless of organizational size and structure. Additionally, we stress that an iterative approach in which the plan seeks input from employees and is consistently evaluated is critical to the success of these plans.

(f)-1. OSHA is seeking input on whether other activities or subjects should be specifically included in the list of minimum requirements for the risk management plan.

We believe the key to risk management and the key to ensuring all these requirements is to form a health &safety committee that includes both the employer and employees, or employee representatives. Based upon this we also contend that there needs to be proper documentation of committee meetings made available (e.g., minutes must be posted), that employees are involved (those outside of management), and that management must respond to employees' request with a written response and proper documentation.

Perhaps more importantly, we recommend that OSHA more specifically and explicitly addresses the connections between the different paragraphs within the proposed rule. For example, hazard risk analysis should be leveraged to develop the risk management plan. Based upon this approach, we recognize that OSHA is determined to support the unique needs of the fire service. Therefore, we

We encourage all departments to provide a written risk management plan, but we refer to our above statements on how to best implement this paragraph given the diverse needs of different departments and agencies.

(f)-2. OSHA is proposing to have a performance-based infection control program provision in the risk management plan. OSHA is seeking comment on this approach including whether a final standard should incorporate a particular consensus standard or other guidance, or otherwise include specific requirements regarding infection control.

The SARS COVID-19 pandemic required departments and agencies to review and revise infection control plans. While we recognize the critical issues associated with infection control, one consideration is that emerging threats are important and therefore, the flexibility to adopt appropriate infection control plans relevant to threats may require expansion beyond one specific consensus standard. However, we do acknowledge that referencing relevant consensus standards and the CDC are a critical component to ensuring emergency responder safety.

We recommend inclusion of the following standard(s) as a guideline:
- NFPA 1581 (Consolidated Standard 1580)

(g)-1. OSHA is seeking input and data on whether the proposed rule's requirements for medical evaluations are an appropriate minimum screening. Should the minimum screening include more or fewer elements, and if so, what elements? Provide supporting documentation and data that might establish the appropriate minimum screening. OSHA is also seeking additional data and information on the feasibility of the proposed medical evaluation and surveillance requirements for WEREs and ESOs.

IAFF recognizes that emergency responders working in various capacities will likely have exposures at different action levels. We appreciate that OSHA focuses on combustion-related exposures as these are critical to monitor, but IAFF suggests that

OSHA focuses on the role of the emergency responder and duration of exposures, rather than arbitrary numbers of exposures.

For example, wildland fire fighters are often deployed for long durations (e.g., days, weeks, or months, depending on their role and agency). A silo rescue or recovery could take hours or in some cases, days. We contend that this would not be well represented in the current exposure assessment OSHA has proposed. For this reason, it does not make sense to focus on individual numbers of exposures as there are cumulative effects over time, as already cited in the proposed rule. Additionally, some exposures may involve greater health risks than others, but at minimum, we know that fire fighters are exposed to many different toxicants, carcinogens, and on the fire ground, fire line, and at the scene of incidents.

We recognize that the number of exposures is important, but based on the available medical and scientific literature, as well as the different job roles and tasks within emergency response, we cannot successfully implement medical surveillance programs without further consideration of type of exposures, duration, etc. We contend that medical surveillance should focus less on arbitrary number of exposures and should align with other OSHA recommendations for workers in parallel professions and the best available scientific evidence.

We acknowledge NFPA 1582 as the ideal standard, but departments, in negotiation or consultation with employee representatives, can initiate an annual medical surveillance program that incorporates their primary care needs, as we recognize that not all departments can achieve the resources required to be compliant with NFPA 1582.

(g)-3. OSHA is seeking input on whether the additional medical surveillance proposed in paragraph (g)(3) should be extended to include WEREs and team members.

Based on the information provided, there are compelling reasons to extend the proposed medical surveillance requirements outlined in paragraph (g)(3) to include WEREs (Workplace Emergency Response Employees) and team members, especially those working in industrial settings. Here are some key points to consider:

- Equity and Fairness: The principle of equity suggests that all workers, regardless of their specific role or sector, should have access to the same level of protection and assessment when it comes to workplace safety and health. Extending medical surveillance requirements ensures that WEREs and team members receive comparable protections to municipal ESOs, aligning with the notion of fairness in occupational health standards.

- Diverse Work Environments: WEREs and team members may operate in a wide range of industries with varying levels of exposure to hazardous substances and conditions. While municipal ESOs may face combustion products from firefighting activities, industrial fire fighters and other workers in

chemical-intensive environments may encounter different types and levels of exposures on a daily basis. Therefore, tailored medical surveillance criteria may be necessary to account for these differences and ensure adequate protection for all workers.

- Risk Assessment: The proposed requirement in paragraph (g)(3)(ii) emphasizes the importance of documenting exposures to combustion products for responders. Similarly, WEREs and team members working in industrial settings should have their exposures documented to assess the need for medical surveillance. Given the potential for higher exposure levels in certain industries, it is crucial to establish clear criteria for triggering medical surveillance to safeguard the health and well-being of these workers.

- Preventive Healthcare: Medical surveillance plays a critical role in identifying early signs of occupational health hazards and preventing adverse health outcomes among workers. By extending surveillance requirements to WEREs and team members, proactive measures can be taken to address potential health risks associated with their work environments. This approach aligns with the proactive stance of promoting worker safety and well-being.

In summary, extending the proposed medical surveillance requirements to include WEREs and team members, particularly in industrial settings, is justified by considerations of equity, risk assessment, and preventive healthcare. By ensuring that all workers receive appropriate protections and assessments, regardless of their specific roles or industries, we can promote a safer and healthier work environment for everyone involved.

(g)-4. OSHA is seeking input and data on whether stakeholders support the proposed fitness for duty requirements or whether the requirements pose a burden on or raise concerns for team members, responders, WEREs or ESOs. Commenters should provide explanation and supporting information for their position.

IAFF recognizes the criticality of fitness for duty evaluations. Fitness for duty is determined by an emergency responder's capacity to perform a wide range of essential job functions that are required to protect public safety (See essential job tasks 1-14 in chapter 5.1 in NFPA 1582, 2022 edition); capacity to perform such tasks is ever changing and based on a dynamic mix of physical and mental health factors. Fire departments shall establish a process to evaluate the ability of a member to perform essential job functions (See NFPA 1500, 11.7, 2021 edition).

However, due to misconceptions about medical evaluations, the fire service requires clear definitions of these terms in order to align them with the language commonly used by ESOs. For example, there is a lack of clarity between medical exam, a fitness for duty evaluation, and a fitness test. Some of these assessments focus on ability, rather than evaluating health. For example, a person could pass a fitness test, but still have an

underlying condition that makes them more susceptible to cardiac events or cancer. Additionally, training typically focuses on skills assessment, not medical evaluation. An example of this would be someone could accurately complete a skills assessment or drill, but this would not measure their heart ejection fraction rate (EJF) and whether their cardiac health is at risk. Additionally, there needs to be clearer definitions for return to duty as well. IAFF supports an employee-employer discussion or determination to ensure that the nuances for every individual department are accommodated.

(g)-5. OSHA is seeking input on whether the health and fitness program in proposed paragraph (g)(6) should be extended to include WEREs and team members.

Based on the information provided, there are strong reasons to consider extending the health and fitness program outlined in proposed paragraph (g)(6) to include WEREs and team members. Here's why:

- Equitable Access to Health Resources: Just as with medical surveillance and other safety measures, ensuring equitable access to health and fitness programs is essential for promoting the well-being of all workers. WEREs and team members, regardless of their specific roles or industries, should have access to resources that support their physical health and fitness.

- Worker Health and Safety: Health and fitness programs are not only beneficial for individual workers but also contribute to overall workplace safety. Employees who are physically fit are better equipped to handle the physical demands and potential hazards of their jobs, including emergency response situations. Extending the program to WEREs and team members helps prioritize their health and safety in the workplace.

- Tailored Program Development: While recognizing the need for flexibility and customization to suit the unique needs of different departments or industries, it's important to establish baseline standards for health and fitness programs. These standards can serve as a foundation upon which departments can build tailored programs that address specific needs and considerations. By including WEREs and team members in the program, departments can ensure that all workers benefit from a structured approach to health and fitness management.

- Accountability and Support: Designating an individual to oversee the fitness program, as proposed in paragraph (g)(6)(ii)(A), is essential for providing guidance, assistance, and accountability. This applies equally to WEREs and team members who can benefit from having dedicated support in their efforts to maintain or improve their health and fitness levels. By establishing clear roles and responsibilities, departments can enhance the effectiveness of their health and fitness initiatives.

In conclusion, extending the health and fitness program to include WEREs and team members aligns with principles of equity, worker health and safety, and tailored program development. By ensuring that all workers have access to resources and support for maintaining their physical well-being, departments can foster a healthier and more resilient workforce capable of meeting the challenges of their respective roles and industries. Additionally, we suggest referencing the wellness programming standards in Chapt. 12.2.1 of NFPA 1500, 2021 edition.

(g)-6. OSHA is seeking input on whether every three years is an appropriate length of time for fitness re-evaluation, and if not, what period of time would be appropriate. The agency is seeking any available data to support an alternative length of time between evaluations.

It's important to recognize that fitness assessments should be a collaborative effort between the employer and the employees. Each department may have unique needs and circumstances that warrant a customized approach to fitness evaluation. Therefore, the appropriate frequency of fitness assessments should be determined through mutual agreement, considering input from both parties. We appreciate that OSHA recognizes and prioritizes the importance of fitness, but we also encourage these assessments to focus on and emphasize operational effectiveness; these assessments should focus on the concept that the better a fire can be controlled, the less exertion required. Perhaps more importantly, studies have demonstrated that exercise contributes to reducing the risk of cancer, which is critical for fire fighters.

(h)-1. OSHA is seeking stakeholder input and data regarding the appropriate methods and interval(s) for skills checks, as it relates to proposed paragraph (h)(3).

The recommendation for annual skills checks aligns well with the periodicity referenced in national consensus standards such as NFPA 600 (Industrial Fire Brigades), NFPA 1500 (Fire Department Occupational Safety, Health, and Wellness Program), and NFPA 1670 (Standard on Operations and Training for Technical Search and Rescue Incidents), as well as other OSHA regulations like 29 CFR 1910.120 (HAZWOPER), 29 CFR 1910.134 (Respiratory Protection), and the existing 29 CFR 1910.156 (Fire Brigades).

The frequency and method of skills checks should be adapted based on the complexity and use frequency of the skill in question. Skills that are complex, less frequently used, or critical for safety should be checked more rigorously and perhaps more frequently than those that are part of daily routines. For example, it would be reasonable for fire fighters to participate in Rapid Intervention/Fire fighter Rescue skills assessments on a more frequent basis, perhaps twice a year due to the low frequency of these events. Whereas a 12-month period skills assessment for inspecting SCBAs would likely be sufficient as this skill is performed on a daily basis.

(i)-1. OSHA is seeking input regarding what WEREs are currently doing for decontamination, disinfection, cleaning, and storage of PPE and equipment, and whether OSHA should include any additional requirements for these processes in a final standard.

WEREs should have the same protections as ESOs when it comes to decontamination, disinfection, cleaning, and storage of PPE and equipment. IAFF strongly supports the science and research that demonstrates following appropriate standards and cleaning procedures will limit exposures. We align the needs of this standard with the typical processes involved when following appropriate decontamination procedures. The first level involves the removal of dirt and debris using soap and water. Specialized cleaning may involve the removal of hazardous materials, body fluids, or other forms of contamination. This includes disinfection and sanitization procedures. Finally, decontamination involves the elimination of potentially harmful substances (e.g., biological, chemical, and radioactive materials) from ESO Vehicles, employees' bodies, attire, gear, tools, and/or premises as required to avoid harmful health and environmental impacts. Cleaned personal protective equipment (PPE) must be stored separately from contaminated items, both on the apparatus (e.g., as a second set) and within designated fire fighters' gear lockers at the facility. Additionally, all worn accessories and web gear must meet the same cleanliness standards as clothing.

(j)-2. OSHA is seeking input on whether ESO facilities with sleeping facilities should be protected by automatic sprinkler systems, as proposed in paragraph (j)(2)(ii).

ESOs should provide automatic sprinklers to protect fire fighters in all new facility construction regardless of sleeping facilities. Recent events in Los Angeles County and Maine, where fire stations caught fire while crews were sleeping, highlight the importance of protecting fire stations with inter-connected fire detection and alarm systems and automatic suppression systems. Fire stations are a mixed occupancy and pose fire risks involving gas-fueled vehicles, lithium-ion powered tools and stored fuel on the vehicles. These increased risks warrant basic fire protection systems throughout the building.

(k)-1. OSHA is seeking input on whether the agency should specify retirement age(s) for PPE.

We know that gear that has been worn for a long time is more likely to offload PFAS, as demonstrated by the recent studies from NIST. As long as PFAS is in use, gear should have a retirement age, which will force ESOs to change out gear when new PFAS-free gear becomes available. If a new product is developed and there is no retirement age, ESOs will keep that PFAS-laden gear longer to save money. Wildfire programs agree with Government affairs but suggest considering adding a number of washings as a retirement standard, not just years. As long as PFAS is in use, gear needs to have a retirement age as it becomes even more toxic to fire fighters over time.

Additionally, we recognize the need to address multiple types of PPE and not just turnout gear. For example, wildland programs have different needs as the age of gear is not the only measure of adequacy. Laundering impacts the integrity of wildland fire fighter gear and consequently, we need to ensure that the PPE provided to wildland fire fighters is also safe and in proper condition according to the available best practices.

(k)-2. OSHA is seeking input regarding whether and how WEREs and ESOs currently provide separation and distinction of PPE and non-PPE equipment that have not undergone gross decontamination.

Gross decontamination represents an important practice for exposure control. When conditions prevent gross contamination, all gear should be bagged and tagged for decontamination. Most departments have already made the move to provide a second set of turnout gear. This represents a critical step in supporting the improvement of exposure control practices.

Departments should have a policy in place when fire fighters get detailed to a different station that the gear be placed in a gear bag and transported in the trunk/rear of the vehicle (e.g., proper laundering procedures). Additionally, any fire department vehicles that require the occupants to carry gear, also should be storing their gear in a gear bag and in the trunk/back of the vehicle.

We acknowledge that potentially contaminated ensembles or ensemble elements shall not be brought into the home, taken to public facilities, or transported in private vehicles in accordance with the NFPA 1851, section 4.5.4. Despite this, there are situations where response missions do not permit access to adequate facilities for decontamination. For example, wildland fire fighters deployed in remote areas may unavoidably require the use of public laundromats when specific precautions are followed as described in Chapter 7 of NFPA 1877. Wildland fire fighters may also not have access to sufficient laundry facilities.

International Agencies, including the Swedish Civil Contingencies Agency, have multifactorial systems to manage fire fighter exposure to unknown chemical substances. The system is called the Skellefteå Model and is implemented through three factors: tools, routines/workflows, and knowledge/insight. Of particular interest here is the routine and workflows component. This includes the transportation of PPE to and from incident scenes, routines on scene, storing equipment after incidents, handling potentially contaminated equipment at the ESF, and methods of decontamination of equipment and personnel. ESOs wishing to establish comprehensive contamination control procedures are advised to look to the Skellefteå Model as an example of a comprehensive, evidence-based, and proven system.

The Swedish Civil Contingencies Agency has provided a comprehensive guide to Skellefteå Model implementation. It is available in English as a PDF under the Publications tab on the website[28].

(k)-3. OSHA is seeking information on whether there is evidence of per- and polyfluoroalkyl substances (PFAS) in PPE causing health issues for team members and responders.

This question can only be properly answered through related questions:

- What PFAS are found in fire fighter PPE?

- What routes of exposure do fire fighters have to those PFAS?

- What evidence for elevated internal doses of those PFAS in fire fighters?

- When considering the PFAS from fire fighter gear shown to be at increased concentrations within fire fighters, what associated health risks exist?

Two recent studies on fire fighter turnout gear have identified a great number of PFAS (listed above) as being present in measurable quantities.[29,30] These analytes were identified through targeted testing. Given the wide range of polymer and monomer PFAS, branched-chain, precursor PFAS, water soluble and non-soluble chemistries used in textiles, including intermediary PFAS which are produced through common degradation means, leads us to expect that additional unidentified PFAS would be present in fire fighter turnout gear and serve as an exposure concern.[31,32]

MeFOSAA	MeFBSE	PFNA	MeFOSAA
4:2 FTS	MeFOSE	PFDA	PFPeS
6:2 FTS	EtFOSE	PFUdA	PFDS
10:2 FTS	8:2 FTAc	PFDoA	MeFBSA
5:3 FTCA	10:2 FTAc	PFDoDA	FHxSA
8:2 UFTCA	6:2 FTMAc	PFTrDA	FOSA
6:2 diPAP	8:2 FTMAc	PFTeDA	EtFOSAA
diSAmPAP	PFBA	PFPrS	PF4OPeA
6:2 FTOH	PFPeA	PFBS	PF5OPeA
8:2 FTOH	PFHxA	PFHxS	HFPO-DA
10:2 FTOH	PFHpA	PFOS	PFUnDA
12:2 FTOH	PFOA	FBSA	PFEESA

With respects to the routes of exposure to PFAS for fire fighters, from turnout gear, we must contradict the statement by OSHA on p. 7829 of the Emergency Response Standard, "*While current information leans towards ingestion being the most common mode of exposure to PFAS…*" It has been demonstrated that dermal exposure to newer replacement PFAS (including those found in fire fighter turnout gear) have similar trends in liver effects compared to oral exposure to legacy PFAS.[33] Further research has proven that dermal penetration of PFAS occurs readily and rapidly.[34,35] Additionally, and as opposed to ingestion, dermal penetration of PFAS can be long-lasting and contribute considerably to the body burden of PFAS in humans.[36] Furthermore, the direct contact-

deposition of solid PFAS onto the skin is unnecessary for risk to be present. This is because transdermal absorption of neutral gaseous PFAS has been proven, and shown to be a form of PFAS exposure concurrent with inhalation for these gaseous PFAS.[37] Building on the relevant and substantive inhalation risk related to PFAS exposure, studies prove that the fluorotelomer alcohols used in fire fighter textiles are readily inhaled from the dust coming off the textiles, and also from off-gassing when these PFAS and their precursors (6:2 diPAP) are heated. Unfortunately, fire fighters not only inhale, but also inadvertently ingest airborne dust within fire stations proven to be heavily contaminated with PFAS from AFFF and turnout gear sources.[38,39,40] Fire fighters have been shown to have a higher blood concentration of several PFAS as compared to the general public, and it would be reasonable to conclude that they also have higher concentrations of PFAS yet tested within the fire fighter population. Some of the PFAS proven to be at higher concentrations within fire fighters are: PFOS, PFHxS, PFNS, Cl-PFOS, ketone-PFOS, ether-PFHxS, Cl-PFHxS, PFHpS, PFOA, PFNA, PFDA, PFUnDA, PFDoA, PFBS, PFOSA, MeFOSAA, EtFOSAA.[41,42,43,44,45,46,47]

Strong high-power research on humans has proven that PFOA, PFOS, PFHxS and PFNA are causally associated with cancers of the: brain, esophagus, lung, prostate, kidney, testicular, breast, liver, and skin.[48,49,50,51] Beyond the increased risk for cancer, the PFAS within fire fighter PPE and found in fire fighter blood are also causally linked to increased rates, and occurrences of: cardiovascular disease, reduced fertility, reduced serum testosterone levels, and nearly all negative pregnancy and birth outcomes, including reduced breastfeeding duration, gestational diabetes, reduced executive function in offspring, metabolic disorder.[52,53,54,55,56,57,58,59,60,61] Most importantly studies show that the increased PFAS within fire fighters that have textile (PFAS) associations alter DNA methylation and epigenetics within incumbent fire fighters, and those changes accelerate the epigenetic age of fire fighters and are markers associated with the previously noted diseases/conditions, which unsurprisingly afflict fire fighters at increased rates as compared to the general population.[62,63]

Evidence exists and continues to accumulate confirming that PFAS found in fire fighter PPE is bioavailable through several exposure routes and are found and persist in high concentrations in fire fighter blood. Furthermore, these PFAS are linked to negative health outcomes, including – *cancers, reproductive, cardiovascular, metabolic, all of which epidemiological studies prove occur in fire fighters at increased rates as compared to the general public (despite an overall healthy-worker-effect)*.

(k)-4. OSHA is seeking input on whether the scheduled updates to NFPA 1971 will address or alleviate stakeholder's concerns about PFAS in PPE.

Because of the revision process, we cannot foreseeably anticipate what the finalized version of the standard will contain, and therefore, we cannot assume that this standard will completely address or alleviate stakeholder concerns.

Several updates have passed first and second drafts of the proposed consolidated NFPA 1970 Standard; however, two NFPA 1970 Technical Committee members, including one who represents a manufacturer of PFAS, has asked for the entire Standards Draft to go back to Committee for further opportunities to redress the positive agreements made regarding hazard reduction including PFAS exposure within the Standard. If this occurs, increased delays and changes are inevitable to the current proposed Draft Standard. This does not adequately address the concerns from stakeholders and fire fighter end-users.

Table 5. Hazards Table from NFPA Standard

Physical Hazards	**Chemical Hazards**
Falling objects	Inhalation
Flying debris	Skin absorption or contact
Projectiles or ballistic objects	Chemical ingestion or injection
Abrasive or rough surfaces	Liquefied gas contact
Sharp edges	Chemical flashover
Pointed objects	Chemical explosions
Slippery surfaces	**Electrical Hazards**
Excessive vibration	High voltage
Environmental Hazards	Electrical arc flashover
High heat and humidity	Static charge buildup
Ambient cold	**Radiation Hazards**
Wetness	Ionizing radiation
High wind	Non-ionizing radiation
Insufficient or bright light	**Person-Position Hazards**
Excessive noise	Daytime visibility
Thermal Hazards	Nighttime visibility
High convective heat	Falling
Low radiant heat	Drowning
High radiant heat	**Person-Equipment Hazards**
Flame impingement	Material biocompatibility
Steam	Ease of contamination
Hot liquids	Thermal comfort
Molten metals	Range of motion
Hot solids	Hand function
Hot surfaces	Ankle and back support
Biological Hazards	Communications ease
Bloodborne pathogens	Fit (poor)
Airborne pathogens	Ease of donning and doffing
Biological toxins	
Biological allergens	

Additionally, the Technical Committee for NFPA 1970 has passed through the 2nd Draft of the Standard a transition period. This would allow manufacturers 1.5 years beyond the publication date of the future consolidated NFPA 1970 Standard (which will hopefully have a Restricted Substances List, that will include chemicals of concern) to be

compliant with the new Standard. This is an unacceptable pseudo-regulatory delay to the process of allowing for safer, carcinogen/toxin free PPE from being guaranteed within the market.

For these reasons and given the unknowns regarding what the final Standard may look like, we have no assurances or guaranteed expectations that end-users – fire fighters, and other stakeholders will have their concerns alleviated through the NFPA process.

(I)-1. OSHA is seeking information on whether there are any other situations or vehicles where OSHA should require, or exclude, the use of seat belts and vehicle harnesses. If so, please explain.

All standards today focus on restraints (i.e. seatbelt) safety, including alarm notification for those not restrained. A gator/golf cart may be the only vehicle that may not have restraints. The department should have SOPs regarding the use of seatbelts, and they usually place the officer in charge responsible for enforcement, but the driver should ensure that all passengers are wearing restraints before the vehicle is in motion.

Wearing a lap/shoulder seatbelt is the single most important step anyone can take to reduce injury in a motor vehicle accident. Studies sponsored by the National Highway Traffic Safety Administration (NHTSA) conclude that seatbelt use in cars and pickup trucks reduces the risk of injury by half or more[64].

(I)-2. OSHA is seeking input on how compliance with (I)(2)(iii) would be achieved in situations where PPE must be donned enroute to an incident. Would the team members or responders stop enroute or wait until arrival at the scene?

According to best practices, it is recommended that when a response is dispatched while the apparatus is in motion, the engineer should, when safe to do so, pull over to a safe location. This allows personnel to don their personal protective equipment (PPE) before arriving at the scene. It is emphasized that at no point should personnel remove seatbelts to don PPE or wear structural firefighting helmets while the apparatus is in motion. This approach prioritizes the safety of personnel by ensuring that they are properly equipped before engaging in any firefighting activities upon arrival at the scene.

(I)-3. OSHA is seeking input on whether it should also require that patients be restrained during transport to prevent an unrestrained patient from being thrown into a team member or responder in the event of a vehicle collision or an evasive driving maneuver.

Ambulance design had developed better seating arrangements in the back of an ambulance getting away from the bench seat. This allows the provider to sit in a forward, rear, or 45-degree angle with a four-point restraint harness. The provider seats have an alert system for the driver so they will know when you are belted or not. Patient restraint to the stretcher requires the use of shoulder straps. Crash testing in ambulance and seating configurations has confirmed the increased safety to the provider and

patient when devices are properly worn. Even in the event of cardiac arrest, the Lucas device assists with CPR compressions preventing the provider from having to be unrestrained. The IAFF suggests OSHA move forward with the recommendation.

(o)-1. OSHA is seeking input about WERE and ESO current use of an IMS, whether the NIMS and NRF were used as guidance for the IMS, and if there are any concerns with being compatible with NIMS.

Many WEREs and ESOs already employ some form of IMS to manage emergency incidents. These systems vary widely in complexity and scope, depending on the organization's size, the nature of the emergencies they respond to, and the resources, both personnel and equipment, available to them. Organizations in larger communities or those with significant risk factors (such as industrial facilities) tend to have more sophisticated IMSs that closely align with NIMS principles, given their higher likelihood of interfacing with multiple agencies during incidents.

Smaller organizations may face challenges in aligning their IMS with NIMS due to limited resources, including funding, training, and personnel. Support mechanisms, such as grants, training programs, and technical assistance from federal and state agencies, are needed to facilitate NIMS compatibility.

Ensuring that all members of WEREs and ESOs are adequately trained in NIMS principles and the specific requirement of their IMS requires ongoing education and practice. The dynamic nature of incident management also necessitates continuous (annual) training to keep up with best practices and changes in standards.

A technical challenge often encountered is the interoperability of communication systems, which is critical for the effective application of an IMS during multi-agency responses. Investment in compatible communication technologies and protocols is necessary.

(o)-2. OSHA is seeking input on which aspects of an IMS are the most effective and the least effective in protecting the safety and health of team members and responders. Commenters should explain how and why certain IMS components are or are not effective.

The development and use of an Incident Management System (IMS) is critical for ensuring the safety and health of team members and responders during emergency incidents. The IMS provides a structured framework for managing the broad range of emergency incidents, from routine to complex, multi-agency responses.

Effective Components

The establishment of a clear command structure with designated roles and responsibilities is highly effective in ensuring coordinated and safe responses. This

structure helps in minimizing confusion, ensuring accountability, and improving the decision-making process during emergencies.

- Standardized communication protocols are vital for the effectiveness of an IMS. They ensure that information is accurately and promptly shared among all participants, which is essential for the safety of team members and the success of the operation.

- Providing comprehensive training based on tiers of duty and ensuring that ICs have the necessary authority to perform their duties are critical for managing incidents effectively. Training that aligns with standards in NFPA 1021 ensures that ICs have the skills and knowledge to lead responses, make informed decisions, and prioritize responder safety.

- An IMS that integrates safety and health considerations into every aspect of incident management, including risk assessment, operational planning, and post-incident analysis, is effective in protecting team members and responders.

Ineffective Components

While training for ICs is emphasized, insufficient training for other roles within the IMS can be a limitation. Every team member needs to understand their role within the IMS framework and possess the skills necessary to perform their duties effectively.

- In some cases, the IMS may not fully support interoperability between different agencies and jurisdictions. This lack of interoperability can hinder the effectiveness of multi-agency responses and put the safety and health of team members and responders at risk. Usually due to a lack of multi-agency training and pre-incident communication.

- While a clear command structure is vital, an over-reliance on a hierarchical command in rapidly evolving situations can sometimes delay critical decisions or actions. Flexibility in command, allowing for decentralized decision-making when appropriate, can enhance responsiveness.

- To ensure coordination between centralized strategic decisions and decentralized tactical decisions, effective communication on the fireground must exist, in which the strategic decisions are communicated to all units, and the key tactical choices and success or failures are communicated back to Command[65].

(p)-1. OSHA is seeking stakeholder input on current practices for identifying and communicating the various control zone boundaries. What marking methods are used? How are they communicated to team members and responders? Do the marking methods help or hinder on-scene operations?

Current practices for identifying and communicating control zone boundaries in emergency incidents vary widely across Emergency Services Organizations (ESOs). The effectiveness of these practices is critical to ensuring the safety and operational efficiency of team members and responders. Here's a breakdown of common practices and common communication techniques.

Colored tape is a widely used method for demarcating control zones. Different colors signify the type of zone (e.g., red for hot zones, yellow for warm zones, and green for cold zones). This method is effective due to its visibility and simplicity. Signage, while not as often, is used to clearly label zones, especially at entry points, providing clear instructions or warnings. Signs can be beneficial in reinforcing the significance of the zone and any specific precautions that need to be taken.

Cones, barricades, and other physical barriers are used to physically delineate zones and prevent unauthorized entry. While effective, these require more time to set up and may not be as easily movable as fire line tape. In some cases, especially in large outdoor areas, flagging or marking paint may be used to indicate boundaries. These are less common but can be effective for long-term operations where tape and barriers may not be durable. In more technologically advanced operations, electronic or digital markers, such as GPS-based systems or drones, can provide dynamic mapping of zones. These are especially useful for large-scale or complex incidents but require specialized equipment and training.

Before engaging in an incident response, team members and responders are briefed on the control zones, including any specific hazards associated with each zone with ongoing updates and changes to control zones typically communicated via radio, ensuring real-time dissemination of information to all involved parties.

(q)-1. OSHA seeks input on whether the agency should include requirements for Standard Operating Procedures (SOPs) regarding protections against workplace violence for team members and responders, and for any data or documentation to support or refute potential requirements. OSHA notes that its regulatory agenda includes a separate rulemaking addressing workplace violence against health care workers. While OSHA has not published a proposed rule in that rulemaking, OSHA welcomes comments on whether violence against emergency responders should be addressed in a potential Emergency Response final rule in addition to that Workplace Violence rulemaking, instead of in that rulemaking, or primarily in that other rulemaking.

Including requirements for Standard Operating Procedures (SOPs) regarding protections against workplace violence for team members and responders within the context of an Emergency Response final rule is both critical and necessary. This need is underscored by the increasing incidents of violence emergency responders face, ranging from physical assaults to verbal threats, during their duties. Addressing this concern directly within emergency response regulations would ensure that specific

measures are in place to protect those who are often the first on the scene of emergencies, where the risk of violence can be significantly heightened.

Emergency responders, including fire fighters, EMTs, face unique workplace violence risks not always shared by health care workers in controlled environments. Their work often puts them in volatile and unpredictable situations where the risk of violence is high. Including SOPs in the Emergency Response rule would ensure tailored strategies that address these unique circumstances. While the separate rulemaking initiative focusing on health care workers is vital, emergency responders engage in a broader range of environments and situations. Including protections within the Emergency Response rule ensures that all aspects of emergency response work are covered, providing a more comprehensive approach to workplace violence.

Specific SOPs would guide emergency response organizations in developing and implementing strategies to prevent, identify, and respond to violent incidents. This could include de-escalation training, situational awareness education, and protocols for quick assistance when violence occurs. Including these requirements in the Emergency Response final rule would promote consistency in protections against workplace violence for emergency responders across different states and jurisdictions, ensuring a standardized level of safety.

(r)-1. OSHA is considering adding a requirement to permit team members, responders, and their representative to be involved in the review and evaluation of the relevant plans as part of the Post-Incident Analysis and would like stakeholder input on whether to add this requirement.

Incident investigations are often conducted by a supervisor, but to be most effective, they should include managers and employees working together since each brings different knowledge, understanding, and perspectives to the investigation. See post-incident analysis Chapt 8.11 in NFPA 1500.

It is beneficial to include a review and evaluation of the RMP, IMS, IAPs, PIPs, and SOPs for accuracy and adequacy. This review ensures safe and effective operations for similar incidents moving forward.

IAFF's Responses to *D. Additional Issues*

Consensus Standards

The NWCG is a respected organization. Since 1976, the National Wildfire Coordination Group (NWCG) has served as a guiding force in the realm of wildland fire. NWCG has continued to evolve, looking to enhance safety and efficiency in the workforce through standards, qualifications, and best practices. They are referenced by various organizations including federal, state, local, and tribal agencies and have established standards that transcend borders and regions similar to the National Registry of Emergency Medical Technicians. It would be an incredible oversight to neglect their

input or standards, as they have been regulating training in the wildland community for decades. We suggest that NWCG standards are evaluated with a thought to incorporating into the OSHA standard as a way to address the safety, health, and competency of our wildfire/urban-interface fire fighters.

The IAFF has developed and implemented a nationally recognized training course, "Responding to the Interface," training that is on par with NWCG S215 standards, which identifies and teaches critical skills in wildfire/urban-interface firefighting that structural/municipal fire fighters need for safe, competent, response during initial attack, extended attack, and major incidents within their jurisdiction and when assigned to other jurisdictions at the federal, state, and local agency level.

Timeline for Compliance

We support OSHA's efforts to implement these standards as soon as possible. That said, given procurement timelines, and external challenges, we foresee this timeline taking longer than OSHA has outlined. We support this standard broadly and therefore ask that OSHA considers extending these timelines to best support the fire service, with a more realistic timeframe of at least 12-18 months in addition to the recommended timeframes. For example, if it is recommended to take 6 months, we encourage OSHA to consider extending that timeframe to 18 months.

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