NFPA 1003
Standard for Airport Fire Fighter Professional Qualifications

2000 Edition

National Fire Protection Association, 1 Batterymarch Park, PO Box 9101, Quincy, MA 02269-9101
An International Codes and Standards Organization

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This edition of NFPA 1003, *Standard for Airport Fire Fighter Professional Qualifications*, was prepared by the Technical Committee on Fire Fighter Professional Qualifications, released by the Technical Correlating Committee on Professional Qualifications, and acted on by the National Fire Protection Association, Inc., at its November Meeting held November 14–17, 1999, in New Orleans, LA. It was issued by the Standards Council on January 14, 2000, with an effective date of February 11, 2000, and supersedes all previous editions.

This edition of NFPA 1003 was approved as an American National Standard on February 11, 2000.

Origin and Development of NFPA 1003

In 1972, the Joint Council of National Fire Service Organizations (JCNFSO) created the National Professional Qualifications Board for the Fire Service (NPQB) to facilitate the development of nationally applicable performance standards for uniformed fire service personnel. On December 14, 1972, the Board established four technical committees to develop those standards using the National Fire Protection Association (NFPA) standards-making system. The initial committees addressed the following career areas: fire fighter, fire officer, fire service instructor, and fire inspector and investigator.

The Committee on Fire Fighter Professional Qualifications met regularly from 1976 to 1978 to produce the first edition of this document. Adopted by the Association in 1978, NFPA 1003 was the third in the series of fire fighter professional qualifications standards.

Subsequent to the adoption of the initial edition, the committee has met regularly to revise and update the standard. A revised edition was adopted and issued by the NFPA under the auspices of the NFPQB in 1987.

The original concept of the professional qualification standards, as directed by the JCNFSO and the NPQB, was to develop an interrelated set of performance standards specifically for the fire service. The various levels of achievement in the standards were to build upon each other within a strictly defined career ladder. In the late 1980s, revisions of the standards recognized that the documents should stand upon their own merit in terms of job performance requirements for a given field. Accordingly, the strict career ladder concept was abandoned, except for the progression from fire fighter to fire officer. The later revisions, therefore, facilitated the use of the documents by other than the uniformed fire services.

In 1990, responsibility for the appointment of professional qualifications committees and the development of the professional qualifications standards was assumed by the NFPA.

The Correlating Committee for Professional Qualifications Standards was appointed by the NFPA Standards Council in 1990 and assumed the responsibility for coordinating the requirements of all of the professional qualifications documents.

The intent of the technical committee was to develop clear and concise job performance requirements that can be used to determine that an individual, when measured to the standard, possesses the skills and knowledge to perform as an airport fire fighter. The committee further contends that these job performance requirements can be used in any fire department in any city, town, or private organization throughout North America.

The Technical Committee would like to thank the members of the Airport Fire Fighter Task Group who provided them with valuable time and expertise in the development of this document. These individuals are Hugh Pike, Chair; Collin DeWitt; George Hall; Paul Robinson; and Wayne Sibley.

Changes in the standard for this edition include the requirement that for certification as an airport fire fighter, the candidate meet the requirements for Fire Fighter II defined in NFPA 1001, *Standard for Fire Fighter Professional Qualifications*.

Technical Correlating Committee on Professional Qualifications (PQU-AAC)

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Frank Florence, NFPA Staff Liaison

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.

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.

Technical Committee on Fire Fighter Professional Qualifications (PQU-FFQ)

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Committee Scope: This Committee shall have primary responsibility for documents on professional competence required of fire fighters.

Contents

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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 Appendix A.

Information on referenced publications can be found in Chapter 4 and Appendix D.

Chapter 1 Administration

1-1 Scope. This standard identifies the minimum job performance requirements for the airport fire fighter responsible for aircraft rescue and fire fighting.

1-2 Purpose. The purpose of this standard is to specify the minimum job performance requirements for service as an airport fire fighter. It is not the intent of this standard to restrict any jurisdiction from exceeding these minimum requirements.

1-3 General.

1-3.1* For certification as an airport fire fighter, the candidate shall meet the requirements for Fire Fighter II defined in NFPA 1001, *Standard for Fire Fighter Professional Qualifications;* first responder operational level defined in Chapter 3 of NFPA 472, *Standard for Professional Competence of Responders to Hazardous Materials Incidents;* and the requirements for airport fire fighter defined in this standard.

1-3.2 Candidates shall safely complete job performance requirements in accordance with recognized practices and procedures. Candidates also shall meet all applicable occupational safety and health requirements of the jurisdiction.

1-3.3 Job performance requirements defined by this standard shall be evaluated by individuals approved by the authority having jurisdiction. Evaluators shall be individuals who were not involved as instructors for the requirement being evaluated.

1-3.4 Job performance requirements need not be mastered in the order in which they appear. The local, state/provincial, or federal training program shall establish the instructional priority and the training program content to prepare individuals to meet the job performance requirements of this standard.

1-3.5 Job performance requirements involving exposure to products of combustion outside of the aircraft rescue and fire-fighting (ARFF) vehicle shall be performed in full protective clothing.

1-4* Definitions.

1-4.1 Aircraft Accident. An occurrence associated with the operation of an aircraft that takes place between the time any person boards the aircraft with the intention of flight and until all such persons have disembarked and in which any person suffers death or serious injury or in which the aircraft receives substantial damage.

1-4.2 Aircraft Incident. An occurrence, other than an accident, that is associated with the operation of an aircraft and affects or could affect continued safe operation if not corrected but does not result in serious injury to persons or substantial damage to aircraft.

1-4.3 Airport Fire Fighter. The Fire Fighter II who has demonstrated the skills and knowledge necessary to function as an integral member of an aircraft rescue and fire-fighting (ARFF) team as defined in Chapter 3.

1-4.4* Approved. Acceptable to the authority having jurisdiction.

1-4.5* Authority Having Jurisdiction. The organization, office, or individual responsible for approving equipment, materials, an installation, or a procedure.

1-4.6* Critical Rescue and Fire-Fighting Access Area. The rectangular area surrounding a runway within which most aircraft accidents can be expected to occur on airports.

1-4.7 Dangerous Goods. Articles or substances that are capable of posing a significant risk to health, safety, or property when transported by air and that are classified and outlined in the International Air Transport Association (IATA) *Dangerous Goods Manual/Regulations.*

1-4.8 Fire Department. An organization providing rescue, fire suppression, and related activities. The term *fire department* shall include any public, governmental, private, industrial, or military organization engaging in this type of activity.

1-4.9* Hazardous Area. For an aircraft, the area inside 75 ft (23 m) from any external surface of the aircraft.

1-4.10 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.

1-4.11* National Defense Area. An area established on nonfederal lands located in the United States, its territories, or its possessions for the purpose of safeguarding classified defense information or protecting Department of Defense (DOD) equipment, material, or both.

1-4.12 Practical Critical Fire Area (PCA). This area is two-thirds of the Theoretical Critical Fire Area (TCA). *(See also definition 1-4.19, Theoretical Critical Fire Area.)*

1-4.13 Proximity Personal Protective Equipment (PrPPE). For fire fighters, approved proximity protective clothing meeting NFPA 1976, *Standard on Protective Clothing for Proximity Fire Fighting;* self-contained breathing apparatus (SCBA) meeting NFPA 1981, *Standard on Open-Circuit Self-Contained Breathing Apparatus for the Fire Service;* and personal alert safety systems (PASS) meeting NFPA 1982, *Standard on Personal Alert Safety Systems (PASS).*

1-4.14 Requisite Knowledge. Fundamental knowledge one must have in order to perform a specific task.

1-4.15 Requisite Skills. The essential skills one must have in order to perform a specific task.

1-4.16 Shall. Indicates a mandatory requirement.

1-4.17 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, footnote, or fine-print note and are not to be considered a part of the requirements of a standard.

1-4.18 Task. A specific job behavior or activity.

1-4.19* Theoretical Critical Fire Area (TCA). A rectangle, the longitudinal dimension of which is the overall length of

the aircraft, and the width includes the fuselage and extends beyond it by a predetermined set distance that is dependent on the overall width.

1-4.20 Zone. One of the sections of an area created for a particular purpose.

1-4.20.1* Zone, Cold. The hazard-free area around an incident.

1-4.20.2* Zone, Hot. The control zone immediately surrounding a hazardous materials incident that extends far enough to prevent adverse effects from hazardous materials releases to personnel outside the zone.

1-4.20.3* Zone, Warm. The control zone at a hazardous materials incident site where personnel and equipment decontamination and hot zone support takes place.

1-5 Units. In this standard, values for measurement are followed by an equivalent in SI units, but only the first stated value shall be regarded as the requirement. Equivalent values in SI units shall not be considered as the requirement, as these values are approximate. Table 1-5 gives the conversion values for area measures.

Table 1-5 SI Conversions

Quantity	U.S. Unit/ Symbol	SI Unit/Symbol	Conversion Factor
Length	inch/in	millimeter/mm	1 in. = 25.4 mm
	foot/ft	meter/m	1 ft = 0.305 m
Area	sq foot/ft^2	sq meter/m^2	1 ft^2 = 0.0929 m^2

Chapter 2 Entrance Requirements

2-1 Entry Requirements. Prior to entering training to meet the requirements of Chapter 3, the candidate shall meet the following requirements:

(1) The minimum educational requirements established by the authority having jurisdiction
(2) The age requirements established by the authority having jurisdiction
(3) The medical requirements of NFPA 1582, *Standard on Medical Requirements for Fire Fighters*

2-2 Physical Fitness Requirements. Physical fitness requirements shall be developed and validated by the authority having jurisdiction. Physical fitness requirements shall be in compliance with applicable equal opportunity regulations and other legal requirements.

Chapter 3 Airport Fire Fighter

3-1 General.

3-1.1 For qualification as an airport fire fighter, the candidate shall meet each of the job performance requirements defined in this chapter. These requirements are divided into three major duties: response, fire suppression, and rescue. The primary function of the airport fire fighter shall be to execute fire suppression and rescue activities.

3-1.1.1* General Knowledge Requirements. Fundamental aircraft fire-fighting techniques, including the approach, positioning, initial attack, and selection, application, and management of the extinguishing agents; limitations of various sized hand lines; use of proximity protective personal equipment (PrPPE); fire behavior; fire-fighting techniques in oxygen-enriched atmospheres; reaction of aircraft materials to heat and flame; critical components and hazards of civil aircraft construction and systems related to ARFF operations; special hazards associated with military aircraft systems; a national defense area and limitations within that area; characteristics of different aircraft fuels; hazardous areas in and around aircraft; aircraft fueling systems (hydrant/vehicle); aircraft egress/ingress (hatches, doors, and evacuation chutes); hazards associated with aircraft cargo, including dangerous goods; hazardous areas, including entry control points, crash scene perimeters, and requirements for operations within the hot, warm, and cold zones; and critical stress management policies and procedures.

3-1.1.2 General Skills Requirements. Don PrPPE; operate hatches, doors, and evacuation chutes; approach, position, and initially attack an aircraft fire; select, apply, and manage extinguishing agents; shut down aircraft systems, including engine, electrical, hydraulic, and fuel systems; operate aircraft extinguishing systems, including cargo area extinguishing systems.

3-1.2 The job performance requirements of this chapter shall be accomplished in accordance with the requirements of the authority having jurisdiction and NFPA 1500, *Standard on Fire Department Occupational Safety and Health Program*.

3-2 Response. This duty involves the timely arrival at an incident or accident and the capability to perform fire suppression, rescue operations, or both. The duty also includes responding to hazardous conditions and performing standby operations.

3-2.1 Respond to day and night incidents or accidents on and adjacent to the airport, given an assignment, operating conditions, a location, a grid map, a vehicle, and a prescribed response time, so that the route selected and taken provides access to the site within the allotted time.

(a) *Requisite Knowledge:* Airport familiarization including runway and taxiway designations, frangible gate locations, airport markings, lights, instrument landing system (ILS) critical areas, critical rescue and fire-fighting access areas, designated isolation areas, vehicular traffic controls on airfield, bridge load limits, controlled access points, aircraft traffic patterns and taxi routes, fuel storage and distribution locations, airport and immediate local area topographic layout, drainage systems, water supplies, airport facilities.

(b) *Requisite Skills:* Read, interpret, and take correct action related to grid maps, water distribution maps, airport markings, and lights.

3-2.2 Communicate critical incident information regarding an incident or accident on or adjacent to an airport, given an assignment involving an incident or accident and an incident management system (IMS) protocol, so that the information provided is accurate and sufficient for the incident commander to initiate an attack plan.

(a) *Requisite Knowledge:* Incident management system protocol, the airport emergency plan, airport and aircraft familiarization, communications equipment and procedures.

(b) *Requisite Skills:* Operate communications systems effectively, communicate an accurate situation report, implement IMS protocol and airport emergency plan, recognize aircraft types.

3-2.3 Communicate with applicable air traffic control facilities, given a response destination on or adjacent to an airport and radio equipment, so that all required clearances are obtained.

(a) *Requisite Knowledge:* Communications equipment and frequencies, tower light signals, fire department and airport terminology.

(b) *Requisite Skills:* Operate communications equipment effectively.

3-2.4* Perform an airport standby operation, given an assignment, a hazardous condition, and the airport standby policies and procedures, so that unsafe conditions are detected and mitigated in accordance with the airport policies and procedures.

(a) *Requisite Knowledge:* Airport and aircraft policies and procedures for hazardous conditions.

(b) *Requisite Skills:* Recognize hazardous conditions and initiate corrective action.

3-3 Fire Suppression. This duty involves the attack, control, and extinguishment of fires involving aircraft, aircraft cargo, airport facilities, and other equipment related to airport operations and property conservation. The primary purpose of this duty is to protect lives and property.

3-3.1* Extinguish a 250-ft^2 (23.2-m^2) aircraft fuel spill fire, given PrPPE and a minimum of a 100-lb (45-kg) dry chemical fire extinguisher, so that the agent is applied using the proper technique and the fire is extinguished in 25 seconds.

(a) *Requisite Knowledge:* The fire behavior of aircraft fuels in pools, physical properties, characteristics of aircraft fuel.

(b) *Requisite Skills:* Operate dry chemical extinguishers equipped with a hose line, including removing and operating hose and applying agent.

3-3.2* Extinguish an aircraft fuel spill fire, given PrPPE, an assignment, an ARFF vehicle hand line flowing a minimum of 95 gpm (359 L/min) of AFFF extinguishing agent, and a fire sized to the AFFF gpm flow rate divided by 0.13 (gpm/0.13 = fire square footage) (L/min/0.492 = 0.304 m^2), so that the agent is applied using the proper techniques and the fire is extinguished in 90 seconds.

(a) *Requisite Knowledge:* The fire behavior of aircraft fuels in pools, physical properties and characteristics of aircraft fuel, agent application rates and densities.

(b) *Requisite Skills:* Operate fire streams and apply agent.

3-3.3* Extinguish an aircraft fuel spill fire, given PrPPE, an ARFF vehicle turret, and a fire sized to the AFFF flow rate of 0.13 gpm (0.492 L/min) divided by the square feet of fire area, so that the agent is applied using the proper technique and the fire is extinguished in 90 seconds.

(a) *Requisite Knowledge:* Operation of ARFF vehicle agent delivery systems, the fire behavior of aircraft fuels in pools, physical properties and characteristics of aircraft fuel, agent application rates and densities.

(b) *Requisite Skills:* Apply fire-fighting agents and streams using ARFF vehicle turrets.

3-3.4* Extinguish a three-dimensional aircraft fuel fire, given PrPPE, an assignment, and ARFF vehicle hand line(s) using primary and secondary agents, so that a dual agent attack is used, the agent is applied using the proper technique, the fire is extinguished, and the fuel source is secured.

(a) *Requisite Knowledge:* The fire behavior of aircraft fuels in three-dimensional and atomized states, physical properties and characteristics of aircraft fuel, agent application rates and densities, and methods of controlling fuel sources.

(b) *Requisite Skills:* Operate fire streams and apply agents, secure fuel sources.

3-3.5* Attack a fire on the interior of an aircraft while operating as a member of a team, given PrPPE, an assignment, an ARFF vehicle hand line, and appropriate agent, so that team integrity is maintained, the attack line is deployed for advancement, ladders are correctly placed when used, access is gained into the fire area, effective water application practices are used, the fire is approached, attack techniques facilitate suppression given the level of the 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:* Techniques for accessing the aircraft interior according to the aircraft type, methods for advancing hand lines from an ARFF vehicle, precautions to be followed when advancing hose lines to a fire, observable results that a fire stream has been applied, dangerous structural 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, the role of the backup team in fire attack situations, attack and control techniques, techniques for exposing hidden fires.

(b) *Requisite Skills:* Deploy ARFF hand line on an interior aircraft fire; gain access to aircraft interior; open, close, and adjust nozzle flow and patterns; apply agent using direct, indirect, and combination attacks; advance charged and uncharged hose lines up ladders and up and down interior and exterior stairways; locate and suppress interior fires.

3-3.6* Attack an engine or auxiliary power unit/emergency power unit (APU/EPU) fire on an aircraft while operating as a member of a team, given PrPPE, an assignment, ARFF vehicle hand line or turret, and appropriate agent, so that the fire is extinguished and the engine or APU/EPU is secured.

(a) *Requisite Knowledge:* Techniques for accessing the aircraft engines and APU/EPUs, methods for advancing hand line from an ARFF vehicle, methods for operating turrets, methods for securing engine and APU/EPU operation.

(b) *Requisite Skills:* Deploy and operate ARFF hand line, operate turrets, gain access to aircraft engine and APU/EPU, secure engine and APU.

3-3.7* Attack a wheel assembly fire, given PrPPE, an assignment, an ARFF vehicle hand line and appropriate agent, so that the fire is controlled.

(a) *Requisite Knowledge:* Agent selection criteria, special safety considerations, and the characteristics of combustible metals.

(b) *Requisite Skills:* Approach the fire in a safe and effective manner, select and apply agent.

3-3.8* Ventilate an aircraft through available doors and hatches while operating as a member of a team, given PrPPE, an assignment, tools, and mechanical ventilation devices, so that a sufficient opening is created, all ventilation barriers are removed, the heat and other products of combustion are released.

(a) *Requisite Knowledge:* Aircraft access points; principles, advantages, limitations, and effects of mechanical ventilation; the methods of heat transfer; the principles of thermal layering within an aircraft on fire; the techniques and safety precautions for venting aircraft.

(b) *Requisite Skills:* Operate doors, hatches, and forcible entry tools; operate mechanical ventilation devices.

3-3.9* Replenish extinguishing agents while operating as a member of a team, given an assignment, an ARFF vehicle, a fixed or mobile water source, a supply of agent, and supply lines and fittings, so that agents are available for application by the ARFF vehicle within the time established by the authority having jurisdiction (AHJ).

(a) *Requisite Knowledge:* Resupply procedures, operation procedures for ARFF vehicle replenishment.

(b) *Requisite Skills:* Connect hose lines, operate valves.

3-3.10 Preserve the aircraft accident scene, given an assignment, so that evidence is identified, protected, and reported.

(a) *Requisite Knowledge:* Airport emergency plan requirements for preservation of the scene.

(b) *Requisite Skills:* Preserve the scene for investigators.

3-3.11 Overhaul the accident scene, given PrPPE, an assignment, hand lines, and property conservation equipment, so that all fires are extinguished and all property is protected from further damage.

(a) *Requisite Knowledge:* Methods of complete extinguishment and prevention of re-ignition, purpose for conservation, operating procedures for property conservation equipment.

(b) *Requisite Skills:* Use property conservation equipment.

3-4* Rescue. This duty involves gaining access to an aircraft and assisting in the evacuation process, performing disentanglement, and initial triage.

3-4.1* Gain access into and out of an aircraft through normal entry points and emergency hatches and assist in the evacuation process while operating as a member of a team, given PrPPE and an assignment, so that passenger evacuation and rescue can be accomplished.

(a) *Requisite Knowledge:* Aircraft familiarization, including materials used in construction, aircraft terminology, automatic explosive devices, hazardous areas in and around aircraft, aircraft egress/ingress (hatches, doors, and evacuation chutes), military aircraft systems and associated hazards; capabilities and limitations of manual and power rescue tools and specialized high-reach devices.

(b) *Requisite Skills:* Operate power saws and cutting tools, hydraulic devices, pneumatic devices, and pulling devices; operate specialized ladders and high-reach devices.

3-4.2* Disentangle an entrapped victim from an aircraft, given PrPPE, an assignment, and rescue tools, so that the victim is freed from entrapment without undue further injury and hazards are managed.

(a) *Requisite Knowledge:* Capabilities and limitations of rescue tools.

(b) *Requisite Skills:* Operate rescue tools.

3-4.3 Implement initial triage of the victims of an aircraft accident, given PrPPE, an assignment, and the triage protocol of the airport, so that each victim is evaluated and correctly categorized according to protocol.

(a) *Requisite Knowledge:* Categories of triage according to the triage protocol of the airport, methods of assessment.

(b) *Requisite Skills:* Assess the critical factors of patient condition, label patient for triage category.

Chapter 4 Referenced Publications

4-1 The following documents or portions thereof are referenced within this standard as mandatory requirements and shall be considered part of the requirements of this standard. The edition indicated for each referenced mandatory document is the current edition as of the date of the NFPA issuance of this standard. Some of these mandatory documents might also be referenced in this standard for specific informational purposes and, therefore, are also listed in Appendix D.

4-1.1 NFPA Publications. National Fire Protection Association, 1 Batterymarch Park, P.O. Box 9101, Quincy, MA 02269-9101.

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

NFPA 1001, *Standard for Fire Fighter Professional Qualifications,* 1997 edition.

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

NFPA 1582, *Standard on Medical Requirements for Fire Fighters,* 1997 edition.

NFPA 1976, *Standard on Protective Clothing for Proximity Fire Fighting,* 1992 edition.

NFPA 1981, *Standard on Open-Circuit Self-Contained Breathing Apparatus for the Fire Service,* 1997 edition.

NFPA 1982, *Standard on Personal Alert Safety Systems (PASS),* 1998 edition.

4-1.2 IATA Publication. International Air Transport Association, IATA Building, 2000 Peel Street, Montreal, Canada H3A 2R4.

Dangerous Goods Manual/Regulations, 1996.

Appendix A Explanatory Material

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

A-1-3.1 Due to improvements in the design and construction of modern aircraft and the increased structural integrity that results, the potential exists for significant interior fires that cannot be extinguished using external aircraft fire-fighting tactics. Because extinguishing aircraft interior fires is an essential task of the airport fire fighter, the Fire Fighter II requirement in this document is primary. The basic fire-fighting skills and knowledge required for Fire Fighter II in NFPA 1001, *Standard for Fire Fighter Professional Qualifications*, are essential to the airport fire fighter.

The requirement for first responder at the operational level (in NFPA 472, *Standard for Professional Competence of Responders to Hazardous Materials Incidents*) was included in this standard because of the airport fire fighter's potential for frequent exposure to a wide variety of hazardous materials. The potential exposure frequency is significantly greater than anticipated for the Fire Fighter II.

A-1-4 Definitions of action verbs used in the job performance requirements in this document are based on the first definition of the word found in *Webster's Third New International Dictionary of the English Language.*

A-1-4.4 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-1-4.5 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-1-4.6 Critical Rescue and Fire-Fighting Access Area. Its width extends 500 ft (150 m) from each side of the runway centerline, and its length is 3300 ft (1000 m) beyond each runway threshold.

A-1-4.9 Hazardous Area. The hazardous area may be adjusted by the incident commander, based on site conditions and risk analysis.

A-1-4.11 National Defense Area. Establishment of a national defense area temporarily places such nonfederal lands under the effective control of the Department of Defense and results only from an emergency event. The senior DOD representative at the scene will define the boundary, mark it with a physical barrier, and post warning signs. The landlord's consent and cooperation will be obtained whenever possible; however, military necessity will dictate the final decision regarding location, shape, and size of the national defense area.

A-1-4.19 Theoretical Critical Fire Area (TCA). Therefore, the aircraft length multiplied by the calculated width equals the size of the TCA.

A-1-4.20.1 Zone, Cold. The purpose of the cold zone is to ensure that there is an easily recognized boundary for arriving fire fighters and support personnel to ensure that they do not impinge on the hazardous area, where SCBA and PrPPE are required. The secondary purpose of the cold zone is to allow a distance sufficient to allow for an initial hand line to reach the entrance of the aircraft interior.

A-1-4.20.2 Zone, Hot. The control zone immediately surrounding a hazardous materials incident, which extends far enough to prevent adverse effects from hazardous materials releases to personnel outside the zone. This zone is also referred to as the exclusion zone or the restricted zone in other documents.

A-1-4.20.3 Zone, Warm. It includes control points for the decontamination corridor, thus helping to reduce the spread of contamination. This zone is also referred to as the decontamination zone or limited access zone in other documents.

A-3-1.1.1 Airport fire fighters should possess a knowledge of military aircraft at those airports that accept military aircraft or at those airports that are co-located with a military installation with either separate or shared runways. This knowledge should include the following:

(a) Military cargo/passenger aircraft (C-5, C-9, C-17, C-21, C-141, C-130, C-9, C-135) are basically the same as civilian general aviation large-frame aircraft and present no additional hazards other than the cargo that might be carried on the aircraft.

NOTE: The AC-130 Gunship carries a variety of munitions that are fired from the left side of the aircraft.

(b) Military tanker aircraft (KC-10, KC-135, and KC-130) are basically the same as civilian versions except for the amount and location of fuel carried.

NOTE: Variants of the commercial 707 are also used by the military for command, control, and communications (AWACS, EC-135, etc.).

(c) Military fighter/attack aircraft (AV-8, A-10, F-14, F-15, F-16, F-18, F-22, and F-117) and bomber aircraft (B-1, B-2, B-52) present the highest risk to airport fire fighters. These aircraft are equipped with explosive devices and ejection systems, forward-firing weapons, and aft-firing flares and chaff of which the airport fire fighter should be aware.

(d) Military helicopter aircraft afford similar risks as those of A-3-1.1.1(c).

(e) USAF Technical Order 00-105E-9 contains specific information concerning aircraft rescue and fire-fighting procedures and should be consulted prior to any attempt to perform rescue operations if trained military specialists are not available for immediate assistance. Copies of TO 00-105E-9 in hard copy or CD-ROM may be requested from HQ AFCESA/CEXF. This document contains specific information concerning fire-fighting and rescue operations for aircraft in the military inventory. It specifically addresses the following:

(1) *Entry.* If the emergency controls are activated, an explosive charge will explosively separate the canopy from the aircraft.

(2) *Ejection Systems.* All fighter, bomber, and attack aircraft are equipped with ejection seats. Once access has been gained to the cockpit, caution is extremely important, because these ejection seats, when activated, are pro-

pelled out of the aircraft by an explosive charge. Airport fire fighters should not touch or activate any controls.

NOTE: If a canopy or hatch has been separated from an aircraft, the ejection seat is automatically armed. Extreme caution must be exercised in crew removal.

(3) *Extrication.* The aircrew member is secured to the seat by a series of straps, harnesses, and restraint belts. These restraints can be released by cutting, if the release procedure is unknown.
(4) *Ordnance.* Fighter and attack aircraft will have forward firing ordnance located in the forward part of the fuselage or wings.
(5) *Engine Shutdown.* Engine shutdown usually can be accomplished by pulling T-handles, as on a commercial jet.

The NFPA *Aircraft Familiarization Charts Manual*, which contains complete diagrams of 115 types of aircraft, detailing their physical characteristics, is also helpful.

A-3-2.4 Hazardous conditions include special fuels, fueling operations (grounding and bonding), welding operations, hazardous materials operations, corrosion control, fuel cell maintenance, and military operations.

A-3-3.1 Concerns with the environmental impact of traditional flammable liquid training fires have caused many facilities to convert to propane-fueled simulators. The intent of this requirement is a safe and proper extinguishment technique for pool fires involving aircraft fuels. The use of pressurized flammable gas or flammable liquid is acceptable for this simulation.

A-3-3.2 See A-3-3.1.

A-3-3.3 See A-3-3.1.

A-3-3.4 Three-dimensional or running fuel fires involve a fuel leak from an elevated or pressurized source. The fuel burns as it falls through the air, and, once on the ground, the burning fuel can pool or run across the ground surface. These fuel fires are extremely difficult to extinguish. They must be recognized and action must be taken to extinguish them early in the incident or accident for successful fire-fighting operations. Typically, these fires cannot be extinguished by smothering agents such as aqueous film-forming foam, because these agents cannot seal the surface and exclude oxygen. Such fires are more successfully extinguished by shutting off the fuel flow or by using agents, such as dry chemicals, that interfere with the chemical or chain reaction.

A-3-3.5 This requirement can be met by using a structural burn facility that is configured to simulate the interior layout and dimensions of an aircraft fuselage and that contains mannequins to simulate victims. The mock-up should include at least three metal seats and training dummies to simulate victims. It is intended that the size of the aircraft be the largest type that normally uses the airport and that the hand line be appropriate to the size of the aircraft. For information on training mockups, see Appendix B.

A-3-3.6 See Appendix B for information on training mock-ups.

A-3-3.7 See Appendix B for information on training mock-ups.

A-3-3.8 Training and evaluation of this task can be accomplished using actual aircraft or mock-ups and smoke-generation devices used for training.

A-3-3.9 The replenishment task is time critical. Evaluating the proficiency of potential ARFF personnel to replenish the extinguishing agents on an ARFF vehicle requires that the AHJ evaluate several factors related to its own airport emergency plan in order to establish a fair benchmark for personnel. The following factors influence this time constraint:

(1) Size of the ARFF vehicles' agent reservoirs
(2) Available replenishment methods and their agent flow capacities
(3) Proximity of replenishment means to the potential ARFF emergency locations in and around the airport

In making these evaluations, the AHJ must keep in mind that its overall objective is to assure an adequate agent flow at the scene during an emergency. The following is an example of determining the replenishment time variable:

If the typical ARFF vehicle on the airport runway holds 1500 gal (5677 L) of water and 150 gal (568 L) of AFFF, the replenishment means is a fixed water hydrant located at the midway point of the runways and with a flow capacity of 250 gpm (946 L/min), and the average time to drive from the approach and departure end of any runway to the midpoint is 2 minutes, then a reasonable time to replenish a vehicle and return it to operation from the end of the runway is 18 minutes. This allows 2 minutes to drive to the hydrant, 4 minutes to connect to the hydrant, 7 minutes to fill the water tank, 3 minutes to disconnect from the hydrant, and 2 minutes to drive back to the end of the runway.

This may be considered a reasonable amount of time to replenish the vehicle at this particular airport, if additional vehicles are available to continue support at the emergency scene, but it may be entirely too slow for an airport where this ARFF vehicle is the only vehicle available to support an aircraft scene. In this case the replenishment plan needs to be reevaluated and adjusted to reduce the time required.

A-3-4 One of the primary tasks of rescue operations is for the airport fire fighter to maintain a habitable environment around the fuselage and assist with aircraft evacuation by stabilizing slide chutes and assisting and controlling the evacuees.

A-3-4.1 Training and evaluation of this task can be accomplished using actual aircraft or mock-ups. See Appendix B.

A-3-4.2 Training and evaluation of this task can be accomplished using actual aircraft or mock-ups. See Appendix B.

Appendix B Aircraft Fire Suppression and Rescue Fire Training Mock-up

This appendix is not a part of the requirements of this NFPA document but is included for informational purposes only.

B-1 Pre-Incident Planning. Pre-incident planning directly affects a fire department's ability to provide quality resource protection. Fire fighters must be trained, competent, and certified to execute pre-incident plans. The live fire training program focuses on a fire fighter's ability to work as a team member during realistic and challenging training events.

B-2 Simulator Requirements. The following basic designs for an aircraft fire/rescue training simulator challenge fire fighters and result in increased protection for airports and airlines. Simulators can be constructed with low-cost materials that are usually available in maintenance yards or public works departments. Simulators can be equipped to use hydrocarbon fuels, such as Jet A, or clean-burning propane. *[See Figures B-2(a) through B-2(h).]*

(a) *Running Fuel Fire (see 3-3.4).* This requirement is met by allowing a continuous, small stream of aircraft fuel to flow from the engine simulator into a catch basin. The fuel is ignited, resulting in a fire at the lead source. The fuel burns as it falls through the air and ignites the surface fire in the catch basin. *[See Figure B-2(b).]*

(b) *Interior Aircraft Fire (see 3-3.5).* The fuselage and cabin section should be constructed of steel frames and heavy metal skin that will withstand heat and rapid cooldown. The simulator should be 30 ft to 40 ft (9 m to 12 m) in length to allow a realistic cabin fire-fighting exercise. The scenario includes burning Class A materials in the simulator to create the conditions expected with an interior aircraft fire. *[See Figures B-2(f) and B-2(g).]*

(c) *Auxiliary Power Unit (APU) Fire (see 3-3.6).* The APU fire is created by burning fuel within a 6-in. (15-cm) steel pipe, suspended from the wing. This addition is a reasonable simulation of both the intake and exhaust ports. *[See Figure B-2(b).]*

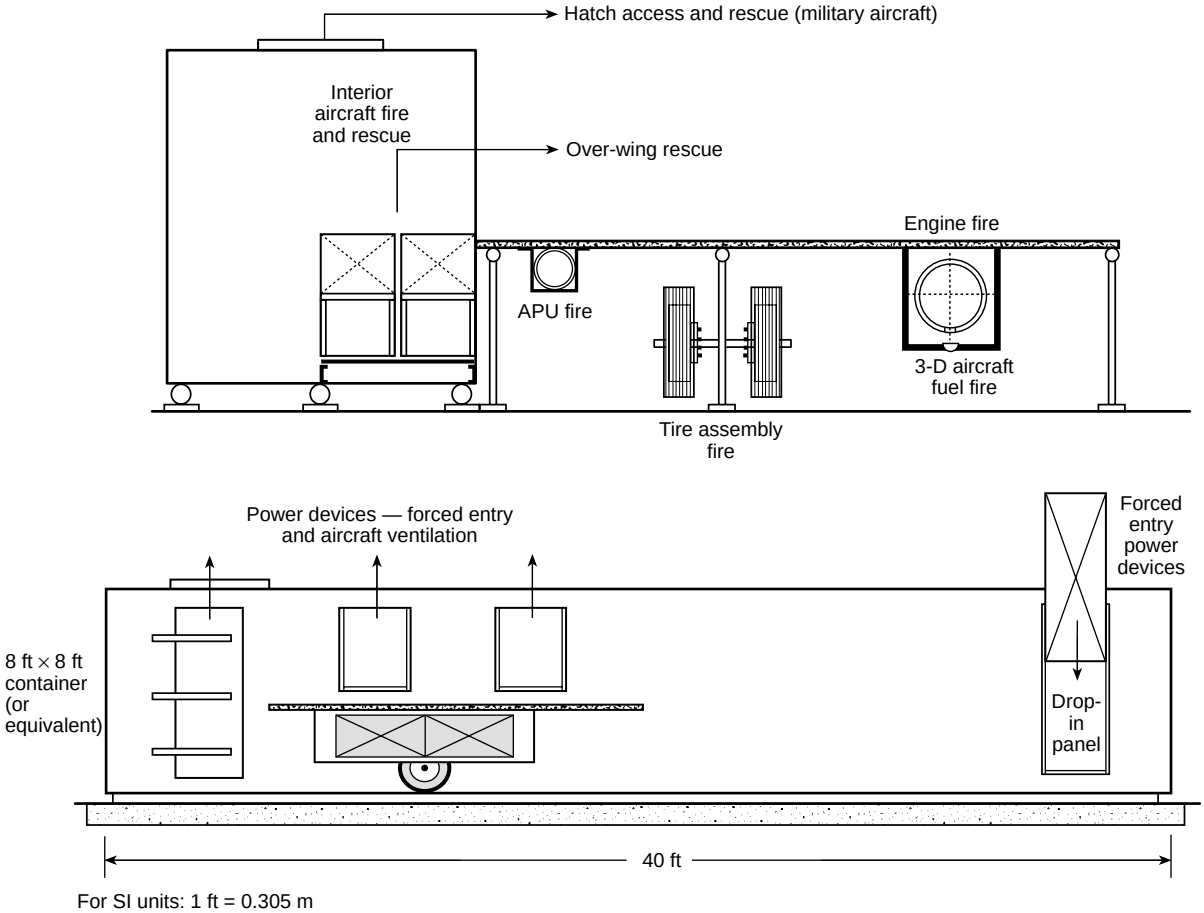
(d) *Wheel Assembly Fire (see 3-3.7).* Salvaged tire rims can be welded onto the number 2 wing support. Fuel can flow from above or through a pressurized device around the rims, or spray fuel on the rims to create a typical aircraft tire assembly fire. *[See Figures B-2(a) and B-2(g).]*

(e) *Ventilation of Doors and Hatches (see 3-3.8).* This design provides for both normal and emergency means of entry and egress. Normal entry is made through a hinged door, mounted forward of the wing. Emergency entrance is made through two over-wing openings and one aft door. All emergency openings are framed on the sides and bottom by angle iron. This allows for sections of corrugated metal to be dropped into place and removed after use. An additional hatch has been added to the top of the fuselage to simulate military aircraft and provide for vertical ventilation. *[See Figures B-2(d) and B-2(h).]*

(f) *Access through Normal and Emergency Hatches for Rescue (see 3-4.1).* Compliance with this requirement can be met by using the openings discussed in 3-3.8.

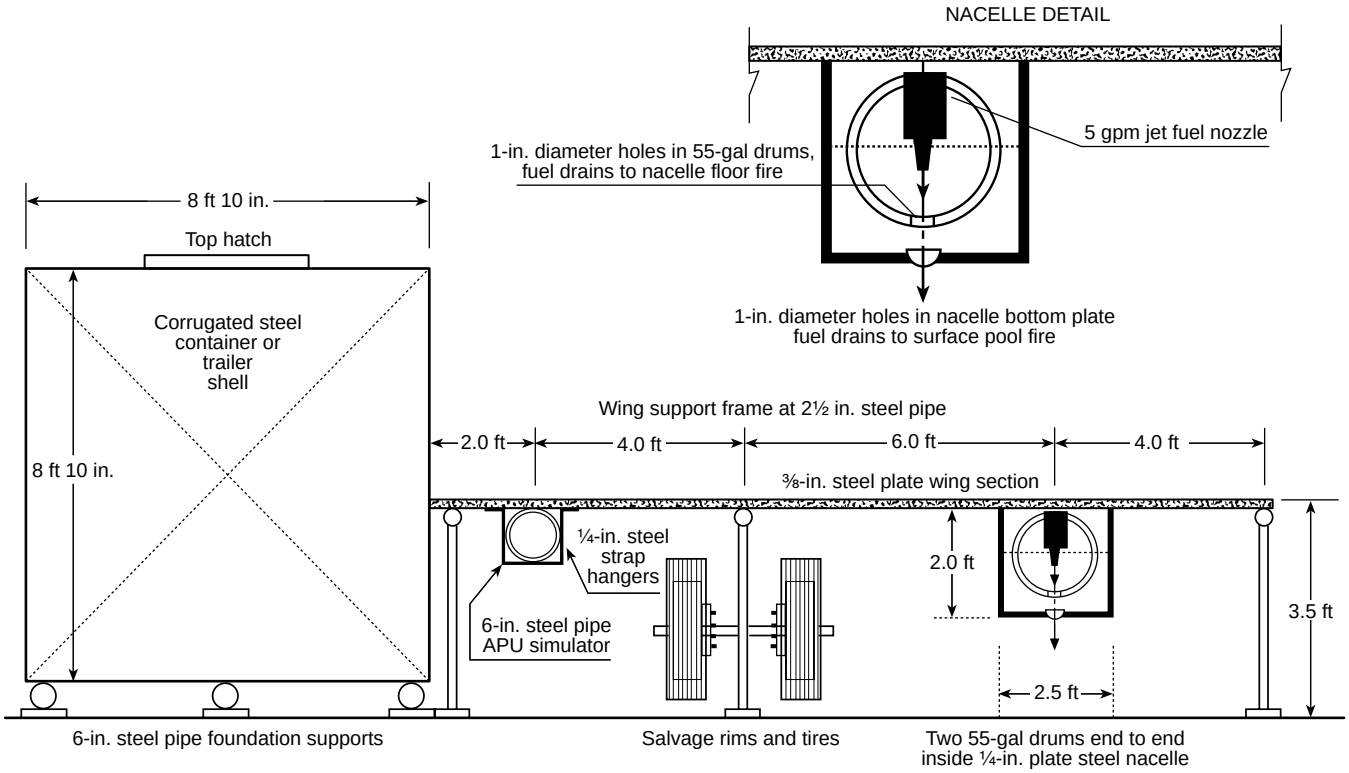
(g) *Passenger Extraction and Use of Rescue Equipment (see 3-4.2).* Access to simulated passengers is possible by using mechanical rescue equipment to force openings in the corrugated metal panels discussed in 3-3.8. These sections can be forced or cut with pneumatic cutting devices or power saws. These metal sections can be secured with pins to allow the realistic use of other hydraulic rescue equipment. *[See Figures B-2(e) and B-2(f).]*

FIGURE B-2(a) Aircraft fire suppression and rescue live fire training mock-up. (This mock-up was developed for the users' information by U.S. Air Force HQ AFCESA/DEF, Tyndall AFB, FL 32403.)



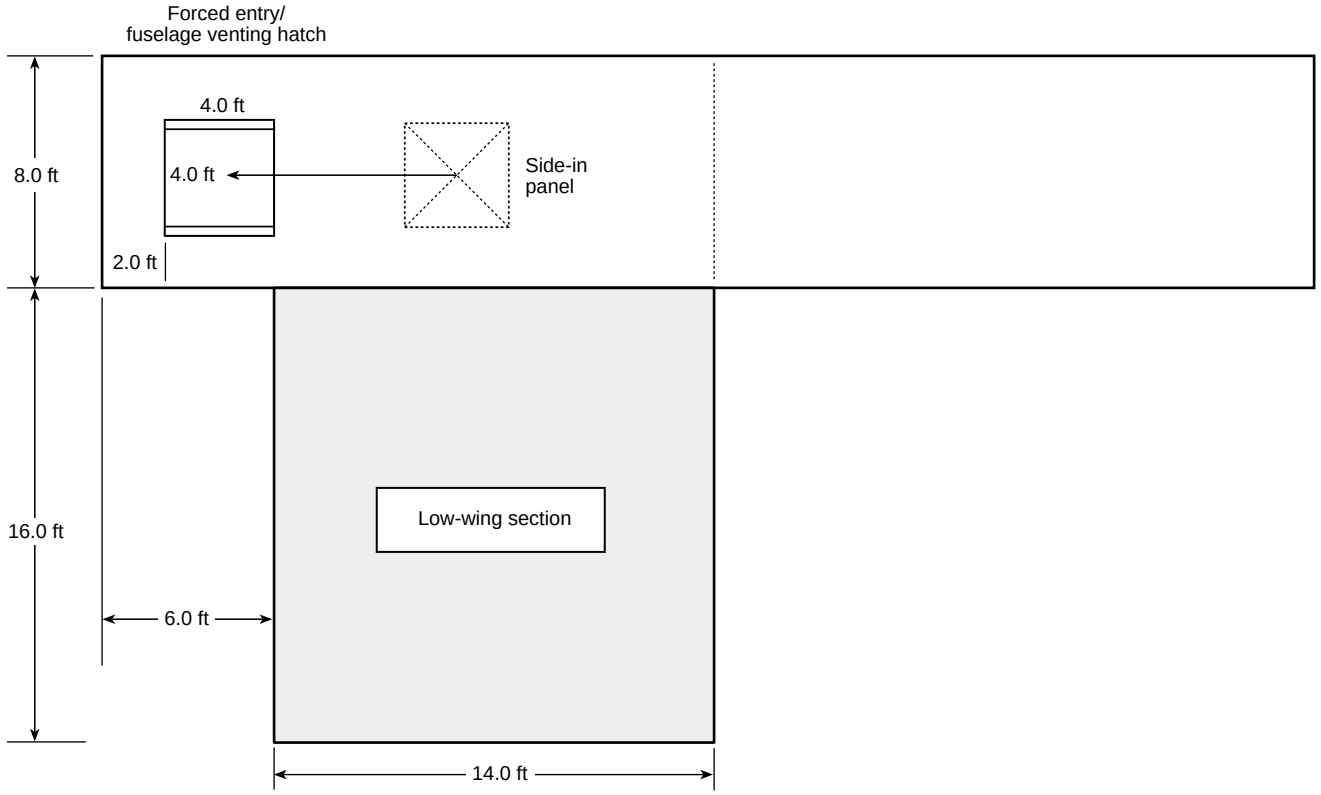
For SI units: 1 ft = 0.305 m

FIGURE B-2(b) Aircraft fire suppression and rescue live fire training mock-up (front view). This mock-up was developed for the users' information by U.S. Air Force HQ AFCESA/DEF, Tyndall AFB, FL 32403.)



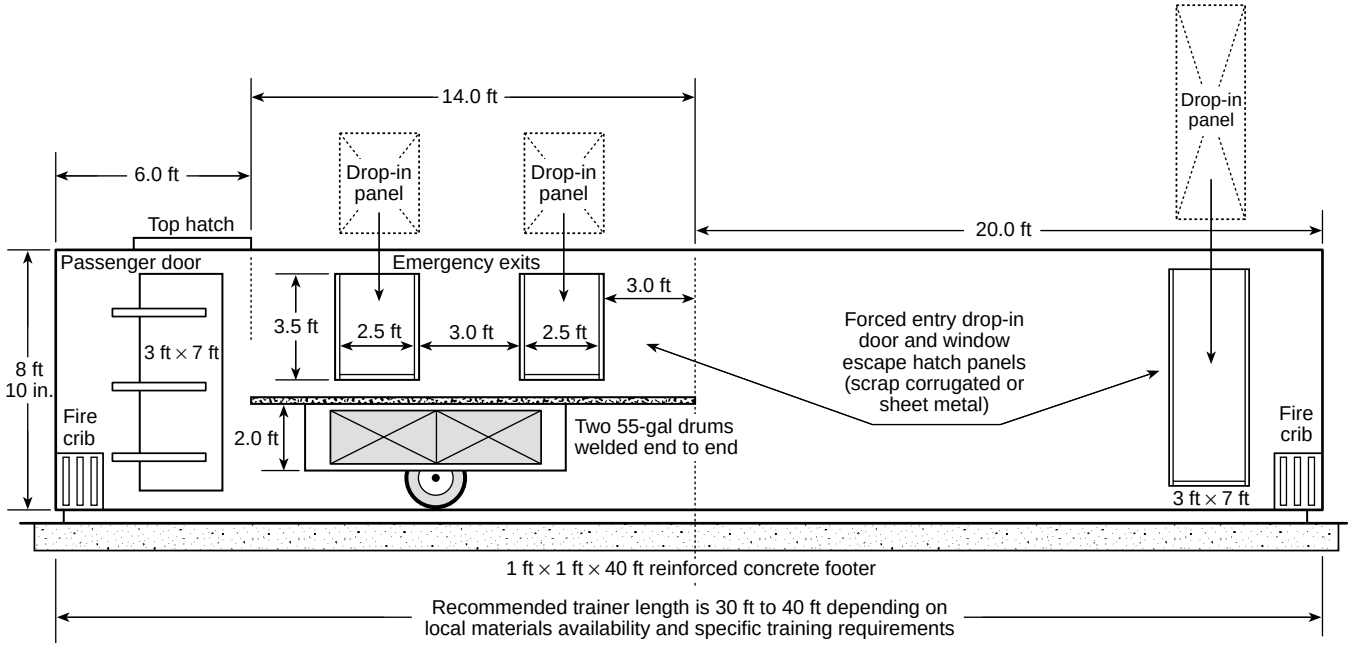
For SI units: 1 ft = 0.305 m;
1 in. = 25.4 mm; 1 gal = 3.79 L

FIGURE B-2(c) Aircraft fire suppression and rescue live fire training mock-up (top view). (This mock-up was developed for the users' information by U.S. Air Force HQ AFCESA/DEF, Tyndall AFB, FL 32403.)



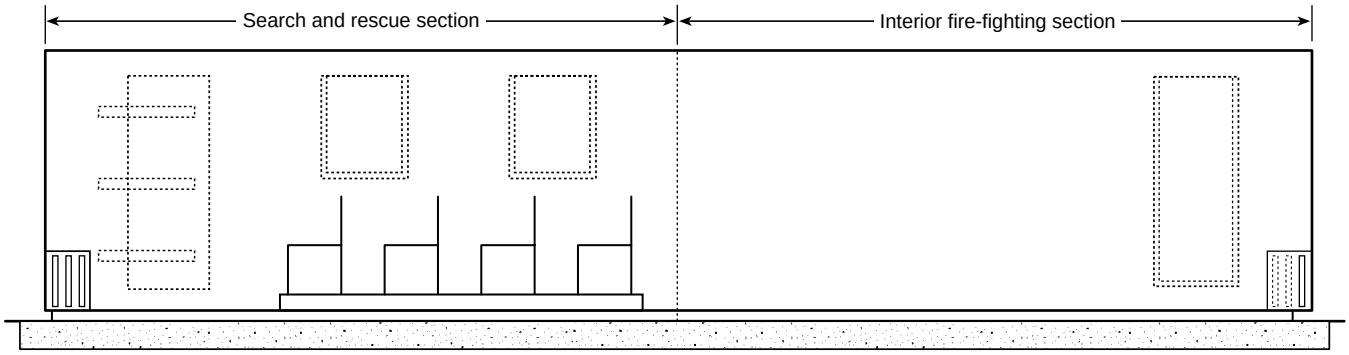
For SI units: 1 ft = 0.305 m

FIGURE B-2(d) Aircraft fire suppression and rescue live fire training mock-up (over-wing egress side view). (This mock-up was developed for the users' information by U.S. Air Force HQ AFCESA/DEF, Tyndall AFB, FL 32403.)



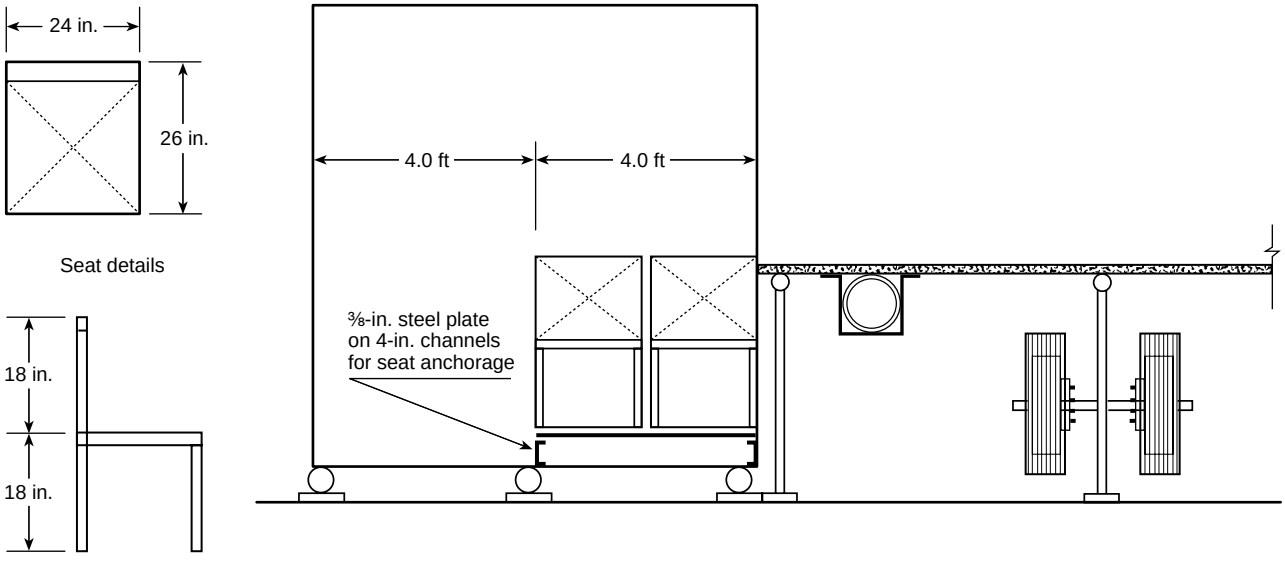
For SI units: 1 ft = 0.305 m; 1 in. = 25.4 mm

FIGURE B-2(e) Aircraft fire suppression and rescue live fire training mock-up (interior aircraft seat arrangement). (This mock-up was developed for the users' information by U.S. Air Force HQ AFCESA/DEF, Tyndall AFB, FL 32403.)



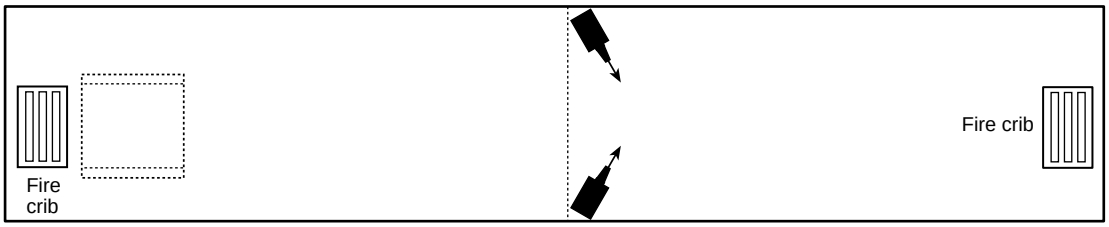
For SI units: 1 ft = 0.305 m

FIGURE B-2(f) Aircraft fire suppression and rescue live fire training mock-up (interior seating arrangement). (This mock-up was developed for the users' information by U.S. Air Force HQ AFCESA/DEF, Tyndall AFB, FL 32403.)

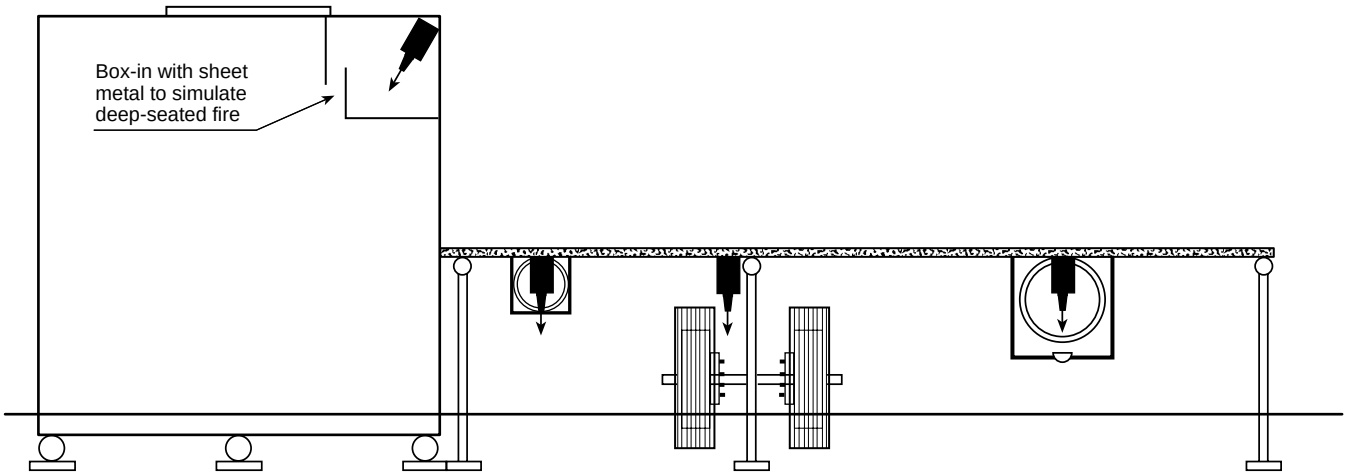


For SI units: 1 ft = 0.305 m; 1 in. = 25.4 mm

FIGURE B-2(g) Aircraft fire suppression and rescue live fire training mock-up [liquid propane or atomized jet fuel nozzle locations (no scale)]. (This mock-up was developed for the users' information by U.S. Air Force HQ AFCESA/DEF, Tyndall AFB, FL 32403.)

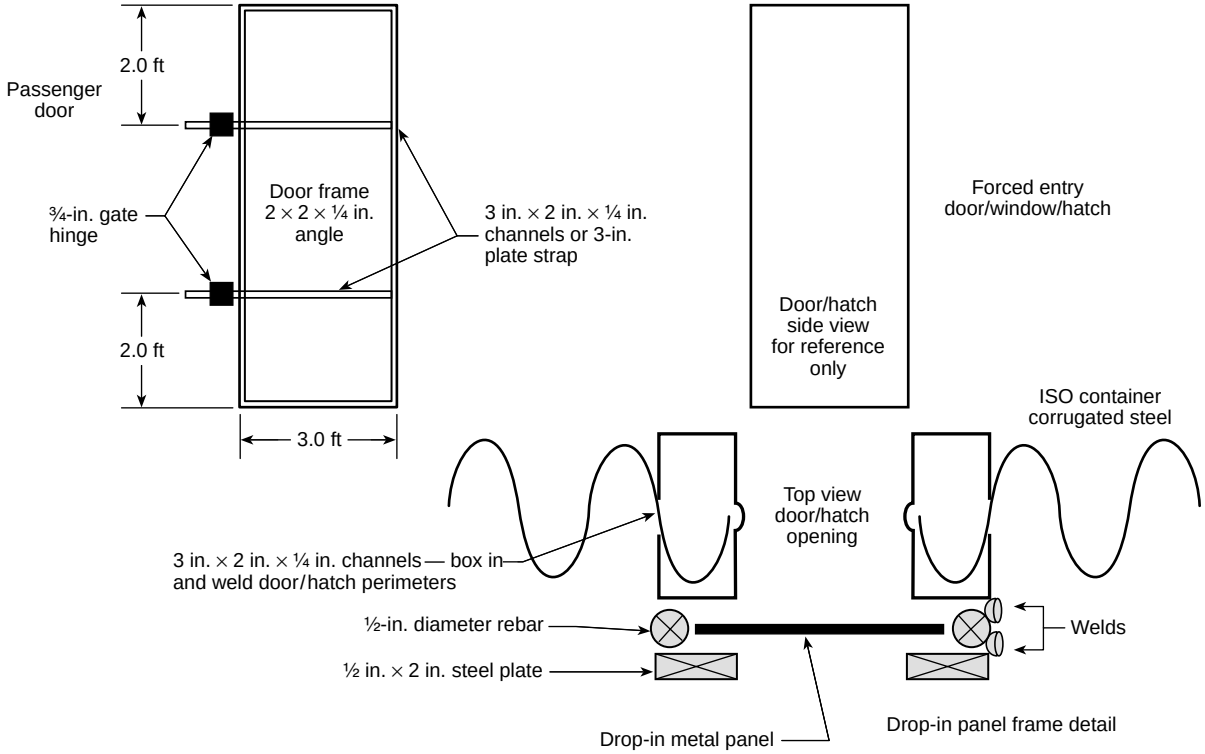


TOP VIEW



FRONT VIEW

FIGURE B-2(h) Aircraft fire suppression and rescue live fire training mock-up (door and forced entry hatch details). (This mock-up was developed for the users' information by U.S. Air Force HQ AFCESA/DEF, Tyndall AFB, FL 32403.)



For SI units: 1 ft = 0.305 m; 1 in. = 25.4 mm

Appendix C Using Job Performance Requirements

This appendix is not a part of the requirements of this NFPA document but is included for informational purposes only.

C-1 Explanation of the Standards and Concepts of Job Performance Requirements (JPRs). The primary benefit of establishing national professional qualification standards is to provide the public and private sectors with a framework of the job requirements 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 implementing training design and evaluation; certifying, 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 professional qualification standard as a whole is a job description.

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

Table C-2 Example of a JPR

(1) Task	Ventilate a pitched roof
(2) Tools, equipment, or materials	Given an ax, a pike pole, an extension ladder, and a roof ladder
(3) Evaluation parameters and performance outcomes	So that a 4 ft × 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