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California Energy Commission DOCKETED 11-AFC-02
TN # 70197 APR. 03 2013

District Counsel for the Southern Inyo
County Fire Protection District

STATE OF CALIFORNIA
State Energy Resources
Conservation and Development Commission

In the Matter of:)	DOCKET NO. 11-AFC-2
)	
APPLICATION FOR CERTIFICATION)	MOTION TO SUPPLEMENT THE
FOR THE HIDDEN HILLS SOLAR)	EVIDENTIARY RECORD BY THE
ELECTRIC GENERATING SYSTEM)	SOUTHERN INYO FIRE PROTECTION
)	DISTRICT

MOTION TO SUPPLEMENT THE EVIDENTIARY RECORD

Pursuant to Title 20, Section 1716.5 of the California Code of Regulations (the “Commission Regulations”), the Southern Inyo Fire Protection District (the “District”) moves to supplement the evidentiary record that is before the California Energy Commission (“Commission”) in the above-captioned proceeding for the Hidden Hills Solar Electric Generating System (the “Project”).

The District, which intervened in this matter on February 11, 2013, is participating in ongoing negotiations with the Project Applicant aimed at achieving an agreement that would adequately fund District services to achieve an adequate level of service for fire prevention, fire suppression, and emergency medical response, as well as mitigating the impacts of the Project on the District and its service area.

On March 18, 2013, during the Commission’s Evidentiary Hearings, the Project Applicant indicated that it could form and maintain an industrial fire brigade as an alternative to relying on the District for fire prevention, fire suppression, emergency medical response, and related services. The Project Applicant also indicated that the fire brigade would not respond to emergencies outside of the Project Site.

However, neither the Staff nor the Applicant have addressed the feasibility of implementing a fire brigade that would operate in compliance with the requirements set forth by Occupation Safety and Health Administration (“OSHA”) Standard 1910.156 *et seq.* and National Fire Protection Association (NFPA) Standards 600 and 1081. These standards set forth rigorous requirements for equipping, staffing, training, administering, and operating an industrial fire brigade. Additionally, the representation that an industrial fire brigade would not

respond outside of the Project Site calls into question how the fire brigade would mitigate the Project's impacts on the District.

In light of the representations regarding an industrial fire brigade, the District respectfully requests that the enclosed true and correct copies of OSHA Standard 1910.156 *et seq.* and NFPA Standards 600 and 1081 be admitted into the evidentiary record.

Additionally, the District respectfully requests that the evidentiary record be supplemented by the enclosed Declaration of District consultant Mr. Ronny J. Coleman¹, the Former State Fire Marshal. Mr. Coleman testified on March 18, 2013 regarding calculating the Project's impacts on the District, consistent with NFPA Standard 1720, also enclosed. Mr. Coleman has reviewed the statements regarding formation of a fire brigade, confirming that there has been no indication as to how the brigade would be made in compliance with the applicable standards, let alone doing so without costing substantially more than if the services were to be provided by the District.

These materials are admissible pursuant to Commission Regulation Section 1212, which provides that any "relevant noncumulative evidence shall be admitted if it is the sort of evidence on which responsible persons are accustomed to rely in the conduct of serious affairs." These materials are of the type to be relied upon by a responsible person, as they are comprised of mandatory regulations establishing industry standards (that is, existing law) and the opinion of an expert in the field of fire protection and emergency medical response.

Therefore, it is respectfully requested that the Commission admit the following enclosed exhibits into evidence:

Exhibit A - Declaration of Ronny Coleman

Exhibit B - NFPA Standard 1720

Exhibit C - OSHA Standard 1910.156

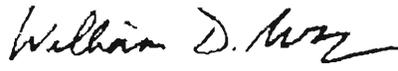
¹ Mr. Coleman's C.V. has previously been lodged with the Docket Unit.

Exhibit C - NFPA Standard 600

Exhibit D - NFPA Standard 1081

DATED: April 3, 2013

LAW OFFICES OF WILLIAM D. ROSS
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By: 

WILLIAM D. ROSS

District Counsel for the Southern Inyo Fire
Protection District

Exhibit A

LAW OFFICES OF WILLIAM D. ROSS,
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District Counsel for the Southern Inyo
County Fire Protection District

**STATE OF CALIFORNIA
State Energy Resources
Conservation and Development Commission**

In the Matter of:

APPLICATION FOR CERTIFICATION
FOR THE HIDDEN HILLS SOLAR
ELECTRIC GENERATING SYSTEM
(SEGS)

DOCKET NO. 11-AFC-2

**DECLARATION OF RONNY J. COLEMAN IN
SUPPORT OF PROJECT MITIGATION FOR THE
SOUTHERN INYO FIRE PROTECTION DISTRICT**

DECLARATION OF RONNY J. COLEMAN

I, Ronny J. Coleman, say and declare:

1. I have extensive experience in the fire service including but not limited to analysis of the allocation of fire facilities (fire station) equipment included but not limited to fire apparatus, personal protection clothing, and staffing and to address levels of fire service throughout the United States and specifically in California. My experience, which includes that of a fire chief and as the State Fire Marshal is set forth in my resume, a copy of which has been filed with the Commission and lodged on the docket.
2. I have been retained by the Southern Inyo Fire Protection District (“District”) to analyze the impact of the Hidden Hills Solar Project (the “Project”) on the District and to prepare an analysis that is consistent with anticipated and available District resources and service demands to mitigate the impact of the Project on the District.
3. In performing this analysis I have utilized the nationally recognized and acceptance standard formulated by the National Fire Protection Association (“NFPA”) Standard Number 1720, a true and correct copy of which is enclosed.
4. I have visited the Project site and several aspects of the District, the including station, apparatus, and facilities of the District in Southeastern Inyo County. I have also visited and reviewed the procedures of the Ivanpah power facility located in San Bernardino County. Based on my personal observation of the Project site location, a review of similar but not comparable facilities, and an extensive review of the District’s existing personnel equipment and facilities I am of the opinion that the Deployment Declaration which has been adopted by the District to addresses the Project’s impact with respect to fire protection is a manner that is both rational and physically realistic.
5. In coming to this conclusion I am aware of the financial condition of the District, including that it does not share in of the one percent property tax levied in Inyo County,

but rather currently has only one source of income: a fire benefit assessment generating approximately \$100,000 of revenue per year.

6. I have read and reviewed both the Applicant's analysis of fire protection and the Staff's analysis and concurred with the Staff's analysis regarding an agreement between the Project Applicant and the District to fund the implementation or to otherwise address fire mitigation. When implemented, the District Deployment Declaration provides a means of calculating the cost of the District to accomplish the needed facilities, equipment, and staffing to mitigate the Project consistent with the NFPA Standard 1720.
7. Neither the Project Applicant nor the commission staff presented a comprehensive analysis consistent with the accepted NFPA Standard 1720 methodology to evaluate project impacts. I have participated in discussions with the applicant's representatives on this issue and believe that the annual amount of \$400,000 would accomplish implementation of the mitigation measures set forth in NFPA 1720.
8. I am familiar with OSHA Standard 1910.156 *et seq.* and NFPA Standards 600 and 1081. True and correct copies of these standards are enclosed. I have also reviewed the representations regarding the Project Applicant forming an industrial fire brigade as an alternative to relying on the District's services. However, there has been no indication of how the fire brigade would be made to comply with the OSHA and NFPA Standards, nor how it would operate without costing substantially more than if the services were provided by the District.

I declare under penalty of perjury that the foregoing is true and correct. Executed this 18th day of March 2013 at Sacramento California



Ronny J. Coleman

Exhibit B

NFPA 1720

Standard for the

Organization and Deployment of Fire Suppression Operations, Emergency

Medical Operations, and Special Operations to the Public by Volunteer Fire

Departments

2001 Edition

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This edition of NFPA 1720, *Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Volunteer Fire Departments*, was prepared by the Technical Committee on Fire and Emergency Service Organization and Deployment — Volunteer and acted on by NFPA at its May Association Technical Meeting held May 13–17, 2001, in Anaheim, CA. It was issued by the Standards Council on July 13, 2001, with an effective date of August 2, 2001.

This edition of NFPA 1720 was approved as an American National Standard on August 2, 2001.

Origin and Development of NFPA 1720

The development of this technical standard is a result of a considerable amount of hard work and tenacity by Technical Committee members and the organizations they represent. In the case of this standard, their work is the first organized approach to defining deployment capabilities for those “substantially” volunteer fire departments.

The uniqueness of the volunteer fire service, the different services they provide, and how they deploy and respond are being left to the authority having jurisdiction (AHJ) to determine.

The work done by the Committee will provide the user a template for developing an implementation plan on the standard. Most importantly, it will provide the body politic and the citizens a true picture of what the risks are in their community, and the fire department's capabilities to respond to and manage those risks.

Technical Committee on Fire and Emergency Service Organization and Deployment — Volunteer

Peter A. McMahon *Chair*
Town of Grand Island, NY [C]

Alden H. (Andy) Andersen, Deer Park, MD [C]

Robert T. Bettenhausen, Village of Tinley Park, IL [E]
Rep. International Association of Fire Chiefs

Douglas E. Chappell, Village of Hazel Crest, IL [U]
Rep. National Volunteer Fire Council

Alan Corner, Alan Corner, Esq., WA [E]
Rep. International Association of Fire Chiefs

Larry W. Curl, Wayne Township Fire Department, IN [E]
Rep. International Association of Fire Chiefs

Ronald R. Farr, Kalamazoo Township Fire Department, MI [L]
Rep. National Association of Town and Township

James L. Gordon, City of Pierre Fire Department, SD [U]
Rep. National Volunteer Fire Council

James G. Hannigan, New York State Association of Fire Chiefs, NY [E]
Rep. New York State Association of Fire Chiefs

Maureen Hennessy, Prince George's County Fire/EMS Department, MD [L]
Rep. NFPA Fire Service Section

Richard C. Maddox, Creedmoor Psychiatric Center, NY [U]
Rep. Fire Department Safety Officers Association

John J. McAuliffe, Wethersfield, CT [U]
Rep. National Volunteer Fire Council

Kenneth H. McMahon, MOTIVA LLC., DE [L]
Rep. Delaware Volunteer Firemen's Association

Dale Moon, City of Williams Lake Fire Department, British Columbia, Canada [E]

Vernon J. Patton, First Energy Corporation, OH [C]

Timothy N. Pelton, Do It Better.com, Inc., CT [L]

Richard Trexler, Colfax Volunteer Fire Department, NC [I]
Rep. Volunteer Firemen's Insurance Services, Inc.

Alternates

Stephan D. Cox, National Volunteer Fire Council, MD [U]
(Alt. to D. E. Chappell)

Jay Howell, Pikeville Insurance Agency, Inc., NC [I]
(Alt. to R. Trexler)

Robert J. Kilpeck, Brandon Fire Department, VT [U]
(Alt. to J. L. Gordon)

Jeremiah O'Sullivan, Association of Fire Districts — New York State, NY [E]
(Alt. to J. G. Hannigan)

Stephen N. Foley, NFPA Staff Liaison

Committee Scope: This Committee shall have primary responsibility for documents on the organization, operation, deployment, and evaluation of substantially all volunteer public fire protection and emergency medical services.

This list represents the membership at the time the Committee was balloted on the final text of this edition. Since that time, changes in the membership may have occurred. A key to classifications is found at the back of the document.

NOTE: Membership on a committee shall not in and of itself constitute an endorsement of the Association or any document developed by the committee on which the member serves.

**Standard for the
Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and
Special Operations to the Public by Volunteer Fire Departments
2001 Edition**

NOTICE: An asterisk (*) following the number or letter designating a paragraph indicates that explanatory material on the paragraph can be found in Annex A.

A reference in brackets [] following a section or paragraph indicates material that has been extracted from another NFPA document. The complete title and edition of the document the material is extracted from is found in Annex B. Editorial changes to extracted material consist of revising references to an appropriate division in this document or the inclusion of the document number with the division number when the reference is to the original document. Requests for interpretations or revisions of extracted text shall be sent to the appropriate technical committee.

Information on referenced publications can be found in Chapter 2 and Annex B.

Chapter 1 Administration

1.1* Scope.

This standard contains minimum requirements relating to the organization and deployment of fire suppression operations, emergency medical operations, and special operations to the public by substantially all volunteer fire departments.

1.1.1* The requirements address functions and outcomes of fire department emergency service delivery, response capabilities, and resources.

1.1.2 This standard also contains minimum requirements for managing resources and systems, such as health and safety, incident management, training, communications, and pre-incident planning.

1.1.3 This standard addresses the strategic and system issues involving the organization, operation, and deployment of a fire department and does not address tactical operations at a specific emergency incident.

1.1.4 This standard does not address fire prevention, community education, fire investigations, support services, personnel management, and budgeting.

1.2 Purpose.

1.2.1 The purpose of this standard is to specify the minimum criteria addressing the effectiveness and efficiency of the volunteer public fire suppression operations, emergency medical service, and special operations delivery in protecting the citizens of the jurisdiction.

1.2.2 Nothing herein is intended to restrict any jurisdiction from exceeding these minimum requirements.

1.2.3* The authority having jurisdiction shall determine if this standard is applicable to their fire department.

1.3 Equivalency.

Nothing in this standard is intended to prohibit the use of systems, methods, or approaches of equivalent or superior performance to those prescribed in this standard. Technical documentation shall be submitted to the authority having jurisdiction to demonstrate equivalency.

Chapter 2 Referenced Publications

2.1 General.

The documents or portions thereof listed in this chapter are referenced within this standard and shall be considered part of the requirements of this document.

2.1.1 NFPA Publications.

National Fire Protection Association, 1 Batterymarch Park, P.O. Box 9101, Quincy, MA 02269-1901.

NFPA 472, *Standard for Professional Competence of Responders to Hazardous Materials Incidents*, 1997

edition.

NFPA 1221, *Standard for the Installation, Maintenance, and Use of Emergency Services Communications Systems*, 1999 edition.

NFPA 1500, *Standard on Fire Department Occupational Safety and Health Program*, 1997 edition.

NFPA 1561, *Standard on Emergency Services Incident Management System*, 2000 edition.

2.1.2 Other Publications.

(Reserved)

Chapter 3 Definitions

3.1 General.

The definitions contained in this chapter shall apply to the terms used in this standard. Where terms are not included, common usage of the terms shall apply.

3.2 NFPA Official Definitions.

3.2.1* Approved. Acceptable to the authority having jurisdiction.

3.2.2* Authority Having Jurisdiction. The organization, office, or individual responsible for approving equipment, materials, an installation, or a procedure.

3.2.3 Shall. Indicates a mandatory requirement.

3.2.4 Should. Indicates a recommendation or that which is advised but not required.

3.3 General Definitions.

3.3.1 Aid.

3.3.1.1* Automatic Aid. The pre-determined response of personnel and equipment for an alarm to a neighboring jurisdiction.

3.3.1.2* Mutual Aid. A written policy or contract to allow for the deployment of personnel and equipment to respond to an alarm in another jurisdiction. *(See also Automatic Aid.)*

3.3.2* Alarm. A signal or message from a person or device indicating the existence of a fire, medical emergency, or other situation that requires emergency services response.

3.3.3* Company. A group of members with the following characteristics: (1) Under the direct supervision of an officer; (2) Trained and equipped to perform assigned tasks; (3) Usually organized and identified as engine companies, ladder companies, rescue companies, squad companies, or multi-functional companies; (4) Usually operating with one piece of fire apparatus (engine, ladder truck, elevating platform, quint, rescue, squad, ambulance); (5) Arriving at the incident scene on fire apparatus; (6) Company configurations shall be permitted to allow for multiple apparatus that are dispatched and arrive together, continuously operate together, and are managed by a single company officer.

3.3.4 Emergency Incident. A specific emergency operation. [1500:1.5]

3.3.5 Emergency Medical Care. The provision of treatment to patients, including first aid, cardiopulmonary resuscitation, First Responder, Basic Life Support, Advanced Life Support, and other medical procedures that occur prior to arrival at a hospital or other health care facility. [1521:1.4]

3.3.6 Emergency Operations. Activities of the fire department relating to rescue, fire suppression, emergency medical care, and special operations, including response to the scene of the incident and all functions performed at the scene. [1500:1.5]

3.3.7 Fire Apparatus. A fire department emergency vehicle used for rescue, fire suppression, or other specialized functions. [1404:1.4]

3.3.8 Fire Department Member. See Member. [1500:1.5]

3.3.9 Fire Department Vehicle. Any vehicle, including fire apparatus, operated by a fire department. [1002:1.4]

3.3.10 Fire Protection. Methods of providing fire detection, control, and extinguishment.

3.3.11* Fire Suppression. The activities involved in controlling and extinguishing fires. [1500:1.5]

3.3.12* First Responder (EMS). Functional provision of initial assessment (airway, breathing, and circulatory systems) and basic first aid intervention, including CPR and automatic external defibrillator (AED) capability.

3.3.13* Hazard. The potential for harm or damage to people, property, or the environment. [1500:1.5]

3.3.14 Hazardous Material. A substance that presents an unusual danger to persons due to properties of toxicity, chemical reactivity or decomposition, corrosivity, explosion or detonation, etiological hazards, or similar properties. [1500:1.5]

3.3.15 Incident Commander. The fire department member in overall command of an emergency incident. [1500:1.5]

3.3.16* Incident Management System (IMS). An organized system of roles, responsibilities, and standard operating procedures used to manage emergency operations. [1021:1.4]

3.3.17 Incident Safety Officer. An individual appointed to respond or assigned at an incident scene by the incident commander to perform the duties and responsibilities of that position as part of the command staff.

3.3.18 Initial Attack. Fire-fighting efforts and activities that occur in the time increment between the arrival of the fire department on the scene of a fire and the tactical decision by the Incident Commander that the resources dispatched on the original response will be insufficient to control and extinguish the fire, or that the fire is extinguished.

3.3.19 Life Support.

3.3.19.1 Advanced Life Support (ALS) (EMS). Functional provision of advanced airway management including intubation, advanced cardiac monitoring, manual defibrillation, establishment and maintenance of intravenous access, and drug therapy.

3.3.19.2* Basic Life Support (BLS). Functional provision of patient assessment; basic airway management; oxygen therapy; stabilization of spinal, musculoskeletal, soft tissue, and shock injuries; stabilization of bleeding; and stabilization and intervention for sudden illness, poisoning and heat/cold injuries, childbirth, CPR, and automatic external defibrillator (AED) capability.

3.3.20* Member. A person(s) involved in performing the duties and responsibilities of a fire department, under the auspices of the organization. [1500:1.5]

3.3.21 Officer.

3.3.21.1* Company Officer. A supervisor of a crew/company of personnel.

3.3.21.2* Supervisory Chief Officer. A member whose responsibility is above that of a company officer, who responds automatically and/or is dispatched to an alarm beyond the initial alarm capabilities, or other special calls.

3.3.22* Public Fire Department. An organization providing rescue, fire suppression, emergency medical services, and related activities to the public.

3.3.23* Rapid Intervention Crew (RIC). A dedicated crew of fire fighters who are assigned to account for and rescue trapped or lost members.

3.3.24 Rescue. Those activities directed at locating endangered persons at an emergency incident, removing those persons from danger, treating the injured, and providing for transport to an appropriate health care facility. [1410:1.3]

3.3.25 Special Operations. Those emergency incidents to which the fire department responds that require specific and advanced training and specialized tools and equipment. [1561:1.3]

3.3.26 Standard Operating Procedure. An organizational directive that establishes a standard course of action. [1201:1.7]

3.3.27 Structural Fire Fighting. The activities of rescue, fire suppression, and property conservation involving buildings, enclosed structures, vehicles, vessels, aircraft, or like properties that are involved in a fire or emergency situation. [1500:1.5]

3.3.28 Team. Two or more fire fighters operating in the buddy system.

Chapter 4 Organization, Operation, and Deployment

4.1* Fire Suppression Organization.

Fire suppression operations shall be organized to ensure the fire department's fire suppression capability includes sufficient personnel, equipment, and other resources to efficiently, effectively, and safely deploy fire suppression resources.

4.1.1* The authority having jurisdiction shall promulgate the fire department's organizational, operational, and deployment procedures by issuing written administrative regulations, standard operating procedures, and departmental orders.

4.1.2* The fire department shall participate in a process that develops a community risk management plan with respect to the risks associated with the storage, use, and transportation of hazardous materials. The specific role of the fire department and other responding agencies shall be defined by the community risk management plan for hazardous materials and other special operations.

4.1.3* Fire department procedures shall clearly state the succession of command responsibility.

4.1.4* Personnel responding to fires and other emergencies shall be organized into company units or response teams and shall have appropriate apparatus and equipment.

4.1.5 The fire department shall identify minimum staffing requirements to ensure that a sufficient number of members are available to operate safely and effectively.

4.1.6* The fire department shall maintain a standard report containing specified information for each response. These reports shall include the location and nature of the fire or emergency and describe the operations performed. This report shall identify the members responding to the incident.

4.1.7* Standard response assignments and procedures, including mutual aid response and mutual aid agreements predetermined by the location, and nature of the reported incident, shall regulate the dispatch of companies, response groups, and command officers to fires and other emergency incidents.

4.1.8* The number and type of units assigned to respond to a reported incident shall be determined by either risk analysis and/or pre-fire planning.

4.2 Fire Suppression Operations.

4.2.1* **Incident Commander.** One individual shall be assigned as the incident commander.

4.2.1.1* The assumption and identification of command shall be communicated to all units responding to or involved at the incident scene.

4.2.1.2 The incident commander shall be responsible for the overall coordination and direction of all activities for the duration of the incident.

4.2.1.3 The incident commander shall ensure that a personnel accountability system is immediately utilized to rapidly account for all personnel at the incident scene.

4.2.1.4 The company officer/crew leader shall at all times be aware of the identity, location, and activity of each member assigned to the company.

4.2.1.5 Each member of the company shall be aware of the identity of the company officer/crew leader.

4.2.1.6 Orders addressed to individual members, particularly verbal orders and orders at incident scenes, shall be transmitted through the company officer.

4.2.2 Initial Attack.

4.2.2.1 Upon assembling the necessary resources at the emergency scene, the fire department shall have the capability to safely initiate an initial attack within two minutes 90 percent of the time.

4.2.2.2* Initial attack operations shall be organized to ensure that at least four members shall be assembled before initiating interior fire suppression operations at a working structural fire.

4.2.2.2.1 In the hazardous area, two individuals shall work as a team.

4.2.2.2.2 Outside the hazardous area, two individuals shall be present for assistance or rescue of the team operating in the hazardous area. One of the two individuals assigned outside the hazardous area shall be permitted to be engaged in other activities.

4.2.2.2.3 The assignment of any individuals shall not be permitted if abandoning their critical task(s) to perform rescue clearly jeopardizes the safety and health of any fire fighter operating at the incident.

4.2.2.3 Initial attack operations shall be organized to ensure that if, upon arrival at the emergency scene, initial attack personnel find an imminent life-threatening situation where immediate action could prevent the loss of life or serious injury, such action shall be permitted with less than four personnel when conducted in accordance with NFPA 1500, *Standard on Fire Department Occupational Safety and Health Program*.

4.2.2.4 The fire department shall have the capability for sustained operations, including fire suppression; engagement in search and rescue, forcible entry, ventilation, and preservation of property; accountability for personnel; a dedicated rapid intervention crew (RIC); and provision of support activities for those situations that are beyond the capability of the initial attack.

4.3 Intercommunity Organization.

4.3.1* Mutual aid, automatic aid, and fire protection agreements shall be in writing and shall address such issues as liability for injuries and deaths, disability retirements, cost of service, authorization to respond, staffing, and equipment, including the resources to be made available and the designation of the incident commander.

4.3.2 Procedures and training of personnel for all fire departments in mutual aid, automatic aid, and fire protection agreement plans shall be comprehensive to produce an effective fire force and to ensure uniform operations.

4.3.3 Companies responding to mutual aid incidents shall be equipped with communications equipment that allow personnel to communicate with the incident commander and division officers, group officers, or sector officers.

4.4* Emergency Medical Services.

4.4.1 **Purpose.** Emergency medical services (EMS) operations shall be organized to ensure the fire department's emergency medical capability includes personnel, equipment, and resources to deploy the initial arriving company and additional alarm assignments. The fire department shall be permitted to use established automatic mutual aid or mutual aid agreements to comply with the requirements of Section 4.4.

4.4.1.1* The provisions of this chapter shall only apply to those fire departments that are involved in the delivery of emergency medical services.

4.4.1.2* The fire department shall clearly document its role, responsibilities, functions, and objectives for the delivery of EMS.

4.4.2 **System Components.** The basic treatment levels within an EMS system, for the purposes of this standard, shall be categorized as first responder, basic life support (BLS), and advanced life support (ALS). The specific patient treatment capabilities associated with each level shall be determined by the authority having jurisdiction for the approval and licensing of EMS providers within each state and province.

4.4.3* EMS System Functions.

4.4.3.1 The following shall be considered the five basic functions within an EMS system:

- (1) First responder
- (2) BLS response
- (3) ALS response
- (4) Patient transport in an ambulance or alternative vehicle designed to provide for uninterrupted patient care at the ALS or BLS level while en route to a medical facility
- (5) Assurance of response and medical care through a quality management program

4.4.3.2 The fire department shall be involved in providing any or all of the functions as identified in 4.4.3.1(1) through 4.4.3.1(5).

4.5 Quality Management.

4.5.1 The fire department shall institute a quality management program.

4.5.2 All first responder and BLS medical care provided by the fire department shall be reviewed by the fire department medical personnel. This review process shall be documented.

4.5.3 All fire departments with ALS services shall have a named medical director with the responsibility to oversee and ensure quality medical care in accordance with state or provincial laws or regulations. This review process shall be documented.

4.5.4 Fire departments providing ALS services shall provide a mechanism for immediate communications with EMS supervision and medical oversight.

4.6* Special Operations Response.

4.6.1 Special operations shall be organized to ensure that the fire department's special operations capability includes sufficient personnel, equipment, and resources to efficiently, effectively, and safely deploy the initial arriving company and additional alarm assignments providing such services. The fire department shall be permitted to use established automatic mutual aid or mutual aid agreements to comply with the requirements of Section 4.6.

4.6.1.1 The provisions of this chapter shall apply to fire departments that are involved in the delivery of special operations response.

4.6.2 The fire department shall adopt a special operations response plan and standard operating procedures that specify the role and responsibilities of the fire department and the authorized functions of members responding to hazardous materials emergency incidents.

4.6.3 All fire department members who are expected to respond to emergency incidents beyond the first responder operations level for hazardous materials response shall be trained to the applicable requirements of NFPA 472, *Standard for Professional Competence of Responders to Hazardous Materials Incidents*.

4.6.4 The fire department shall have the capacity to implement an RIC during all special operations incidents that would subject fire fighters to immediate danger of injury, or in the event of equipment failure or other sudden events, as required by NFPA 1500, *Standard on Fire Department Occupational Safety and Health Program*.

4.6.5* If a higher level of emergency response is needed beyond the capability of the fire department for special operations, the fire department shall determine the availability of outside recourses that deploy these capabilities and the procedures for initiating their response. The fire department shall be limited to performing only those specific special operations functions for which its personnel have been trained and are properly equipped.

Chapter 5 Systems

5.1* Safety and Health System.

A fire fighter occupational safety and health program shall be provided in accordance with NFPA 1500, *Standard on Fire Department Occupational Safety and Health Program*, to form the basic structure of protecting the health and safety of fire fighters, regardless of the scale of the department or the emergency.

5.2* Incident Management System.

5.2.1 An incident management system shall be provided in accordance with NFPA 1561, *Standard on Emergency Services Incident Management System*, to form the basic structure of all emergency operations of the fire department, regardless of the scale of the department or the emergency.

5.2.2* An effective incident management system shall be designed to manage incidents of different types, including structure fires, wildland fires, hazardous materials incidents, emergency medical operations, and other types of emergencies that could be handled by the department.

5.3 Training Systems.

The fire department shall have a training program and policy that ensures that personnel are trained and competency is maintained to effectively, efficiently, and safely execute all responsibilities consistent with the department's organization and deployment as addressed in Chapter 4.

5.4* Communications Systems.

5.4.1 The fire department shall have a reliable communications system to facilitate prompt delivery of public fire suppression, emergency medical services, and special operations.

5.4.2 All communications facilities, equipment, staffing, and operating procedures shall comply with NFPA 1221, *Standard for the Installation, Maintenance, and Use of Emergency Services Communications Systems*.

5.4.3 Operating procedures for radio communications shall provide for the use of standard protocols and terminology at all types of incidents.

5.4.3.1 Standard terminology, in compliance with NFPA 1561, *Standard on Emergency Services Incident Management System*, shall be established to transmit information, including strategic modes of operation, situation reports, and emergency notifications of imminent hazards.

5.5* Pre-Incident Planning.

The fire department shall set forth operational requirements to conduct pre-incident planning. Particular attention shall be provided to target hazards.

Annex A Explanatory Material

Annex A is not a part of the requirements of this NFPA document but is included for informational purposes only. This annex contains explanatory material, numbered to correspond with the applicable text paragraphs.

A.1.1 The standard includes minimum requirements that are intended to provide effective, efficient, and safe protective services that operate on a sound basis to prevent fires, reduce risk to lives and property, deal with incidents that occur, and prepare for anticipated incidents. It sets minimum standards considered necessary for the provision of public fire protection by volunteer fire departments. It addresses the structure and operation of organizations providing such services, including fire suppression, emergency medical services, hazardous materials operations, and special operations.

A.1.1.1 The delivery of services that are directed toward saving lives from a variety of perils is generally included in the mission of the fire service, although the nature and extent of these services varies from one jurisdiction to another.

In addition to duties at fires, fire departments should be prepared to perform rescue work and provide emergency care for those injured in connection with incidents such as traffic accidents, train wrecks, aircraft crashes, floods, windstorms, weapons of mass destruction/terrorism, and earthquakes, unless specifically excluded from involvement.

In many areas, the fire department is designated as the primary provider of emergency medical services (EMS). This could involve the delivery of basic or advanced (paramedic) life-support services and could include ambulance service. These services could be performed by fire fighters or by members of the fire department specializing in EMS. The impact on fire department resources and the department's continued ability to perform its other responsibilities should be considered when undertaking the EMS activity.

A.1.2.3 The authority having jurisdiction generally has the responsibility to determine the following:

- (1) Scope and level of service provided by the fire department
- (2) Necessary level of funding
- (3) Necessary level of personnel and resources, including facilities

In order to provide service, the authority having jurisdiction can have the power to levy taxes, solicit funding, own property and equipment, and cover personnel costs. The authority necessary is conveyed by law of a local jurisdiction.

In addition, the governing body also should monitor the achievement of the management goals of the department, such as fire prevention, community life safety education, fire suppression, employee training,

communications, maintenance, and department administration.

Spelling out the specific parameters of services to be provided allows the fire department to plan, staff, equip, train, and deploy members, career and volunteer, to perform these duties. It also gives the governing body an accounting of the costs of services and allows it to select those services they can afford to provide. Likewise, the governing body should identify services it cannot afford to provide and cannot authorize the fire department to deliver or these services should be assigned to another agency.

The fire department should be no different from any other government agency that has the parameters of its authority and services clearly defined by the governing body.

A.3.2.1 Approved. The National Fire Protection Association does not approve, inspect, or certify any installations, procedures, equipment, or materials; nor does it approve or evaluate testing laboratories. In determining the acceptability of installations, procedures, equipment, or materials, the authority having jurisdiction may base acceptance on compliance with NFPA or other appropriate standards. In the absence of such standards, said authority may require evidence of proper installation, procedure, or use. The authority having jurisdiction may also refer to the listings or labeling practices of an organization that is concerned with product evaluations and is thus in a position to determine compliance with appropriate standards for the current production of listed items.

A.3.2.2 Authority Having Jurisdiction. The phrase “authority having jurisdiction” is used in NFPA documents in a broad manner, since jurisdictions and approval agencies vary, as do their responsibilities. Where public safety is primary, the authority having jurisdiction may be a federal, state, local, or other regional department or individual such as a fire chief; fire marshal; chief of a fire prevention bureau, labor department, or health department; building official; electrical inspector; or others having statutory authority. For insurance purposes, an insurance inspection department, rating bureau, or other insurance company representative may be the authority having jurisdiction. In many circumstances, the property owner or his or her designated agent assumes the role of the authority having jurisdiction; at government installations, the commanding officer or departmental official may be the authority having jurisdiction.

A.3.3.1.1 Automatic Aid. This process is accomplished through simultaneous dispatch, documented in writing, and included as part of a communication center's dispatch protocols.

A.3.3.1.2 Mutual Aid. This is part of the written deployment criteria, for response to alarms, as dispatched by the communications center.

A.3.3.2 Alarm. In some jurisdictions this could be referred to as an incident or call for service.

A.3.3.3 Company. *Company*, as used in this standard, is synonymous with company unit, response team, crew, and response group, rather than a synonym for a fire department. Jurisdictions exist where the response capability of the initial arriving company is configured with the response of two apparatus. In some jurisdictions the fire apparatus does not have seated and belted positions for four personnel and therefore would respond with an additional vehicle(s) (i.e., POVs), in concert with the initial arriving engine to carry additional personnel. This response would be to ensure that a minimum of four personnel are assigned to and deployed as a company. The intent of this definition and the requirements in the standard are to ensure that these two (or more) pieces of apparatus would always be dispatched and respond together as a single company. Some examples of this include the following:

- (1) Engine and tanker/tender that would be responding outside a municipal water district
- (2) Multiple piece company assignment, specified in a fire department's response SOPs, such as an engine company response with a pumper and a hose wagon
- (3) Engine with a vehicle personnel carrier
- (4) Engine with an ambulance or rescue unit
- (5) Engine and members who respond in their personal vehicles (POVs)

A.3.3.11 Fire Suppression. Fire suppression includes all activities performed at the scene of a fire incident or training exercise that expose fire department members to the dangers of heat, flame, smoke, and other products of combustion, explosion, or structural collapse.

A.3.3.12 First Responder (EMS). A first responder assists higher level EMS providers.

A.3.3.13 Hazard. Hazards include the characteristics of facilities, equipment systems, property, hardware, or other objects, and the actions and inactions of people that create such hazards.

A.3.3.16 Incident Management System (IMS). Such systems are also referred to as incident command systems (ICS).

A.3.3.19.2 Basic Life Support (BLS). Basic life support providers assist higher level EMS providers.

A.3.3.20 Member. A fire department member can be a full-time or part-time employee or a paid or unpaid volunteer, can occupy any position or rank within the fire department, and can engage in emergency operations.

A.3.3.21.1 Company Officer. This person could be someone appointed in an acting capacity. The rank structure could be either sergeant, lieutenant, or captain.

A.3.3.21.2 Supervisory Chief Officer. In some jurisdictions this is the rank of battalion chief, district chief, deputy chief, assistant chief, or senior divisional officer (UK fire service). The purpose of their response is to assume command, through a formalized transfer of command process, and to allow company officers to directly supervise personnel assigned to them.

A.3.3.22 Public Fire Department. The term *fire department* includes any public, governmental, private, or military organization engaging in this type of activity.

A.3.3.23 Rapid Intervention Crew (RIC). Emergency services personnel respond to many incidents that present a high risk to personnel safety. Departments in compliance with OSHA 29 CFR 1910.134 need to have a minimum of two persons on scene fully equipped when members are operating in an immediately dangerous to life and health (IDLH) or potentially IDLH atmosphere. The primary purpose is the rescue of injured, lost, or trapped fire fighters. Departments utilizing an incident management system in accordance with NFPA 1561, *Standard on Emergency Services Incident Management System*, or 29 CFR 1910.120, along with a personnel accountability system have incorporated the RIC into their management system. Many departments have redefined their response plans to include the dispatch of an additional company (i.e., engine, rescue, or truck) to respond to incidents and standby as the RIC/company. Incident commanders can assign additional RICs based on the size and complexity of the incident scene. This requirement is also included as part of special operations incidents in NFPA 1500, *Standard on Fire Department Occupational Safety and Health Program*, Chapter 8.

A.4.1 Suppression capability is an expression of how much fire-fighting power can be put into action when there is a fire. It includes the amount of apparatus, equipment, and personnel available; the time needed to respond and place equipment in action; the water supply; the application of strategy and tactics; the level of training; and all of the components that add up to effective fireground operations.

A.4.1.1 Departmental regulations and operating procedures and orders should be developed for the purpose of ensuring uniformity and effectiveness in department actions and operations. These procedures should be published and circulated to all members, and training should be provided whenever major changes or additions are made. A system should be established that requires each member to read and acknowledge existing and revised regulations and procedures.

Such procedures should cover matters not subject to frequent changes and should be reviewed at least annually to ensure that they are current. All members should have access to the system of orders and directives that relate to their unit. Orders should be reviewed periodically by company officers during company meetings or training sessions.

The departmental procedures should specify the channels through which orders are to be transmitted. All orders should pass through the established chain of command and should be acknowledged. The chain of command also should be followed, in reverse order, for reports and other communications from units to headquarters.

A.4.1.2 In many communities, the fire department is assigned primary responsibility for the management of hazardous materials emergencies. In some cases, this includes regulatory responsibilities to identify and minimize risks to the community resulting from the storage, use, transportation, and disposal of hazardous materials. (*See 29 CFR 1910.120.*)

The planning process should be coordinated with community and private sector planning processes that are implemented to meet legal requirements. This comprehensive emergency management plan (CEMP) should be developed by the local emergency planning committee (LEPC) and exercised at least annually. These plans should include evacuation plans, intervention strategies, sources of expertise, and specialized assistance and

disposal plans. The planning process should identify clearly the authority having jurisdiction for command responsibility during hazardous materials incidents.

Disaster planning should be coordinated at all levels of government in anticipation of large-scale emergencies. There could be legislation or legal restrictions that establish the overall controlling authority in disaster operations. All planning and activity should operate within the framework of these restrictions.

NFPA 1600, *Standard on Disaster/Emergency Management and Business Continuity Programs*, is a document that provides additional information to assist those users in preparing for, responding to, and mitigating disasters in their jurisdictions. In addition, it covers federal, state, and local disaster agencies' roles and responsibilities within a comprehensive planning process.

A.4.1.3 The succession of command responsibility is necessary to provide for the continuity of operations due to death, injury, disability, or the absence of individuals. Succession should include the job title designation "acting" but should not imply automatic reassignment or promotion.

A.4.1.4 The fire chief should determine the number and type of fire company units to be provided. All personnel except those assigned to staff or support units or those serving as chief officers should be assigned to a specific company unit. It is the fire chief's responsibility to ensure that the best use is made of personnel and equipment. See NFPA 1561, *Standard on Emergency Services Incident Management System*, for additional information.

A.4.1.6 Reports on emergencies are essential to providing an accurate record of a department's activities. Reports also serve as a basis for determining local, state, and national fire trends and for establishing the needs of a fire department. NFPA 901, *Standard Classifications for Incident Reporting and Fire Protection Data*, should be used as the basis for classifying data on emergency incidents. NFPA 902, *Fire Reporting Field Incident Guide*, and the FEMA *National Fire Incident Reporting System (NFIRS)* should form the basis of an incident reporting system.

A.4.1.7 Modern computerized dispatch systems have the capability of providing specific dispatch assignments for individual buildings. Where street fire alarm boxes are provided, a response assignment should be prepared for each box location. Where street boxes are not used, zone numbers should be assigned to different points, sectors, or properties.

The number and type of units assigned to a particular incident depend on the availability of units at the time the incident occurs. Dispatchers should be given the authority to use judgment, within departmental guidelines, when they encounter situations or circumstances that demand modification of normal response assignments.

Procedures for the redistribution of available companies within the jurisdiction should be established in such a manner as to provide the best possible protection in the event of major incidents or high activity. Mutual aid companies should be used for back-up coverage in these situations.

A.4.1.8 A variety of factors should be taken into account including the size, height, and configuration of buildings, special life risks, exposures between structures, construction types, occupancy classifications, and other hazards.

A.4.2.1 The responsibility for assigning fire companies at an emergency belongs to the incident commander, who establishes priorities and assigns units based on identified objectives. Normally, on a first alarm response, the first engine company and truck company respond directly to the front of the emergency, while other responding units stand by or stage nearby until assigned to a particular task. Whenever an emergency situation demands extended operational activities, additional alarms should be called to provide reinforcements and a reserve supply of personnel and equipment at the scene.

Arriving companies that have not been assigned according to standard operating procedures or directions from the incident commander should proceed automatically to a standby or staging position. These units should stop short and remain uncommitted about a block from the scene until assigned by the incident commander. Staging positions should take into account access to potential operating positions, water supply, and traffic conditions. The primary emphasis is on avoiding the independent commitment of companies to tasks or positions that conflict with the incident commander's objectives. Once the initial command responsibilities have been completed, the incident commander should begin to obtain progress reports from operating units and evaluate efforts. The initial action plan should then be revised or refined as necessary.

The convergence of many units at the scene of an incident, particularly units that are not part of a planned response system, can cause major problems. Procedures should be established on a regional basis to provide for orderly response when major incidents occur. All responding multiple alarm companies should gather in a specific area designated by the incident commander. This formal staging area should be located away from the emergency scene in order to provide adequate space for assembly of all response apparatus. The first officer to arrive in this designated location should automatically assume control of the staging area. This officer should maintain an accurate log of available companies and, when requested by command, should verbally assign companies to report to specific sectors or divisions or for specific functions with instructions on where and to whom to report.

A.4.2.1.1 Fire department standard operating procedures should define operational procedures for the passing of or transferring of command. Command should never be transferred to an individual not on the scene. The arrival of senior officers on the scene does not result in an automatic transfer of command. The identity of incident command could change during the course of an incident, but the continuity of responsibility and accountability should be maintained.

On a typical first alarm assignment, the chain of command is usually transferred on the arrival of a chief officer. The officer being relieved should be prepared to provide the superior with an assessment of the general conditions and tactical priorities, such as the location of companies that have been assigned, the identity of companies available for assignment, and the need for additional resources.

The situation faced by a company officer assuming initial command of an incident dictates an operating mode in each case. The basic options available to that officer are as follows:

- (1) *Investigation Mode*. If fire is not evident, the first arriving company officer investigates while all other units stand by in staging mode or positions. The company officer assumes command responsibility.
- (2) *Initial Attack Mode*. The first arriving company officer assumes command responsibility while leading an initial rapid attack to stabilize the situation. This mode is effective where fast action is critical and will control the situation quickly.
- (3) *Command Post Mode*. The first arriving company officer identifies the large, complex situation and assigns resources while setting up a command post operation from the outset.

In each case, the company officer assuming command is fully responsible for the identified tasks assigned to the command function. The degree of personal involvement in tactical actions varies in each mode.

A.4.2.2.2 RIC members should have the fire fighters' personal protective ensemble and protective equipment, self-contained breathing apparatus, and any specialized rescue equipment that could be needed for the specifics of the operation underway as required by NFPA 1500, *Standard on Fire Department Occupational Safety and Health Program*.

A.4.3.1 Where appropriate, the mutual aid agreement should include automatic responses on first alarms (automatic aid). This concept contemplates joint response of designated apparatus and personnel on a predetermined running assignment basis.

Mutual aid concepts should be considered on a regional basis. In an effective mutual aid arrangement, each fire department should retain reserves of personnel and apparatus. Traditionally and legally, overall command of the incident is vested with the senior officer of the jurisdiction experiencing the emergency.

Some areas use consolidated dispatching to coordinate the response of fire companies to assist an outside fire department. The management of responses can be made easier by utilizing computerization, running cards, and other advance planning.

A.4.4 An EMS system is defined as a comprehensive, coordinated arrangement of resources and functions that are organized to respond in a timely, staged manner to medical emergencies, regardless of their cause. The term *system* can be applied locally, at the state, province, or national level.

The fundamental functions of an EMS system are the following:

- (1) System organization and management
- (2) Medical direction
- (3) Human resources and training

- (4) Communications
- (5) Emergency response
- (6) Transportation
- (7) Care facilities
- (8) Quality assurance
- (9) Public information and education
- (10) Disaster medical services
- (11) Research
- (12) Special populations

A.4.4.1.1 See requirements as outlined in NFPA 1710, *Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments*.

A.4.4.1.2 In addition to the resources provided by the fire department to meet these response criteria, other community resources should be considered. The initial treatment could be enhanced by other means, including citizens trained in CPR, self-help instructions from appropriately trained communications personnel, or by other means. The plan for delivering BLS should include consideration of these alternatives.

A.4.4.3 The five functions in 4.4.3.1 do not necessarily exist as separate elements in a particular system. The following list of functions outlines different EMS service delivery capabilities:

- (1) The first responding unit can be an ALS ambulance that can provide ALS treatment and ambulance transportation.
- (2) The first responding unit can be a fire suppression unit that can provide both initial and advanced level medical care.
- (3) ALS can be provided by the ambulance or by an additional fire suppression unit or a unit that is dedicated to ALS response only.
- (4) The system does not necessarily have ALS treatment capability — only a BLS ambulance unit can respond.

A.4.6 Special operations incidents can include, but are not limited to, the following:

- (1) Rope rescue including high angle
- (2) Water rescue
- (3) Trench/collapse rescue
- (4) Confined space rescue
- (5) Extrication rescue
- (6) Air/sea rescue
- (7) Urban search and rescue (USAR)
- (8) SWAT (special weapons and tactics team operations)

The specific role of the fire department in responding to special operations incidents should be outlined in the community's emergency management plan. This plan will define the scope of activities and responsibilities assigned to the fire department and the level of service that is provided in each area.

A.4.6.5 Although fire departments are called to respond to a variety of incidents and should have the ability to perform special operations to the extent that can be reasonably anticipated, there is significant possibility of being called to a situation that was unanticipated or was impossible to predict. In these situations the fire department could or could not have the specific training, procedures, or resources to deal with the problem. In those types of incidents the incident commander is responsible for evaluating the situation, the risks that are involved, and the capabilities of the resources that are available to take action, before an action plan can be developed. The operational risk management guidelines should be used to determine the appropriate action in such circumstances.

A.5.1 This standard addresses all areas of fire service occupational safety and health and serves as an umbrella document for other specific NFPA fire department safety and health documents such as NFPA 1500, *Standard on Fire Department Occupational Safety and Health Program*. In addition, it also meets the intent of OSHA 29 CFR 1910.134, “Respiratory Protection Regulations.”

A.5.2 Emergency incidents can involve operations that vary considerably in their complexity and scale. The control of these incidents depends on the planned, systematic implementation of an effective fireground organization to accomplish identified objectives. Every fire department, regardless of size, needs a proper system to regulate and direct emergency forces and equipment at both routine and major incidents. The incident management system forms the basic structure of operations, regardless of scale. An effective system is designed to manage incidents of different types, including structure fires, wildland fires, hazardous materials incidents, and medical and other emergencies. See NFPA 1561, *Standard on Emergency Services Incident Management System*.

A.5.2.2 Incident management systems are designed to provide a standard approach and response to all types of incidents and have been developed and implemented by many fire departments. A basic concept of these systems uses an incremental approach in building a command structure, starting with the first officer arriving at the scene of an incident. The development of the command structure should coincide with the commitment of emergency forces assigned to the situation. The specific methods used by fire departments throughout the country differ, but the essential operational objectives remain consistent. The main distinguishing characteristics of the various incident management systems currently employed involve terminology and specific details of organization structures.

Individuals with specific expertise, particularly in highly technical areas, perform some functions best. The fire department should endeavor to have more than one qualified individual to perform all essential functions within the incident management system.

A model incident management system has been developed by the National Fire Service Incident Management System Consortium. This model combines command strategy with organizational procedures and is designed primarily for structure fire incidents using up to 25 fire companies, though much of the organizational design is applicable to other types of emergency incidents. The model reflects a merger of the California Firescope Incident Command System and the Phoenix Fireground Command System.

A.5.4 The provision and operation of a reliable communications system is essential to facilitate the delivery of public fire services. The nature and extent of the system provided will vary with the size and nature of the jurisdiction served, the services provided, and other local conditions and preferences.

A fire communications system could serve an individual jurisdiction or multiple jurisdictions. In many cases, a regional system, operating under a valid intergovernmental agreement, provides operational advantages and reduced overall costs as compared with a number of smaller systems serving individual jurisdictions. The benefits could be reflected in a more functional mutual aid system, as well as in operational advantages within the communications system itself.

A.5.5 Fire departments when conducting pre-fire planning should use NFPA 1620, *Recommended Practice for Pre-Incident Planning*, for fires and other related emergencies. The fire department should pay particular attention to target hazards.

Annex B Informational References

B.1 Referenced Publications.

The following documents or portions thereof are referenced within this standard for informational purposes only and are thus not part of the requirements of this document unless also listed in Chapter 2.

B.1.1 NFPA Publications. National Fire Protection Association, 1 Batterymarch Park, P.O. Box 9101, Quincy, MA 02269-9101.

NFPA 901, *Standard Classifications for Incident Reporting and Fire Protection Data*, 2001 edition.

NFPA 902, *Fire Reporting Field Incident Guide*, 1997 edition.

NFPA 1500, *Standard on Fire Department Occupational Safety and Health Program*, 1997 edition.

NFPA 1561, *Standard on Emergency Services Incident Management System*, 2000 edition.

NFPA 1600, *Standard on Disaster/Emergency Management and Business Continuity Programs*, 2000 edition.

NFPA 1620, *Recommended Practice for Pre-Incident Planning*, 1998 edition.

NFPA 1710, *Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments*, 2001 edition.

B.1.2 Other Publications.

B.1.2.1 FEMA Publication. Federal Emergency Management Agency, Washington, DC 20002.

National Fire Incident Reporting System (NFIRS).

B.1.2.2 U.S. Government Publications. U.S. Government Printing Office, Washington, DC 20402.

Title 29, *Code of Federal Regulations*, Part 1910, Section 120(q)(3), March 6, 1989.

Title 29, *Code of Federal Regulations*, Part 1910, Section 134, "Respiratory Protection Regulations," January 8, 1998.

B.2 Informational References.

(Reserved)

B.3 References for Extracts.

The following documents are listed here to provide reference information, including title and edition, for extracts given throughout this standard as indicated by a reference in brackets [] following a section or paragraph. These documents are not a part of the requirements of this document unless also listed in Chapter 2 for other reasons.

NFPA 1002, *Standard for Fire Apparatus Driver/Operator Professional Qualifications*, 1998 edition.

NFPA 1021, *Standard for Fire Officer Professional Qualifications*, 1997 edition.

NFPA 1201, *Standard for Developing Fire Protection Services for the Public*, 2000 edition.

NFPA 1404, *Standard for a Fire Department Self-Contained Breathing Apparatus Program*, 1996 edition.

NFPA 1410, *Standard on Training for Initial Emergency Scene Operations*, 2000 edition.

NFPA 1500, *Standard on Fire Department Occupational Safety and Health Program*, 1997 edition.

NFPA 1521, *Standard for Fire Department Safety Officer*, 1997 edition.

NFPA 1561, *Standard for Emergency Services Incident Management System*, 2000 edition.

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Exhibit C



LEXISNEXIS' CODE OF FEDERAL REGULATIONS
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*** This section is current through the March 28, 2013 ***
*** issue of the Federal Register ***

TITLE 29 -- LABOR
SUBTITLE B -- REGULATIONS RELATING TO LABOR
CHAPTER XVII -- OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION, DEPARTMENT OF LA-
BOR
PART 1910 -- OCCUPATIONAL SAFETY AND HEALTH STANDARDS
SUBPART L -- FIRE PROTECTION

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29 CFR 1910.156

§ 1910.156 Fire brigades.

(a) Scope and application -- (1) Scope. This section contains requirements for the organization, training, and personal protective equipment of fire brigades whenever they are established by an employer.

(2) Application. The requirements of this section apply to fire brigades, industrial fire departments and private or contractual type fire departments. Personal protective equipment requirements apply only to members of fire brigades performing interior structural fire fighting. The requirements of this section do not apply to airport crash rescue or forest fire fighting operations.

(b) Organization -- (1) Organizational statement. The employer shall prepare and maintain a statement or written policy which establishes the existence of a fire brigade; the basic organizational structure; the type, amount, and frequency of training to be provided to fire brigade members; the expected number of members in the fire brigade; and the functions that the fire brigade is to perform at the workplace. The organizational statement shall be available for inspection by the Assistant Secretary and by employees or their designated representatives.

(2) Personnel. The employer shall assure that employees who are expected to do interior structural fire fighting are physically capable of performing duties which may be assigned to them during emergencies. The employer shall not permit employees with known heart disease, epilepsy, or emphysema, to participate in fire brigade emergency activities unless a physician's certificate of the employees' fitness to participate in such activities is provided. For employees assigned to fire brigades before September 15, 1980, this paragraph is effective on September 15, 1990. For employees assigned to fire brigades on or after September 15, 1980, this paragraph is effective December 15, 1980.

(c) Training and education. (1) The employer shall provide training and education for all fire brigade members commensurate with those duties and functions that fire brigade members are expected to perform. Such training and education shall be provided to fire brigade members before they perform fire brigade emergency activities. Fire brigade leaders and training instructors shall be provided with training and education which is more comprehensive than that provided to the general membership of the fire brigade.

(2) The employer shall assure that training and education is conducted frequently enough to assure that each member of the fire brigade is able to perform the member's assigned duties and functions satisfactorily and in a safe manner so as not to endanger fire brigade members or other employees. All fire brigade members shall be provided with train-

ing at least annually. In addition, fire brigade members who are expected to perform interior structural fire fighting shall be provided with an education session or training at least quarterly.

(3) The quality of the training and education program for fire brigade members shall be similar to those conducted by such fire training schools as the Maryland Fire and Rescue Institute; Iowa Fire Service Extension; West Virginia Fire Service Extension; Georgia Fire Academy, New York State Department, Fire Prevention and Control; Louisiana State University Firemen Training Program, or Washington State's Fire Service Training Commission for Vocational Education. (For example, for the oil refinery industry, with its unique hazards, the training and education program for those fire brigade members shall be similar to those conducted by Texas A & M University, Lamar University, Reno Fire School, or the Delaware State Fire School.)

(4) The employer shall inform fire brigade members about special hazards such as storage and use of flammable liquids and gases, toxic chemicals, radioactive sources, and water reactive substances, to which they may be exposed during fire and other emergencies. The fire brigade members shall also be advised of any changes that occur in relation to the special hazards. The employer shall develop and make available for inspection by fire brigade members, written procedures that describe the actions to be taken in situations involving the special hazards and shall include these in the training and education program.

(d) Fire fighting equipment. The employer shall maintain and inspect, at least annually, fire fighting equipment to assure the safe operational condition of the equipment. Portable fire extinguishers and respirators shall be inspected at least monthly. Fire fighting equipment that is in damaged or unserviceable condition shall be removed from service and replaced.

(e) Protective clothing. The following requirements apply to those employees who perform interior structural fire fighting. The requirements do not apply to employees who use fire extinguishers or standpipe systems to control or extinguish fires only in the incipient stage.

(1) General. (i) The employer shall provide at no cost to the employee and assure the use of protective clothing which complies with the requirements of this paragraph. The employer shall assure that protective clothing ordered or purchased after July 1, 1981, meets the requirements contained in this paragraph. As the new equipment is provided, the employer shall assure that all fire brigade members wear the equipment when performing interior structural fire fighting. After July 1, 1985, the employer shall assure that all fire brigade members wear protective clothing meeting the requirements of this paragraph when performing interior structural fire fighting.

(ii) The employer shall assure that protective clothing protects the head, body, and extremities, and consists of at least the following components: foot and leg protection; hand protection; body protection; eye, face and head protection.

(2) Foot and leg protection. (i) Foot and leg protection shall meet the requirements of paragraphs (e)(2)(ii) and (e)(2)(iii) of this section, and may be achieved by either of the following methods:

(A) Fully extended boots which provide protection for the legs; or

(B) Protective shoes or boots worn in combination with protective trousers that meet the requirements of paragraph (e)(3) of this section.

(ii) Protective footwear shall meet the requirements of § 1910.136 for Class 75 footwear. In addition, protective footwear shall be water-resistant for at least 5 inches (12.7 cm) above the bottom of the heel and shall be equipped with slip-resistant outer soles.

(iii) Protective footwear shall be tested in accordance with paragraph (1) of appendix E, and shall provide protection against penetration of the midsole by a size 8D common nail when at least 300 pounds (1330 N) of static force is applied to the nail.

(3) Body protection. (i) Body protection shall be coordinated with foot and leg protection to ensure full body protection for the wearer. This shall be achieved by one of the following methods:

(A) Wearing of a fire-resistive coat meeting the requirements of paragraph (e)(3)(ii) of this section in combination with fully extended boots meeting the requirements of paragraphs (e)(2)(ii) and (e)(2)(iii) of this section; or

(B) Wearing of a fire-resistive coat in combination with protective trousers both of which meet the requirements of paragraph (e)(3)(ii) of this section.

(ii) The performance, construction, and testing of fire-resistive coats and protective trousers shall be at least equivalent to the requirements of the National Fire Protection Association (NFPA) standard NFPA No. 1971-1975, "Protective Clothing for Structural Fire Fighting," which is incorporated by reference as specified in § 1910.6. (See appendix D to subpart L) with the following permissible variations from those requirements:

(A) Tearing strength of the outer shell shall be a minimum of 8 pounds (35.6 N) in any direction when tested in accordance with paragraph (2) of appendix E; and

(B) The outer shell may discolor but shall not separate or melt when placed in a forced air laboratory oven at a temperature of 500[degrees]F (260[degrees]C) for a period of five minutes. After cooling to ambient temperature and using the test method specified in paragraph (3) of appendix E, char length shall not exceed 4.0 inches (10.2 cm) and after-flame shall not exceed 2.0 seconds.

(4) Hand protection. (i) Hand protection shall consist of protective gloves or glove system which will provide protection against cut, puncture, and heat penetration. Gloves or glove system shall be tested in accordance with the test methods contained in the National Institute for Occupational Safety and Health (NIOSH) 1976 publication, "The Development of Criteria for Fire Fighter's Gloves; Vol. II, Part II: Test Methods," which is incorporated by reference as specified in § 1910.6, (See appendix D to subpart L) and shall meet the following criteria for cut, puncture, and heat penetration:

(A) Materials used for gloves shall resist surface cut by a blade with an edge having a 60[degrees] included angle and a .001 inch (.0025 cm.) radius, under an applied force of 16 lbf (72N), and at a slicing velocity of greater or equal to 60 in/min (2.5 cm./sec);

(B) Materials used for the palm and palm side of the fingers shall resist puncture by a penetrometer (simulating a 4d lath nail), under an applied force of 13.2 lbf (60N), and at a velocity greater or equal to 20 in/min (.85 cm./sec); and

(C) The temperature inside the palm and gripping surface of the fingers of gloves shall not exceed 135[degrees]F (57[degrees]C) when gloves or glove system are exposed to 932[degrees]F (500[degrees]C) for five seconds at 4 psi (28 kPa) pressure.

(ii) Exterior materials of gloves shall be flame resistant and shall be tested in accordance with paragraph (3) of appendix E. Maximum allowable afterflame shall be 2.0 seconds, and the maximum char length shall be 4.0 inches (10.2 cm).

(iii) When design of the fire-resistive coat does not otherwise provide protection for the wrists, protective gloves shall have wristlets of at least 4.0 inches (10.2 cm) in length to protect the wrist area when the arms are extended upward and outward from the body.

(5) Head, eye and face protection. (i) Head protection shall consist of a protective head device with ear flaps and chin strap which meet the performance, construction, and testing requirements of the National Fire Safety and Research Office of the National Fire Prevention and Control Administration, U.S. Department of Commerce (now known as the U.S. Fire Administration), which are contained in "Model Performance Criteria for Structural Firefighters' Helmets" (August 1977), which is incorporated by reference as specified in § 1910.6, (See appendix D to subpart L).

(ii) Protective eye and face devices which comply with § 1910.133 shall be used by fire brigade members when performing operations where the hazards of flying or falling materials which may cause eye and face injuries are present. Protective eye and face devices provided as accessories to protective head devices (face shields) are permitted when such devices meet the requirements of § 1910.133.

(iii) Full facepieces, helmets, or hoods of breathing apparatus which meet the requirements of § 1910.134 and paragraph (f) of this section, shall be acceptable as meeting the eye and face protection requirements of paragraph (e)(5)(ii) of this section.

(f) Respiratory protection. (1) General. (i) The employer must ensure that respirators are provided to, and used by, each fire brigade member, and that the respirators meet the requirements of 29 CFR 1910.134 for each employee required by this section to use a respirator.

(ii) Approved self-contained breathing apparatus with full-facepiece, or with approved helmet or hood configuration, shall be provided to and worn by fire brigade members while working inside buildings or confined spaces where toxic products of combustion or an oxygen deficiency may be present.

Such apparatus shall also be worn during emergency situations involving toxic substances.

(iii) Approved self-contained breathing apparatus may be equipped with either a "buddy-breathing" device or a quick disconnect valve, even if these devices are not certified by NIOSH. If these accessories are used, they shall not cause damage to the apparatus, or restrict the air flow of the apparatus, or obstruct the normal operation of the apparatus.

(iv) Approved self-contained compressed air breathing apparatus may be used with approved cylinders from other approved self-contained compressed air breathing apparatus provided that such cylinders are of the same capacity and pressure rating. All compressed air cylinders used with self-contained breathing apparatus shall meet DOT and NIOSH criteria.

(v) Self-contained breathing apparatuses must have a minimum service-life rating of 30 minutes in accordance with the methods and requirements specified by NIOSH under 42 CFR part 84, except for escape self-contained breathing apparatus (ESCBAs) used only for emergency escape purposes.

(vi) Self-contained breathing apparatus shall be provided with an indicator which automatically sounds an audible alarm when the remaining service life of the apparatus is reduced to within a range of 20 to 25 percent of its rated service time.

(2) Positive-pressure breathing apparatus. (i) The employer shall assure that self-contained breathing apparatus ordered or purchased after July 1, 1981, for use by fire brigade members performing interior structural fire fighting operations, are of the pressure-demand or other positive-pressure type. Effective July 1, 1983, only pressure-demand or other positive-pressure self-contained breathing apparatus shall be worn by fire brigade members performing interior structural fire fighting.

(ii) This paragraph does not prohibit the use of a self-contained breathing apparatus where the apparatus can be switched from a demand to a positive-pressure mode. However, such apparatus shall be in the positive-pressure mode when fire brigade members are performing interior structural fire fighting operations.

HISTORY: [45 *FR* 60706, Sept. 12, 1980; 46 *FR* 24557, May 1, 1981; 49 *FR* 18295, April 30, 1984; 61 *FR* 9228, 9239, March 7, 1996; 63 *FR* 1152, 1284, Jan. 8, 1998; 63 *FR* 33450, 33467, June 18, 1998; 73 *FR* 75568, 75584, Dec. 12, 2008]

AUTHORITY: AUTHORITY NOTE APPLICABLE TO ENTIRE SUBPART:

Sections 4, 6, and 8 of the Occupational Safety and Health Act of 1970 (29 *U.S.C.* 653, 655, and 657); Secretary of Labor's Order No. 12-71 (36 *FR* 8754), 8-76 (41 *FR* 25059), 9-83 (48 *FR* 35736), 1-90 (55 *FR* 9033), 6-96 (62 *FR* 111), 3-2000 (65 *FR* 50017), 5-2002 (67 *FR* 65008), or 5-2007 (72 *FR* 31160), as applicable, and 29 CFR Part 1911.

NOTES: [EFFECTIVE DATE NOTE: 73 *FR* 75568, 75584, Dec. 12, 2008, revised paragraph (f)(1)(i), effective Jan. 12, 2009.]

NOTES APPLICABLE TO ENTIRE SUBTITLE:

CROSS REFERENCES: Railroad Retirement Board: See Employees' Benefits, 20 CFR chapter II.

Social Security Administration: See Employees' Benefits, 20 CFR chapter III.

EDITORIAL NOTE: Other regulations issued by the Department of Labor appear in 20 CFR chapters I, IV, V, VI, VII; 30 CFR chapter I; 41 CFR chapters 50, 60, and 61; and 48 CFR chapter 29.

NOTES APPLICABLE TO ENTIRE CHAPTER:

Railroad Retirement Board, See Employees' Benefits, 20 CFR Chapter II.

Social Security Administration, Department of Health and Human Services:

EDITORIAL NOTE: Other regulations issued by the Department of Labor appear in 20 CFR chapters 1, IV and V, VI, VII; 29 CFR subtitle A, chapters II, IV, V, XXV; 41 CFR chapters 50, 60, and 61. For Standards for a Merit System of Personnel Administration: See 5 CFR part 900.

NOTES APPLICABLE TO ENTIRE PART:

[PUBLISHER'S NOTE: For Federal Register citations concerning Part 1910 Grain Handling Facilities; Standards, see: 52 FR 49592, 49610, 49611, 49622, Dec. 31, 1987; 54 FR 49971, Dec. 4, 1989; 55 FR 50722, Dec. 10, 1990; 55 FR 9033, (1990); 59 FR 15339, Apr. 1, 1994; 68 FR 12301, Mar. 14, 2003.]

[PUBLISHER'S NOTE: For Federal Register citations concerning Part 1910 Notice of availability, see: 70 FR 20807, Apr. 22, 2005.]

[PUBLISHER'S NOTE: For Federal Register citations concerning Part 1910 Interpretations, see: 72 FR 31453, June 7, 2007.]

LexisNexis (R) Notes:

CASE NOTES

CASE NOTES Applicable to entire Part:Part Note

Mclaughlin v. Union Oil Co., 869 F.2d 1039, 1989 U.S. App. LEXIS 3053 (7th Cir Feb. 24, 1989).

Overview: *A company's failure to inspect for hydrogen stress corrosion cracking was a negligent violation of OSHA, but it was not a "willful" violation because there was no evidence that the company was reckless or even grossly negligent.*

- The term "fire brigade" is defined as follows: fire brigade (private fire department, industrial fire department) means an organized group of employees who are knowledgeable, trained, and skilled in at least basic fire fighting operations. 29 C.F.R. § 1910.155(c)(18). The regulation prescribing the training and equipment for fire brigades states that it contains requirements for the organization, training, and personal protective equipment of fire brigades whenever they are established by an employer, 29 C.F.R. § 1910.156(a)(1), but that its personal protective equipment requirements apply only to members of fire brigades performing interior structural fire fighting. 29 C.F.R. § 1910.156(a)(2). Go To Headnote

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Exhibit D

NFPA® 600

Standard on Industrial Fire Brigades

2010 Edition



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An International Codes and Standards Organization

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NFPA® 600

Standard on

Industrial Fire Brigades

2010 Edition

This edition of NFPA 600, *Standard on Industrial Fire Brigades*, was prepared by the Technical Committee on Loss Prevention Procedures and Practices. It was issued by the Standards Council on October 27, 2009, with an effective date of December 5, 2009, and supersedes all previous editions.

This edition of NFPA 600 was approved as an American National Standard on December 5, 2009.

Origin and Development of NFPA 600

In 1902 NFPA adopted *Suggestions for Organizing Private Fire Departments* recommended by the Committee on Private Fire Department Regulations. In 1912 NFPA adopted two pamphlets, *Organization and Execution of Exit Drills* and *Organization and Drilling of Private Fire Brigades*, on the recommendation of the Committee on Private Fire Departments and Fire Drills. In 1924 the NFPA adopted *Suggestions for the Organization, Drilling and Equipment of Private Fire Brigades* on the recommendation of the Committee on Field Practice, and revisions were adopted in 1930, 1937, and 1949.

Jurisdiction for the publication was transferred in 1948 to the new Committee on Fire Brigades and Watchmen, and a revised edition was published in 1955. The guide was completely revised in 1967.

In 1969 the committee was reorganized as the Technical Committee on Loss Prevention Procedures and Practices, and the guide was reconfirmed in 1975. In 1981 a complete revision was accomplished, and a partial revision was made in the 1986 edition, as well as a redesignation from NFPA 27 to NFPA 600.

In 1992 the document was completely revised as a standard to provide a minimum level of occupational safety and health for industrial fire brigade members consistent with the Occupational Safety and Health Administration (OSHA). The standard incorporated the concepts of advanced exterior fire fighting and site-specific hazards for the first time. These concepts were needed for industrial fire brigades to properly address the types of situations they encounter.

In 1996 the document was revised to include industrial fire departments, which were previously addressed in NFPA 1500, *Standard on Fire Department Occupational Safety and Health Program*. This reorganization assisted the authority having jurisdiction and owner/operators in determining the standard they must comply with and if they are in compliance. Other changes made the document more user friendly and better clarified the requirements of the standard.

Changes to the 2000 edition were mainly editorial or were provided for clarification. A noteworthy exception was the change in the number of industrial fire brigade members for interior structural fire fighting. Two industrial fire brigade members were now required to be available for rescue, whereas the previous edition required only one.

The 2005 edition incorporated revised definitions that correspond to preferred terms found in the *Glossary of Terms*. One of the definition changes incorporated a broader scope for the medical professionals who assess medical and physical fitness of fire brigade members. The term "qualified physician" was replaced by "qualified health care professional" to reflect actual practice.

The 2005 edition added references to the professional qualification standard, NFPA 1081, *Standard for Industrial Fire Brigade Member Professional Qualifications*, which was adopted after the effective date of the 2000 edition. The standard was also revised and reorganized in accordance with the *Manual of Style for NFPA Technical Committee Documents*.

The 2010 edition represents a reconfirmation of the requirements in the standard. Minor editorial changes have been made for consistency with the *Manual of Style for NFPA Technical Committee Documents*.

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Committee Scope: This Committee shall have primary responsibility for documents on fire brigades, guard services, and techniques for securing effective fire loss prevention programs in industrial, commercial, institutional, and similar properties.



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NFPA 600
Standard on
Industrial Fire Brigades

2010 Edition

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NOTICE: An asterisk (*) following the number or letter designating a paragraph indicates that explanatory material on the paragraph can be found in Annex A.

A reference in brackets [] following a section or paragraph indicates material that has been extracted from another NFPA document. As an aid to the user, the complete title and edition of the source documents for extracts in mandatory sections of the document are given in Chapter 2 and those for extracts in informational sections are given in Annex B. Extracted text may be edited for consistency and style and may include the revision of internal paragraph references and other references as appropriate. Requests for interpretations or revisions of extracted text shall be sent to the technical committee responsible for the source document.

Information on referenced publications can be found in Chapter 2 and Annex B.

Chapter 1 Administration

1.1* Scope.

1.1.1 This standard contains minimum requirements for organizing, operating, training, and equipping industrial fire brigades. It also contains minimum requirements for the occupational safety and health of industrial fire brigade members while performing fire fighting and related activities.

1.1.2* This standard shall apply to any organized, private, industrial group of employees having fire-fighting response duties, such as emergency brigades, emergency response teams, fire teams, and plant emergency organizations.

1.1.3* This standard shall not apply to industrial fire brigades that respond to fire emergencies outside the boundaries of the industrial site where the off-site fire involves unfamiliar hazards or enclosed structures with layout and contents that are unknown to the industrial fire brigade.

1.1.4 This standard shall not apply to medical response, confined space rescue response, and hazardous material response activities.

1.2* Purpose. The purpose of this standard is to provide minimum requirements for organization, operation, training, and occupational safety and health for industrial fire brigades.

1.3 Alternate Requirements.

1.3.1 The application of the performance objectives of this standard can vary for many industrial operations.

1.3.2 The authority having jurisdiction shall be permitted to examine and approve organization, operations, training, and occupational safety and health requirements that provide an equivalent level of safety to the level of safety provided by the requirements of this standard.

1.4* Limits of Actions and Responsibilities of Industrial Fire Brigade.

1.4.1 General.

1.4.1.1 The degree of potential exposure to a hazardous environment and the degree of training shall determine the limits of any industrial fire brigade action and responsibility.

1.4.1.2 The written industrial fire brigade organizational statement and standard operating procedures shall define these limits.

1.4.2* Incident Command. At facilities where designated employees are intended to function as the first responders to incipient fires, the industrial fire brigade shall assume command of the incident once the brigade arrives on the fire scene.

1.4.3 Limits for Industrial Fire Brigades Assigned Incipient Fire-Fighting Response Duties.

1.4.3.1 Interior and exterior fires shall be considered incipient stage when industrial fire brigade members function as follows:

- (1) They are able to safely fight the fire in normal work clothing.
- (2) They are not required to crawl or take other evasive action to avoid smoke and heat.
- (3) They are not required to wear thermal protective clothing or self-contained breathing apparatus (SCBA).
- (4) They are able to fight the fire effectively with portable extinguishers or handlines flowing up to 473 L/min (125 gpm)

1.4.3.2 Exterior fires shall be considered appropriate for defensive action outside of the hot and warm zones by industrial fire brigade members who have been assigned incipient fire-fighting response duties when the following occurs:

- (1) The organizational statement lists it as a response duty of the industrial fire brigade, and it is covered by the standard operating procedures.
- (2) The industrial fire brigade has received training for that activity.
- (3) SCBA and thermal protective clothing are not required.
- (4) Personal evasive action is not required.
- (5) The industrial fire brigade is able to perform defensive action effectively, using handlines flowing up to 1140 L/min (300 gpm), master streams, or similar devices for the manual application of specialized agents.

1.4.4 Limits for Industrial Fire Brigades Assigned Only Advanced Exterior Fire-Fighting Response Duties. Exterior fires shall be considered appropriate for offensive action within the hot zone by industrial fire brigade members who have been assigned advanced exterior fire-fighting response duties when the following occurs:

- (1) The organizational statement lists it as a response duty of the industrial fire brigade, and it is covered by the standard operating procedures.
- (2) The industrial fire brigade has received training for that activity.

- (3) SCBA and thermal protective clothing are provided.
- (4) The industrial fire brigade is able to perform offensive action effectively, using handlines flowing up to 1140 L/min (300 gpm), master streams, or similar devices for the manual application of specialized agents.

1.4.5 Limits for Industrial Fire Brigades Assigned Only Interior Structural Fire-Fighting Response Duties. Interior structural fires shall be considered appropriate for offensive action within the hot zone by industrial fire brigade members who have been assigned interior fire-fighting response duties when the following occurs:

- (1) The organizational statement lists it as a response duty of the industrial fire brigade, and it is covered by the standard operating procedures.
- (2) The industrial fire brigade has received training for that activity.
- (3) SCBA and protective clothing for structural fire fighting are provided.
- (4) The industrial fire brigade is able to perform offensive actions effectively, using handlines flowing up to 1140 L/min (300 gpm), master streams, or similar devices for the manual application of specialized agents.

1.4.6 Limits of Industrial Fire Brigades Assigned Both Advanced Exterior and Interior Structural Fire-Fighting Response Duties.

1.4.6.1 Both exterior fires and interior structural fires shall be considered appropriate for offensive action within the hot zone for industrial fire brigade members who have been assigned both advanced exterior and interior fire-fighting response duties when the following occurs:

- (1) The organizational statement lists it as a response duty of the industrial fire brigade, and it is covered by the standard operating procedures.
- (2) The industrial fire brigade has received training for that activity.
- (3) SCBA and thermal protective clothing are provided.
- (4) The industrial fire brigade is able to perform offensive action effectively, using handlines flowing up to 1140 L/min (300 gpm), master streams, or similar devices for the manual application of specialized agents.

1.4.6.2 Protective clothing for proximity fire fighting shall not be worn for interior structural fire fighting.

Chapter 2 Referenced Publications

2.1 General. The documents or portions thereof listed in this chapter are referenced within this standard and shall be considered part of the requirements of this document.

2.2 NFPA Publications. National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02169-7471.

NFPA 1081, *Standard for Industrial Fire Brigade Member Professional Qualifications*, 2007 edition.

NFPA 1403, *Standard on Live Fire Training Evolutions*, 2007 edition.

NFPA 1911, *Standard for the Inspection, Maintenance, Testing, and Retirement of In-Service Automotive Fire Apparatus*, 2007 edition.

NFPA 1971, *Standard on Protective Ensembles for Structural Fire Fighting and Proximity Fire Fighting*, 2007 edition.

NFPA 1981, *Standard on Open-Circuit Self-Contained Breathing Apparatus (SCBA) for Emergency Services*, 2007 edition.

NFPA 1982, *Standard on Personal Alert Safety Systems (PASS)*, 2007 edition.

2.3 Other Publications.

2.3.1 *Merriam-Webster's Collegiate Dictionary*, 11th edition, Merriam-Webster, Inc., Springfield, MA, 2003.

2.4 References for Extracts in Mandatory Sections.

NFPA 601, *Standard for Security Services in Fire Loss Prevention*, 2010 edition.

NFPA 1521, *Standard for Fire Department Safety Officer*, 2008 edition.

Chapter 3 Definitions

3.1 General. The definitions contained in this chapter shall apply to the terms used in this standard. Where terms are not defined in this chapter or within another chapter, they shall be defined using their ordinarily accepted meanings within the context in which they are used. *Merriam-Webster's Collegiate Dictionary*, 11th edition, shall be the source for the ordinarily accepted meaning.

3.2 NFPA Official Definitions.

3.2.1* Approved. Acceptable to the authority having jurisdiction.

3.2.2* Authority Having Jurisdiction (AHJ). An organization, office, or individual responsible for enforcing the requirements of a code or standard, or for approving equipment, materials, an installation, or a procedure.

3.2.3 Shall. Indicates a mandatory requirement.

3.2.4 Should. Indicates a recommendation or that which is advised but not required.

3.2.5 Standard. A document, the main text of which contains only mandatory provisions using the word "shall" to indicate requirements and which is in a form generally suitable for mandatory reference by another standard or code or for adoption into law. Nonmandatory provisions shall be located in an appendix or annex, footnote, or fine-print note and are not to be considered a part of the requirements of a standard.

3.3 General Definitions.

3.3.1* Combustible Liquid. A liquid that has a closed-cup flash point at or above 37.8°C (100°F).

3.3.2 Designated Employee. An employee who is not a member of an industrial fire brigade but who has been trained to use portable fire extinguishers or small hose lines to fight incipient fires in the employee's immediate work area.

3.3.3 Drill. An exercise involving a credible simulated emergency that requires personnel to perform emergency response operations for the purpose of evaluating the effectiveness of the training and education programs and the competence of personnel in performing required response duties and functions. [601, 2010]

3.3.4 Drug. Any substance, chemical, over-the-counter medication, or prescribed medication that can affect performance.

3.3.5* Education. The process of imparting knowledge or skill through systematic instruction.

3.3.6 Emergency Response Operations. Activities related to emergency incidents, including response to the scene of the incident and specific response duties performed at the scene.

3.3.7 Enclosed Structure. A structure with a roof or ceiling and at least two walls that can present fire hazards to employees, such as accumulations of smoke, toxic gases, and heat, similar to those found in buildings.

3.3.8 Fire Fighting.

3.3.8.1* Advanced Exterior Fire Fighting. Offensive fire fighting performed outside of an enclosed structure when the fire is beyond the incipient stage.

3.3.8.2 Defensive Fire Fighting. The mode of manual fire control in which the only fire suppression activities taken are limited to those required to keep a fire from extending from one area to another.

3.3.8.3 Incipient Fire Fighting. Fire fighting performed inside or outside of an enclosed structure or building when the fire has not progressed beyond incipient stage.

3.3.8.4* Interior Structural Fire Fighting. The physical activity of fire suppression, rescue, or both, inside of buildings or enclosed structures that are involved in a fire beyond the incipient stage.

3.3.8.5 Offensive Fire Fighting. The mode of manual fire control in which manual fire suppression activities are concentrated on reducing the size of a fire to accomplish extinguishment.

3.3.9 Fit.

3.3.9.1 Medically Fit. As determined by a qualified healthcare professional, there are no known medical limitations that would interfere with the process of making decisions and providing direction while exposed to a stressful environment.

3.3.9.2 Physically Fit. As determined by a qualified healthcare professional, there are no known physical or medical limitations that would interfere with the performance of strenuous heavy lifting and pulling or with the use of self-contained breathing apparatus that can be required during emergency response organizations.

3.3.10* Flammable Liquid. A liquid that has a closed-cup flash point that is below 37.8°C (100°F) and a maximum vapor pressure of 2068 mm Hg (40 psia) at 37.8°C (100°F).

3.3.11* Hazardous Atmosphere. Any atmosphere that is oxygen deficient or that contains a toxic or disease-producing contaminant.

3.3.12 Incident Management System. A system that defines the roles and responsibilities to be assumed by personnel and the operating procedures to be used in the management and direction of emergency operations; the system is also referred to as an incident command system (ICS).

3.3.13* Incipient Stage. The early stage of a fire, in which the progression has not developed beyond that which can be extinguished using either portable fire extinguishers or handlines flowing up to 473 L/min (125 gpm).

3.3.14 Industrial Fire Brigade. An organized group of employees within an industrial occupancy who are knowledgeable, trained, and skilled in at least basic fire-fighting operations, and whose full-time occupation might or might not be

the provision of fire suppression and related activities for their employer.

3.3.15 Industrial Fire Brigade Apparatus. An industrial fire brigade emergency response vehicle designed and intended primarily for fire suppression, rescue, or other specialized function that includes pumpers, foam apparatus, aerial ladders, rescue vehicles, and other such apparatus.

3.3.16 Industrial Fire Brigade Management. The individual designated by top management to be responsible for the organization, management, and functions of the industrial fire brigade.

3.3.17 Industrial Fire Brigade Training Coordinator. The designated company representative with responsibility for coordinating effective, consistent, and quality training within the industrial fire brigade training and education program.

3.3.18 Industrial Occupancy. Occupancies that include industrial, commercial, mercantile, warehouse, power plant (utility), and institutional or similar occupancy, including for-profit, not-for-profit, and governmental facilities.

3.3.19 Master Stream. A portable or fixed fire-fighting appliance supplied by either hose lines or fixed piping and that has the capability of flowing in excess of 1140 L/min (300 gpm) of water or water-based extinguishing agent.

3.3.20 Performance Standards. Minimum requirements for knowledge and skills that must be provided to or demonstrated by the industrial fire brigade member upon completion of a training or education session.

3.3.21 Qualified Healthcare Professional. A licensed medical doctor or other licensed healthcare professional qualified to provide professional expertise in the areas of occupational safety and health as they relate to emergency response activities.

3.3.22 Response Duty. A fire-related service, function, or task identified in the industrial fire brigade organizational statement and assigned to a member to perform.

3.3.23* Site. The location of an industrial complex/facility that includes all property within the property lines of the company.

3.3.24 Site-Specific Hazard. A hazard that is present at the specific facility for which the industrial fire brigade has been organized.

3.3.25 Specialized Agents. Fire-extinguishing agents, such as dry chemicals, dry powders, carbon dioxide, halon, and other such non-water-based agents.

3.3.26 Standard Operating Procedure. A written organizational directive that establishes or prescribes specific operational or administrative methods to be followed routinely for the performance of designated operations or actions. [1521, 2008]

3.3.27* Support Members. Personnel assigned to the industrial fire brigade to perform specific response duties, including those people who have specific technical knowledge or skills or who have been given specific assignments that indirectly support manual fire suppression efforts.

3.3.28 Thermal Protective Clothing. Protective clothing such as helmets, footwear, gloves, hoods, trousers, and coats that are designed and manufactured to protect the industrial fire brigade member from the adverse effects of fire.

3.3.29 Training. The process of achieving proficiency through instruction and hands-on practice in the operation of equipment and systems that are expected to be used in the performance of assigned response duties.

3.3.30 Zone.

3.3.30.1 Cold Zone. The area immediately outside the boundary of the established warm zone where personnel are safe from the adverse effects of a fire.

3.3.30.2 Hot Zone. The area immediately surrounding the physical location of a fire having a boundary that extends far enough from the fire to protect industrial fire brigade members positioned outside the hot zone from being directly exposed to flames, dense smoke, or extreme temperatures.

3.3.30.3 Warm Zone. The control area immediately outside the boundary of the established hot zone having a boundary that extends far enough from the hot zone to protect personnel outside the warm zone from the adverse effects of the fire.

Chapter 4 Requirements for All Industrial Fire Brigades

4.1 General Administration.

4.1.1* Corporate or local management shall be responsible for the following:

- (1) Evaluating the site-specific conditions and hazards to determine site-specific response duties to be assigned to the industrial fire brigade
- (2) Assigning the site-specific response duties of the industrial fire brigade
- (3) Establishing, reviewing, and maintaining a written industrial fire brigade organizational statement
- (4) Establishing lines of authority and assigning responsibilities to ensure that the components of the industrial fire brigade organizational statement are accomplished
- (5)*Establishing a written policy for the occupational safety and health of industrial fire brigade members
- (6)*Establishing a written policy for the medical and job-related physical performance requirements for industrial fire brigade members
- (7) Developing or adopting performance-based standards that establish baseline levels of proficiency in skills, knowledge, and the safety measures necessary for industrial fire brigade members to accomplish the site-specific response duties described in the industrial fire brigade organizational statement
- (8) Developing, reviewing, and maintaining written standard operating procedures for site-specific conditions and hazards
- (9) Ensuring that a system exists to advise industrial fire brigade management of changes in an employee's eligibility for participation in an industrial fire brigade, resulting from changes in the employee's medical condition
- (10) Establishing a policy to ensure that the records required in this standard are maintained
- (11) Establishing a policy to ensure that annual funds are budgeted and available for equipment, vehicles, training and education, medical and job-related physical performance evaluations, and other necessary items to accomplish these objectives

4.1.2* Management shall establish, review, and maintain a written industrial fire brigade organizational statement.

4.1.2.1 This policy statement, which establishes the existence of the industrial fire brigade, shall include the following:

- (1) Basic organizational structure
- (2) The type, amount, and frequency of training and education to be provided
- (3) The expected number of members in the brigade
- (4) The response duties that the brigade is expected to perform in the workplace, which define the limits of industrial fire brigade responsibility
- (5) The shifts during which the brigade members are available for response

4.1.2.2* The organizational statement shall be available for inspection by the authority having jurisdiction, the industrial fire brigade members, and their designated representatives.

4.1.3 Management shall establish lines of authority and assign responsibilities to ensure that the components of the industrial fire brigade organizational statement are accomplished.

4.1.3.1 Management shall designate the responsible individual for the administration of the industrial fire brigade organizational statement and the training and education program.

4.1.3.2 Management shall establish responsibility for initiating, maintaining, and enforcing standard operating procedures to ensure the safety and health of industrial fire brigade members.

4.1.3.3 Management shall establish a policy to ensure that each industrial fire brigade member cooperates, participates, and complies with the provisions of the industrial fire brigade organizational statement and the training and education program.

4.1.4* Management shall ensure that industrial fire brigade members are a part of a corporate or local company occupational safety and health policy that identifies specific goals and objectives for the prevention and elimination of accidents, injuries, illness, and fatalities while performing industrial fire brigade response duties.

4.1.4.1 Management shall ensure that industrial fire brigade members are adequately represented on corporate or local company occupational safety and health committees as they relate to members performing assigned industrial fire brigade response duties.

4.1.4.2* Management shall delegate the response duties and responsibilities of the industrial fire brigade safety program to a qualified individual(s).

4.1.4.3 The safety program shall include the following:

- (1) Records and data management
- (2) Liaison with management, equipment suppliers, site or corporate safety, and medical and health departments
- (3) Development and maintenance of standard operating procedures
- (4) Accident prevention
- (5) Equipment specification and maintenance
- (6) Accident investigation
- (7) Incident scene safety
- (8) Training and education

4.1.5* All records associated with the operation of the industrial fire brigade required in this standard shall be maintained in a location where they are available for inspection by the authority having jurisdiction.

4.2 General Operations.

4.2.1* An incident management system shall be established with written procedures applying to all members involved in emergency and training operations and shall be utilized to manage all emergency and training operations.

4.2.1.1 All members involved in emergency response organizations shall be familiar with the incident management system.

4.2.1.2 The incident management system shall identify roles and responsibilities relating to the safety of industrial fire brigade operations.

4.2.1.3 Safety responsibilities shall be assigned to supervisory personnel at each level of the organization.

4.2.1.4 This system shall include the roles and responsibilities of any responding public fire department and other outside agencies.

4.2.1.5* A standard system shall be used to identify and account for each industrial fire brigade member present at the scene of the emergency.

4.2.1.6 NFPA 1081, *Standard for Industrial Fire Brigade Member Professional Qualifications*, shall be used to establish minimum levels of proficiency in both skills and knowledge to permit all industrial fire brigade members to safely accomplish the site-specific response duties described in the industrial fire brigade organizational statement.

4.2.1.7 The incident management system shall ensure that the risk to members is evaluated prior to taking action.

4.2.1.7.1 In situations where the risk to industrial fire brigade members is unacceptable, the emergency response activities shall be limited to defensive operations.

4.2.1.7.2 Regardless of the risk, actions shall not exceed the scope of the organizational statement and standard operating procedures.

4.2.2 Standard operating procedures for site-specific conditions and hazards shall be developed, reviewed, and maintained.

4.2.2.1 These procedures shall be maintained in written form and shall address the site-specific functions identified in the industrial fire brigade organizational statement.

4.2.2.2* These procedures shall include information regarding site-specific hazards to which industrial fire brigade members can be exposed during a fire or other emergency.

4.2.2.3 These procedures shall address the site-specific limitations of emergency response organizations.

4.2.2.4 These procedures shall be accessible to all industrial fire brigade members.

4.2.2.5 These procedures shall ensure that the shift industrial fire brigade leader is notified of all major fire protection systems and equipment that are out of service.

4.2.3 Risk Management Policy.

4.2.3.1 A risk management policy for emergency response shall be established by industrial fire brigade management.

4.2.3.2 The risk management policy shall be routinely reviewed with industrial fire brigade members and shall be based on the following recognized principles:

- (1) Some risk to the safety of industrial fire brigade members is acceptable where saving human lives is possible.

- (2) Minimal risk to the safety of the industrial fire brigade members, and only in a calculated manner, is acceptable where saving endangered property is possible.

- (3) No risk to the safety of industrial fire brigade members is acceptable where saving lives or property is not possible.

4.2.4 Operational safety requirements for industrial fire brigade members responding to a fire emergency shall be established and shall at a minimum include the following:

- (1) Personnel who are not trained in accordance with this standard are not permitted to enter the warm or hot zones established for a fire emergency.
- (2)*SCBA and thermal protective clothing are worn by industrial fire brigade members entering the hot zone.
- (3) Thermal protective clothing is worn by industrial fire brigade members entering the warm zone.
- (4) Industrial fire brigade members operate in teams of two or more in response to fires that have advanced beyond the incipient stage.
- (5) Industrial fire brigade members operating in the hot and warm zones have an established communications system.
- (6) When industrial fire brigade members are operating in the hot zone, at least one industrial fire brigade member with the capability to call for assistance remains outside the hot zone and maintains an awareness of the safety of industrial fire brigade members located inside the hot zone.
- (7) When industrial fire brigade members are operating in the hot zone, additional brigade members are standing by in the warm zone with approved equipment to provide assistance or rescue.
- (8) Industrial fire brigade members positioned in the warm zone are visible to command positions at all times.
- (9) Personnel and industrial fire brigade members positioned in any fire zone have opportunity to relocate to an alternate position should fire conditions change.
- (10) Experienced industrial fire brigade members oversee activities of less experienced brigade members during fire-fighting operations.

4.3 Education, Training, and Drills.

4.3.1 A training and education program shall be established and maintained for all industrial fire brigade members to ensure that they are able to perform their assigned response duties in a manner that does not pose a hazard to themselves or other members.

4.3.2 All members shall be trained to a level of competency commensurate with the response duties and functions that they are expected to perform, including the operation of all of the fire-fighting and rescue equipment and systems they are expected to use.

4.3.3* Members shall meet the minimum skills and knowledge requirements of NFPA 1081, *Standard for Industrial Fire Brigade Member Professional Qualifications*, for each site-specific task expected to be performed by brigade members before their participation in emergency response operations.

4.3.4 Industrial fire brigade members shall not perform any response duties they have not been trained and educated to perform.

4.3.5* The quality and frequency of training and education provided shall ensure that industrial fire brigade members are capable of performing their assigned response duties in a manner that does not present a hazard to themselves or endanger other personnel.

4.3.6 The prevention of accidents, injury, death, and illness during performance of any industrial fire brigade function shall be an established goal of training and education.

4.3.7* A designated industrial fire brigade training coordinator shall provide instruction to the industrial fire brigade or shall verify the qualifications of other instructors providing training and education to industrial fire brigade members.

4.3.8* Industrial fire brigade members designated as leaders shall receive training and education commensurate with their response duties. Such training and education shall be more comprehensive than that provided to the other industrial fire brigade members.

4.3.9* Drills shall be conducted as often as necessary to evaluate the effectiveness of the industrial fire brigade training and education program and the competence of industrial fire brigade members in performing assigned response duties. Lessons learned shall be evaluated and documented, and additional training shall be provided as necessary to improve performance that is below established standards.

4.3.10* The training and education provided to members shall include a review of the applicable provisions of this standard.

4.3.11 The training and education program shall include the principles and practices of fire fighting and emergency response to the extent required by the type of industrial fire brigade established and by the assignment within the brigade.

4.3.12 The training and education program shall address new hazards, equipment, and procedures introduced into the facility.

4.3.13* Training provided to industrial fire brigades shall develop and increase competency in life safety, property conservation, and reduction of business interruption.

4.3.14 Training shall include site-specific hazards. (See 4.2.2.2.)

4.3.15 Training Records.

4.3.15.1 Individual training records shall be maintained for each member of the industrial fire brigade.

4.3.15.2 Training records shall include, but not be limited to, courses completed, subjects studied, refresher courses completed, and other evaluations of skills and knowledge, drill attendance records, and leadership or other special accomplishments related to industrial fire brigade activities.

4.3.15.3 Training records shall be maintained and shall be available for inspection by the authority having jurisdiction.

4.3.15.4 Training records shall be reviewed at least annually by industrial fire brigade management and the industrial fire brigade training coordinator to evaluate training needs and equipment needs of the brigade.

4.4 Organization of the Industrial Fire Brigade.

4.4.1 **Industrial Fire Brigade Management.** Industrial fire brigade management shall be responsible for the following:

- (1) Establishing programs to accomplish the items identified in the industrial fire brigade organizational statement
- (2) Establishing the size and organization of the industrial fire brigade
- (3) Coordinating and scheduling necessary meetings

- (4) Establishing and maintaining fire protection equipment inspection programs for industrial fire brigade equipment
- (5) Coordinating the maintenance and review of necessary reports and records
- (6)*Maintaining liaison with local fire authorities
- (7) Making information on hazardous materials and processes to which the brigade can be exposed available to brigade members
- (8) Establishing job-related physical performance requirements for industrial fire brigade members

4.4.2 **Industrial Fire Brigade Leader.** The industrial fire brigade leader shall be responsible for the following:

- (1) Establishing a chain of command within the brigade to act in the absence of the brigade leader
- (2) Assisting in the selection process of brigade members
- (3) Establishing and maintaining a brigade roster
- (4) Selecting assistant industrial fire brigade leaders as appropriate to the size of the brigade and keeping them informed of all operations of the brigade
- (5) Developing pre-emergency plans for site-specific hazards and making information on hazardous materials and processes to which the industrial fire brigade can be exposed available to all industrial fire brigade members
- (6) Selecting and maintaining equipment used by the brigade
- (7) Issuing written reports on the status of the industrial fire brigade to management, at least annually
- (8) Assisting in fire investigations

4.4.3 **Assistant Industrial Fire Brigade Leaders.** The assistant industrial fire brigade leader shall complete all tasks assigned by the industrial fire brigade leader and shall substitute in the leader's absence.

4.4.4 Industrial Fire Brigade Members.

4.4.4.1 Industrial fire brigade members shall be selected from employees at the facility.

4.4.4.2 Members shall meet the requirements established for industrial fire brigade members and shall represent as many separate areas and departments of the facility as is practical.

4.4.4.3 Each industrial fire brigade member shall cooperate, participate, and comply with the provisions of the industrial fire brigade organizational statement and the training and education program.

4.4.4.4 Industrial fire brigade leaders or designated representatives shall ensure that support members are trained for their assigned response duties.

4.4.5 **Identification.** Industrial fire brigade members shall be issued identification for the following purposes:

- (1) Assistance in reaching the incident in an emergency
- (2) Identification by security personnel
- (3) Establishing authority

4.4.6 **Industrial Fire Brigade Communications.** Means shall be established for the following:

- (1) Notification of industrial fire brigade members of a reported incident
- (2) Communications between industrial fire brigade members during an emergency

4.4.7 Support Members.

4.4.7.1 Support members shall demonstrate awareness of the plant's pre-fire plan prior to an incident and shall demonstrate their assigned response duties for those tasks.

4.4.7.2 Support members shall not be permitted to enter the warm zone or the hot zone.

4.5 Medical and Job-Related Physical Requirements.

4.5.1 General Fitness.

4.5.1.1* Prior to being accepted for industrial fire brigade membership, employees who are expected to perform advanced exterior or interior structural fire fighting shall be examined and certified as medically and physically fit by a qualified healthcare professional.

4.5.1.2 The medical and physical fitness requirements shall take into account the risks and the tasks associated with the individual's assigned industrial fire brigade response duties.

4.5.1.3 Industrial fire brigade members who are under the influence of alcohol or drugs shall not participate in any industrial fire brigade operations.

4.5.2 **Medical Requirements.** Industrial fire brigade members who perform advanced exterior fire fighting or interior structural fire fighting shall be medically evaluated annually and after each medical leave of absence by a qualified healthcare professional.

4.5.3* Job-Related Physical Performance Requirements.

4.5.3.1* Industrial fire brigade management shall establish job-related physical performance requirements for industrial fire brigade members.

4.5.3.2 Industrial fire brigade members shall meet the job-related physical performance requirements of 4.5.3.1 prior to assignment to the industrial fire brigade.

4.5.3.3 Industrial fire brigade members who are expected to perform advanced exterior or interior structural fire fighting shall be evaluated annually to ensure that they continue to meet the job-related physical performance requirements of 4.5.3.1.

4.5.3.4 When the evaluation required in 4.5.3.3 concludes that an industrial fire brigade member does not meet the job-related physical performance requirements of 4.5.3.1, the member shall not be permitted to continue to perform those task-specific activities.

4.5.4* **Physical Fitness.** Industrial fire brigade members shall be required to report to management any changes in their physical condition that could impact their performance as an industrial fire brigade member.

4.6 Industrial Fire Brigade Equipment.

4.6.1 The industrial fire brigade shall be provided with the appropriate equipment to enable it to perform the response duties assigned in the organizational statement.

4.6.2* The equipment shall be selected based on the nature of the facility and the site-specific hazards present.

4.6.3 Storage space for the industrial fire brigade equipment shall be provided so that fire-fighting equipment is accessible.

4.6.4 A written equipment list that the industrial fire brigade is expected to use shall be maintained on the site, reviewed

annually, and updated as necessary. The list shall include the location of the equipment and procedures for obtaining the equipment when needed.

4.6.5 All industrial fire brigade equipment shall be inspected and maintained at least annually.

4.6.6 Operation and maintenance manuals for industrial fire brigade equipment shall be available to the industrial fire brigade.

4.6.7 Maintenance reports of industrial fire brigade equipment shall be available to the industrial fire brigade.

4.7 Industrial Fire Brigade Apparatus.

4.7.1 Industrial fire brigade management shall include industrial fire brigade health and safety as primary concerns in the specification, design, construction, acquisition, operation, maintenance, inspection, and repair of all apparatus.

4.7.1.1* Industrial fire brigade apparatus shall be operated only by members who have been qualified in its proper operation by formal training using performance-based standards.

4.7.1.2 Industrial fire brigade apparatus drivers shall have valid driver's licenses for the applicable type of vehicle as required by state law or corporate policy.

4.7.1.3 Apparatus shall be operated in compliance with all applicable traffic laws.

4.7.1.4 Industrial fire brigade apparatus drivers shall be directly responsible for safe and prudent operation under all conditions.

4.7.1.5* All persons riding on industrial fire brigade apparatus shall be seated and secured with seat belts.

4.7.2 All industrial fire brigade apparatus shall be maintained in accordance with the manufacturer's recommendations.

4.7.3 All industrial fire brigade apparatus shall be inspected at least weekly and within 24 hours after any use or repair to identify and correct unsafe conditions.

4.7.4 Industrial fire brigade apparatus found unsafe shall be placed out of service until repaired.

4.7.5 Fire pumps on apparatus shall be service tested in accordance with the frequency and procedures specified in NFPA 1911, *Standard for the Inspection, Maintenance, Testing, and Retirement of In-Service Automotive Fire Apparatus*.

4.7.6 All aerial devices shall be inspected and service tested in accordance with the frequency and procedures specified in NFPA 1911, *Standard for the Inspection, Maintenance, Testing, and Retirement of In-Service Automotive Fire Apparatus*.

Chapter 5 Industrial Fire Brigades That Perform Incipient Stage Fire Fighting

5.1 **General.** Industrial fire brigades organized to perform incipient stage fire fighting shall meet the requirements of Sections 5.2 through 5.4 in addition to all applicable requirements of Chapters 1 and 4 of this standard.

5.2 Education, Training, and Drills.

5.2.1* All industrial fire brigade members shall receive training and education at least annually.



5.2.2 All industrial fire brigade members shall participate in a drill at least annually.

5.2.3* Training and drills involving live fire evolutions shall be performed in accordance with recognized safety precautions.

5.3 **Protective Clothing and Protective Equipment.** Thermal protective clothing and SCBA shall not be required.

5.4 **Medical.** Each industrial fire brigade member shall meet the medical and job-related physical performance requirements as specified in Section 4.5.

Chapter 6 Industrial Fire Brigades That Perform Advanced Exterior Fire Fighting Only

6.1 **General.** Industrial fire brigades organized to perform advanced exterior fire fighting only shall meet the requirements of Sections 6.2 through 6.4 in addition to all applicable requirements of Chapters 1 and 4 of this standard.

6.2 Education, Training, and Drills.

6.2.1 All industrial fire brigade members shall receive training and education at least quarterly to meet the requirements of Section 4.3.

6.2.2 All industrial fire brigade members shall participate in a drill at least semiannually to meet the requirements of Section 4.3.

6.2.3 Live fire training shall be conducted at least annually. Training and drills involving a live fire evolution shall be performed in accordance with recognized safety precautions.

6.2.4 Live fire training shall include props that are representative of and that simulate as closely as possible the hazards and conditions that could be encountered by the industrial fire brigade member.

6.3 Protective Clothing and Protective Equipment.

6.3.1 Thermal protective clothing and protective equipment shall be available in sufficient quantities and sizes to fit each industrial fire brigade member expected to enter the hot and warm zones.

6.3.2 Thermal protective clothing and protective equipment meeting the requirements of 6.3.2.1 and 6.3.2.2 shall be required to be worn by all industrial fire brigade members entering the hot and warm zones.

6.3.2.1* Protective clothing shall be in accordance with NFPA 1971, *Standard on Protective Ensembles for Structural Fire Fighting and Proximity Fire Fighting*.

6.3.2.2 Helmets, gloves, and footwear shall be in accordance with NFPA 1971, *Standard on Protective Ensembles for Structural Fire Fighting and Proximity Fire Fighting*.

6.3.3 SCBA and personal alert safety systems (PASS) devices meeting the requirements of 6.3.3.1 through 6.3.3.3 shall be provided for and shall be used by all industrial fire brigade members working in the hot zone.

6.3.3.1 PASS devices shall be in accordance with NFPA 1982, *Standard on Personal Alert Safety Systems (PASS)*.

6.3.3.2 Open-circuit-type self-contained breathing devices shall be in accordance with NFPA 1981, *Standard on Open-Circuit Self-Contained Breathing Apparatus (SCBA) for Emergency Services*.

6.3.3.3 Closed-circuit-type self-contained breathing devices shall be approved by the National Institute for Occupational Health and Safety (NIOSH) and Mine Safety and Health Administration (MSHA) with a minimum service duration of 30 minutes and shall operate in the positive pressure mode only.

6.3.4 Thermal protective clothing and protective equipment shall be used and maintained in accordance with manufacturer's instructions.

6.3.4.1 A maintenance and inspection program shall be established for thermal protective clothing and protective equipment.

6.3.4.2 Specific responsibilities shall be assigned for inspection and maintenance of thermal protective clothing and protective equipment.

6.3.5 Industrial fire brigade members using SCBA shall operate in teams of two or more who are in communication with each other through visual, audible, physical, safety guide rope, electronic, or other means to coordinate their activities and are in close proximity to each other to provide assistance in case of an emergency.

6.3.5.1 Where industrial fire brigade members are involved in operations that require the use of SCBA or other respiratory protective equipment, at least one member shall be assigned to remain outside the area where respiratory protection is required.

6.3.5.2 The member who remains outside shall be responsible for maintaining a constant awareness of the number and identity of personnel using SCBA, their location, function, and time of entry.

6.3.5.3 This member, with SCBA, shall be trained, equipped, and available for rescue.

6.3.6 All industrial fire brigade members entering the hot zone shall be provided with approved hoods that provide protection for the ears and neck and interface with the SCBA facepiece, thermal protective coat, and helmet.

6.4 **Medical.** Each industrial fire brigade member shall meet the medical and job-related physical performance requirements specified in Section 4.5.

Chapter 7 Industrial Fire Brigades That Perform Interior Structural Fire Fighting Only

7.1 **General.** Industrial fire brigades organized to perform interior structural fire fighting only shall meet the requirements of Sections 7.2 through 7.4 in addition to all applicable requirements of Chapters 1 and 4 of this standard.

7.2 Education, Training, and Drills.

7.2.1 All industrial fire brigade members shall receive training and education at least quarterly to meet the requirements of Section 4.3.

7.2.2 All industrial fire brigade members shall participate in a drill at least semiannually to meet the requirements of Section 4.3.

7.2.3 Live fire training shall be conducted at least annually. Training and drills involving a live fire evolution shall be performed in accordance with NFPA 1403, *Standard on Live Fire Training Evolutions*.

7.2.4 Live fire training shall include props that are representative of and that simulate as closely as possible the hazards and conditions that could be encountered by the industrial fire brigade member.

7.3 Protective Clothing and Protective Equipment

7.3.1 Thermal protective clothing and protective equipment for structural fire fighting shall be available in sufficient quantities and sizes to fit each industrial fire brigade member expected to enter the hot and warm zones.

7.3.2 Thermal protective clothing and protective equipment meeting the requirements of 7.3.2.1 through 7.3.2.4 shall be required to be worn by all industrial fire brigade members entering the hot and warm zones.

7.3.2.1 Protective clothing, helmets, gloves, and footwear shall be in accordance with NFPA 1971, *Standard on Protective Ensembles for Structural Fire Fighting and Proximity Fire Fighting*.

7.3.2.2 PASS devices shall be in accordance with NFPA 1982, *Standard on Personal Alert Safety Systems (PASS)*.

7.3.2.3 Open-circuit-type self-contained breathing devices shall be in accordance with NFPA 1981, *Standard on Open-Circuit Self-Contained Breathing Apparatus (SCBA) for Emergency Services*.

7.3.2.4 Closed-circuit-type self-contained breathing devices shall be approved by NIOSH and MSHA with a minimum service duration of 30 minutes and shall operate in the positive pressure mode only.

7.3.3 All industrial fire brigade members entering the hot zone shall be provided with approved hoods that provide protection for the ears and neck and interface with the SCBA facepiece, protective coat for structural fire fighting, and helmet.

7.3.4 Thermal protective clothing and protective equipment shall be used and maintained in accordance with manufacturers' instructions.

7.3.4.1 A maintenance and inspection program shall be established for thermal protective clothing and protective equipment.

7.3.4.2 Specific responsibilities shall be assigned for inspection and maintenance.

7.3.5 Industrial fire brigade members performing emergency response operations below ground level shall be provided with self-contained or externally supplied breathing apparatus and shall use that apparatus unless the safety of the atmosphere can be established by testing and continuous monitoring.

7.3.6* Industrial fire brigade members using SCBA shall operate in teams of two or more who are in communication with each other through visual or voice contact to coordinate their activities and are in close proximity to each other to provide assistance in case of an emergency.

7.3.6.1 Where industrial fire brigade members are involved in operations that require the use of SCBA, at least two members shall be assigned to remain outside the area where respiratory protection is required.

7.3.6.2 One member shall be responsible for maintaining a constant awareness of the number and identity of personnel using SCBA, their location, function, and time of entry.

7.3.6.3 These members with SCBA shall be trained, equipped, and available for rescue.

7.4 **Medical.** Each industrial fire brigade member shall meet the medical and job-related physical performance requirements specified in Section 4.5.

Chapter 8 Industrial Fire Brigades That Perform Advanced Exterior and Interior Structural Fire Fighting

8.1 **General.** Industrial fire brigades intended to perform both advanced exterior and interior structural fire-fighting response duties shall meet the requirements of Chapters 1, 4, 6, and 7 of this standard.

Annex A Explanatory Material

Annex A is not a part of the requirements of this NFPA document but is included for informational purposes only. This annex contains explanatory material, numbered to correspond with the applicable text paragraphs.

A.1.1 A major concern of industrial fire protection professionals is the protection of employees and property from the threat of fire in the workplace. In 1980 the Occupational Safety and Health Administration (OSHA) defined its requirements for industrial fire brigades. These requirements apply to industrial fire brigades once corporate or local management, in the role as an authority having jurisdiction, has determined that they want an industrial fire brigade at a facility.

In OSHA, 29 CFR 1910.156, Subpart L, two types of industrial fire brigades are defined in an attempt to establish levels of industrial fire brigade function and to identify the training and safety requirements for each of those levels. Industrial fire protection professionals have wrestled with categorizing every existing industrial fire brigade into either the incipient stage category or the interior structural category.

In attempting to develop a state-of-the-art industrial fire brigade standard, the Technical Committee on Loss Prevention Procedures and Practices has followed OSHA's lead in setting requirements based on the incipient and interior structural industrial fire brigade definitions.

The adoption of NFPA 1500, *Standard on Fire Department Occupational Safety and Health Program*, by the NFPA in 1987 brought about an entirely new perspective — that of inclusion of the industrial fire brigades in the same category as municipal fire departments. Although the work done by the Technical Committee on Fire Department Occupational Safety and Health is admirable and is intended to safeguard all fire fighters, the Technical Committee on Loss Prevention Procedures and Practices believes that a separate industrial fire brigade standard is needed.

Although every industrial fire brigade is unique, just as every municipal fire department is unique, industrial fire brigades, including those that can be referred to as industrial fire departments, have far different needs in many respects from those of municipal fire departments.

The primary difference between industrial fire brigades and municipal fire departments is that industrial fire brigades must deal with conditions and hazards that are limited to those that exist within a given facility that is generally privately owned and operated. Although these site-specific hazards can

and do represent the same degree of hazard to both industrial fire brigade members and municipal fire fighters, industrial fire brigade members are not usually concerned with, nor are they expected to deal with, hazards and emergencies beyond the boundaries of the facility that the brigade serves.

In addition to this primary difference, it must be remembered that at an industrial facility a program of occupational safety and health has already been established for all personnel including members of the industrial fire brigade. Further, industrial fire brigades constituted in accordance with this standard will, of necessity, have a much more thorough knowledge of the buildings and facilities where they respond than do municipal fire fighters who must respond to a significantly greater variety of buildings and facilities, many of which have unidentified and undisclosed hazards.

A municipal fire department, as a local government function, must provide a service to a very broad-based municipality with a multitude of unknown factors at every given response. Variables such as property size and accessibility; building size, construction, and contents; manufacturing process hazards; fixed fire-extinguishing systems and special agent availability; and storage and use of solvents, oils, chemicals, or other hazardous materials are all potential unknown factors that can hinder the effectiveness of any municipal fire department and place a greater safety risk on the fire fighters.

This distinct advantage of familiarity achieves a higher level of industrial fire brigade safety and allows for the fundamental difference between a municipal fire department and an industrial fire brigade.

A.1.1.2 This standard is intended to meet or exceed the industrial fire brigade-related requirements of OSHA, 29 CFR 1910, Chapter XVII, Subpart L, "Fire Protection." Further, this standard is intended to assure the industrial fire brigade member with an appropriate degree of occupational safety and health while performing industrial fire brigade response duties, just as NFPA 1500, *Standard on Fire Department Occupational Safety and Health Program*, assures an appropriate degree of occupational safety and health for the municipal fire department member.

For additional information on industrial fire brigade organization, see Chapter 4 in the NFPA *Industrial Fire Hazards Handbook*.

A.1.1.3 It is the intent that industrial fire brigade members, who are trained and qualified under the guidance of this standard respond to familiar hazards that are common to the industrial facility being protected.

Industrial fire brigades complying with the requirements of this standard should be permitted to respond to fires outside the boundaries of the industrial facility only when the industrial fire brigade is trained and familiar with the hazards associated with the fire. For example, an industrial fire brigade having appropriate training in accordance with this standard can respond to a fire involving an enclosed structure outside the boundaries of the industrial facility, if such response was anticipated and preplanned by industrial fire brigade management. Each industrial fire brigade member should be familiar with the layout and contents of the structure and should be provided with the opportunity to tour the structure at least quarterly.

A.1.2 Requirements for the establishment of industrial fire brigades are established by the authority having jurisdiction.

A.1.4 The potential exposure and training separates an organized industrial fire brigade from designated employees (as

defined by OSHA) who have some fire response duties in the general work area. The scope of industrial fire brigade actions and responsibilities is based on the specific response duties that the industrial fire brigade members are expected to perform. If an industrial fire brigade member is not expected to perform a particular fire-fighting function, then management has no obligation to train or equip the industrial fire brigade member to perform that function.

A.1.4.2 Designated employees who are intended to respond to incipient fires in their immediate work area should receive training commensurate with the response duties they are expected to perform. Their responsibilities normally are limited to sounding an alarm, taking immediate action to extinguish the fire, and evacuating the area.

A.3.2.1 Approved. The National Fire Protection Association does not approve, inspect, or certify any installations, procedures, equipment, or materials; nor does it approve or evaluate testing laboratories. In determining the acceptability of installations, procedures, equipment, or materials, the authority having jurisdiction may base acceptance on compliance with NFPA or other appropriate standards. In the absence of such standards, said authority may require evidence of proper installation, procedure, or use. The authority having jurisdiction may also refer to the listings or labeling practices of an organization that is concerned with product evaluations and is thus in a position to determine compliance with appropriate standards for the current production of listed items.

A.3.2.2 Authority Having Jurisdiction (AHJ). The phrase "authority having jurisdiction," or its acronym AHJ, is used in NFPA documents in a broad manner, since jurisdictions and approval agencies vary, as do their responsibilities. Where public safety is primary, the authority having jurisdiction may be a federal, state, local, or other regional department or individual such as a fire chief; fire marshal; chief of a fire prevention bureau, labor department, or health department; building official; electrical inspector; or others having statutory authority. For insurance purposes, an insurance inspection department, rating bureau, or other insurance company representative may be the authority having jurisdiction. In many circumstances, the property owner or his or her designated agent assumes the role of the authority having jurisdiction; at government installations, the commanding officer or departmental official may be the authority having jurisdiction.

A.3.3.1 Combustible Liquid. Combustible liquids are classified as follows:

- (1) Class II. Liquids that have flash points at or above 37.8°C (100°F) and below 60°C (140°F).
- (2) Class IIIA. Liquids that have flash points at or above 60°C (140°F) and below 93.4°C (200°F).
- (3) Class IIIB. Liquids that have flash points at or above 93.4°C (200°F).

A.3.3.5 Education. It does not necessarily require formal classroom instruction.

A.3.3.8.1 Advanced Exterior Fire Fighting. Advanced exterior fire fighting often requires industrial fire brigade members to contain, control, and extinguish exterior fires involving site-specific hazards, such as flammable and combustible liquid spills or leaks, liquefied petroleum gas releases, and electrical substations. Advanced exterior fire fighting is usually performed using handlines flowing up to 1140 L/min (300 gpm), master streams, or similar devices for the manual application

of specialized agents. Thermal protective clothing is required and the use of SCBA could be required.

A.3.3.8.4 Interior Structural Fire Fighting. This definition is extracted from OSHA, 29 CFR 1910.

Rescue is the activity of removing victims by an industrial fire brigade as part of fire-fighting activities. Rescue activities requiring specialized equipment and training, such as confined space and high-angle rescue, are not included in this standard.

A.3.3.10 Flammable Liquid. Flammable liquids (Class I) are classified as follows:

- (1) Class IA. Liquids that have flash points below 22.8°C (73°F) and boiling points below 37.8°C (100°F).
- (2) Class IB. Liquids that have flash points below 22.8°C (73°F) and boiling points at or above 37.8°C (100°F).
- (3) Class IC. Liquids that have flash points at or above 22.8°C (73°F) and below 37.8°C (100°F).

A.3.3.11 Hazardous Atmosphere. A hazardous atmosphere might or might not be immediately dangerous to life and health.

A.3.3.13 Incipient Stage. A fire is considered to be beyond the incipient stage when the use of thermal protective clothing or self-contained breathing apparatus is required or an industrial fire brigade member is required to crawl on the ground or floor to stay below smoke and heat.

A.3.3.23 Site. A site can include several facilities.

A.3.3.27 Support Members. When organizing the industrial fire brigade, management should take into consideration the need for specialized response duties required in the event of a fire or related emergency and should assign personnel to the brigade to ensure that these response duties are accomplished.

In most cases, personnel are not expected to perform manual fire suppression activities in the event of an emergency but are expected to perform only those specialized tasks for which they have been chosen. Some of these specialized assignments include the following:

- (1) Building evacuation: Personnel are expected to perform specialized response duties to ensure that personnel are safely evacuated from an enclosed structure or the facility in the event of fire. They can be known as industrial fire brigade wardens or by a variety of other titles.
- (2) Sprinkler system control: Personnel are assigned to perform specialized response duties to ensure that control of the automatic sprinkler protection system within the fire area or the facility is maintained by facility personnel in the event of fire. These personnel can be known as industrial fire brigade sprinkler valve operators or a variety of other titles.
- (3) Electrical power control: Personnel are expected to perform specialized response duties to ensure that control of electrical power within the fire area or the facility is maintained by facility personnel in the event of fire. These personnel can be known as industrial fire brigade electricians or by a variety of other titles.
- (4) Utility control: Personnel are expected to perform specialized response duties to ensure that control of plant utilities within the fire area or the facility — for example, steam, water, natural gas, and other liquid or vapor piping systems — is maintained by facility personnel in the event of fire. These personnel can be known as industrial fire brigade utility control technicians or by a variety of other titles.

(5) Fire pump operation: Personnel are expected to perform specialized response duties to ensure that stationary fire pumps are placed into operation or are operating properly in the event of fire. They can be known as industrial fire brigade fire pump operators or by a variety of other titles.

(6) Salvage: Personnel are expected to perform specialized response duties to ensure that actions are taken during and after manual fire suppression activities to minimize the resultant damage from the fire. These personnel can be known as industrial fire brigade salvage personnel or by a variety of other titles.

(7) Traffic control: Personnel are expected to perform specialized response duties to ensure that control of foot and vehicular traffic in and around the fire area or the facility is maintained in the event of fire and to ensure that any responding agency is directed to the fire area. These operations can be accomplished by facility security personnel who have been assigned to the industrial fire brigade.

A.4.1.1 Even during times of economic stress, providing adequate funds for proper equipment and training is necessary in order to maintain the safety and operational effectiveness of the industrial fire brigade.

The structure of the brigade should be determined based on an analysis of all factors present in the areas where the brigade will operate, including, but not limited to, the following:

- (1) Property size
- (2) Property accessibility
- (3) Building size and construction
- (4) Building contents
- (5) Fire protection equipment
- (6) Fire hazards
- (7) Personnel safety
- (8) Public fire department assistance
- (9) Availability of personnel
- (10) Shift and vacation schedule of the facility
- (11) Other response duties of the brigade, such as fire watch and maintenance of fire-fighting equipment

A.4.1.1(5) The establishment of a written policy for the occupational safety and health of industrial fire brigade members is intended to help prevent, and reduce the severity of, accidents, injuries, and exposures that occur. It is possible that an existing corporate safety program or policy satisfies the requirements of this standard.

A.4.1.1(6) The establishment of a written policy for medical and job-related physical performance requirements will help ensure that industrial fire brigade members will be medically and physically capable of performing their required response duties and will help to reduce the risk of injuries and illnesses.

A.4.1.2 The following is a sample industrial fire brigade organizational statement.

**ABC Industrial Fire Brigade Organizational Statement
November 2004**

Purpose: The ABC Industrial Fire Brigade was organized to safeguard the employees and the property of the ABC Corporation from the threat of fire. The industrial fire brigade is intended to function as an incipient stage industrial fire brigade as identified by OSHA, 29 CFR 1910, Subpart L.

Membership: Anyone who works at the ABC Corporation is welcome to join the industrial fire brigade, although certain specific members are appointed, based on their particular job and location within the facility. At the present time, there are a total of 25 members in the brigade.

Members are identified as fire-fighting members and support members. Fire-fighting members are expected to perform fire-fighting response duties, utilizing both hand portable fire extinguishers and wheeled fire extinguishers and the 38 mm (1½ in.) hose lines stationed throughout the facility. Support members are not expected to fight fires but are expected to perform specialized response duties that are intended to support the fire-fighting operations. These support functions ensure the following:

- (1) Building is evacuated.
- (2) Sprinkler valves are open.
- (3) Fire department is directed to the scene of the fire.
- (4) Fire pump is operating properly.
- (5) Other logistical needs of the fire-fighting members are met.

Organization: The brigade is headed by a brigade chief. A shift industrial fire brigade leader is also assigned to each shift. In the absence of the chief, the shift chief is in charge of the brigade. During a fire incident, the shift chief or brigade chief is in charge of the incident until the local municipal fire department arrives. At this time, the officer in charge of the fire department forces on scene and the shift chief will establish a joint incident command.

Functions: The primary function of the industrial fire brigade is to perform fire-fighting operations prior to the arrival of the fire department or operation of the sprinkler system. The fire-fighting operations cannot exceed the capabilities of the brigade members present to prevent fires from spreading.

Additional functions include the provision of advanced first aid assistance in any salvage operations that are necessary during any type of incident, including a fire, and the checking of fire protection and life safety equipment throughout the facility on a daily basis.

Training: The primary source of training for fire-fighting members is that conducted within the facility by the industrial fire brigade training officer. This training is conducted on a monthly basis.

Support members receive training on a bimonthly basis in the operation of the fire protection equipment, building evacuation information, and other related topics. This training is provided by the industrial fire brigade training officer and other personnel from the facility, such as the maintenance supervisor, the emergency coordinator, and the safety director.

Safety: While this industrial fire brigade exists to help safeguard the people and property of the ABC Corporation, the first and foremost consideration must be for the safety of the industrial fire brigade members. The brigade has limited resources and training and thus has limited abilities. These limits must be recognized by all members to ensure that members are not extended beyond their capabilities or the limitations imposed by the equipment with which they must operate.

Sample Organizational Statement — An Alternative Sample

The ABC Corporation, under contract with the XYZ Company for management and operation of the XYZ plant, will use an emergency response team (ERT) for the protection of those facilities.

The ERT is composed of employees whose normal job duties are not that of an ERT. In the event of an emergency, ERT members will leave their normal assigned duties and assume the response duties of the ERT. Responding ERT members will be grouped into teams, and designated ERT leaders (ERTLs) using the Incident Management System will direct and supervise emergency response operations. The total number of available ERT members responding to an emergency will vary from 2 to 40 depending on the particular site, the time of day, and response times. As dictated by the size and duration of the emergency, this number could increase to more than 100 with response by trained ERT members and leaders from other XYZ plant sites.

For fires involving enclosed structures, the ERT will perform only incipient fire fighting and will not enter into a building or enclosed structure involved with fire beyond the incipient stage. For a building involved with fire beyond the incipient stage, ERT members will notify local municipal fire departments or mutual aid organizations to respond and will assist with evacuation, account for personnel, perform first aid, and protect adjacent exposures.

For emergency fire response to the site-specific hazards associated with the storage and transfer of crude oil, the ERT will perform advanced exterior fire fighting. In performing advanced exterior fire fighting, ERT members will wear protective gear and will have responsibilities for rescue, emergency first aid, isolation of fuel sources, and application of water, foam, and dry chemical from the perimeter of the fire, which does not require entry into the interior of enclosed structures involved with fire beyond the incipient stage. Emergency contractors will be employed as necessary for complex fire emergencies that are beyond the training of the ERT.

For response to site-specific hazardous materials emergencies, the ERT will perform limited functions. In performing the limited hazardous materials functions, ERT members will be provided with appropriate personal protective equipment and will approach the source of a spill or leak and attempt to contain, control, and terminate the emergency conditions for which they have been trained. Emergency contractors will be employed as necessary for complex spills, leaks, and cleanups that are beyond that for which the ERT are trained.

Each ERT member will receive training and education commensurate with the response duties and functions they are expected to perform. Forty hours of fire, safety, and hazardous materials response training will be provided annually at the ERT Training Academy using established performance-based standards. Training at the academy will include, but not be limited to, hose and nozzle handling, fire fighter safety, use of protective gear, strategies and tactics, first aid, cardiopulmonary resuscitation (CPR), hazard identification, spill control, and live fire fighting involving flammable liquids and gases. ERT members must attend and successfully complete one ERT Training Academy program before participating in emergency response organizations.

ERT members will receive additional fire training quarterly. Training will be provided at each of the ABC Corporation facilities by qualified personnel to meet established performance standards. Such training will include classroom instruction and hands-on training that has been selected to keep ERT members familiar with site-specific equipment, systems, and standard operating procedures.

Designated ERTLs will annually receive 8 hours of specialized classroom instruction and will train and function as leaders in all live fire and hazardous materials training exercises at

the ERT Training Academy and at the sites. Such training will be over and above that provided to other members and will be provided by qualified personnel. Instruction will include, but not be limited to, such subjects as leadership, methods of teaching, incident command, communications, tactics and strategies, and standard operating procedures.

A.4.1.2.2 The purpose of the industrial fire brigade's organizational statement is to demonstrate management's commitment to the establishment of an industrial fire brigade. This statement identifies all of the information pertinent to the industrial fire brigade and is intended to provide the industrial fire brigade member with a clear picture of the organization of the brigade and the response duties that he or she is expected to perform as they relate to the industrial fire brigade.

In addition to the information required in the organizational statement, the following information should also be included:

- (1) Line of authority of each industrial fire brigade member
- (2) Number of industrial fire brigade leaders
- (3) Number of industrial fire brigade instructors
- (4) List and description of the types of awards or recognition that brigade members are eligible to receive

The industrial fire brigade organizational statement is intended to represent the foundation of the industrial fire brigade and is similar to the mission statement of the organization. Thus, everything that the brigade does should be in accordance with the information in the organizational statement. As such, the organizational statement requires periodic revision as the mission, organization, or response duties of the brigade change.

A.4.1.4 The following is an example of a safety policy statement:

It is corporate or local company policy to operate an industrial fire brigade and to provide all industrial fire brigade members with the highest possible levels of safety and health while they are performing their assigned industrial fire brigade response duties.

A.4.1.4.2 The determination of whether the individual will have a full-time or part-time assignment should be made by the management. This determination should depend on the size and structure of the industrial fire brigade; the activity level; the level of risk in the industrial fire brigade's work environment; and the history of accidents, injuries, occupational illness, deaths, and exposures.

A.4.1.5 Medical records can be stored elsewhere in accordance with company policies.

A.4.2.1 For information on incident management systems, see NFPA 1561, *Standard on Emergency Services Incident Management System*.

A.4.2.1.5 Industrial fire brigades are often organized in such a manner that they respond to the emergency scene and assemble upon arrival. A system should be established to identify each industrial fire brigade member arriving at the emergency scene and to organize them into groups with appropriate supervision. A standard system of "reporting in" at the incident and becoming a part of the organized system of operation should be implemented.

A.4.2.2.2 Site-specific special hazards should be identified and itemized for the industrial fire brigade, along with a detailed explanation of each hazard. Special hazards can consist of unique operations or hazardous materials. Typical opera-

tions are emergency response activities for data processing and electronic control equipment, where the discharge of a special extinguishing agent can present a special hazard to industrial fire brigade members; engine test areas; paint dip, mix, and storage rooms; spray booths; flammable liquid tank farms; oil quenching and machinery operations; energized electrical equipment; hazardous materials; and combustible dusts.

A.4.2.4(2) Industrial fire brigade members using SCBA should be fit-tested to meet the requirements of NFPA and 29 CFR 1910.134, "Respiratory Protection."

A.4.3.3 Job training requirements can vary significantly from one location to another. Those requirements should be documented based on site-specific needs. In order to meet the requirements of 4.3.3, industrial fire brigade management should perform an analysis of required industrial fire brigade response duties.

A.4.3.5 Management should develop a plan and schedule to provide training, education, and drills at the minimum specified frequencies required by this standard.

Scheduling difficulties in the industrial setting can make it difficult to provide training, education, or drills for each individual brigade member on a specific day. For this reason, the following clarifications are intended to provide the necessary flexibility for planning and scheduling these activities:

- (1) Quarterly requirements should be accomplished every 90 days and should not exceed 120 days between sessions.
- (2) Semiannual requirements should be accomplished every 183 days and should not exceed 243 days between sessions.
- (3) Annual requirements should be accomplished every 365 days and should not exceed 455 days between sessions.

A.4.3.7 The industrial fire brigade training coordinator should be an employee who is recognized or certified as an industrial fire brigade or fire service instructor by a government authority or national certification organization, or the coordinator should demonstrate the competency to meet the requirements of management in its role as an authority having jurisdiction.

For information on performance standards for industrial fire brigade instructors, see NFPA 1041, *Standard for Fire Service Instructor Professional Qualifications*, or equivalent performance standards.

Where industrial fire brigade training is contracted and provided by individuals or agencies outside of the company organization, the designated fire training coordinator should verify and ensure that instructors providing the training are knowledgeable in the subjects being presented. Such training should be accomplished using prepared lesson plans and performance-based standards that have been approved by the industrial fire brigade training coordinator.

Employees and members of the industrial fire brigade who have been trained in the methods of teaching and are recognized by the fire training coordinator as knowledgeable in the subject being presented can provide instruction to the industrial fire brigade with the use of prepared lesson plans and performance-based standards that have been approved by the fire training coordinator.

The industrial fire brigade training coordinator should oversee the industrial fire brigade training and education program to ensure quality and consistency of the training provided.

A.4.3.8 Industrial fire brigade leaders should be provided training on the incident management system established in 4.2.1 of this standard. For information on performance stan-

dards for industrial fire brigade leaders, see NFPA 1081, *Standard for Industrial Fire Brigade Member Professional Qualifications*; Chapter 2 of NFPA 1021, *Standard for Fire Officer Professional Qualifications*; or other performance standards.

A.4.3.9 Management should designate the person(s) responsible for planning and scheduling drills based on realistic scenarios for credible site-specific emergencies. Drills can be either announced or unannounced as determined by the authority having jurisdiction. Management should consider the use of periodic unannounced drills. Generally, drills are not considered training evaluations. However, announced drills can incorporate a degree of training while performing an evaluation of the industrial fire brigade. Announced drills can vary in types of response, speed of response, and use of equipment. Unannounced drills can be used to evaluate the fire-fighting readiness of the industrial fire brigade, industrial fire brigade leader, and fire protection systems and equipment.

Where mutual aid or other outside agencies play an important role in the emergency response procedures of the site, drills and pre-emergency planning should be conducted in conjunction with these agencies.

Management should designate the person(s) responsible for observing drills and for critiquing industrial fire brigade or outside agency performance. Lessons learned should be incorporated into the training and education program to improve any performance that is below established standards.

While recognizable training benefits are achieved through drills exercising the knowledge and skills of the industrial fire brigade, drills should not be considered as training (*see 3.3.3, Drill*). For example, if industrial fire brigade members were never trained in the operation of a piece of industrial fire brigade apparatus or in the proper strategies and tactics for emergency fire operations, then industrial fire brigade members could not demonstrate competence in performing these tasks in a drill. Drills can be valuable in determining the frequency of refresher training necessary to maintain industrial fire brigade skills.

Responses to actual emergencies can reduce the necessity to conduct drills, providing the actual responses occur with sufficient frequency and as long as the industrial fire brigade performance during these responses is evaluated in accordance with established performance objectives and is properly documented.

A.4.3.10 Because members will be required to meet the provisions of this standard that apply to the type of industrial fire brigade of which they are members, it is important that the applicable provisions of this standard be reviewed in the training program.

A.4.3.13 Members of the industrial fire brigade should be afforded opportunities to improve their skills and knowledge of fire prevention and fire fighting through attendance at outside meetings and special training classes. Members who belong to volunteer fire departments and who receive certified training from a qualified instructor as a part of their public fire department activities can have this training documented in their individual industrial fire brigade training records.

A.4.4.1(6) Industrial fire brigade management should maintain a close working relationship with all emergency response organizations that could reasonably be expected to respond to the facility during an emergency. This relationship should include the following:

- (1) A written mutual aid agreement signed by management and the emergency response organization
- (2) Establishment of an incident management system that identifies the roles and responsibilities of both the industrial fire brigade and the emergency response organization
- (3) An invitation to the emergency response organizations to participate in a pre-fire planning walk-through or tour of the facility
- (4) An invitation to the emergency response organizations to participate in industrial fire brigade drills at least annually
- (5) A means of communication between the industrial fire brigade and the emergency response organizations (This communication can be accomplished by the use of common radio frequencies, the exchange of respective portable radios, or other means.)
- (6) A means to ensure that fire hose threads are compatible or that adequate adapters are provided and available
- (7) Knowledge by both the industrial fire brigade and the emergency response organizations of the other's available equipment (This information should include items such as water supply, pump size, foam capabilities, portable or fixed master stream devices, or both, and other specialized equipment.)

A.4.5.1.1 For information on medical requirements, see OSHA requirements in 29 CFR 1910.156, 29 CFR 1910.134, or NFPA 1582, *Standard on Comprehensive Occupational Medical Program for Fire Departments*.

A.4.5.3 Minimum physical performance requirements should be established to ensure that industrial fire brigade members are able to satisfactorily perform their assigned emergency response activities under adverse conditions.

A.4.5.3.1 Many critical emergency response activities can be physically demanding. These tasks require muscular strength, muscular endurance, aerobic capacity, flexibility, equilibrium, and anaerobic power. Industrial fire brigade management should include these capabilities for the evaluation of industrial fire brigade members.

A.4.5.4 Industrial fire brigade members should be encouraged to maintain good physical condition.

A.4.6.2 In selecting the equipment necessary to allow the industrial fire brigade members to perform their response duties as specified in the industrial fire brigade organizational statement, management should recognize that such a selection can be drawn from a wide range of equipment. The following is a sample of the equipment more commonly selected:

- (1) Portable fire extinguishers (Portable fire extinguishers should be in accordance with NFPA 10, *Standard for Portable Fire Extinguishers*.)
- (2) Hose and hose accessories (Fire hose should be in accordance with NFPA 1961, *Standard on Fire Hose*. Hose should be maintained in accordance with NFPA 1962, *Standard for the Inspection, Care, and Use of Fire Hose, Couplings, and Nozzles and the Service Testing of Fire Hose*.)
- (3) Portable lighting equipment, including portable electric generators, extension cords, electrical adapters, hand-held lights, and spare batteries
- (4) Forcible entry tools, including axes, saws, power tools, plaster hooks, pike poles, claw tools, door openers, crowbars, sledgehammers, wire and bolt cutters, and battering rams
- (5) Ladders

- (6) Salvage and overhaul equipment
- (7) Rescue and first aid equipment
- (8) Special purpose equipment, such as portable foam-making equipment
- (9) Personnel protective equipment

A.4.7.1.1 For information on performance standards for industrial fire brigade apparatus operators, see NFPA 1081, *Standard for Industrial Fire Brigade Member Professional Qualifications*; Chapters 2 through 6 of NFPA 1002, *Standard for Fire Apparatus Driver/Operator Professional Qualifications*; or other performance standards.

A.4.7.1.5 On existing fire apparatus where there is an insufficient number of seats available for the number of members assigned to or expected to ride on that piece of apparatus, alternate means of transportation that provide seated and belted positions should be used.

A.5.2.1 Training and education objectives can be accomplished in the same session.

A.5.2.3 Live training fire field safety recommendations are as follows:

- (1) Site selection preparation: Select an open area with a safe clearance from important buildings, dry vegetation, and storage containers holding flammable liquids and gases and compressed gases.
- (2) Safety procedures: The following procedures should be followed:
 - (a) Smoking should be permitted only in designated areas.
 - (b) Fuel and ignition sources should be separated by safe distances.
 - (c) If high winds or other adverse weather conditions present a hazard to members or adjacent property, live fire training should not be conducted.
 - (d) Only appropriate ignition sources should be used.
 - (e) When participating in an evolution, each student should utilize a charged extinguisher.
 - (f) Fire attack should be from the upwind side.
 - (g) Care should be taken to ensure that members are not placed at risk of being exposed to the products of combustion.
 - (h) For Class B fires, at least two portable extinguishers of the applicable size and rating should be available for each evolution.
 - (i) Participants should retreat from an extinguished fire in an organized manner, always being alert for possible reflash or rekindle.
- (3) Fire training evolutions: Evolutions should be commensurate with the size of fires that the members are expected to extinguish in their normal response duties.
- (4) Student clothing: Individuals participating in field evolutions should be attired in the type of clothing they would normally wear during the performance of their day-to-day job function.
- (5) Instructors: The instructor should perform the following functions:
 - (a) Guide each student while he or she is approaching, extinguishing, and retreating from each live fire training evolution
 - (b) Provide for the proper supervision of members who are not participating in the current evolution
- (6) Fuels: Fuels and handling procedures should meet the following criteria:
 - (a) Flammable liquids should not be used as accelerants to ignite Class A training fires.
 - (b) Only approved safety containers should be used to dispense combustible liquids used as accelerants.
 - (c) The person fueling and lighting the fire should be properly instructed and should wear appropriate protective clothing.
 - (d) A qualified person equipped with a charged handline or appropriate extinguisher should stand by in any case where a combustible liquid is being used to light a training fire.

A.6.3.2.1 Based on site-specific hazards, the authority having jurisdiction can choose either structural or proximity thermal protective clothing. In most situations, structural fire-fighting clothing will provide an appropriate level of protection. However, in special circumstances, proximity clothing can be used to provide an additional level of protection from high levels of radiant heat.

A.7.3.6 Radios can be used for communication on the fire-ground; however, they cannot be the sole tool for accounting for one's partner in the interior of a structure fire.

One of the two individuals located outside the hot zone can be assigned to an additional role, such as incident commander in charge of the emergency or safety officer, so long as this individual is able to perform assistance or rescue activities without jeopardizing the safety or health of any fire fighters working at the incident. Nothing in this subsection is meant to preclude fire fighters from performing emergency rescue activities before industrial fire brigade team members have assembled.

Separate teams of two or more who remain outside the structure are not required for each team operating in the interior of a structure fire. If a structure is so large that accountability cannot be maintained from a single entry point, or rapid rescue is not possible, additional teams of at least two members should be assigned to appropriate divisions or sectors in accordance with the incident management system for the site.

Annex B Informational References

B.1 Referenced Publications. The documents or portions thereof listed in this annex are referenced within the informational sections of this standard and are not part of the requirements of this document unless also listed in Chapter 2 for other reasons.

B.1.1 NFPA Publications. National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02169-7471.

NFPA 10, *Standard for Portable Fire Extinguishers*, 2010 edition.

NFPA 1002, *Standard for Fire Apparatus Driver/Operator Professional Qualifications*, 2009 edition.

NFPA 1021, *Standard for Fire Officer Professional Qualifications*, 2009 edition.

NFPA 1041, *Standard for Fire Service Instructor Professional Qualifications*, 2007 edition.

NFPA 1081, *Standard for Industrial Fire Brigade Member Professional Qualifications*, 2007 edition.

NFPA 1500, *Standard on Fire Department Occupational Safety and Health Program*, 2007 edition.



NFPA 1561, *Standard on Emergency Services Incident Management System*, 2008 edition.

NFPA 1582, *Standard on Comprehensive Occupational Medical Program for Fire Departments*, 2007 edition.

NFPA 1961, *Standard on Fire Hose*, 2007 edition.

NFPA 1962, *Standard for the Inspection, Care, and Use of Fire Hose, Couplings, and Nozzles and the Service Testing of Fire Hose*, 2008 edition.

NFPA *Industrial Fire Hazards Handbook*, third edition.

B.1.2 Other Publications.

B.1.2.1 U.S. Government Publications. U.S. Government Printing Office, Washington, DC 20402.

Title 29, Code of Federal Regulations, Part 1910, Chapter XVII, Subpart L, "Fire Protection."

Title 29, Code of Federal Regulations, Part 1910.134, "Respiratory Protection."

Title 29, Code of Federal Regulations, Part 1910.156.

B.2 Informational References. The following documents or portions thereof are listed here as informational resources only. They are not a part of the requirements of this document.

NFPA 1001, *Standard for Fire Fighter Professional Qualifications*, 2008 edition.

B.3 References for Extracts in Informational Sections. (Reserved)

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Sequence of Events Leading to Issuance of an NFPA Committee Document

Step 1: Call for Proposals

- Proposed new Document or new edition of an existing Document is entered into one of two yearly revision cycles, and a Call for Proposals is published.

Step 2: Report on Proposals (ROP)

- Committee meets to act on Proposals, to develop its own Proposals, and to prepare its Report.
- Committee votes by written ballot on Proposals. If two-thirds approve, Report goes forward. Lacking two-thirds approval, Report returns to Committee.
- Report on Proposals (ROP) is published for public review and comment.

Step 3: Report on Comments (ROC)

- Committee meets to act on Public Comments to develop its own Comments, and to prepare its report.
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Step 4: Technical Report Session

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- NFPA membership meets each June at the Annual Meeting Technical Report Session and acts on Technical Committee Reports (ROP and ROC) for Documents with “certified amending motions.”
- Committee(s) vote on any amendments to Report approved at NFPA Annual Membership Meeting.

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Revise definition of effective ground-fault current path to read:

3.3.78 Effective Ground-Fault Current Path. An intentionally constructed, permanent, low impedance electrically conductive path designed and intended to carry ~~underground electric fault current conditions~~ from the point of a ground fault on a wiring system to the electrical supply source.

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Exhibit E

NFPA® 1081

Standard for Industrial Fire Brigade Member Professional Qualifications

2012 Edition



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NFPA® 1081

Standard for

Industrial Fire Brigade Member Professional Qualifications

2012 Edition

This edition of NFPA 1081, *Standard for Industrial Fire Brigade Member Professional Qualifications*, was prepared by the Technical Committee on Industrial Fire Brigades Professional Qualifications and released by the Technical Correlating Committee on Professional Qualifications. It was issued by the Standards Council on May 31, 2011, with an effective date of June 20, 2011, and supersedes all previous editions.

This edition of NFPA 1081 was approved as an American National Standard on June 20, 2011.

Origin and Development of NFPA 1081

In 1996, the NFPA Standards Council, after receipt of a request for the development of a standard for the professional qualifications of industrial fire brigade members, approved the establishment of a Technical Committee on Industrial Fire Brigades Member Professional Qualifications under the Professional Qualifications project. The purpose of the document was to identify requirements for personnel who perform as members of organized industrial fire brigades at specific sites or facilities. An organizational meeting of the new committee was held in October 1997 in Tampa, FL. The technical committee met a total of eight times during the development of this document.

The development process was coordinated with other professional qualifications documents and with the Technical Committee on Loss Prevention Procedures and Practices, the committee responsible for NFPA 600, *Standard on Industrial Fire Brigades*. To accommodate the site-specific needs of industrial fire brigades at various locations, the committee developed a core set of job performance requirements, as well as site-specific requirements for each defined level in the document. The intent is that the management of a facility utilizing the requirements of NFPA 1081 would identify those site-specific requirements applicable to the facility and incorporate them into the requirements for their industrial fire brigade members. This departure from the traditional style of other professional qualifications documents was necessary in order to track with the NFPA 600 and OSHA requirements in 29 CFR 1910.156 for fire brigades.

The first edition of NFPA 1081, *Standard for Industrial Fire Brigade Member Professional Qualifications*, adopted at the May 2001 meeting of the National Fire Protection Association, established job performance requirements for the levels of industrial fire brigade operations defined in NFPA 600: Incipient, Advanced Exterior, and Interior Structural. Requirements for the position of Fire Brigade Leader were also provided in the document.

The 2007 edition of NFPA 1081 was a complete revision of the document and included editorial changes to JPRs, Requisite Knowledge and Requisite Skills statements, and their associated Annex A statements. New material was also added for "site-specific requirements."

In the 2012 edition of NFPA 1081, the committee has added time requirements of 2 minutes (120 seconds) to Chapters 6 and 7 that relate to the donning and doffing of thermal protective clothing and donning and activation of SCBA and PASS devices. In addition, a section has been added that addresses the limits and responsibilities of industrial fire brigade members in order to be consistent with NFPA 600, *Standard on Industrial Fire Brigades*. The committee has also added a chapter to address the qualifications that support members would provide to the industrial fire brigade.

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NOTE: Membership on a committee shall not in and of itself constitute an endorsement of the Association or any document developed by the committee on which the member serves.

Committee Scope: This Committee shall have primary responsibility for the management of the NFPA Professional Qualifications Project and documents related to professional qualifications for fire service, public safety, and related personnel.



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NOTE: Membership on a committee shall not in and of itself constitute an endorsement of the Association or any document developed by the committee on which the member serves.

Committee Scope: This Committee shall have primary responsibility for documents on the professional competence required for personnel who participate as members of industrial fire brigades.



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NFPA 1081

Standard for

Industrial Fire Brigade Member Professional Qualifications

2012 Edition

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Information on referenced publications can be found in Chapter 2 and Annex E.

Chapter 1 Administration

1.1* Scope. This standard identifies the minimum job performance requirements (JPRs) necessary to perform the duties as a member of an organized industrial fire brigade providing services at a specific facility or site.

1.2 Purpose. The purpose of this standard is to specify the minimum JPRs for industrial fire brigade members. It is not the intent of the standard to restrict any jurisdiction from exceeding these requirements.

1.3 Application.

1.3.1* The management of the industrial fire brigade shall establish instructional priority and the training program content to prepare individuals to meet the JPRs of this standard. The JPRs found in Chapters 5 through 8 are not required to be mastered in the order they appear.

1.3.1.1* The management of the industrial fire brigade shall establish an ongoing process to ensure that members continue to meet the JPRs of this standard.

1.3.2 Wherever in this standard the terms *rules, regulations, procedures, supplies, apparatus, or equipment* are referred to, it is implied that they are those of the management of the industrial fire brigade.

1.4* Limits of Actions and Responsibilities of the Industrial Fire Brigade. [600:A.1.4]

1.4.1 General. [600:1.4.1]

1.4.1.1 The degree of potential exposure to a hazardous environment and the degree of training shall determine the limits of any industrial fire brigade action and responsibility. [600:1.4.1.1]

1.4.1.2 The written industrial fire brigade organizational statement and standard operating procedures shall define these limits. [600:1.4.1.2]

1.4.2* Incident Command. At facilities where designated employees are intended to function as the first responders to incipient fires, the industrial fire brigade shall assume command of the incident once the brigade arrives on the fire scene. [600:A.1.4.2]

1.4.3 Limits for Industrial Fire Brigades Assigned Incipient Fire-Fighting Response Duties. [600:1.4.3]

1.4.3.1 Interior and exterior fires shall be considered incipient stage when industrial fire brigade members function as follows: [600:1.4.3.1]

- (1) They are able to safely fight the fire in normal work clothing. [600:1.4.3.1(1)]
- (2) They are not required to crawl or take other evasive action to avoid smoke and heat. [600:1.4.3.1(2)]
- (3) They are not required to wear thermal protective clothing or self-contained breathing apparatus (SCBA). [600:1.4.3.1(3)]
- (4) They are able to fight the fire effectively with portable extinguishers or handlines flowing up to 473 L/min (125 gpm). [600:1.4.3.1(4)]

1.4.3.2 Exterior fires shall be considered appropriate for defensive action outside of the hot and warm zones by industrial fire brigade members who have been assigned incipient fire-fighting response duties when the following occur: [600:1.4.3.2]

- (1) The organizational statement lists it as a response duty of the industrial fire brigade, and it is covered by the standard operating procedures. [600:1.4.3.2(1)]
- (2) The industrial fire brigade has received training for that activity. [600:1.4.3.2(2)]
- (3) SCBA and thermal protective clothing are not required. [600:1.4.3.2(3)]
- (4) Personal evasive action is not required. [600:1.4.3.2(4)]
- (5) The industrial fire brigade is able to perform defensive action effectively, using handlines flowing up to 1140 L/min (300 gpm), master streams, or similar devices for the manual application of specialized agents. [600:1.4.3.2(5)]

1.4.4 Limits for Industrial Fire Brigades Assigned Only Advanced Exterior Fire-Fighting Response Duties. [600:1.4.4]

1.4.4.1 Exterior fires shall be considered appropriate for offensive action within the hot zone by industrial fire brigade members who have been assigned advanced exterior fire-fighting response duties when all of the following occur: [600:1.4.4]

- (1) The organizational statement lists it as a response duty of the industrial fire brigade, and it is covered by the standard operating procedures. [600:1.4.4(1)]
- (2) The industrial fire brigade has received training for that activity. [600:1.4.4(2)]
- (3) SCBA and thermal protective clothing are provided. [600:1.4.4(3)]
- (4) The industrial fire brigade is able to perform offensive action effectively, using handlines flowing up to 1140 L/min (300 gpm), master streams, or similar devices for the manual application of specialized agents. [600:1.4.4(4)]



1.4.5 Limits for Industrial Fire Brigades Assigned Only Interior Structural Fire-Fighting Response Duties. [600:1.4.5]

1.4.5.1 Interior structural fires shall be considered appropriate for offensive action within the hot zone by industrial fire brigade members who have been assigned interior fire-fighting response duties when the following occur: [600:1.4.5]

- (1) The organizational statement lists it as a response duty of the industrial fire brigade, and it is covered by the standard operating procedures. [600:1.4.5(1)]
- (2) The industrial fire brigade has received training for that activity. [600:1.4.5(2)]
- (3) SCBA and protective clothing for structural fire fighting are provided. [600:1.4.5(3)]
- (4) The industrial fire brigade is able to perform offensive actions effectively, using handlines flowing up to 1140 L/min (300 gpm), master streams, or similar devices for the manual application of specialized agents. [600:1.4.5(4)]

1.4.6 Limits of Industrial Fire Brigades Assigned Both Advanced Exterior and Interior Structural Fire-Fighting Response Duties. [600:1.4.6]

1.4.6.1 Both exterior fires and interior structural fires shall be considered appropriate for offensive action within the hot zone for industrial fire brigade members who have been assigned both advanced exterior and interior fire-fighting response duties when the following occur: [600:1.4.6.1]

- (1) The organizational statement lists it as a response duty of the industrial fire brigade, and it is covered by the standard operating procedures. [600:1.4.6.1(1)]
- (2) The industrial fire brigade has received training for that activity. [600:1.4.6.1(2)]
- (3) SCBA and thermal protective clothing are provided. [600:1.4.6.1(3)]
- (4) The industrial fire brigade is able to perform offensive action effectively, using handlines flowing up to 1140 L/min (300 gpm), master streams, or similar devices for the manual application of specialized agents. [600:1.4.6.1(4)]

1.4.6.2 Protective clothing for proximity fire fighting shall not be worn for interior structural fire fighting. [600:1.4.6.2]

1.5 Units and Formulas. In this standard, values for measurement are followed by an equivalent in U.S. units, but only the first stated value shall be regarded as the requirement. Equivalent values are not considered as the requirement, as these values can be approximate. (See Table 1.5.)

Table 1.5 SI Conversions

Quantity	SI Unit/Symbol	U.S. Unit/Symbol	Conversion Factor
Length	millimeter (mm)	inch (in.)	25.4 mm = 1 in.
	meter (m)	foot (ft)	0.305 m = 1 ft
Area	square meter (m ²)	square foot (ft ²)	0.0929 m ² = 1 ft ²
Volume	liters per minute (L/min)	gallons per minute (gpm)	3.78 L/min = 1 gpm
Pressure	newtons/meter ² (N/m ²)	pounds per square inch (psi)	0.345 N/m ² = 1 psi

Chapter 2 Referenced Publications

2.1 General. The documents or portions thereof listed in this chapter are referenced within this standard and shall be considered part of the requirements of this document.

- 2.2 NFPA Publications.** National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02169-7471.
 NFPA 472, *Standard for Competence of Responders to Hazardous Materials/Weapons of Mass Destruction Incidents*, 2008 edition.
 NFPA 600, *Standard on Industrial Fire Brigades*, 2010 edition.
 NFPA 1002, *Standard for Fire Apparatus Driver/Operator Professional Qualifications*, 2009 edition.
 NFPA 1561, *Standard on Emergency Services Incident Management System*, 2008 edition.

2.3 Other Publications.

2.3.1 U.S. Government Publications. U.S. Government Printing Office, Washington, DC 20402.

Title 29, Code of Federal Regulations, Part 1910.120.

2.3.2 Other Publications. *Merriam-Webster's Collegiate Dictionary*, 11th edition, Merriam-Webster, Inc., Springfield, MA, 2003.

2.4 References for Extracts in Mandatory Sections.

- NFPA 472, *Standard for Competence of Responders to Hazardous Materials/Weapons of Mass Destruction Incidents*, 2008 edition.
 NFPA 600, *Standard on Industrial Fire Brigades*, 2010 edition.
 NFPA 1000, *Standard for Fire Service Professional Qualifications Accreditation and Certification Systems*, 2011 edition.
 NFPA 1002, *Standard for Fire Apparatus Driver/Operator Professional Qualifications*, 2009 edition.
 NFPA 1021, *Standard for Fire Officer Professional Qualifications*, 2009 edition.
 NFPA 1031, *Standard for Professional Qualifications for Fire Inspector and Plan Examiner*, 2009 edition.
 NFPA 1500, *Standard on Fire Department Occupational Safety and Health Program*, 2007 edition.
 NFPA 1521, *Standard for Fire Department Safety Officer*, 2008 edition.
 NFPA 1561, *Standard on Emergency Services Incident Management System*, 2008 edition.
 NFPA 1620, *Standard for Pre-Incident Planning*, 2010 edition.
 NFPA 1710, *Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments*, 2010 edition.

Chapter 3 Definitions

3.1 General. The definitions contained in this chapter shall apply to the terms used in this standard. Where terms are not defined in this chapter or within another chapter, they shall be defined using their ordinarily accepted meanings within the context in which they are used. *Merriam-Webster's Collegiate Dictionary*, 11th edition, shall be the source for the ordinarily accepted meaning.

3.2 NFPA Official Definitions.

3.2.1* Approved. Acceptable to the authority having jurisdiction.

3.2.2* Listed. Equipment, materials, or services included in a list published by an organization that is acceptable to the authority having jurisdiction and concerned with evaluation of

products or services, that maintains periodic inspection of production of listed equipment or materials or periodic evaluation of services, and whose listing states that either the equipment, material, or service meets appropriate designated standards or has been tested and found suitable for a specified purpose.

3.2.3 Standard. A document, the main text of which contains only mandatory provisions using the word "shall" to indicate requirements and which is in a form generally suitable for mandatory reference by another standard or code or for adoption into law. Nonmandatory provisions shall be located in an appendix or annex, footnote, or fine-print note and are not to be considered a part of the requirements of a standard.

3.3 General Definitions.

3.3.1 Certification. An authoritative attestation; specifically, the issuance of a document that states that an individual has demonstrated the knowledge and skills necessary to function in a particular fire service professional field. [1000, 2011]

3.3.2 Drill. An exercise involving a credible simulated emergency that requires personnel to perform emergency response operations for the purpose of evaluating the effectiveness of the training and education programs and the competence of personnel in performing required response duties and functions. [600, 2010]

3.3.3 Emergency Response Operations. Activities related to emergency incidents, including response to the scene of the incident and specific response duties performed at the scene. [600, 2010]

3.3.4 Enclosed Structure. A structure with a roof or ceiling and at least two walls that can present fire hazards to employees such as accumulations of smoke, toxic gases, and heat, similar to those found in buildings. [600, 2010]

3.3.5 Facility. A structure or building located on a site that serves a particular purpose.

3.3.6 Fire Fighting.

3.3.6.1* Advanced Exterior Fire Fighting. Offensive fire fighting performed outside of an enclosed structure when the fire is beyond the incipient stage. (See also 3.3.8, *Incipient Stage*.) [600, 2010]

3.3.6.2 Defensive Fire Fighting. The mode of manual fire control in which the only fire suppression activities taken are limited to those required to keep a fire from extending from one area to another. [600, 2010]

3.3.6.3 Incipient Fire Fighting. Fire fighting performed inside or outside of an enclosed structure or building when the fire has not progressed beyond incipient stage.

3.3.6.4* Interior Structural Fire Fighting. The physical activity of fire suppression, rescue, or both, inside of buildings or enclosed structures that are involved in a fire beyond the incipient stage. [600, 2010]

3.3.6.5 Offensive Fire Fighting. The mode of manual fire control in which manual fire suppression activities are concentrated on reducing the size of a fire to accomplish extinguishment. [600, 2010]

3.3.6.6 Structural Fire Fighting. Rescue, fire suppression, and property conservation activities in buildings, enclosed structures, aircraft interiors, vehicles, vessels, aircraft, or like properties that are involved in a fire or emergency situation.

3.3.7 Incident Management System (IMS). A system that defines the roles and responsibilities to be assumed by responders and the standard operating procedures to be used in the management and direction of emergency incidents and other functions. [1561, 2008]

3.3.8* Incipient Stage. Refers to the severity of a fire where the progression is in the early stage and has not developed beyond that which can be extinguished using portable fire extinguishers or handlines flowing up to 473 L/min (125 gpm).

3.3.9 Industrial Fire Brigade. An organized group of employees within an industrial occupancy who are knowledgeable, trained, and skilled in at least basic fire fighting operations, and whose full-time occupation might or might not be the provision of fire suppression and related activities for their employer. [600, 2010]

3.3.10 Industrial Fire Brigade Apparatus. An industrial fire brigade emergency response vehicle designed and intended primarily for fire suppression, rescue, or other specialized function that includes pumpers, foam apparatus, aerial ladders, rescue vehicles, and other such apparatus. [600, 2010]

3.3.11 Industrial Fire Brigade Leader. An individual responsible for overseeing the performance or activity of other members.

3.3.12 Industrial Fire Brigade Management. The individual designated by top management to be responsible for the organization, management, and functions of the industrial fire brigade. [600, 2010]

3.3.13 Industrial Fire Brigade Training Coordinator. The designated company representative with responsibility for coordinating effective, consistent, and quality training within the industrial fire brigade training and education program. [600, 2010]

3.3.14 Job Performance Requirement (JPR). A statement that describes a specific job task, lists the items necessary to complete the task, and defines measurable or observable outcomes and evaluation areas for the specific task. [1000, 2010]

3.3.15 Personal Protective Equipment (PPE). Consists of full thermal protective clothing, plus a self-contained breathing apparatus (SCBA) and a personal alert safety system (PASS) device.

3.3.16 Pre-Incident Plan. A document developed by gathering general and detailed data that is used by responding personnel in effectively managing emergencies for the protection of occupants, responding personnel, property, and the environment. [1620, 2010]

3.3.17 Procedure. The series of actions, conducted in an approved manner and sequence, designed to achieve an intended outcome.

3.3.18 Rapid Intervention Crew/Company (RIC). A minimum of two fully equipped members who are on-site and assigned specifically to initiate the immediate rescue of injured or trapped members. [1500, 2007]

3.3.19 Requisite Knowledge. Fundamental knowledge one must have in order to perform a specific task. [1031, 2009]

3.3.20 Requisite Skills. The essential skills one must have in order to perform a specific task. [1031, 2009]

3.3.21 Safely. To perform the assigned tasks without injury to self or others, to the environment, or to property. [472, 2008]



3.3.22 Site. The entire premises within the governed property lines that contains one or more facilities.

3.3.23 Site-Specific Hazard. A hazard that is present at the specific facility for which the industrial fire brigade has been organized. [600, 2010]

3.3.24 Standard Operating Procedure (SOP). A written organizational directive that establishes or prescribes specific operational or administrative methods to be followed routinely for the performance of designated operations or actions. [1521, 2008]

3.3.25* Support Member. Personnel assigned to the industrial fire brigade to perform specific response duties, including those people who have specific technical knowledge or skills or who have been given specific assignments that indirectly support manual fire suppression efforts. [600, 2010]

3.3.26 Task. A specific job behavior or activity. [1002, 2009]

3.3.27 Team. Two or more individuals who have been assigned a common task and are in communication with each other, coordinate their activities as a work group, and support the safety of one another.

3.3.28* Thermal Protective Clothing. Protective clothing such as helmets, eye protection, footwear, gloves, hoods, trousers, and coats that are designed and manufactured to protect the fire brigade member from the adverse effects of fire.

3.3.29 Zone.

3.3.29.1 Cold Zone. The area immediately outside the boundary of the established warm zone where personnel are safe from the adverse effects of a fire. [600, 2010]

3.3.29.2 Hot Zone. The area immediately surrounding the physical location of a fire having a boundary that extends far enough from the fire to protect industrial fire brigade members positioned outside the hot zone from being directly exposed to flames, dense smoke, or extreme temperatures. [600, 2010]

3.3.29.3 Warm Zone. The control area immediately outside the boundary of the established hot zone having a boundary that extends far enough from the hot zone to protect personnel outside the warm zone from the adverse effects of the fire. [600, 2010]

Chapter 4 Entrance Requirements

4.1* General. Prior to entering training to meet the requirements of Chapters 5 through 8, the candidate shall meet the entrance and educational requirements established by the management of the industrial fire brigade and the medical- and job-related physical requirements established by NFPA 600, *Standard on Industrial Fire Brigades*.

4.2* Emergency Medical Care. The emergency medical care performance capabilities for industrial fire brigade personnel shall be determined and validated by the management of the industrial fire brigade.

4.3 Job Performance Requirements (JPRs). The JPRs shall be accomplished in accordance with the requirements of the management of the industrial fire brigade and NFPA 600, *Standard on Industrial Fire Brigades*.

4.3.1* In addition to the requirements defined in Chapters 5 through 8, the management of the industrial fire brigade shall

define the site-specific requirements for each level of industrial fire brigade membership that are applicable to its employees and shall include those requirements in the evaluation of the employee at the applicable level. The process used to identify the site-specific requirements for a site or facility shall be documented.

4.3.2* Performance of each requirement of this standard shall be evaluated by individuals approved by the management of the industrial fire brigade.

4.3.3 The entrance requirements of Chapter 4 shall be met prior to beginning training at the incipient level.

4.3.4* Prior to being qualified or certified at the incipient level, the candidate shall meet the JPRs defined in Sections 5.1 and 5.2 and the applicable site-specific requirements in Section 5.3 as defined by the management of the industrial fire brigade.

4.3.4.1 The incipient level shall be the first level of progression for the subsequent levels of progression in this standard.

4.3.5 Prior to being qualified or certified at the advanced exterior level, the industrial fire brigade member shall meet the JPRs of Sections 5.1, 5.2, 6.1, and 6.2 and the applicable site-specific requirements in Sections 5.3 and 6.3 as defined by the management of the industrial fire brigade.

4.3.6 Prior to being qualified or certified at the interior structural level, the industrial fire brigade member shall meet the JPRs of Sections 5.1, 5.2, 7.1, and 7.2 and the applicable site-specific requirements in Sections 5.3 and 7.3 as defined by the management of the industrial fire brigade.

4.3.7 Prior to being qualified or certified at the interior structural/advanced exterior level, the industrial fire brigade member shall meet the JPRs of Chapters 5, 6, and 7 and the applicable site-specific requirements as defined by the management of the industrial fire brigade.

4.3.8 Prior to being qualified or certified at the fire brigade leader level, the industrial fire brigade member shall meet the JPRs of Chapter 5, 6, 7, or 8 for the level of the industrial fire brigade he or she is leading and the applicable site-specific requirements as defined by the management of the industrial fire brigade.

4.3.9* Industrial fire brigade members who operate industrial fire brigade apparatus in the performance of their duties at any level of qualification defined by this document shall meet the applicable requirements as determined by the management of the industrial fire brigade in Chapters 4 through 10 of NFPA 1002, *Standard for Fire Apparatus Driver/Operator Professional Qualifications*.

4.3.9.1 Prior to operating industrial fire brigade apparatus, the fire apparatus operator/driver shall meet the entrance requirements of Chapter 4, Sections 5.1 through 5.3, and the applicable site-specific requirements as defined by the management of the industrial fire brigade.

4.3.10* Prior to responding to incidents such as civil unrest, use of weapons of mass destruction, or acts of terrorism, the management of the industrial fire brigade shall provide appropriate training to members that is consistent with their role.

4.3.11 Incident Command Training. The management of the industrial fire brigade shall provide incident management system training to industrial fire brigade members as defined by the National Incident Management System (NIMS) and NFPA 1561, *Standard on Emergency Services Incident Management System*.



Chapter 5 Incipient Industrial Fire Brigade Member

5.1 General. This duty shall involve initiating communications, using facility communications equipment to effectively relay oral or written information, responding to alarms, returning equipment to service, and completing incident reports, according to the JPRs in 5.1.1 through 5.2.3.

5.1.1 Qualification or Certification. For qualification or certification at the incipient industrial fire brigade level, the industrial fire brigade member shall meet the entrance requirements in Chapter 4 and Sections 5.1 and 5.2; the site-specific requirements in Section 5.3 as defined by the management of the industrial fire brigade; and the requirements defined in Chapter 4 of NFPA 472, *Standard for Competence of Responders to Hazardous Materials/Weapons of Mass Destruction Incidents*.

5.1.2 Basic Incipient Industrial Fire Brigade Member JPRs. All industrial fire brigade members shall have a general knowledge of basic fire behavior, operation within an incident management system, operation within the emergency response operations plan for the site, the standard operating and safety procedures for the site, and site-specific hazards.

5.1.2.1 Initiate a response to a reported emergency, given the report of an emergency, facility standard operating procedures, and communications equipment, so that all necessary information is obtained and communications equipment is operated properly.

(A) Requisite Knowledge. Procedures for reporting an emergency.

(B) Requisite Skills. The ability to operate facility communications equipment, relay information, and record information.

5.1.2.2* Transmit and receive messages via the facility communications system, given facility communications equipment and operating procedures, so that the information is promptly relayed and is accurate, complete, and clear.

(A) Requisite Knowledge. Facility communications procedures and etiquette for routine traffic, emergency traffic, and emergency evacuation signals.

(B) Requisite Skills. The ability to operate facility communications equipment and discriminate between routine and emergency communications.

5.1.2.3 Respond to a facility emergency, given the necessary equipment and facility response procedures, so that the team member arrives in a safe manner.

(A) Requisite Knowledge. Facility layout, special hazards, and emergency response procedures.

(B) Requisite Skills. The ability to recognize response hazards and to safely use each piece of response equipment provided.

5.1.2.4* Return equipment to service, given an assignment, policies, and procedures, so that the equipment is inspected, damage is noted, the equipment is cleaned, and the equipment is placed in a ready state for service or is reported otherwise.

(A) Requisite Knowledge. Types of cleaning methods for various equipment, correct use of cleaning materials, and manufacturer's or facility guidelines for returning equipment to service.

(B) Requisite Skills. The ability to clean, inspect, and maintain equipment and to complete recording and reporting procedures.

5.1.2.5* Complete a basic incident report, given the report forms, guidelines, and incident information, so that all pertinent information is recorded, the information is accurate, and the report is complete.

(A) Requisite Knowledge. Content requirements for basic incident reports, the purpose and usefulness of accurate reports, consequences of inaccurate reports, and how to obtain necessary information.

(B) Requisite Skills. The ability to collect necessary information, proof reports, and operate facility equipment necessary to complete reports.

5.2 Manual Fire Suppression. This duty shall involve tasks related to the manual control of fires and property conservation activities by the incipient industrial fire brigade member.

5.2.1* Extinguish incipient fires, given an incipient fire and a selection of portable fire extinguishers, so that the correct extinguisher is chosen, the fire is completely extinguished, proper extinguisher-handling techniques are followed, and the area of origin and fire cause evidence are preserved.

(A) Requisite Knowledge. The classifications of fire; risks associated with each class of fire; and the types, rating systems, operating methods, and limitations of portable fire extinguishers.

(B) Requisite Skills. The ability to select, carry, and operate portable fire extinguishers, using the appropriate extinguisher based on the size and type of fire.

5.2.2* Conserve property, given special tools and equipment and an assignment within the facility, so that the facility and its contents are protected from further damage.

(A) Requisite Knowledge. The purpose of property conservation and its value to the organization, methods used to protect property, methods to reduce damage to property, types of and uses for salvage covers, and operations at properties protected with automatic sprinklers or special protection systems.

(B) Requisite Skills. The ability to deploy covering materials, control extinguishing agents, and cover building openings, including doors, windows, floor openings, and roof openings.

5.2.3 Exit hazardous area, given that the fire has progressed beyond the incipient stage, so that a safe haven is found and the team members' safety is maintained.

(A) Requisite Knowledge. Communication procedures, emergency evacuation methods, what constitutes a safe haven, and elements that create or indicate a hazard.

(B) Requisite Skills. The ability to follow facility evacuation routes, evaluate areas for hazards, and identify a safe haven.

5.3* Site-Specific Requirements. The management of the industrial fire brigade shall determine the site-specific requirements that are applicable to the incipient industrial fire brigade members operating on their site. The process used to determine the site-specific requirements shall be documented, and these additional JPRs added to those identified in Sections 5.1 and 5.2.

5.3.1* Attack an incipient stage fire, given a handline flowing up to 473 L/min (125 gpm), appropriate equipment, and a fire situation, so that the fire is approached safely, exposures are protected, the spread of fire is stopped, agent application is effective, the fire is extinguished, and the area of origin and fire cause evidence are preserved.



(A) **Requisite Knowledge.** Types of handlines used for attacking incipient fires, precautions to be followed when advancing handlines to a fire, observable results that a fire stream has been properly applied, dangerous building conditions created by fire, principles of exposure protection, and dangers such as exposure to products of combustion resulting from fire condition.

(B) **Requisite Skills.** The ability to recognize inherent hazards related to the material's configuration; operate handlines; prevent water hammers when shutting down nozzles; open, close, and adjust nozzle flow; advance charged and uncharged hose; extend handlines; operate handlines; evaluate and modify water application for maximum penetration; assess patterns for origin determination; and evaluate for complete extinguishment.

5.3.2* Activate a fixed fire protection system, given a fixed fire protection system, a procedure, and an assignment, so that the steps are followed and the system operates.

(A) **Requisite Knowledge.** Types of extinguishing agents, hazards associated with system operation, how the system operates, sequence of operation, system overrides and manual intervention procedures, and shutdown procedures to prevent damage to the operated system or to those systems associated with the operated system.

(B) **Requisite Skills.** The ability to operate fixed fire protection systems via electrical or mechanical means.

5.3.3* Utilize master stream appliances, given an assignment, an extinguishing agent, and a master stream device, so that the agent is applied to the fire as assigned.

(A) **Requisite Knowledge.** Safe operation of master stream appliances, uses for master stream appliances, tactics using fixed master stream appliances, and property conservation.

(B) **Requisite Skills.** The ability to put into service a fixed master stream appliance, and to evaluate and forecast a fire's growth and development.

5.3.4* Establish a water supply for fire-fighting operations, given an assignment, a water source, and tools, so that a water supply is established and maintained.

(A) **Requisite Knowledge.** Water sources, operation of site water supply components, hydraulic principles, and the effect of mechanical damage and temperatures on the operability of the water supply source.

(B) **Requisite Skills.** The ability to operate the site water supply components and to identify damage or impairment.

5.3.5 Perform a fire safety survey in a facility, given an assignment, survey forms, and procedures, so that fire and life safety hazards are identified, recommendations for their correction are made, and unresolved issues are referred to the proper authority.

(A) **Requisite Knowledge.** Organizational policy and procedures, common causes of fire and their prevention, the importance of fire safety, and referral procedures.

(B) **Requisite Skills.** The ability to complete forms, recognize hazards, match findings to preapproved recommendations, and effectively communicate findings to the proper authority.

Chapter 6 Advanced Exterior Industrial Fire Brigade Member

6.1* General.

6.1.1 **Qualification or Certification.** For qualification or certification at the advanced exterior industrial fire brigade member level, the industrial fire brigade member shall meet the entrance requirements in Chapter 4 and Sections 5.1, 5.2, 6.1, and 6.2 and the site-specific requirements in Sections 5.3 and 6.3 as defined by the management of the industrial fire brigade.

6.1.2 Basic Advanced Exterior Industrial Fire Brigade Member JFRs.

6.1.2.1 Utilize a pre-incident plan, given pre-incident plans and an assignment, so that the industrial fire brigade member implements the responses detailed by the plan.

(A) **Requisite Knowledge.** The sources of water supply for fire protection or other fire-extinguishing agents, site-specific hazards, the fundamentals of fire suppression and detection systems including specialized agents, and common symbols used in diagramming construction features, utilities, hazards, and fire protection systems.

(B) **Requisite Skills.** The ability to identify the components of the pre-incident plan such as fire suppression and detection systems, structural features, site-specific hazards, and response considerations.

6.1.2.2* Interface with outside mutual aid organizations, given standard operating procedures (SOPs) for mutual aid response and communication protocols, so that a unified command is established and maintained.

(A) **Requisite Knowledge.** Mutual aid procedures and the structure of the mutual aid organization, site SOPs, and incident management systems.

(B) **Requisite Skills.** The ability to communicate with mutual aid organizations and to integrate operational personnel into teams under a unified command.

6.2 Manual Fire Suppression.

6.2.1 Use thermal protective clothing during exterior fire-fighting operations, given thermal protective clothing, so that the clothing is correctly donned within 2 minutes (120 seconds), worn, and doffed.

(A) **Requisite Knowledge.** Conditions that require personal protection, uses and limitations of thermal protective clothing, components of thermal protective clothing ensemble, and donning and doffing procedures.

(B) **Requisite Skills.** The ability to correctly don and doff thermal protective clothing and to perform assignments while wearing thermal protective clothing.

6.2.2* Use SCBA and a PASS device during exterior fire-fighting operations, given SCBA, PASS, thermal protective clothing, and other personal protective equipment, so that the SCBA and the PASS device are correctly donned and activated within 2 minutes (120 seconds), the equipment is correctly worn, controlled breathing techniques are used, emergency procedures are enacted if the SCBA fails, all low-air warnings are recognized, respiratory protection is not intentionally compromised, hazardous areas are exited prior to air depletion, and the SCBA is correctly doffed.



(A) **Requisite Knowledge.** Conditions that require respiratory protection, uses and limitations of SCBA, components of SCBA, donning and doffing procedures, breathing techniques, indications for and emergency procedures used with SCBA, and physical requirements of the SCBA wearer.

(B) **Requisite Skills.** The ability to control breathing, use SCBA in limited-visibility conditions, replace SCBA air cylinders, use SCBA to exit through restricted passages, initiate and complete emergency procedures in the event of SCBA failure or air depletion, and donning and doffing procedures.

6.2.3* Attack an exterior fire operating as a member of a team, given a water source, a handline, personal protective equipment, tools, and an assignment, so that team integrity is maintained, the attack line is correctly deployed for advancement, access is gained into the fire area, appropriate application practices are used, the fire is approached in a safe manner, attack techniques facilitate suppression given the level of the fire, hidden fires are located and controlled, the correct body posture is maintained, hazards are avoided or managed, and the fire is brought under control.

(A) **Requisite Knowledge.** Principles of fire streams; types, design, operation, nozzle pressure effects, and flow capabilities of nozzles; precautions to be followed when advancing handlines to a fire; observable results that a fire stream has been correctly applied; dangerous conditions created by fire; principles of exposure protection; potential long-term consequences of exposure to products of combustion; physical states of matter in which fuels are found; the application of each size and type of attack line; the role of the backup team in fire attack situations; attack and control techniques; and exposing hidden fires.

(B) **Requisite Skills.** The ability to prevent water hammers when shutting down nozzles; open, close, and adjust nozzle flow and patterns; apply water using direct, indirect, and combination attacks; advance charged and uncharged 38 mm (1½ in.) diameter or larger handlines; extend handlines; replace burst hose sections; operate charged handlines of 38 mm (1½ in.) diameter or larger; couple and uncouple various handline connections; carry hose; attack fires; and locate and suppress hidden fires.

6.2.4 Conduct search and rescue operations as a member of a team, given an assignment, obscured vision conditions, personal protective equipment, scene lighting, forcible entry tools, handlines, and ladders when necessary, so that all equipment is correctly used, all assigned areas are searched, all victims are located and removed, team integrity is maintained, and team members' safety, including respiratory protection, is not compromised.

(A) **Requisite Knowledge.** Use of appropriate tools and equipment, psychological effects of operating in obscured conditions and ways to manage them, methods to determine if an area is tenable, primary and secondary search techniques, team members' roles and goals, methods to use and indicators of finding victims, victim removal methods, and considerations related to respiratory protection.

(B) **Requisite Skills.** The ability to use SCBA to exit through restricted passages, use tools and equipment for various types of rescue operations, rescue an industrial fire brigade member with functioning respiratory protection, rescue an industrial fire brigade member whose respiratory protection is not functioning, rescue a person who has no respiratory protection, and assess areas to determine tenability.

6.2.5* Conserve property operating as a member of a team, given special tools and equipment and an assignment within

the facility, so that exposed property and the environment are protected from further damage.

(A) **Requisite Knowledge.** The purpose of property conservation and its value to the organization, methods used to protect property, methods to reduce damage to property, operations at properties protected with automatic sprinklers or special protection systems, understanding the impact of using master streams and multiple hose streams on property conservation, particularly as it can relate to the impact on outside facilities.

(B) **Requisite Skills.** The ability to deploy covering materials, control extinguishing agents, and cover openings and equipment such as doors, windows, floor openings, and roof openings related to the impact of outside facilities.

6.2.6 Overhaul a fire scene, given personal protective equipment, a handline, hand tools, scene lighting, and an assignment, so that structural integrity is not compromised, all hidden fires are discovered, fire cause evidence is preserved, and the fire is extinguished.

(A) **Requisite Knowledge.** Types of fire handlines and water application devices most effective for overhaul, water application methods for extinguishment that limit water damage, types of tools and methods used to expose hidden fire, dangers associated with overhaul, obvious signs of area of origin or signs of arson, and reasons for protection of a fire scene.

(B) **Requisite Skills.** The ability to deploy and operate a handline, expose void spaces without compromising structural integrity, apply water for maximum effectiveness, expose and extinguish hidden fires, recognize and preserve obvious signs of area of origin and fire cause, and evaluate for complete extinguishment.

6.2.7* Establish a water supply for fire-fighting operations, given a water source and tools, so that a water supply is established and maintained.

(A) **Requisite Knowledge.** Water sources, correct operation of site water supply components, hydraulic principles, and the effect of mechanical damage and temperatures on the operability of the water supply source.

(B) **Requisite Skills.** The ability to operate the site water supply components and identify damage or impairment.

6.2.8* Exit a hazardous area as a team, given vision-obscured conditions, so that a safe haven is found before exhausting the air supply, others are not endangered, and the team integrity is maintained.

(A) **Requisite Knowledge.** Personnel accountability systems, communication procedures, emergency evacuation methods, what constitutes a safe haven, elements that create or indicate a hazard, and emergency procedures for loss of air supply.

(B) **Requisite Skills.** The ability to operate as a team member in vision-obscured conditions, locate and follow a guideline, conserve air supply, evaluate areas for hazards, and identify a safe haven.

6.2.9* Operate as a member of a rapid intervention crew, given size-up information, basic rapid intervention tools and equipment, and an assignment, so that strategies to effectively rescue the industrial brigade member(s) are identified and implemented; hazard warning systems are established and understood by all participating personnel; incident-specific personal protective equipment is identified, provided, and utilized; physical hazards are identified; and confinement, containment, and avoidance measures are discussed.



(A) **Requisite Knowledge.** Identification and care of personal protective equipment; specific hazards associated with the facility; strategic planning for rescue incidents; communications and safety protocols; atmospheric monitoring equipment needs; identification, characteristics, expected behavior, type, causes, and associated effects of personnel becoming incapacitated or trapped; and recognition of, potential for, and signs of impending building collapse.

(B) **Requisite Skills.** The ability to use personal protective equipment, determine resource needs, select and operate basic and specialized tools and equipment, implement communications and safety protocols, and mitigate specific hazards associated with rescue of trapped or incapacitated personnel.

6.3* Site-Specific Requirements. The JPRs in 6.3.1 through 6.3.11 shall be considered as site-specific functions of the advanced exterior industrial fire brigade member. The management of the industrial fire brigade shall determine the site-specific requirements that are applicable to the advanced exterior industrial fire brigade member operating on their site. The process used to determine the site-specific requirements shall be documented, and these additional JPRs added to those identified in Sections 6.1 and 6.2. Based on the assessment of the site-specific hazards of the facility and the duties that industrial fire brigade members are expected to perform, the management of the industrial fire brigade shall determine the specific requirements of Chapters 5 or 6 of NFPA 472, *Standard for Competence of Responders to Hazardous Materials/Weapons of Mass Destruction Incidents*, or the corresponding requirements in OSHA 29 CFR 1910.120(q) that apply.

6.3.1 Perform a fire safety survey in a facility, given an assignment, survey forms, and procedures, so that fire and life safety hazards are identified, recommendations for their correction are made, and unresolved issues are referred to the proper authority.

(A) **Requisite Knowledge.** Organizational policy and procedures, common causes of fire and their prevention, and the importance of fire safety and referral procedures.

(B) **Requisite Skills.** The ability to complete forms, recognize hazards, match findings to pre-approved recommendations, and effectively communicate findings to the proper authority.

6.3.2* Gain access to facility locations, given keys, forcible entry tools (e.g., bolt cutters, small hand tools, and ladders), and an assignment, so that areas are accessed and remain accessible during advanced exterior industrial fire brigade operations.

(A) **Requisite Knowledge.** Site drawing reading, access procedures, forcible entry tools and procedures, and site-specific hazards, such as access to areas restricted by railcar movement, fences, and walls. Procedures associated with special hazard areas such as electrical substations, radiation hazard areas, and other areas specific to the site, if needed.

(B) **Requisite Skills.** The ability to read site drawings, identify areas of low overhead clearance, identify areas on roadways having load restrictions, identify access routes to water supplies, identify hazardous materials locations, identify electrical equipment locations (overhead and belowgrade equipment), ability to open gates by manual and/or automatic means, ability to forcibly gain access to areas, and the ability to identify site hazards.

6.3.3 Utilize master stream appliances, given an assignment, an extinguishing agent, and a master stream device and supply hose, so that the appliance is set up correctly and the agent is applied as assigned.

(A) **Requisite Knowledge.** Correct operation of master stream appliances, uses for master stream appliances, tactics using master stream appliances, selection of the master stream appliance for different fire situations, the effect of master stream appliances on search and rescue, ventilation procedures, and property conservation.

(B) **Requisite Skills.** The ability to correctly put in service a master stream appliance and evaluate and forecast a fire's growth and development.

6.3.4* Extinguish an ignitable (or simulated ignitable) liquid fire operating as a member of a team, given an assignment, a handline, personal protective equipment, a foam proportioning device, a nozzle, foam concentrates, and a water supply, so that the correct type of foam concentrate is selected for the given fuel and conditions, a correctly proportioned foam stream is applied to the surface of the fuel to create and maintain a foam blanket, the fire is extinguished, re-ignition is prevented, and team protection is maintained.

(A) **Requisite Knowledge.** Methods by which foam prevents or controls a hazard; principles by which foam is generated; causes for poor foam generation and corrective measures; difference between hydrocarbon and polar solvent fuels and the concentrates that work on each; the characteristics, uses, and limitations of fire-fighting foams; the advantages and disadvantages of using fog nozzles versus foam nozzles for foam application; foam stream application techniques; hazards associated with foam usage; and methods to reduce or avoid hazards.

(B) **Requisite Skills.** The ability to prepare a foam concentrate supply for use, assemble foam stream components, master various foam application techniques, and approach and retreat from fires and spills as part of a coordinated team.

6.3.5* Control a flammable gas fire operating as a member of a team, given an assignment, a handline, personal protective equipment, and tools, so that crew integrity is maintained, contents are identified, the flammable gas source is controlled or isolated, hazardous conditions are recognized and acted upon, and team safety is maintained.

(A) **Requisite Knowledge.** Characteristics of flammable gases, components of flammable gas systems, effects of heat and pressure on closed containers, boiling liquid expanding vapor explosion (BLEVE) signs and effects, methods for identifying contents, water stream usage and demands for pressurized gas fires, what to do if the fire is prematurely extinguished, alternative actions related to various hazards, and when to retreat.

(B) **Requisite Skills.** The ability to execute effective advances and retreats, apply various techniques for water application, assess gas storage container integrity and changing conditions, operate control valves, and choose effective procedures when conditions change.

6.3.6* Extinguish an exterior fire using special extinguishing agents other than foam operating as a member of a team, given an assignment, a handline, personal protective equipment, and an extinguishing agent supply, so that fire is extinguished, re-ignition is prevented, and team protection is maintained.

(A) **Requisite Knowledge.** Methods by which special agents, such as dry chemical, dry powder, and carbon dioxide, prevent or control a hazard; principles by which special agents are generated; the characteristics, uses, and limitations of fire-fighting special agents; the advantages and disadvantages of using special agents; special agents application techniques; hazards associated with special agents usage; and methods to reduce or avoid hazards.



(B) Requisite Skills. The ability to operate a special agent supply for use, master various special agents application techniques, and approach and retreat from hazardous areas as part of a coordinated team.

6.3.7* Interpret alarm conditions, given an alarm signaling system, a procedure, and an assignment, so that the alarm condition is correctly interpreted and a response is initiated.

(A) Requisite Knowledge. The different alarm detection systems within the facility; difference between alarm, trouble, and supervisory alarms; hazards protected by the detection systems; hazards associated with each type of alarm condition; knowledge of the emergency response plan; and communication procedures.

(B) Requisite Skills. The ability to understand the different types of alarms, to implement the response, and to provide information through communications.

6.3.8* Activate a fixed fire suppression system, given personal protective equipment, a fixed fire protection system, a procedure, and an assignment, so that the correct steps are followed and the system operates.

(A) Requisite Knowledge. Different types of extinguishing agents, hazards associated with system operation, how the system operates, sequence of operation, system overrides and manual intervention procedures, and shutdown procedures to prevent damage to the operated system or to those systems associated with the operated system.

(B) Requisite Skills. The ability to operate fixed fire suppression systems via electrical or mechanical means and shutdown procedures for fixed fire suppression systems.

6.3.9* Extinguish a Class C (electrical) or simulated Class C fire as a member of a team, given an assignment, a Class C fire-extinguishing appliance/extinguisher, and personal protective equipment, so that the proper type of Class C agent is selected for the condition, the selected agent is correctly applied to the fuel, the fire is extinguished, re-ignition is prevented, team protection is maintained, and the hazard is faced until retreat to safe haven is reached.

(A) Requisite Knowledge. Methods by which a Class C agent prevents or controls a hazard; methods by which Class C fires are de-energized; causes of injuries from Class C fire fighting on live Class C fires with Class A agents and the Class C agents; the extinguishing agents' characteristics, uses, and limitations; the advantages and disadvantages of de-energizing as using water fog nozzles on a Class A or Class B fire; and methods to reduce or avoid hazards.

(B) Requisite Skills. The ability to operate Class C fire extinguishers or fixed systems and approach and retreat from Class C fires as part of a coordinated team.

6.3.10* Utilize tools and equipment assigned to the industrial fire brigade, given an assignment and specific tools, so that tools are selected and correctly used under adverse conditions in accordance with manufacturer's recommendations and the policies and procedures of the industrial fire brigade.

(A) Requisite Knowledge. Available tools and equipment, their storage locations, and their correct use in accordance with recognized practices, and selection of tools and equipment given different conditions.

(B) Requisite Skills. The ability to select and use the correct tools and equipment for various tasks, follow guidelines, and restore tools and equipment to service after use.

6.3.11 Set up and use portable ladders, given an assignment, single and extension ladders, and team members as appropriate, so that hazards are assessed, the ladder is stable, the angle is correct for climbing, extension ladders are extended to the correct height with the fly locked, the top is placed against a reliable structural component, and the assignment is accomplished.

(A) Requisite Knowledge. Parts of a ladder, hazards associated with setting up ladders, what constitutes a stable foundation for ladder placement, different angles for various tasks, safety limits to the degree of angulation, and what constitutes a reliable structural component for top placement.

(B) Requisite Skills. The ability to carry ladders, raise ladders, extend ladders and lock flies, determine that a wall and roof will support the ladder, judge extension ladder height requirements, and place the ladder to avoid obvious hazards.

Chapter 7 Interior Structural Industrial Fire Brigade Member

7.1 General.

7.1.1 Qualification or Certification. For qualification or certification at the interior structural industrial fire brigade member level, the member shall meet the entrance requirements in Chapter 4 and Sections 5.1, 5.2, 7.1, and 7.2 and the site-specific requirements in Sections 5.3 and 7.3 as defined by the management of the industrial fire brigade.

7.1.2 Basic Interior Structural Fire Brigade Member JPRs.

7.1.2.1 Use thermal protective clothing during structural fire-fighting operations, given thermal protective clothing, so that the clothing is correctly donned within 2 minutes (120 seconds), worn, and doffed.

(A) Requisite Knowledge. Conditions that require personal protection, uses and limitations of thermal protective clothing, components of thermal protective clothing ensemble, and donning and doffing procedures.

(B) Requisite Skills. The ability to correctly don and doff thermal protective clothing and perform assignments while wearing thermal protective clothing.

7.1.2.2* Use SCBA and a PASS device during interior fire-fighting operations, given SCBA, a PASS device, thermal protective clothing, and other personal protective equipment, so that the SCBA and the PASS device are correctly donned and activated within 2 minutes (120 seconds), the equipment is correctly worn, controlled breathing techniques are used, emergency procedures are enacted if the SCBA fails, all low-air warnings are recognized, respiratory protection is not intentionally compromised, and hazardous areas are exited prior to air depletion and correctly doffed.

(A) Requisite Knowledge. Conditions that require respiratory protection, uses and limitations of SCBA, components of SCBA, donning and doffing procedures, breathing techniques, indications for and emergency procedures used with SCBA, and physical requirements of the SCBA wearer.

(B) Requisite Skills. The ability to control breathing, use SCBA in limited-visibility conditions, replace SCBA air cylinders, use SCBA to exit through restricted passages, initiate and complete emergency procedures in the event of SCBA failure or air depletion, and complete donning and doffing procedures.



7.1.2.3 Utilize a pre-incident plan, given pre-incident plans and an assignment, so that the industrial fire brigade member implements the pre-incident plan.

(A) **Requisite Knowledge.** The sources of water supply for fire protection or other fire-extinguishing agents, site-specific hazards, the fundamentals of fire suppression and detection systems including specialized agents, and common symbols used in diagramming construction features, utilities, hazards, and fire protection systems.

(B) **Requisite Skills.** The ability to identify the components of the pre-incident plan such as fire suppression and detection systems, structural features, site-specific hazards, and response considerations.

7.2 Manual Fire Suppression.

7.2.1* Attack an interior structural fire operating as a member of a team, given a water source, a handline, personal protective equipment, tools, and an assignment, so that team integrity is maintained, the handline is deployed for advancement, access is gained into the fire area, correct application practices are used, the fire is approached safely, attack techniques facilitate suppression given the level of the fire, hidden fires are located and controlled, the correct body posture is maintained, hazards are avoided or managed, and the fire is brought under control.

(A) **Requisite Knowledge.** Principles of conducting initial fire size-up; principles of fire streams; types, design, operation, nozzle pressure effects, and flow capabilities of nozzles; precautions to be followed when advancing hose lines to a fire; observable results that a fire stream has been correctly applied; dangerous building conditions created by fire; principles of exposure protection; potential long-term consequences of exposure to products of combustion; physical states of matter in which fuels are found; common types of accidents or injuries and their causes; and the application of each size and type of handlines, the role of the backup team in fire attack situations, attack and control techniques, and exposing hidden fires.

(B) **Requisite Skills.** The ability to prevent water hammers when shutting down nozzles; open, close, and adjust nozzle flow and patterns; apply water using direct, indirect, and combination attacks; advance charged and uncharged 38 mm (1½ in.) diameter or larger handlines; extend handlines; replace burst hose sections; operate charged handlines of 38 mm (1½ in.) diameter or larger; couple and uncouple various handline connections; carry hose; attack fires; and locate and suppress hidden fires.

7.2.2 Force entry into a structure, given personal protective equipment, tools, and an assignment, so that the tools are used, the barrier is removed, and the opening is in a safe condition and ready for entry.

(A) **Requisite Knowledge.** Basic construction of typical doors, windows, and walls within the facility; operation of doors, windows, and their associated locking mechanisms; and the dangers associated with forcing entry through doors, windows, and walls.

(B) **Requisite Skills.** The ability to transport and operate site-specific tools to force entry through doors, windows, and walls using assorted methods and tools.

7.2.3* Perform ventilation on a structure operating as a member of a team, given an assignment, personal protective equip-

ment, and tools, so that a sufficient opening is created, all ventilation barriers are removed, structural integrity is not compromised, and products of combustion are released from the structure.

(A) **Requisite Knowledge.** The principles, advantages, limitations, and effects of horizontal and vertical ventilation; safety considerations when venting a structure; the methods of heat transfer; the principles of thermal layering within a structure on fire; fire behavior in a structure; the products of combustion found in a structure fire; the signs, causes, effects, and prevention of backdrafts; and the relationship of oxygen concentration to life safety and fire growth.

(B) **Requisite Skills.** The ability to transport and operate tools and equipment to create an opening and implement ventilation techniques.

7.2.4* Overhaul a fire scene, given personal protective equipment, attack line, hand tools, a flashlight, and an assignment, so that structural integrity is not compromised, all hidden fires are discovered, fire cause evidence is preserved, and the fire is extinguished.

(A) **Requisite Knowledge.** Types of fire handlines and application devices most effective for overhaul, application methods for extinguishing agents that limit damage, types of tools and methods used to expose hidden fire, dangers associated with overhaul, obvious signs of area of origin and signs of arson, and reasons for protection of fire scene.

(B) **Requisite Skills.** The ability to deploy and operate handlines, expose void spaces without compromising structural integrity, apply extinguishing agents for maximum effectiveness, expose and extinguish hidden fires, recognize and preserve obvious signs of area of origin and fire cause, and evaluate for complete extinguishment.

7.2.5* Exit a hazardous area as a team, given vision-obscured conditions, so that a safe haven is found before exhausting the air supply, others are not endangered, and the team integrity is maintained.

(A) **Requisite Knowledge.** Personnel accountability systems, communication procedures, emergency evacuation methods, what constitutes a safe haven, elements that create or indicate a hazard, and emergency procedures for loss of air supply.

(B) **Requisite Skills.** The ability to operate as a team member in vision-obscured conditions, locate and follow a guideline, conserve air supply, and evaluate areas for hazards and identify a safe haven.

7.2.6* Establish a water supply for fire-fighting operations, given a water source and tools, so that a water supply is established and maintained.

(A) **Requisite Knowledge.** Water sources, correct operation of site water supply components, hydraulic principles, and the effect of mechanical damage and temperatures on the operability of the water supply source.

(B) **Requisite Skills.** The ability to operate the site water supply components and take action to address damage or impairment.

7.2.7 Interface with outside mutual aid organizations, given SOPs for mutual aid response and communication protocols, so that a unified command is established and maintained.

(A) **Requisite Knowledge.** Mutual aid procedures and the structure of the mutual aid organization, site SOPs, and incident management systems.



(B) Requisite Skills. The ability to communicate with mutual aid organizations and to integrate operational personnel into teams under a unified command.

7.2.8 Conduct search and rescue operations as a member of a team, given an assignment, obscured vision conditions, personal protective equipment, a flashlight, forcible entry tools, handlines, and ladders when necessary, so that all equipment is correctly used, all assigned areas are searched, all victims are located and removed, team integrity is maintained, and team members' safety, including respiratory protection, is not compromised.

(A) Requisite Knowledge. Use of appropriate tools and equipment, psychological effects of operating in obscured conditions and ways to manage them, methods to determine if an area is tenable, primary and secondary search techniques, team members' roles and goals, methods to use and indicators of finding victims, victim removal methods, and considerations related to respiratory protection.

(B) Requisite Skills. The ability to use SCBA to exit through restricted passages, use tools and equipment for various types of rescue operations, rescue an industrial fire brigade member whose respiratory protection is not functioning, rescue a person who has no respiratory protection, and assess areas to determine tenability.

7.2.9* Conserve property operating as a member of a team, given special tools and equipment and an assignment within the facility, so that exposed property and the environment are protected from further damage.

(A) Requisite Knowledge. The purpose of property conservation and its value to the organization, methods used to protect property, methods to reduce damage to property, types of and uses for salvage covers, operations at properties protected with automatic sprinklers or special protection systems, and understanding the impact of using master streams and multiple hose streams on property conservation, particularly as it can relate to the impact on outside facilities.

(B) Requisite Skills. The ability to deploy covering materials, control extinguishing agents, and cover building openings, including doors, windows, floor openings, and roof openings.

7.2.10* Operate as a member of a rapid intervention crew, given size-up information, basic rapid intervention tools and equipment, and an assignment, so that strategies to effectively rescue the brigade member(s) are identified and implemented; hazard warning systems are established and understood by all participating personnel; incident-specific personal protective equipment is identified, provided, and utilized; physical hazards are identified; and confinement, containment, and avoidance measures are discussed.

(A) Requisite Knowledge. Identification and care of personal protective equipment; specific hazards associated with the facility; strategic planning for rescue incidents; communications and safety protocols; atmospheric monitoring equipment needs; identification, characteristics, expected behavior, type, causes, and associated effects of personnel becoming incapacitated or trapped; and recognition of, potential for, and signs of impending building collapse.

(B) Requisite Skills. The ability to use personal protective equipment, determine resource needs, select and operate basic and specialized tools and equipment, implement communications and safety protocols, and mitigate specific hazards associated with rescue of trapped or incapacitated personnel.

7.3* Site-Specific Requirements. The management of the industrial fire brigade shall determine the site-specific requirements that are applicable to the interior structural industrial fire brigade member operating on their site. The process used to determine the site-specific requirements shall be documented, and these additional JPRs added to those identified in Sections 7.1 and 7.2. Based on the assessment of the site-specific hazards of the facility and the duties that industrial fire brigade members are expected to perform, the management of the industrial fire brigade shall determine the specific requirements of Chapters 5 and 6 of NFPA 472, *Standard for Competence of Responders to Hazardous Materials/Weapons of Mass Destruction Incidents*, or the corresponding requirements in OSHA 29 CFR 1910.120(q) that apply.

7.3.1* Interpret alarm conditions, given an alarm signaling system, a procedure, and an assignment, so that the alarm condition is correctly interpreted and a response is initiated.

(A) Requisite Knowledge. The different alarm detection systems within the facility; difference between alarm, trouble, and supervisory alarms; hazards protected by the detection systems; hazards associated with each type of alarm condition; the emergency response plan; and communication procedures.

(B) Requisite Skills. The ability to understand the different types of alarms, to implement the response, and to provide information through communications.

7.3.2* Activate a fixed fire protection system, given required personal protective equipment, a fixed fire protection system, a procedure, and an assignment, so that the procedures are followed and the system operates.

(A) Requisite Knowledge. Different types of extinguishing agents on site, manual fire suppression activities within areas covered by fixed fire suppression systems, hazards associated with system operation, how the system operates, sequence of operation, system overrides and manual intervention procedures, and shutdown procedures to prevent damage to the operated system or to those systems associated with the operated system.

(B) Requisite Skills. The ability to operate fixed fire suppression systems via electrical or mechanical means and to shut down fixed fire suppression systems.

7.3.3 Utilize master stream appliances, given an assignment, an extinguishing agent, a master stream device, and a supply hose, so that the appliance is set up correctly and the agent is applied as assigned.

(A) Requisite Knowledge. Correct operation of master stream appliances, uses for master stream appliances, tactics using master stream appliances, selection of the master stream appliances for different fire situations, and the effect of master stream appliances on search and rescue, ventilation procedures, and property conservation.

(B) Requisite Skills. The ability to correctly put in service a master stream appliance and to evaluate and forecast a fire's growth and development.

7.3.4* Extinguish an ignitable liquid fire operating as a member of a team, given an assignment, a handline, personal protective equipment, a foam proportioning device, a nozzle, foam concentrates, and a water supply, so that the correct type of foam concentrate is selected for the given fuel and conditions, a correctly proportioned foam stream is applied to the surface of the fuel to create and maintain a foam blanket, fire is extinguished, re-ignition is prevented, and team protection is maintained.



(A) **Requisite Knowledge.** Methods by which foam prevents or controls a hazard; principles by which foam is generated; causes for poor foam generation and corrective measures; difference between hydrocarbon and polar solvent fuels and the concentrates that work on each; the characteristics, uses, and limitations of fire-fighting foams; the advantages and disadvantages of using fog nozzles versus foam nozzles for foam application; foam stream application techniques; hazards associated with foam usage; and methods to reduce or avoid hazards.

(B) **Requisite Skills.** The ability to prepare a foam concentrate supply for use, assemble foam stream components, master various foam application techniques, and approach and retreat from fires and spills as part of a coordinated team.

7.3.5* Control a flammable gas fire operating as a member of a team, given an assignment, a handline, personal protective equipment, and tools, so that team integrity is maintained, contents are identified, the flammable gas source is controlled or isolated, hazardous conditions are recognized and acted upon, and team safety is maintained.

(A) **Requisite Knowledge.** Characteristics of flammable gases, components of flammable gas systems, effects of heat and pressure on closed containers, BLEVE signs and effects, methods for identifying contents, water stream usage and demands for pressurized gas fires, what to do if the fire is prematurely extinguished, alternative actions related to various hazards, and when to retreat.

(B) **Requisite Skills.** The ability to execute effective advances and retreats, apply various techniques for water application, assess gas storage container integrity and changing conditions, operate control valves, and choose effective procedures when conditions change.

7.3.6* Extinguish a fire using special extinguishing agents other than foam operating as a member of a team, given an assignment, a handline, personal protective equipment, and an extinguishing agent supply, so that fire is extinguished, re-ignition is prevented, and team protection is maintained.

(A) **Requisite Knowledge.** Methods by which special agents, such as dry chemical, dry powder, and carbon dioxide, prevent or control a hazard; principles by which special agents are generated; the characteristics, uses, and limitations of fire-fighting special agents; the advantages and disadvantages of using special agents; special agent application techniques; hazards associated with special agent usage; and methods to reduce or avoid hazards.

(B) **Requisite Skills.** The ability to operate a special agent supply for use, master various special agents application techniques, and approach and retreat from hazardous areas as part of a coordinated team.

7.3.7* Utilize tools and equipment assigned to the industrial fire brigade, given an assignment and specific tools, so that tools are selected and correctly used under adverse conditions in accordance with manufacturer's recommendations and the policies and procedures of the industrial fire brigade.

(A) **Requisite Knowledge.** Available tools and equipment, their storage locations, and their correct use in accordance with recognized practices; and selection of tools and equipment given different conditions.

(B) **Requisite Skills.** The ability to select and use the correct tools and equipment for various tasks, follow guidelines, and restore tools and equipment to service after use.

7.3.8 Set up and use portable ladders, given an assignment, single and extension ladders, and team members as appropriate, so that hazards are assessed, the ladder is stable, the angle is correct for climbing, extension ladders are extended to the correct height with the fly locked, the top is placed against a reliable structural component, and the assignment is accomplished.

(A) **Requisite Knowledge.** Parts of a ladder, hazards associated with setting up ladders, what constitutes a stable foundation for ladder placement, different angles for various tasks, safety limits to the degree of angulation, and what constitutes a reliable structural component for top placement.

(B) **Requisite Skills.** The ability to carry ladders, raise ladders, extend ladders and lock flies, determine that a wall and roof will support the ladder, judge extension ladder height requirements, and place the ladder to avoid obvious hazards.

7.3.9* Interface with outside mutual aid organizations, given SOPs for mutual aid response and communication protocols, so that a unified command is established and maintained.

(A) **Requisite Knowledge.** Mutual aid procedures and the structure of the mutual aid organization, site SOPs, and incident management systems.

(B) **Requisite Skills.** The ability to communicate with mutual aid organizations and to integrate operational personnel into teams under a unified command.

7.3.10 Perform a fire safety survey in a facility, given an assignment, survey forms, and procedures, so that fire and life safety hazards are identified, recommendations for their correction are made, and unresolved issues are referred to the proper authority.

(A) **Requisite Knowledge.** Organizational policy and procedures, common causes of fire and their prevention, and the importance of fire safety and referral procedures.

(B) **Requisite Skills.** The ability to complete forms, recognize hazards, match findings to pre-approved recommendations, and effectively communicate findings to the proper authority.

7.3.11* Extinguish a Class C (electrical) fire as a member of a team, given an assignment, a Class C fire-extinguishing appliance/extinguisher, and personal protective equipment, so that the type of Class C agent is selected for the condition, a selected agent is correctly applied to the fuel, fire is extinguished, re-ignition is prevented, team protection is maintained, and the hazard is faced until retreat to safe haven is reached.

(A) **Requisite Knowledge.** Methods by which a Class C agent prevents or controls a hazard; methods by which Class C fires are de-energized; causes of injuries from Class C fire fighting on live Class C fires with Class A agents and the Class C agents; the extinguishing agents' characteristics, uses, and limitations; the advantages and disadvantages of de-energizing using water fog nozzles on a Class A or Class B fire; and methods to reduce or avoid hazards.

(B) **Requisite Skills.** The ability to operate Class C fire extinguishers or fixed systems and approach and retreat from Class C fires as part of a coordinated team.



Chapter 8 Industrial Fire Brigade Leader

8.1 General.

8.1.1 This duty shall involve establishing command, using emergency response procedures, and overseeing the emergency response and other administrative duties as outlined in Chapter 4 of NFPA 600, *Standard on Industrial Fire Brigades*, depending on the site organizational statement.

8.1.2 **Qualification or Certification.** For qualification or certification as an industrial fire brigade leader, the member shall meet the JPRs of the level of the industrial fire brigade in which they are leading in accordance with the requirements of Chapters 5, 6, or 7 and the JPRs as defined in Sections 8.1 and 8.2.

8.1.3 **General Requisite Knowledge.** The organizational structure of the industrial fire brigade; operating procedures for administration, emergency operations, and safety; information management and record keeping; incident management system; methods used by leaders to obtain cooperation within a group of subordinates; and policies and procedures regarding the operation of the industrial fire brigade.

8.1.4 **General Prerequisite Skills.** The ability to operate at all levels in the incident management system as defined by the National Incident Management System (NIMS) and NFPA 1561, *Standard on Emergency Services Incident Management System*.

8.2 Supervisory Functions.

8.2.1 Assign tasks or responsibilities to members, given an assignment at an emergency situation, so that the instructions are complete, clear, and concise; safety considerations are addressed; and the desired outcomes are conveyed.

(A) **Requisite Knowledge.** Verbal communications during emergency situations, techniques used to make assignments under stressful situations, and methods of confirming understanding of assigned tasks.

(B) **Requisite Skills.** The ability to condense instructions for frequently assigned unit tasks based upon training and SOPs.

8.2.2 Develop an initial action plan, given size-up information for an incident and assigned emergency response resources, so that resources are deployed to control the emergency.

(A)* **Requisite Knowledge.** Elements of a size-up, SOPs for emergency operations, and fire behavior.

(B) **Requisite Skills.** The ability to analyze emergency scene conditions, to allocate resources, and to communicate verbally.

8.2.3* Implement an action plan at an emergency situation, given assigned resources, type of incident, preliminary plan, and industrial fire brigade safety policies and procedures, so that resources are deployed to mitigate the situation and team safety is maintained.

(A) **Requisite Knowledge.** SOPs, resources available, basic fire control and emergency operation procedures, an incident management system, rapid intervention crew (RIC) procedures, personnel accountability system, common causes of personal injury during industrial fire brigade activities, safety policies and procedures, and basic industrial fire brigade member safety.

(B)* **Requisite Skills.** The ability to implement an incident management system, to communicate verbally, to supervise and account for assigned personnel under emergency conditions, and to identify safety hazards.

8.2.4* Coordinate multiple resources, such as in-house and mutual aid, during emergency situations, given an incident requiring multiple resources and a site incident management system, so that the site incident management system is implemented and the required resources, their assignments, and safety considerations for successful control of the incident are identified.

(A) **Requisite Knowledge.** SOPs and local resources available for the handling of the incident under emergency situations, basic fire control and emergency operation procedures, an incident management system, and a personnel accountability system.

(B) **Requisite Skills.** The ability to implement the site incident management system, to communicate verbally, and to supervise and account for assigned personnel under emergency conditions.

8.2.5 Implement support operations at an incident, given an assignment and available resources, so that scene lighting is adequate for the tasks to be undertaken, personnel rehabilitation is facilitated, and the support operations facilitate the incident objectives.

(A) **Requisite Knowledge.** Resource management protocols, principles for establishing lighting, and rescuer rehabilitation practices and procedures.

(B) **Requisite Skills.** The ability to manage resources, provide power, set up lights, use lighting, select rehab areas, and personnel rotations.

8.2.6 Direct members during a training evolution, given a training evolution and training policies and procedures, so that the evolution is performed in accordance with safety plans, and the stated objectives or learning outcomes are achieved as directed.

(A) **Requisite Knowledge.** Oral communication techniques to facilitate learning.

(B) **Requisite Skills.** The ability to distribute issue-guided directions to members during training evolutions.

Chapter 9 Industrial Fire Brigade Support Member

9.1 General.

9.1.1 This duty shall involve supporting the operational activities of the fire brigade. In most cases, support member personnel are not expected to perform manual fire suppression activities in the event of an emergency but are expected to perform those specialized tasks, that they have been assigned, depending on the site organizational statement.

9.1.2 **Qualification.** For qualification as an industrial fire brigade support member, the member shall meet the JPRs of the level of the industrial fire brigade support member in accordance with the requirements of this chapter. Support members shall not be permitted to enter the wann zone or the hot zone.

9.1.3 Education, Training, and Drills.

9.1.3.1 All industrial fire brigade support members shall receive training and education at least annually.

9.1.3.2 All industrial fire brigade support members shall participate in a drill at least annually.



9.1.3.3 Training and drills that involve supporting live fire evolutions shall be performed in accordance with recognized health and safety precautions.

9.1.3.4 The support members shall have an understanding of how to perform their duties without being engaged by emergency operations.

9.1.4 **Protective Clothing and Protective Equipment.** Since the industrial fire brigade support member will not be entering the warm or hot zones, neither thermal protective clothing nor SCBA shall be needed.

9.1.5* **Medical.** Each industrial fire brigade support member shall meet the medical and job-related performance requirements as specified in Section 4.5 of NFPA 600.

9.1.6 **Basic Industrial Fire Brigade Support Member.** All industrial fire brigade support members shall have a general knowledge of site-specific hazards, operation within an incident management system, operation within the emergency response operations plan for the site, standard operating and safety procedures for the site, and special procedures and duties of the particular industrial support team member's role.

9.1.7 Initiate a response to a reported emergency, given the report of an emergency, facility standard operating procedures, and communication equipment, so that all necessary information is obtained and communication equipment is operating properly.

(A) **Requisite Knowledge.** Procedures for reporting an emergency.

(B) **Requisite Skills.** The ability to operate facility communication equipment, relay information, and record information.

9.1.8 Respond to a facility emergency, given the necessary equipment and facility response procedures, so that the support member arrives at the assigned duty location.

(A) **Requisite Knowledge.** Facility layout, special hazards, and emergency response procedures.

(B) **Requisite Skills.** The ability to recognize response hazards and to operate within the duties for that support member position.

9.2 **Site-Specific Requirements.** The management of the industrial fire brigade shall determine the site-specific requirements that are applicable to the industrial fire brigade support members operating on their site. The process used to determine the site-specific requirements shall be documented, and these additional JPRs added to those identified above. The duties shall be selected from the list of examples located in Annex B; the management of the industrial fire brigade can develop additional duties for support members as needed.

9.2.1 **Building Evacuation.** Respond to a facility emergency, given equipment as determined by the AHJ, and facility evacuation procedures, so that the all building personnel are evacuated to their assigned assembly point.

(A) **Requisite Knowledge.** Facility evacuation plans and building layout, special hazards, and emergency response procedures.

(B) **Requisite Skills.** The ability to assist building occupants to evacuate in a safe manner and to safely operate within the duties for that support member position.

9.2.2 **Sprinkler System Control.** Respond to a facility emergency, given facility sprinkler system or other fixed fire protec-

tion equipment and facility fixed fire protection equipment operation procedures, so that the control of the automatic sprinkler protection system within the fire area or the facility is maintained in the event of fire.

(A) **Requisite Knowledge.** Facility fixed fire protection equipment operating procedures, special hazards, and emergency response procedures.

(B) **Requisite Skills.** The ability to operate the fixed fire protection system equipment and the understanding of the site emergency procedures to know when to operate the fixed fire protection systems to safely operating within the duties for that support member position.

9.2.3 **Electrical Power Control.** Respond to a facility emergency, given the site electrical system and facility electrical equipment operation procedures, so that the control of the electrical system within the fire area or the facility is maintained in the event of fire.

(A) **Requisite Knowledge.** Facility electrical equipment operating procedures, special hazards, and emergency response procedures.

(B) **Requisite Skills.** The ability to operate the electrical system equipment and the understanding of the site emergency procedures to know when to de-energize electrical systems to safely operating within the duties for that support member position.

9.2.4 **Utility Control.** Respond to a facility emergency, given the plant utilities (e.g., heating, ventilation, and air conditioning; steam, water, LP-Gas or natural gas, and other liquid or vapor piping systems) and facility utilities operation procedures, so that the control of the utilities system within the fire area or the facility is maintained in the event of fire.

(A) **Requisite Knowledge.** Facility utilities (e.g., heating, ventilation, and air conditioning; steam, water, LP-Gas or natural gas, and other liquid or vapor piping systems) operating procedures, special hazards, and emergency response procedures.

(B) **Requisite Skills.** The ability to operate the plant utilities (e.g., heating, ventilation, and air conditioning; steam, water, LP-Gas or natural gas, and other liquid or vapor piping systems) equipment and the understanding of the site emergency procedures to know when to operate or de-energize systems to safely operating within the duties for that support member position.

9.2.5 **Process Control.** Respond to a facility emergency, given the process equipment (petrochemical processing, refinery processing, computer processing, etc.) and process operation procedures, so that the control of the process control system within the fire area or the facility is maintained in the event of fire.

(A) **Requisite Knowledge.** Facility process equipment (petrochemical processing, refinery processing, computer processing, etc.) operating procedures, special hazards, and emergency response procedures.

(B) **Requisite Skills.** The ability to operate the process equipment (petrochemical processing, refinery processing, computer processing, etc.) and the understanding of the site emergency procedures to know when to operate or de-energize systems to safely operating within the duties for that support member position.

9.2.6 **Fire Pump/Fire Water System Operation.** Respond to a facility emergency, given the fire pump/fire water system and fire pump/fire water system procedures, so that the control of



fire pump/fire water system within the fire area or the facility is maintained in the event of fire.

(A) Requisite Knowledge. Facility fire pump/fire water operating procedures, special hazards, and emergency response procedures.

(B) Requisite Skills. The ability to operate the fire pump/fire water systems and the understanding of the site emergency procedures to know when to operate or de-energize systems to safely operating within the duties for that support member position.

9.2.7 Salvage. Respond to a facility emergency, given salvage equipment and salvage procedures, so that salvage operations in the cold zone within the fire area or the facility are completed in the event of fire.

(A) Requisite Knowledge. Facility salvage operating procedures in the cold zone, special hazards, and emergency response procedures.

(B) Requisite Skills. The ability to operate salvage equipment and understanding of the site emergency procedures to know when and how to perform salvage operations safely within the duties for that support member position.

9.2.8 Traffic Control and Site Security Duties. Respond to a facility emergency, given traffic control and security equipment and security procedures, so that traffic control and security outside the fire zone and in the cold zone within the fire area or the facility are completed in the event of fire.

(A) Requisite Knowledge. Facility traffic control and security procedures in the cold zone, special hazards, and emergency response procedures.

(B) Requisite Skills. The ability to use traffic control and security devices and to understand the site emergency procedures and traffic control and security procedures to know when and how to perform traffic control and security operations safely within the duties for that support member position.

9.2.9 Escort. Respond to a facility emergency, given escort equipment and escort procedures, so that escorting of personnel outside the fire zone and in the cold zone within the fire area or the facility is completed in the event of fire.

(A) Requisite Knowledge. Escort procedures in the cold zone, special hazards, and emergency response procedures.

(B) Requisite Skills. The ability to use escort devices and to understand the site emergency procedures and escort procedures to know when and how to perform escort operations safely within the duties for that support member position.

9.2.10 General Support Services. Respond to a facility emergency, given general support services equipment and specific support services procedures as determined by the facility fire brigade management, so that general support services are completed in the event of fire.

(A) Requisite Knowledge. General support services procedures in the cold zone, special hazards, and emergency response procedures.

(B) Requisite Skills. The ability to use necessary specific support services devices as determined by the facility fire brigade management and to understand the site emergency procedures and specific support services procedures to know when and how to perform specific support services operations safely within the duties for that support member position.

Annex A Explanatory Material

Annex A is not a part of the requirements of this NFPA document but is included for informational purposes only. This annex contains explanatory material, numbered to correspond with the applicable text paragraphs.

A.1.1 This standard is intended to comply with the industrial fire brigade-related requirements of 29 CFR 1910.156, Subpart L and the industrial fire brigade-related requirements of 29 CFR 1910.134 (2 in/2 out rule). Further, this standard is intended to ensure the industrial fire brigade member has the appropriate degree of occupational safety and health while performing industrial fire brigade duties, just as NFPA 1500, *Standard on Fire Department Occupational Safety and Health Program*, ensures an appropriate degree of occupational safety and health for municipal fire department members.

For support functions beyond the scope of this document, see Annex B.

A.1.3.1 See Annex C for additional information regarding the use of JPRs for training and evaluation. For support functions beyond the scope of this document, see Annex B.

A.1.3.1.1 Management should define the industrial fire brigades' training requirements to maintain competency for assigned emergency duties that management expects their personnel are to perform. After initial training, recurring training should be required for the industrial fire brigade member to maintain a level of proficiency to perform their duties. 29 CFR 1910 Subpart A paragraphs 1910.120(q), 1910.134(k), 1910.156(c), NFPA 600, *Standard on Industrial Fire Brigades*, Section 4.3, and NFPA 472, *Standard for Competence of Responders to Hazardous Materials/Weapons of Mass Destruction Incidents*, define some of the requirements for maintaining proficiency.

A.1.4 The potential exposure and training separates an organized industrial fire brigade from designated employees (as defined by OSHA) who have some fire response duties in the general work area. The scope of industrial fire brigade actions and responsibilities is based on the specific response duties that the industrial fire brigade members are expected to perform. If an industrial fire brigade member is not expected to perform a particular fire-fighting function, then management has no obligation to train or equip the industrial fire brigade member to perform that function. [600:A.1.4]

A.1.4.2 Designated employees who are intended to respond to incipient fires in their immediate work area should receive training commensurate with the response duties they are expected to perform. Their responsibilities normally are limited to sounding an alarm, taking immediate action to extinguish the fire, and evacuating the area. [600:A.1.4.2]

A.3.2.1 Approved. The National Fire Protection Association does not approve, inspect, or certify any installations, procedures, equipment, or materials; nor does it approve or evaluate testing laboratories. In determining the acceptability of installations, procedures, equipment, or materials, the authority having jurisdiction may base acceptance on compliance with NFPA or other appropriate standards. In the absence of such standards, said authority may require evidence of proper installation, procedure, or use. The authority having jurisdiction may also refer to the listings or labeling practices of an organization that is concerned with product evaluations and is thus in a position to determine compliance with appropriate standards for the current production of listed items.



A.3.2.2 Listed. The means for identifying listed equipment may vary for each organization concerned with product evaluation; some organizations do not recognize equipment as listed unless it is also labeled. The authority having jurisdiction should utilize the system employed by the listing organization to identify a listed product.

A.3.3.6.1 Advanced Exterior Fire Fighting. Advanced exterior fire fighting often requires industrial fire brigade members to contain, control, and extinguish exterior fires involving site-specific hazards, such as flammable and combustible liquid spills or leaks, liquefied petroleum gas releases, and electrical substations. Advanced exterior fire fighting is usually performed using handlines flowing up to 1140 L./min (300 gpm), master streams, or similar devices for the manual application of specialized agents. Thermal protective clothing is required, and the use of self-contained breathing apparatus (SCBA) could be required. [600:A.3.3.8.1]

A.3.3.6.4 Interior Structural Fire Fighting. This definition is extracted from 29 CFR 1910. Rescue is the activity of removing victims by an industrial fire brigade as part of fire-fighting activities. Rescue activities requiring specialized equipment and training, such as confined space and high angle rescue, are not included in this standard. [600:A.3.3.8.4]

A.3.3.8 Incipient Stage. A fire is considered to be beyond the incipient stage when the use of thermal protective clothing or self-contained breathing apparatus (SCBA) is required or an industrial fire brigade member is required to crawl on the ground or floor to stay below smoke and heat.

A.3.3.25 Support Member. When organizing the industrial fire brigade, management should take into consideration the need for specialized duties required in the event of a fire or related emergency and should assign personnel to the industrial fire brigade to ensure that these duties are accomplished. In most cases, personnel are not expected to perform manual fire suppression activities in the event of an emergency but are expected to perform only those specialized tasks for which they have been chosen. (See B.2.1 through B.2.9 for a list of specialized tasks.)

A.3.3.28 Thermal Protective Clothing. For the purpose of this standard, full protective clothing for industrial fire brigade members above the incipient level is considered to include a turnout coat, protective trousers, fire-fighting boots, fire-fighting gloves, a protective hood, and a fire-fighting helmet. All equipment should be compliant with NFPA or applicable standards.

A.4.1 For information on medical requirements, see OSHA requirements in 29 CFR 1910.156, 29 CFR 1910.134, or NFPA 1582, *Standard on Comprehensive Occupational Medical Program for Fire Departments*.

A.4.2 Where management determines that emergency medical care capability is required to be provided by the industrial fire brigade personnel, programs such as the Department of Transportation First Responder and American Red Cross curricula offer models that can be followed.

A.4.3.1 See Annex D.

A.4.3.2 It is recommended, where practical, that evaluators be individuals who are not directly involved as instructors for the requirement being evaluated.

A.4.3.4 The Technical Committee on Industrial Fire Brigades Professional Qualifications uses the phrase “qualified or certi-

fied” throughout the standard because the industrial fire brigade management should determine whether industrial fire brigade members will be certified or qualified to perform emergency response activities. Many different factors are part of the industrial fire brigade management’s decision-making process for certification or qualification. These factors can include company policy, local or state statutes, and training agency policy. It is not the intent of this standard to determine if industrial fire brigade members will be certified or qualified upon the completion of applicable JPRs.

A.4.3.9 NFPA 1002, *Standard for Fire Apparatus Driver/Operator Professional Qualifications*, provides the framework for an industrial fire brigade apparatus driver/operator qualification program. Each fire brigade should develop a similar program that ensures that JPRs are developed for the functions that driver/operators will be expected to perform.

It is recognized that some of the JPRs listed in NFPA 1002 do not apply, such as the requirement that driver/operators should meet the requirements of NFPA 1001, *Standard for Fire Fighter Professional Qualifications*, Sections 5.1 and 5.2. In addition, when a practical driving test is developed, it should incorporate situations that industrial fire brigade vehicle operator/drivers will experience, which might not include all of the situations listed in NFPA 1002, Section 4.3.

A.4.3.10 The management of the industrial fire brigade should determine the response expected from the industrial fire brigade during civil unrest, events involving weapons of mass destruction, or other acts of terrorism. At a minimum, industrial fire brigade members should receive basic awareness training on explosives, chemical and biological agents, and radiation, which are often associated with weapons of mass destruction or acts of terrorism, as part of NFPA 472, *Standard for Competence of Responders to Hazardous Materials/Weapons of Mass Destruction Incidents*, awareness-level training (see 5.1.1). This training will allow them to take limited defensive actions such as evacuation and isolation. If the fire brigade members are going to respond offensively, they should be provided with training that describes the types of hazards and protection from those hazards that they might encounter. The hazards include, but are not limited to, rioting, gunfire, chemical and/or biological agents, radiation, and improvised explosive devices (IEDs). Training on these hazards is available from several local, county, state, and federal agencies. Additional procedures should also be written for these types of events clearly documenting the expected response.

A.5.1.2.2 The industrial fire brigade member should be familiar with the communication systems and understand how the industrial fire brigade transmits and receives messages on the site. Management of the industrial fire brigade has the responsibility to ensure that industrial fire brigade members are trained to site operating procedures. Facility communications equipment can include, but not be limited to, public address systems, intercom systems, radios, pagers, sirens, beacons, and messengers. All industrial fire brigade members should understand the site procedures to address the intent of 4.4.6 of NFPA 600, *Standard on Industrial Fire Brigades*.

A.5.1.2.4 The incipient level industrial fire brigade member should be able to determine equipment operability and to ensure that equipment is returned to service as per site policy or procedure. Industrial fire brigade members could or could not be required by the management of the industrial fire brigade to perform inspections, maintenance, cleaning, or other-



wise to service emergency response equipment, but it is incumbent upon the employer to ensure that the equipment is maintained per manufacturer requirements and appropriate codes and standards (e.g., NFPA 10, *Standard for Portable Fire Extinguishers*; NFPA 14, *Standard for the Installation of Standpipe and Hose Systems*; and NFPA 1962, *Standard for the Inspection, Care, and Use of Fire Hose, Couplings, and Nozzles and the Service Testing of Fire Hose*). The responsibilities for the maintaining, servicing, and cleaning of emergency response equipment should be identified in the industrial fire brigade organizational statement.

A.5.1.2.5 The incident report could only entail contacting a supervisor and letting the supervisor know there was a fire, what agent was used, and any damage that occurred. The intent is to ensure that the management of the industrial fire brigade trains employees to provide all pertinent information for reporting fire incidents at the site. The report assists the management of the industrial fire brigade to accomplish the incident documentation.

A.5.2.1 The incipient industrial fire brigade member should be able to extinguish fires in stacked or piled materials such as hay bales, pallets, lumber, piles of mulch, sawdust, other bulk Class A materials, or small, unattached structures that are attacked from the exterior. The tactics for extinguishing each of these types of fires are similar enough to be included in one JPR. Live fire evolutions should be conducted in accordance with the requirements of NFPA 1403, *Standard on Live Fire Training Evolutions*. In areas where environmental or other concerns restrict the use of normal fuels for training evolutions, properly installed and monitored gas-fueled fire simulators can be substituted.

With regard to Class D fires, some facilities utilize pyrophoric, water-reactive dry chemicals, and reactive metals such as magnesium, aluminum, and sodium in their facilities and catalysts. Industrial fire brigade members need to know that ordinary extinguishing agents such as water, foam, and carbon dioxide can react with these materials. Members should be trained in recognizing these site-specific hazards and should be trained in the use of Class D and other extinguishing agents. Members need to know that automatic fire protection systems can need to be shut down; therefore, members should be trained in the proper procedures for shutting them down.

Class K fires are fires in cooking appliances that involve combustible cooking media such as vegetable or animal oils and fats. Some facilities have cooking facilities that can have fires involving Class K-type fires. Members should be trained in recognizing these site-specific hazards and should also be trained in the use of Class K fire protection systems and extinguishers.

A.5.2.2 Industrial fire brigade members should be aware of the environmental concerns associated with fire extinguishment and runoff. Brigade members should be familiar with site-specific areas where these types of issues pose potential problems. Areas could include storm drains, sumps, bodies of water, terrain, and other areas where pollution could cause environmental concerns for the facility/site. Depending on the material(s) burning, the brigade members need to deal with concerns regarding flammable liquids or chemicals as well as the foam or other extinguishing agents, including water. The extinguishing agents need to be accounted for in the event of an environmental issue.

A.5.3 Each site can vary significantly in the amount and types of fire protection systems, tools, and equipment that are specific to

that site. The management of the industrial fire brigade should document in the site SOPs the types of fire protection systems, tools, and equipment that are available for industrial fire brigade use. If the fire protection system, tool, or equipment is available for use by the industrial fire brigade, the authority having jurisdiction should ensure that the appropriate section knowledge and skills are tested. (See Annex D.)

A.5.3.1 When possible, incipient industrial fire brigade members should attack a fire as a team to enhance the safety of the fire-fighting operation. Each incipient industrial fire brigade member should maintain correct body posture when attacking a fire with a handline. Caution should be taken when advancing a handline during a fire attack.

Incipient industrial fire brigade members can handle various-sized handlines during offensive and defensive operations. The handline diameter should be determined by the management of the industrial fire brigade and is site specific. Water pressure and flow rate depend on the water supply and the type of facility operation.

A.5.3.2 The incipient industrial fire brigade member needs to have an understanding of fire protection systems provided. Members need to know how to manually activate systems, their impact on other plant systems and safety of personnel, and policies and procedures for notification of the industrial fire brigade when systems are out of service.

A.5.3.3 Incipient industrial fire brigades who are expected to utilize master stream appliances should be able to perform defensive actions, utilizing master stream appliances safely and effectively.

A.5.3.4 The industrial fire brigade member should understand hydraulic principles and their effect on water flow. Operation of site water supplies could consist of opening valves or hydrants, starting pumps, drafting from static sources, and utilizing standpipes. The fire brigade member should also understand the specific requirements of the site water supply components and their operation (e.g., correct hydrant operation, including drainage and shutdown, and operation of pressure control devices).

A.6.1 Advanced exterior fire fighting is offensive fire fighting performed outside of an enclosed structure when the fire is beyond the incipient stage. Advanced exterior fire fighting often requires industrial fire brigade members to contain, control, and extinguish exterior fires involving site-specific hazards, such as flammable and combustible liquid spills or leaks, liquefied petroleum gas releases, and electrical equipment. Advanced exterior fire fighting is usually performed using handlines flowing up to 1140 L/min (300 gpm), master streams, or similar devices for the manual application of specialized agents. Thermal protection is required, and the use of SCBA could be required.

A.6.1.2.2 Personnel accountability systems vary from site to site and should be incorporated into the site incident management system/SOPs. This system should include the interface between the site personnel and the outside mutual aid personnel, recognizing that the personnel accountability system for the site can be different from the system of the outside mutual aid organization.

A.6.2.2 The physical and medical requirements associated with wearing SCBA are outlined in Section 4.5 of NFPA 600, *Standard on Industrial Fire Brigades*, and 29 CFR 1910.134(c).



A.6.2.3 Exterior fires can involve Class A materials, such as finished goods, raw materials, bulk materials, and pallets or waste materials stored in various containers and configurations that can be stacked, piled, rolled, baled, or stored in racks or shelving. Industrial fire brigade members need to understand the effects of fire and extinguishing agents and the collapse potential on those types of high-piled storage.

Industrial fire brigade members also need to understand the exposure problem associated with these types of fires, which usually produce flying brands that easily spread fire from one area to another. The industrial fire brigade member should be proficient at deploying and using 38 mm (1½ in.) and 65 mm (2½ in.) hose line and portable and fixed master stream appliances for offensive and defensive fire attack and exposure protection.

The industrial fire brigade member should also understand hose streams and use of straight nozzles for exterior fire fighting. Live fire training can be either Class A or B fires.

Class C fires become Class A or B fires when isolated. The industrial fire brigade member should understand the potential shock hazard associated with Class C fires. The member should understand that high-voltage wiring and equipment can have an electrical field that can create a shock hazard without actually having direct contact with the wire or equipment.

Industrial fire brigade members should understand the company policies for lockout, tagout, and testing equipment to verify that the equipment has been de-energized and that the fire area or component is safe before entering locked electrical rooms or touching electrical equipment. The industrial fire brigade member should understand the safe method of using hose streams on electrical equipment.

A.6.2.5 Combustible or flammable liquids could spread to other areas, exposing additional facilities. Spread could be enhanced by application of water. Environmental impact can result from spread. Actions such as diking or rerouting runoff can be effective means to control exposure to additional facilities.

A.6.2.7 See A.5.3.4.

A.6.2.8 Personnel accountability systems vary from site to site and should be incorporated into the site incident management system/SOPs. When training exercises are intended to simulate emergency conditions, smoke-generating devices that do not create a hazard are required by NFPA 1404, *Standard for Fire Service Respiratory Protection Training*. Several accidents have occurred when smoke bombs or other smoke-generating devices that produce a toxic atmosphere have been used for training exercises.

A.6.2.9 To be in compliance with OSHA 29 CFR 1910.134(g)(4)(ii), a minimum of two industrial fire brigade members should be on-scene with personal protective equipment when industrial fire brigade members are operating in an immediately dangerous to life and health (IDLH) or potentially IDLH atmosphere. Industrial fire brigade members assigned to this function are generally known as a rapid intervention crew (RIC). Their primary purpose is the rescue of injured, lost, or trapped industrial fire brigade members, and they should not be assigned other duties that would delay or impede their rescue effort. It is recognized that industrial fire brigades, utilizing an incident management system along with a personnel accountability system, have incorporated an RIC into their management system. Further, it is the intent of this section to have the rapid intervention personnel standing by in full personal protective equipment (PPE) with RIC equipment immediately available. It is also recommended that NFPA 1407, *Standard for Training Fire*

Service Rapid Intervention Crews, be referred to during the training of brigade members in RIC operations. This state of readiness should be maintained until the incident management structure authorizes de-escalation.

A.6.3 Each site can vary significantly in the amount and types of systems, tools, and equipment that are specific to that site. The management of the industrial fire brigade should document in the site SOPs the types of systems, tools, and equipment that are available for industrial fire brigade use. If the system, tool, and equipment is available for use by the industrial fire brigade, the authority having jurisdiction should ensure that the appropriate section knowledge and skills are tested. (See Annex D.)

A.6.3.2 The industrial fire brigade member should understand site safety and security practices as identified by local laws, regulations, procedural instructions, and standards of care. Each site can vary significantly as to the duties industrial fire brigade members can be expected to perform when making entry into restricted areas. Entry into these areas can be accomplished by utilizing either forcible entry tools or routine access techniques. It is the intent of the NFPA 1081 technical committee to suggest that industrial fire brigade members are to be trained commensurate with the duties assigned.

A.6.3.4 The industrial fire brigade member should understand the use of various types of foam and other extinguishing agent applications for flammable and combustible liquid fires. Members should understand the various methods of extinguishment and the hazards associated with the various types of flammable and combustible liquid spills, leaks, and fires. Industrial fire brigade members need to review and understand the storage containers, configuration, and processes where flammable and combustible liquids are stored, manufactured, and used. Plans need to be available that show piping layout, isolation valves, and remote shutdown locations.

Industrial fire brigade members should review and understand boilover and slopover hazards associated with flammable and combustible liquid fires. Members should also understand the high-heat release associated with flammable and combustible liquid fires and the impact on exposed processes, equipment, and facilities. The potential for structural collapse of equipment and facilities involved or exposed to this type of fire should be recognized, as well as the possible impact on personnel safety. Industrial fire brigade members should extinguish a Class B fire commensurate with the size of fire that they are or can be expected to extinguish at their facility.

A.6.3.5 Industrial fire brigade members need to understand that most flammable gas fires have a high-heat release, which impacts burning and exposed processes, equipment, and facilities. The potential for structural collapse of equipment and facilities involved or exposed to this type of fire should be recognized, as well as the possible impact on personnel safety.

Industrial fire brigade members also need to review specific flammable gases manufactured, stored, and used at their facilities, and the associated hazards (fire and explosion). Some flammable gas fires, such as hydrogen, can burn with an invisible flame, which creates a serious hazard to personnel.

A.6.3.6 Industrial fire brigade members at sites that have dry chemical or carbon dioxide hose line systems require specialized training to become competent in the use of these devices. The industrial fire brigade member should be thoroughly knowledgeable in the operation of the system, how to activate



the system, how to stop system flow, and procedures for restoring the system to full operational condition or reporting to the proper authority that the system has been discharged and needs to be returned to service by competent and authorized personnel. Furthermore, the industrial fire brigade member should understand the proper application techniques and effects of air movement on these types of systems. Special procedures for utilizing these systems and standing by until the hazard is completely mitigated are paramount in effectively managing hazards protected by these systems.

Training in using these systems should cover all operational issues with the devices as well as discharging of these or similar systems so that members have a true understanding and feel for how to use these systems. Live fire training using similar devices to the plant system should be performed for accurate assessment of industrial fire brigade members' ability. Such fire training can be done on Class B fuels of at least 4.65 m² (50 ft²) size and 76.2 mm (3 in.) depth. Emphasizing team approach and importance of backup personnel is also essential.

A.6.3.7 There are facilities that employ fixed fire protection and detection systems, and thus the industrial fire brigade member operates in concert with these systems. Understanding these systems and their uses and limitations makes the industrial fire brigade more effective in handling emergency procedures. Because of the many different types of systems and number of facilities that do not have fixed fire protection systems, the requirements for training the industrial fire brigade member are covered as a site-specific hazard.

For fixed detection systems for fire, the industrial fire brigade member needs to understand the different types of systems on the site as well as signals generated by the system such as alarm, trouble, and supervisory. This understanding is important to determining how to respond to the appropriate situation upon arrival at the control panel or annunciation device. First-arriving industrial fire brigade members can then effectively communicate the indications on the control panel to other responding personnel per site procedures. As additional knowledge requirements, industrial fire brigade members should be intimately familiar with system operations such as activate, silence, and reset procedures, as well as possibly releasing a specialized fire protection system such as deluge spray, FM200[®], Inergen[®], carbon dioxide, or foam.

For fixed gas detection systems, the industrial fire brigade member should understand the different types of gas detection systems at the site. The industrial fire brigade member should also understand the different signals of gas detection systems, which typically include low, medium, and high concentrations of gas as well as fault indications. Other important knowledge for industrial fire brigade members is the understanding of the use of parts per million (ppm) reading and percent of lower flammable and explosive limit readings.

For portable gas monitoring devices, industrial fire brigade members should be thoroughly trained in the safe use of these devices. Further, they should understand flammable and explosive atmospheres and readings. Lastly, they should have an understanding of areas that can accumulate gases and of correct entry and exit procedures.

A.6.3.8 Many sites have fixed fire suppression systems, including sprinkler systems, foam systems, total flooding and local application carbon dioxide systems, dry chemical systems, clean agent systems (e.g., FM200[®] and Inergen[®]), and halon systems. These systems are installed to provide a first line of

defense of fire protection of areas or specific equipment. Operating with these systems is essential to all industrial fire brigade members. Failure of a system to operate by automatic means can be cause for operating the equipment manually to achieve the desired result of fire control or extinguishment. Further, the shutting down of these systems prematurely can cause the fire to intensify and spread. In the case of the total flooding agents such as carbon dioxide, FM200[®], Inergen[®], and halon, interrupting the integrity of the enclosing structure can cause the system to be ineffective.

Industrial fire brigade members should know how the specific systems at their site are intended to perform so that the brigade does not unintentionally interfere with the operation of these systems. The industrial fire brigade member should know by which means they can control the system using electrical and mechanical means. Closing a valve or de-energizing a solenoid as well as performing the opposite functions to initiate the system can be one way to shut down a system. Understanding the system overrides such as bypasses, valve opening, and mechanical overrides of electrical devices allows the industrial fire brigade member to institute the system operation in the event of automatic system failure. An industrial fire brigade member should also recognize that operating a damaged fixed fire protection system, such as one damaged by explosion, can create a more dangerous situation by wasting resources; for example, damaged piping flowing water away from the fire and depleting the water supply to other members or agencies working at the emergency.

Understanding the hazard associated with these systems is essential to industrial fire brigade and personnel safety. Discharging carbon dioxide into an occupied area can be life threatening. Large-volume water flow from monitors or deluge systems can present injury hazards to personnel operating in the area of the discharge from both the effects of the agent as well as moving the fire and smoke into areas occupied by personnel.

A.6.3.9 Class C fires become Class A or B fires when de-energized. The industrial fire brigade member should understand the potential shock hazard associated with Class C fires. The member should understand that high-voltage wiring and equipment can have an electrical field that can create a shock hazard without actually having direct contact with the wire or equipment.

Industrial fire brigade members should understand the company policies for lockout, tagout, and testing equipment to verify that the equipment has been de-energized and that the fire area or component is safe before entering locked electrical rooms or touching electrical equipment. The industrial fire brigade member should understand the safe method of using hose streams on electrical equipment.

A.6.3.10 Site-specific tools and equipment can include ropes, handlights, power tools, hand tools, power plants, portable lighting equipment, hose and hose accessories, salvage and overhaul tools and equipment, and special-purpose equipment such as special agent appliances.

A.7.1.2.2 See A.6.2.2.

A.7.2.1 Site-specific hazards should be identified and itemized for the industrial fire brigade, along with a detailed explanation of each hazard. Special hazards can involve operations or materials. Typical operations are data processing and electronic control equipment, where the discharge of a special extinguishing agent can present a hazard to the industrial fire



brigade members; engine test areas; paint dip, mix, and storage rooms; spray booths; flammable liquid tank farms; machinery operations; energized electrical equipment; hazardous materials; and combustible dusts.

Fire hose should be in accordance with NFPA 1961, *Standard on Fire Hose*. Hose should be maintained in accordance with NFPA 1962, *Standard for the Inspection, Care, and Use of Fire Hose, Couplings, and Nozzles and the Service Testing of Fire Hose*.

Haulline should be commensurate with the size and type of fires that the members are expected to extinguish in their normal duties.

Radios can be used for communications on the fireground; however, they cannot be the sole tool for accounting for one's partner in the interior of a structure fire [see 29 CFR 1910.134(g)(4)(i)].

A.7.2.3 Some sites have fixed smoke removal systems already installed for ventilation of products of combustion. The management of the industrial fire brigade should ensure that appropriate education and training are provided on these systems.

A.7.2.4 The industrial fire brigade member should be able to recognize important evidence as to a fire's cause and maintain the evidence so that further testing can be done without contamination or chain-of-custody problems. Evidence should be left in place (when possible; otherwise, chain of custody should be established); not altered by improper handling, walking, and so forth; and not destroyed. Possible means to protect evidence is to avoid touching, to protect with salvage covers during overhaul, or to rope off the area where the evidence lies. The industrial fire brigade member is not intended to be highly proficient at origin and cause determination.

A.7.2.5 Personnel accountability systems vary from site to site and should be incorporated into the site incident management system/SOPs. When training exercises are intended to simulate emergency conditions, smoke-generating devices that do not create a hazard are required by NFPA 1404, *Standard for Fire Service Respiratory Protection Training*. Several accidents have occurred when smoke bombs or other smoke-generating devices that produce a toxic atmosphere have been used for training exercises.

A.7.2.6 See A.5.3.4.

A.7.2.9 See A.6.2.5.

A.7.2.10 See A.6.2.9.

A.7.3 See Annex D.

A.7.3.1 See A.6.3.7.

A.7.3.2 See A.6.3.8.

A.7.3.4 See A.6.3.4.

A.7.3.5 See A.6.3.5.

A.7.3.6 See A.6.3.6.

A.7.3.7 Site-specific tools and equipment can include ropes, hand lights, power tools, hand tools, power plants, portable lighting equipment, hose and hose accessories, salvage and overhaul tools and equipment, and special-purpose equipment such as special agent appliances.

A.7.3.9 Personnel accountability systems vary from site to site and should be incorporated into the site incident management system/SOPs. This system should include the interface between the site personnel and the outside mutual aid person-

nel, recognizing that the personnel accountability system for the site can be different from the system of the outside mutual aid organization.

A.7.3.11 See A.6.3.9.

A.8.2.2(A) Size-up includes the many variables that the industrial fire brigade leader collects from the time of the alarm, during response, and upon arrival, in order to develop an initial action plan to control an emergency incident. These observations can include structural type and occupancy, fire involvement, number of occupants, materials spilled or involved in fire, wind direction, topography, and other observations relevant to the incident.

A.8.2.3 An incident safety officer should be included as part of the incident management system as a command staff member, as specified in NFPA 1561, *Standard on Emergency Services Incident Management System*. The incident commander should appoint an incident safety officer for most events. If an incident safety officer is not appointed, the incident commander also functions as the incident safety officer. Personnel accountability systems vary and should be incorporated into the site incident management system/SOPs. This system should include the interface between the site personnel and the outside mutual aid personnel, recognizing that the personnel accountability system for the site can be different from that of the outside mutual aid. The industrial fire brigade leader can assign additional RICs based on the size and complexity of the incident scene.

A.8.2.3(B) This requirement takes into consideration the industrial fire brigade leader's ability to give orders, direct personnel, evaluate information, and allocate resources to respond to the wide variety of emergency situations the industrial fire brigade encounters.

A.8.2.4 One of the industrial fire brigade leader's primary responsibilities is safety during industrial fire brigade activities. This standard defines the minimum requirements for the industrial fire brigade leader. Applicable OSHA regulations define additional requirements for those who could be assigned those duties.

A.9.1.5 Generally, industrial fire brigade members' duties do not require them to meet any special medical or job-related performance requirements to perform their duties.

Annex B Industrial Fire Brigade Support Member

This annex is not a part of the requirements of this NFPA document but is included for informational purposes only.

B.1 General Considerations. When organizing an industrial fire brigade, management should take into consideration the need for specialized duties required in the event of a fire or related emergency. Personnel resources should be assigned to support the industrial fire brigade to ensure that these duties are accomplished. These personnel are not industrial fire brigade members but are personnel who perform specific duties to assist the operations of the industrial fire brigade as part of the incident management system. Such actions performed in the cold zones do not require industrial fire brigade training but specific training on the function being performed. Support functions are those functions that are beyond the normal duties assigned to employees as part of the facility emergency action plan.



B.2 Support Area Needs. Support personnel are not expected to perform manual fire suppression activities in the event of an emergency but are expected to perform only those specialized tasks for which they have been chosen. Some of these specialized assignments include the systems and functions in B.2.1 through B.2.9.

B.2.1 Building Evacuation. Support personnel are expected to perform specialized duties to ensure that personnel are safely evacuated from an enclosed structure or the facility in the event of fire. They are known as fire wardens or by a variety of other titles.

B.2.2 Sprinkler System Control. Support personnel are assigned to perform specialized duties to ensure that control of the automatic sprinkler protection system within the fire area or the facility is maintained in the event of fire. They are known as sprinkler valve operators or by a variety of other titles.

B.2.3 Electrical Power Control. Support personnel are expected to perform specialized duties to ensure the control of electrical power within the fire area or the facility in the event of fire. They are known as electricians or by a variety of other titles.

B.2.4 Utility Control. Support personnel are expected to perform specialized duties to ensure the control of plant utilities (e.g., heating, ventilation, and air conditioning; steam, water, LP-Gas or natural gas, and other liquid or vapor piping systems) within the fire area in the event of fire. They are known as utility control technicians or by a variety of other titles.

B.2.5 Process Control. Support personnel are expected to perform specialized duties to ensure the control of process equipment within the fire area or the facility in the event of a fire. They are known as process operators or by a variety of other titles.

B.2.6 Fire Pump Operation. Support personnel are expected to perform specialized duties to ensure that stationary fire pumps are placed into operation or are operating properly in the event of fire. They are known as fire pump operators or by a variety of other titles.

B.2.7 Salvage. Support personnel are expected to perform specialized duties to ensure that actions are taken during and after manual fire suppression activities to minimize the resultant damage from the fire. They are known as salvage personnel or by a variety of other titles.

B.2.8 Traffic Control. Support personnel are expected to perform specialized duties to ensure that control of foot and vehicular traffic in and around the fire area or the facility is maintained in the event of fire and to ensure that any responding agency is directed to the fire area. Facility security or other personnel who have been assigned to assist the fire brigade can accomplish these operations.

B.2.9 Escort. Support personnel are expected to escort industrial fire brigade members or other emergency responders to the area of a fire without entering into the warm or hot zones.

Annex C Job Performance Requirements

This annex is not a part of the requirements of this NFPA document but is included for informational purposes only.

C.1 Explanation of the Standard and Concepts of Job Performance Requirements (JPRs). The primary benefit of establishing national professional qualification standards is to provide both public and private sectors with a framework of the job re-

quirements for the fire service. Other benefits include enhancement of the profession, individual as well as organizational growth and development, and standardization of practices.

NFPA professional qualification standards identify the minimum JPRs for specific fire service positions. The standards can be used for training design and evaluation, certification, measuring and critiquing on-the-job performance, defining hiring practices, and setting organizational policies, procedures, and goals. (Other applications are encouraged.)

Professional qualification standards for a specific job are organized by major areas of responsibility defined as duties. For example, the fire fighter's duties might include fire suppression, rescue, and water supply; and the public fire educator's duties might include education, planning and development, and administration. Duties are major functional areas of responsibility within a job.

The professional qualification standards are written as JPRs. JPRs describe the performance required for a specific job. JPRs are grouped according to the duties of a job. The complete list of JPRs for each duty defines what an individual must be able to do in order to successfully perform that duty. Together, the duties and their JPRs define the job parameters; that is, the standard as a whole is a description of a job.

C.2 Breaking Down the Components of a JPR. The JPR is the assembly of three critical components. (See Table C.2.) These components are as follows:

- (1) Task that is to be performed
- (2) Tools, equipment, or materials that must be provided to successfully complete the task
- (3) Evaluation parameters and/or performance outcomes

C.2.1 The Task to Be Performed. The first component is a concise, brief statement of what the person is supposed to do.

C.2.2 Tools, Equipment, or Materials that Must Be Provided to Successfully Complete the Task. This component ensures that all individuals completing the task are given the same minimal tools, equipment, or materials when being evaluated. By listing these items, the performer and evaluator know what must be provided in order to complete the task.

C.2.3 Evaluation Parameters and/or Performance Outcomes. This component defines how well one must perform each task for both the performer and the evaluator. The JPRs

Table C.2 Example of a JPR

Component	Example
(1) Task	(1) Ventilate a pitched roof
(2) Tools, equipment, or materials	(2) Given an ax, a pike pole, an extension ladder, and a roof ladder
(3) Evaluation parameters and performance outcomes	(3) So that a 1.22 m x 1.22 m (4 ft x 4 ft) hole is created; all ventilation barriers are removed; ladders are properly positioned for ventilation; ventilation holes are correctly placed; and smoke, heat, and combustion by-products are released from the structure



guide performance toward successful completion by identifying evaluation parameters and/or performance outcomes. This portion of the JPRs promotes consistency in evaluation by reducing the variables used to gauge performance.

C.2.4 In addition to these three components, the JPRs contain prerequisite knowledge and skills. Just as the term *prerequisite* suggests, these are the necessary knowledge and skills one must have prior to being able to perform the task. Prerequisite knowledge and skills are the foundation for task performance.

Once the components and prerequisites are put together, the job performance requirements might read as follows.

C.2.4.1 Example 1. The Fire Fighter I shall ventilate a pitched roof, given an ax, a pike pole, an extension ladder, and a roof ladder, so that a 1.22 m × 1.22 m (4 ft × 4 ft) hole is created, all ventilation barriers are removed, ladders are properly positioned for ventilation, and ventilation holes are correctly placed.

(A) Prerequisite Knowledge. Pitched roof construction, safety considerations with roof ventilation, the dangers associated with improper ventilation, knowledge of ventilation tools, the effects of ventilation on fire growth, smoke movement in structures, signs of backdraft, and the knowledge of vertical and forced ventilation.

(B) Prerequisite Skills. The ability to remove roof covering; properly initiate roof cuts; use the pike pole to clear ventilation barriers; use the ax properly for sounding, cutting, and stripping; position ladders; and climb and position self on ladder.

C.2.4.2 Example 2. The fire investigator shall interpret burn patterns, given standard equipment and tools and some structural/content remains, so that each individual pattern is evaluated with respect to the burning characteristics of the material involved.

(A) Prerequisite Knowledge. Knowledge of fire development and the interrelationship of heat release rate, form, and ignitability of materials.

(B) Prerequisite Skill. The ability to interpret the effects of burning characteristics on different types of materials.

C.3 Examples of Potential Uses. JPRs can be used to establish the evaluation criteria for certification at a specific job level. When used for certification, evaluation must be based on the successful completion of JPRs.

First, the evaluator would verify the attainment of prerequisite knowledge and skills prior to JPRs evaluation. This might be through documentation review or testing.

Next, the candidate would be evaluated on completing the JPRs. The candidate would perform the task and be evaluated based on the evaluation parameters and/or performance outcomes. This performance-based evaluation can be either practical (for psychomotor skills such as “ventilate a roof”) or written (for cognitive skills such as “interpret burn patterns”).

Psychomotor skills are those physical skills that can be demonstrated or observed. Cognitive skills (or mental skills) cannot be observed but are rather evaluated on how one completes the task (process oriented) or the task outcome (product oriented).

Using Example 1, a practical performance-based evaluation would measure one’s ability to “ventilate a pitched roof.” The candidate passes this particular evaluation if the standard was met; that is, a 4 ft hole was created, all ventilation barriers were removed, ladders were properly positioned for ventilation, ventilation holes were correctly placed, and smoke, heat, and combustion by-products were released from the structure.

For Example 2, when evaluating the task “interpret burn patterns,” the candidate could be given a written assessment in the form of a scenario, photographs, and drawings, and then be asked to respond to specific written questions related to the JPR’s evaluation parameters.

Remember, when evaluating performance, you must give the person the tools, equipment, or materials listed in the job performance requirements; for example, an ax, a pike pole, an extension ladder, and a roof ladder, before he or she can be properly evaluated.

C.4 Curriculum Development/Training Design and Evaluation. The statements contained in this document that refer to job performance were designed and written as JPRs. While a resemblance to instructional objectives might be present, these statements should not be used in a teaching situation until after they have been modified for instructional use.

JPRs state the behaviors required to perform specific skill(s) on the job as opposed to a learning situation. These statements should be converted into instructional objectives with behaviors, conditions, and standards that can be measured within the teaching/learning environment. A JPR that requires a fire fighter to “ventilate a pitched roof” should be converted into a measurable instructional objective for use when teaching the skill. [See Figure C.4(a).]

Using Example 1, a terminal instructional objective might read as follows: The learner will ventilate a pitched roof, given a simulated roof, an ax, a pike pole, an extension ladder, and a roof ladder, so that 100 percent accuracy is attained on a skills checklist. (At a minimum, the skills checklist should include each of the measurement criteria from the JPRs.)

Figure C.4(b) is a sample checklist for use in evaluating this objective.

While the differences between job performance requirements and instructional objectives are subtle in appearance, the purpose of each statement differs greatly. JPRs state what is necessary to perform the job in the real world. Instructional objectives, however, are used to identify what students must do at the end of a training session and are stated in behavioral terms that are measurable in the training environment.

By converting JPRs into instructional objectives, instructors will be able to clarify performance expectations and avoid confusion related to using statements designed for purposes other than teaching. Additionally, instructors will be able to add local/state/regional elements of performance into the standards as intended by the developers.

Prerequisite skills and knowledge should be converted into enabling objectives. These help to define the course content. The course content would include each of the prerequisite knowledge and skills. Using the example in Figure C.4(b), the enabling objectives would be pitched roof construction, safety considerations with roof ventilation, removal of roof covering, properly initiated roof cuts, and so on. This ensures that the course content supports the terminal objective.

It is assumed that the reader is familiar with curriculum development or training design and evaluation.

C.5 Other Uses. While the professional qualifications standards are principally used to guide the development of training and certification programs, there are a number of other potential uses for the documents. Because the documents are written using terms specific to JPRs, they lend themselves well to any area of the profession where a level of performance or expertise must be determined. These areas might include the following described in C.5.1 through C.5.5.



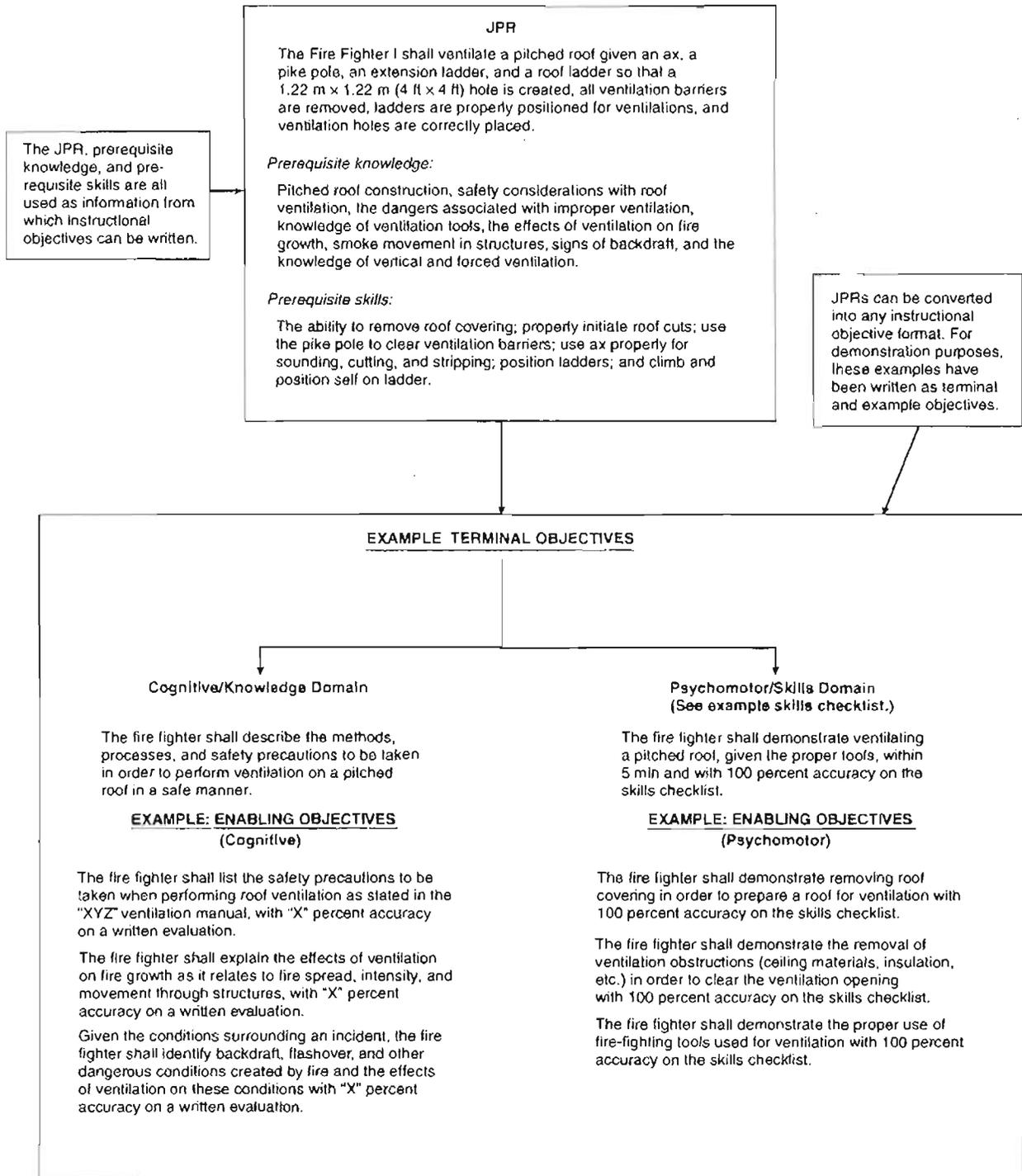


FIGURE C.4(a) Converting JPRs into Instructional Objectives.



OBJECTIVE: The fire fighter shall demonstrate ventilating a pitched roof, given the proper tools, within 5 min and with 100 percent accuracy on the skills checklist.		
YES	NO	
<input type="checkbox"/>	<input type="checkbox"/>	1. 1.22 m x 1.22 m (4 ft x 4 ft) hole was created.
<input type="checkbox"/>	<input type="checkbox"/>	2. All ventilation barriers were removed.
<input type="checkbox"/>	<input type="checkbox"/>	3. Ladders were properly positioned.
<input type="checkbox"/>	<input type="checkbox"/>	4. Ventilation holes were correctly placed (directly over fire, at highest point, and so forth).
<input type="checkbox"/>	<input type="checkbox"/>	5. Task completed within 5 min. (Time to complete task: _____)

FIGURE C.4(b) Skills Checklist.

C.5.1 Employee Evaluation/Performance Critiquing. The JPRs can be used as a guide by both the supervisor and the employee during an evaluation. The JPRs for a specific job define tasks that are essential to perform on the job as well as the evaluation criteria to measure when those tasks are completed.

C.5.2 Establishing Hiring Criteria. The professional qualifications standards can be used in a number of ways to further the establishment of hiring criteria. The authority having jurisdiction could simply require certification at a specific job level; for example, Fire Fighter I. The JPRs could also be used as the basis for pre-employment screening by establishing essential minimal tasks and the related evaluation criteria. An added benefit is that individuals interested in employment can work toward the minimal hiring criteria at local colleges.

C.5.3 Employee Development. The professional qualifications standards can be useful to both the employee and the employer in developing a plan for the individual's growth within the organization. The JPRs and the associated prerequisite knowledge and skills can be used as a guide to determine additional training and education required for the employee to master his or her job or profession.

C.5.4 Succession Planning. Succession planning or career pathing addresses the efficient placement of people into jobs in response to current needs and anticipated future needs. A career development path can be established for targeted individuals to prepare them for growth within the organization. The JPRs and prerequisite knowledge and skills could then be used to develop an educational path to aid in the individual's advancement within the organization or profession.

C.5.5 Establishing Organizational Policies, Procedures, and Goals. The JPRs can be incorporated into organizational policies, procedures, and goals where employee performance is addressed.

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Annex D Management Review of Site-Specific Job Requirement Process

This annex is not a part of the requirements of this NFPA document but is included for informational purposes only.

D.1 Management's Responsibility. Subsection 4.3.1 of this standard requires that the management of the industrial fire brigade define the site-specific requirements for each level of industrial fire brigade membership. The following are examples of a process that could be used to complete this required review.

D.2 Example 1. A small hospital in a rural community creates an in-house fire brigade to respond to fire until the local fire department can arrive. Each shift has four people from maintenance and security personnel who respond to the fire as a fire brigade. The problem is to determine what type of hazards the facility has and what type of fire brigade duties the management wants the fire brigade to perform.

D.2.1 A risk assessment of the fire hazards of the hospital was performed by the fire brigade leader, and the leader determined that an incipient industrial fire brigade would be the appropriate level of responder. The leader conducted a site-specific requirement review, which was incorporated into the hospital fire brigade organizational statement and manual as required by OSHA. The fire brigade leader, as the person in management who determines the site-specific requirements, selected the following JPRs for the brigade.



The assessment that was made was consistent with the guidance in NFPA 600, *Standard on Industrial Fire Brigades*. It determined what type of fire brigade would be used by the hospital: an incipient industrial fire brigade.

The following JPRs are required for the hospital fire brigade:

- (1) "Attack an incipient-stage fire" — The fire brigade is going to use fire extinguishers and fixed standpipe hose streams to attack incipient-stage fires. They call the local fire department immediately to handle all other fires and to assist with incipient-stage fires (*see 5.3.1*).
- (2) "Activate a fixed fire protection system" — The hospital has a wet pipe sprinkler system that the fire brigade supports (*see 5.3.2*).

The fire brigade leader determined that the following site-specific requirements are not needed for the hospital fire brigade:

- (1) "Utilize master stream appliances" — The hospital has no master stream appliances (*see 5.3.3*).
- (2) "Establish a water supply for fire-fighting operations" — The fire brigade is looking to the local fire department to provide this type of service to them (*see 5.3.4*).
- (3) "Perform a fire safety survey" — The security officers and the risk manager conduct this survey outside their duties as fire brigade members (*see 5.3.5*).

D.2.2 The apparatus operator training requirements were evaluated as required by 4.3.9. None of the fire brigade members complete an apparatus driver training program that meets the JPR outlined in NFPA 1002, *Standard for Fire Apparatus Driver/Operator Professional Qualifications*, since the facility does not have a fire apparatus.

D.2.3 The first aid and medical training review was conducted as required by Section 4.2, and the fire brigade leader determined that none of the fire brigade members need to be trained in CPR and basic first aid, since the hospital has medical personnel on site.

D.3 Example 2. A major oil refinery establishes an advanced exterior fire brigade that operates three foam engines. They are going to provide all fire suppression services except interior structural fire fighting. They receive mutual aid assistance from a local industry/government mutual aid group when the fire brigade requests it. The problem is to determine what type of hazards the facility has and what type of fire brigade duties the management wants the fire brigade to perform.

D.3.1 The full-time fire chief, as a member of management, in developing the fire brigade organizational statement, reviewed the site hazards and the site-specific requirements and included the assessment documentation as required in Section 6.3.

The assessment that was made was consistent with the guidance in NFPA 600, *Standard on Industrial Fire Brigades*. It determined what type of fire brigade would be used by the refinery: an advanced exterior industrial fire brigade.

The following JPRs are required for the oil refinery fire brigade:

- (1) "Gain access to facility locations" — This is a required site-specific requirement, since the advanced exterior fire brigade is expected to gain access to fenced storage yards, elevators, and similar areas in the refinery (*see 6.3.2*).
- (2) "Utilize master stream appliances" — This is a required site-specific requirement, since each foam engine carries

four 3785 L/min (1000 gpm) portable monitors for the brigade to use (*see 6.3.3*).

- (3) "Operating as a member of a team, extinguish an ignitable liquid fire" — This is a required site-specific requirement, since it is one of the main hazards that the fire brigade handles in a refinery (*see 6.3.4*).
- (4) "Operating as a member of a team, control a flammable gas fire" — This is a required site-specific requirement, since it is one of the main hazards that the fire brigade handles in a refinery (*see 6.3.5*).
- (5) "Operating as a member of a team, extinguish an exterior fire using special extinguishing agents other than foam" — This is a required site-specific requirement, since the fire brigade is trained in the use of 70 kg (150 lb) and 153 kg (300 lb) dry chemical units to extinguish pressure fires under special situations (*see 6.3.6*).
- (6) "Activate a fixed fire protection system" — This is a site-specific requirement, since the refinery has several fixed water and foam systems that the fire brigade members are expected to be able to operate (*see 6.3.8*).
- (7) "Operating as a member of a team, extinguish a Class C (electrical) fire" — This is a site-specific requirement, since the refinery has electrical switch gear and motors that the fire brigade is expected to be able to extinguish (*see 6.3.9*).
- (8) "Utilize tools and equipment assigned to the industrial fire brigade" — This is a site-specific requirement for all of the tools carried on the apparatus and used in the JPRs (*see 6.3.10*).

The fire chief also determined the following:

- (1) "Perform a fire safety survey" — This is not a site-specific requirement for the advanced exterior fire brigade because these activities are performed by the refinery's safety department and fire protection engineer (*see 6.3.1*).
- (2) "Interpret alarm conditions" — This is not a site-specific requirement for the fire brigade, since these activities are performed by the refinery instrument technicians (*see 6.3.7*).
- (3) "Set up and use portable ladders" — This is not a site-specific requirement for the fire brigade, since they have no ladders on their fire apparatus (*see 6.3.11*).

D.3.2 The apparatus operator training requirements were evaluated as required by 4.3.9.

All of the fire brigade members are apparatus operators and completed a training program that meets the JPRs outlined in NFPA 1002, *Standard for Fire Apparatus Driver/Operator Professional Qualifications*, that apply to the facility's conditions and apparatus.

D.3.3 The first aid and medical training review was conducted as required by Section 4.2, and the fire chief determined that all of the fire brigade members need to be trained in CPR and basic first aid.

D.4 Example 3. A 3700-employee automotive manufacturing plant with a full-time fire brigade in a major city has a large career fire department responding into the facility as mutual aid when needed. The facility has standpipes throughout and is fully sprinklered. The problem is to determine what type of hazards the facility has and what type of fire brigade duties the management wants the fire brigade to perform.

D.4.1 The full-time fire chief, as a member of management, in developing the fire brigade organizational statement, reviewed the site-specific requirements and included the assessment documentation as required in Section 7.3.

An assessment that was made was consistent with the guidance in NFPA 600, *Standard on Industrial Fire Brigades*. It determined what type of fire brigade would be used by the auto manufacturing facility: an incipient fire brigade with portions of the brigade to be trained as an interior structural industrial fire brigade.

The following JPRs will be required for the auto manufacturing incipient fire brigade members:

- (1) "Attack an incipient stage fire" — The fire brigade is going to use fire extinguishers and fixed standpipe hose streams (*see 5.3.1*).
- (2) "Activate a fixed fire protection system" — This is a site-specific requirement for the incipient fire brigade members, since the manufacturing plant has a wet pipe sprinkler system (*see 5.3.2*).
- (3) "Establish a water supply for fire-fighting operations" — This is a site-specific requirement for the incipient fire brigade members (*see 5.3.4*).

The fire chief determined that the following site-specific requirements are not needed for the incipient fire brigade:

- (1) "Utilize master stream appliances" — Since the plant has only portable master stream appliances that are used by the interior fire brigade (*see 5.3.3*).
- (2) "Perform a fire safety survey" — Since the security officers and the risk manager conduct these surveys outside their duties as fire brigade members (*see 5.3.5*).

The fire chief determined that the following site-specific requirements are needed for the interior fire brigade members:

- (1) "Interpret alarm conditions" — This is a site-specific interior fire brigade requirement, since the full-time fire brigade members also service the fire alarm system when a trouble alarm occurs and enters the building to investigate and reset alarm signaling systems (*see 7.3.1*).
- (2) "Activate a fixed fire protection system" — This is a site-specific requirement, since the interior fire brigade enters the building to activate specialized fire protection systems (*see 7.3.2*).
- (3) "Utilize master stream appliances" — This is a site-specific requirement, as the interior brigade uses 1892 L/min (500 gpm) ground monitors inside the buildings (*see 7.3.3*).
- (4) "Operating as a member of a team, extinguish an ignitable liquid fire" — This is a site-specific requirement, since the interior fire brigade enters the building to extinguish paint and paint solvents that can be ignited (*see 7.3.4*).
- (5) "Operating as a member of a team, control a flammable gas fire" — This is a site-specific requirement, since the interior fire brigade enters the building to extinguish flammable gas fires in the dryer areas (*see 7.3.5*).
- (6) "Operating as a member of a team, extinguish a fire using special extinguishing agents other than foam" — This is a site-specific requirement, since the interior fire brigade uses Class D agents to extinguish special engine alloy material that can be on fire in the machine shop (*see 7.3.6*).
- (7) "Utilize tools and equipment assigned to the industrial fire brigade" — This is a site-specific requirement for the tools that the interior fire brigade has to use (*see 7.3.7*).
- (8) "Interface with outside mutual aid organizations" — This is a site-specific requirement, since the interior fire brigade can work with the outside fire department during mutual aid operations (*see 7.3.9*).
- (9) "Perform a fire safety survey in a facility" — This is a site-specific requirement for the interior fire brigade (*see 7.3.10*).

The fire chief also determined that 7.3.8 is not a site-specific requirement: "Set up and use portable ladders" — This is not a site-specific requirement for the brigade, since they have no ladders on their fire apparatus (*see 7.3.8*).

D.4.2 The apparatus operator training requirements were evaluated as required by 4.3.9.

The facility has one minipumper with 1136 L (300 gal) of water and a pick-up truck with 757 L (200 gal) of water. In addition, they have several scooter-type quick-response vehicles for inside building use. All of the fire apparatus operators need to complete a training program that meets the JPRs outlined in NFPA 1002, *Standard for Fire Apparatus Driver/Operator Professional Qualifications*, that apply to the facility.

D.4.3 The first aid and medical training review was conducted as required by Section 4.2, and the fire chief determined that all of the fire brigade members need to be trained in CPR and First Responder Medical Training.

D.5 Example 4. This example illustrates the development of new JPRs to support a site-specific hazard or process. The paper manufacturing process is used as the example.

D.5.1 Site-Specific Requirements. The following JPRs are to be considered site-specific functions of interior structural fire brigade members assigned the responsibility of fighting fires involving paper machines. The management of the industrial fire brigade determines the requirements that are applicable to the interior structural fire brigade member operating on their site. The process used to determine the site-specific requirements needs to be documented, and the JPRs identified are added to those identified by this standard.

D.5.2 Operating as a team and given a water source, an attack line, personal protective equipment, and an assignment, attack a paper machine fire so that team integrity is maintained, the attack line is deployed for advancement, access is gained to the fire area, the fire is approached safely, attack techniques are appropriate for the given level of fire, hidden fires are located and controlled, correct body posture is maintained, hazards are avoided or managed, and the fire is brought under control.

(A) **Requisite Knowledge.** The basic function and design characteristics of site-specific paper machines; the dangers associated with fighting fires in close proximity to paper machines to include nip points on the machine; fire-fighting tactics relating to pressure vessels (dryers); the hazards of steam, lube/hydraulic oil, and paper dust in the machine area; an understanding of when (and when not) to shut down a paper machine during fire attack operations; an understanding of emergency shutdown procedures for the machine; an understanding of flame spread characteristics of materials in and around the paper machine roof and basement areas; and site-specific standard operating guidelines (SOGs) and local emergency procedures for fighting fires in and around site-specific paper machines.

(B) **Requisite Skills.** The ability to attack a fire on the paper machine while limiting or preventing fire spread to other areas of the machine or other exposures and while limiting thermal shock, which can create stresses in the dryer shell; check sprinkler control valves for the affected area; monitor fire pumps for operation; work with operators to apply a pre-developed written procedure for the orderly and controlled shutdown of the paper machine (to include shutting off steam or other sources of heat to the dryers, notifying personnel



responsible for the operation of boilers, shutting off ventilation fans in the exhaust system), use ventilation equipment as appropriate for fire and smoke control; protect roof and basement exposures; and extinguish remote fires.

D.6 Example 5. This example illustrates the development of requirements to support a major petrochemical industry association or industry mutual aid group that determines they have common expectations for their industrial fire brigades. They form a joint consortium with a local fire training program.

D.6.1 The leaders of the consortium, representing the management of the individual fire brigades, worked to establish a common fire brigade organizational statement, reviewed the respective site hazards and the site-specific requirements and included the following assessment documentation as required in Section 6.3.

The assessment that was made was consistent with the guidance in NFPA 600, *Standard on Industrial Fire Brigades*. It determined what type of fire brigade would be used by the members of the trade association or mutual aid group. It was decided that a common training and certification program would be presented at the local university fire training program, with the graduates being certified as advanced exterior and interior fire brigade members by the consortium.

The following JPRs are required for the oil refinery fire brigade:

- (1) "Gain access to facility locations" — This is a required site-specific requirement, since the advanced exterior fire brigade is expected to gain access to fenced storage yards, elevators, and similar areas in the refinery (see 6.3.2).
- (2) "Utilize master stream appliances" — This is a required site-specific requirement, since each of the mutual aid companies has at least one foam engine that carries one 3785 L/min (1000 gpm) portable monitor for the brigade to use (see 6.3.3).
- (3) "Extinguish an ignitable liquid fire" — This is a required site-specific requirement, since it is one of the main hazards that the fire brigade handles in a refinery (see 6.3.4).
- (4) "Control a flammable gas fire" — This is a required site-specific requirement, since it is one of the main hazards that the fire brigade handles in a refinery (see 6.3.5).
- (5) "Extinguish an exterior fire using special extinguishing agents other than foam" — This is a required site-specific requirement, since the fire brigade is trained in the use of 63 kg (150 lb) and 136 kg (300 lb) dry chemical units to extinguish pressure fires under special situations (see 6.3.6).
- (6) "Activate a fixed fire protection system" — This is a site-specific requirement, since the refinery has several fixed water and foam systems that the fire brigade members are expected to be able to operate (see 6.3.8).
- (7) "Extinguish a Class C (electrical) fire" — This is a site-specific requirement, since the refinery has electrical switch gear and motors that the fire brigade is expected to be able to extinguish (see 6.3.9).
- (8) "Utilize tools and equipment assigned to the industrial fire brigade" — This is a site-specific requirement for all of the tools carried on the apparatus and used in the JPRs (see 6.3.10).
- (9) "Interface with outside mutual aid organizations" — This is a common site-specific requirement, since the interior fire brigade can work with the outside fire department during mutual aid operations (see 7.3.9).

D.6.2 The apparatus operator training requirements were evaluated as required by 4.3.9. All of the fire brigade members

will not be apparatus operators and will not complete a training program that meets the JPRs outlined in NFPA 1002, *Standard for Fire Apparatus Driver/Operator Professional Qualifications*, that apply to the facility's conditions and apparatus.

D.6.3 The first aid and medical training review was conducted as required by Section 4.2, and the consortium determined that all of the fire brigade members need to be trained in CPR and basic first aid, but that they would bring this documentation to the consortium school from other training programs.

D.7 Example 6. This example details the development process for the development of industry-specific JPRs for a fictitious, medium-size facility, referred to here as the ABC Electric Generating Facility. The ABC Electric Generating Facility is a multi-unit electric generating facility. The facility employs approximately 200 employees. Four 12-hour production shifts, each with approximately 30 employees, provide coverage 24/7/365, with employees on a traditional work week. There is an automatic fire alarm system and multiple fire detection and suppression systems. The facility has an advanced exterior and interior structural industrial fire brigade.

D.7.1 In developing the site's industrial fire brigade organizational statement, management reviewed the site-specific requirements and included the following assessment documentation as required in Sections 6.3 and 7.3 (see Figure D.7.1).

- (1) Perform a fire safety survey of a facility, given an assignment, survey forms, and procedures, so that fire and life safety hazards are identified, recommendations for their correction made, and unresolved issues are referred to the proper authority (see 6.3.1).
- (2) Utilize master stream appliances, given an assignment, an extinguishing agent, and a master stream and supply hose, so that the appliance is set up correctly and the agent is applied as assigned (see 6.3.3).

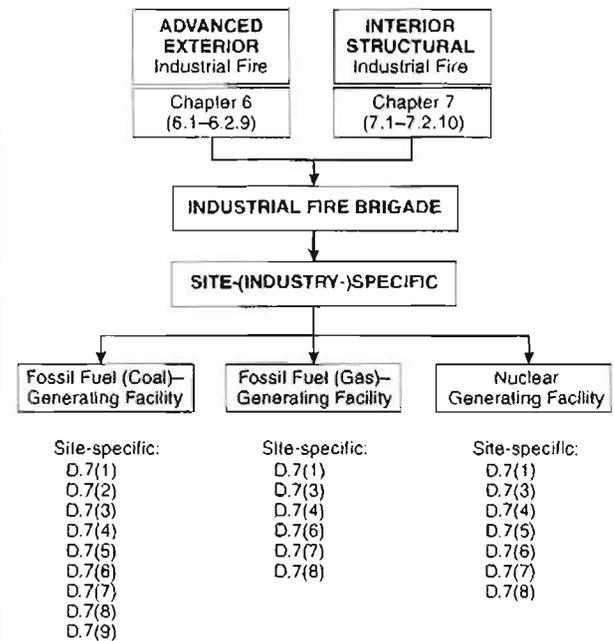


FIGURE D.7.1 Example of Site- (Industry) Specific JPRs.



- (3) Extinguish an ignitable liquid fire, operating as a member of a team, given an assignment, a handline, personal protective equipment, a foam proportioning device, a nozzle, foam concentrates, and a water supply, so that the correct type of foam concentrate is selected for the given fuel and conditions, a correctly proportioned foam stream is applied to the surface of the fuel to create and maintain a foam blanket, fire is extinguished, re-ignition is prevented, and team protection is maintained (see 6.3.4).
- (4) Control a flammable gas fire, operating as a member of a team, given an assignment, a handline, personal protective equipment, and tools, so that crew integrity is maintained, contents are identified, the flammable gas source is controlled or isolated, hazardous conditions are recognized and acted upon, and team safety is maintained (see 6.3.5).
- (5) Interpret alarm conditions, given an alarm signaling system, a procedure, and an assignment, so that the alarm condition is correctly interpreted and a response is initiated (see 6.3.7).
- (6) Activate a fixed fire protection system, given required personal protective equipment, a fixed fire protection system, a procedure, and an assignment, so that the correct steps are followed and the system operates (see 6.3.8).
- (7) Extinguish a fire involving Class C (electrical) equipment, operating as a member of a team, given an assignment, personal protective equipment, method to verify equipment has been de-energized or a Class C fire extinguishing agent, so that the equipment is verified de-energized or correct extinguishing agent is applied to the fuel, fire is extinguished, re-ignition is prevented, and team protection is maintained (see 6.3.9).
- (8) Interface with outside mutual aid organizations, given SOPs for mutual aid response and communication protocols, so that a unified command is established and maintained (see 7.3.9).
- (9) Extinguish a coal-related fire, operating as a member of a team, given an assignment, a handline, personal protective equipment, and a water supply, so that fire is extinguished and team protection is maintained (see 7.2.1 and 6.2.3).

Annex E Informational References

E.1 Referenced Publications. The documents or portions thereof listed in this annex are referenced within the informational sections of this standard, code and are not part of the requirements of this document unless also listed in Chapter 2 for other reasons.

- E.1.1 NFPA Publications.** National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02169-7471.
- NFPA 10, *Standard for Portable Fire Extinguishers*, 2010 edition.
 - NFPA 14, *Standard for the Installation of Standpipe and Hose Systems*, 2010 edition.
 - NFPA 472, *Standard for Competence of Responders to Hazardous Materials/Weapons of Mass Destruction Incidents*, 2008 edition.
 - NFPA 600, *Standard on Industrial Fire Brigades*, 2010 edition.
 - NFPA 1001, *Standard for Fire Fighter Professional Qualifications*, 2008 edition.
 - NFPA 1002, *Standard for Fire Apparatus Driver/Operator Professional Qualifications*, 2009 edition.
 - NFPA 1403, *Standard on Live Fire Training Evolutions*, 2007 edition.
 - NFPA 1404, *Standard for Fire Service Respiratory Protection Training*, 2006 edition.
 - NFPA 1407, *Standard for Training Fire Service Rapid Intervention Crews*, 2010 edition.

- NFPA 1500, *Standard on Fire Department Occupational Safety and Health Program*, 2007 edition.
- NFPA 1561, *Standard on Emergency Services Incident Management System*, 2008 edition.
- NFPA 1582, *Standard on Comprehensive Occupational Medical Program for Fire Departments*, 2007 edition.
- NFPA 1961, *Standard on Fire Hose*, 2007 edition.
- NFPA 1962, *Standard for the Inspection, Care, and Use of Fire Hose, Couplings, and Nozzles and the Service Testing of Fire Hose*, 2008 edition.

E.1.2 Other Publications.

E.1.2.1 U.S. Government Publications. U.S. Government Printing Office, Washington, DC 20402.

Title 29, Code of Federal Regulations, Part 1910.120, "Hazardous Waste and Emergency Response."

Title 29, Code of Federal Regulations, Part 1910.134, "Respiratory Protection Standard."

Title 29, Code of Federal Regulations, Part 1910.156, Subpart L, "Fire Brigades."

E.2 Informational References. The following documents or portions thereof are listed here as informational resources only. They are not a part of the requirements of this document.

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Springer, J. 1980. *Job Performance Standards and Measures*. A series of research presentations and discussions for the ASTD Second Annual Invitational Research Seminar, Savannah, GA (November 5-8, 1979). Madison, WI: American Society for Training and Development.

Tracey W. R. 1984. *Designing Training and Development Systems*. New York: AMACOM.

E.3 References for Extracts in Informational Sections. NFPA 600, *Standard on Industrial Fire Brigades*, 2010 edition.



Index

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Sequence of Events Leading to Issuance of an NFPA Committee Document

Step 1: Call for Proposals

- Proposed new Document or new edition of an existing Document is entered into one of two yearly revision cycles, and a Call for Proposals is published.

Step 2: Report on Proposals (ROP)

- Committee meets to act on Proposals, to develop its own Proposals, and to prepare its Report.
- Committee votes by written ballot on Proposals. If two-thirds approve, Report goes forward. Lacking two-thirds approval, Report returns to Committee.
- Report on Proposals (ROP) is published for public review and comment.

Step 3: Report on Comments (ROC)

- Committee meets to act on Public Comments to develop its own Comments, and to prepare its report.
- Committee votes by written ballot on Comments. If two-thirds approve, Report goes forward. Lacking two-thirds approval, Report returns to Committee.
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Step 4: Technical Report Session

- "Notices of intent to make a motion" are filed, are reviewed, and valid motions are certified for presentation at the Technical Report Session. ("Consent Documents" that have no certified motions bypass the Technical Report Session and proceed to the Standards Council for issuance.)
- NFPA membership meets each June at the Annual Meeting Technical Report Session and acts on Technical Committee Reports (ROP and ROC) for Documents with "certified amending motions."
- Committee(s) vote on any amendments to Report approved at NFPA Annual Membership Meeting.

Step 5: Standards Council Issuance

- Notification of intent to file an appeal to the Standards Council on Association action must be filed within 20 days of the NFPA Annual Membership Meeting.
- Standards Council decides, based on all evidence, whether or not to issue Document or to take other action, including hearing any appeals.

Committee Membership Classifications

The following classifications apply to Technical Committee members and represent their principal interest in the activity of the committee.

- M *Manufacturer:* A representative of a maker or marketer of a product, assembly, or system, or portion thereof, that is affected by the standard.
- U *User:* A representative of an entity that is subject to the provisions of the standard or that voluntarily uses the standard.
- I/M *Installer/Maintainer:* A representative of an entity that is in the business of installing or maintaining a product, assembly, or system affected by the standard.
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- E *Enforcing Authority:* A representative of an agency or an organization that promulgates and/or enforces standards.
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- C *Consumer:* A person who is, or represents, the ultimate purchaser of a product, system, or service affected by the standard, but who is not included in the *User* classification.
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NOTES:

1. "Standard" connotes code, standard, recommended practice, or guide.
2. A representative includes an employee.
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Revise definition of effective ground-fault current path to read:

3.3.78 Effective Ground-Fault Current Path. An intentionally constructed, permanent, low impedance electrically conductive path designed and intended to carry ~~underground electric fault current conditions~~ from the point of a ground fault on a wiring system to the electrical supply source.

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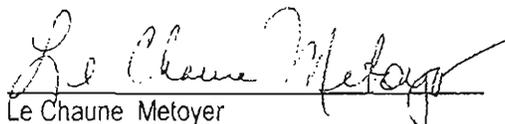
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Dated: April 3, 2013


Le Chaune Metoyer



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COMMISSION OF THE STATE OF CALIFORNIA
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**APPLICATION FOR CERTIFICATION FOR THE
HIDDEN HILLS SOLAR ELECTRIC
GENERATING SYSTEM**

Docket No. 11-AFC-02

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(Revised 3/25/13)**

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