



Public Input No. 27-NFPA 1400-2023 [Chapter 1]

Chapter 1 Administration

GENERAL COMMENT: The scope and purpose statements written below, which are combinations from all of the previous 1400 series standards, are difficult to read. Recommend breaking them out so that they are not each a long, run-on sentence.

Recommend adding a statement indicating that merging the previous 1400 series standards into one 1400 Standard combines language that applies to facilities (from 1402) with language that applies to training operations (all of the other 1400 series standards), and that only Chapters 4 through 14 apply to facilities, with the remaining chapters applying to training operations.

1.1 Scope.

This standard addresses the minimum design, construction, and maintenance requirements for fire service training centers, fire training structures and props, gas-fueled and flammable liquid-fueled live fire training systems, mobile fire training props, and associated training props; the minimum requirements for training all fire suppression personnel engaged in firefighting operations under live fire conditions; minimum requirements for the training component of the respiratory protection programs; the basic training procedures for fire service personnel to conduct firefighter rapid intervention operations; minimum requirements for training fire service personnel to utilize fire service thermal imagers (TI); the context and minimum requirements for evaluating training for fire suppression and rescue procedures used by fire department personnel engaged in emergency scene operations; and the minimum requirements for a fire and emergency service organization (FESO) vehicle operations training programs.

1.2 Purpose.

The purpose of this standard is to establish consistent, minimum criteria for facilities, structures, and props that are used for conducting fire and rescue training classes and exercises; provide a process for conducting live fire training evolutions to ensure that training objectives are achieved and that exposure to health and safety hazards for the firefighters receiving the training is minimized; specify the minimum requirements for respiratory protection training for the emergency response organization, including safety procedures for those expected to be involved in fire suppression, rescue, and related activities in a toxic, contaminated, or oxygen-deficient atmosphere or environment; specify a training program that is designed to create a highly disciplined operational capability to rescue firefighter(s) who become lost, injured, trapped, incapacitated, or disoriented at an emergency scene or in the course of a training operation; specify a training program that is designed to create competency regarding the operation, application, use, and limitations of TI; provide the context and minimum requirements for evaluating training for fire suppression and rescue procedures used by fire department personnel engaged in emergency scene operations; establish a training standard designed to provide fire departments with an objective method of measuring performance for fire suppression and rescue procedures using available personnel and equipment; and specify the minimum requirements for a FESO vehicle operations training program, including procedures for those members that drive or occupy FESO vehicles, respond in private vehicles or unconventional means of transportation, and provide traffic control at the scene of an emergency.

1.3* Application.

This standard shall be applied as follows:

- (1) Chapters 1 through 3; 4 through 14; and Annexes A, B, C, D and N constitute NFPA 1402.
- (2) Chapters 1 through 3; 15 through 20; and Annexes A, E, F, G, and N constitute NFPA 1403.
- (3) Chapters 1 through 3; 21 through 27; and Annexes A, H, I, and N constitute NFPA 1404.
- (4) Chapters 1 through 3; 28 through 32; and Annexes A, J, and N constitute NFPA 1407.
- (5) Chapters 1 through 3; 33 through 37; and Annexes A and N constitute NFPA 1408.
- (6) Chapters 1 through 3; 38 through 46; and Annexes A, K, and N constitute NFPA 1410.
- (7) Chapters 1 through 3; 47 through 53; and Annexes A, L, M and N constitute NFPA 1451.

Statement of Problem and Substantiation for Public Input

These revisions would add clarity and understanding to the 1400 Standard.

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Submittal Date: Wed Aug 23 00:08:02 EDT 2023

Committee: FIY-AAA

Committee Statement

Resolution: The section currently complies with the NFPA MOS for technical documents



Public Input No. 87-NFPA 1400-2023 [Chapter 1]

Chapter 1 Administration

1.1 Scope.

This standard addresses the minimum design, construction, and maintenance requirements for fire service training centers, fire training structures and props, gas-fueled and flammable liquid-fueled live fire training systems, mobile fire training props, and associated training props; the minimum requirements for training all fire suppression personnel engaged in firefighting operations under live fire conditions; minimum requirements for the training component of the respiratory protection programs; the basic training procedures for fire service personnel to conduct firefighter rapid intervention operations; minimum requirements for training fire service personnel to utilize fire service thermal imagers (TI); the context and minimum requirements for evaluating training for fire suppression and rescue procedures used by fire department personnel engaged in emergency scene operations; and the minimum requirements for a fire and emergency service organization (FESO) vehicle operations training programs.

1.2 Purpose.

The purpose of this standard is to establish consistent, minimum criteria for facilities, structures, and props that are used for conducting fire and rescue training classes and exercises; provide a process for conducting live fire training evolutions to ensure that training objectives are achieved and that exposure to health and safety hazards for the firefighters receiving the training is minimized; specify the minimum requirements for respiratory protection training for the emergency response organization, including safety procedures for those expected to be involved in fire suppression, rescue, and related activities in a toxic, contaminated, or oxygen-deficient atmosphere or environment; specify a training program that is designed to create a highly disciplined operational capability to rescue firefighter(s) who become lost, injured, trapped, incapacitated, or disoriented at an emergency scene or in the course of a training operation; specify a training program that is designed to create competency regarding the operation, application, use, and limitations of TI; provide the context and minimum requirements for evaluating training for fire suppression and rescue procedures used by fire department personnel engaged in emergency scene operations; establish a training standard designed to provide fire departments with an objective method of measuring performance for fire suppression and rescue procedures using available personnel and equipment; and specify the minimum requirements for a FESO vehicle operations training program, including procedures for those members that drive or occupy FESO vehicles, respond in private vehicles or unconventional means of transportation, and provide traffic control at the scene of an emergency.

1.3* Application.

This standard shall be applied as follows:

- (1) Chapters 1 through 3; 4 through 14; and Annexes A, B, C, D and N constitute NFPA 1402.
- (2) Chapters 1 through 3; 15 through 20; and Annexes A, E, F, G, and N constitute NFPA 1403.
- (3) Chapters 1 through 3; 21 through 27; and Annexes A, H, I, and N constitute NFPA 1404.
- (4) Chapters 1 through 3; 28 through 32; and Annexes A, J, and N constitute NFPA 1407.
- (5) Chapters 1 through 3; 33 through 37; and Annexes A and N constitute NFPA 1408.
- (6) Chapters 1 through 3; 38 through 46; and Annexes A, K, and N constitute NFPA 1410.
- (7) Chapters 1 through 3; 47 through 53; and Annexes A, L, M and N constitute NFPA 1451.

Additional Proposed Changes

<u>File Name</u>	<u>Description</u>	<u>Approved</u>
230830_NFPA_1402_preface.docx	Edit to 1402 Origin and Development of NFPA 1402	

Statement of Problem and Substantiation for Public Input

Explanatory material should be corrected to match Annex content

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Committee: FIY-AAA

Committee Statement

Resolution: The technical committee does not have oversight of the origin and development of the document. The origin and development for NFPA 1400 will recognize the consolidation of the standards, but the O & D from each standard will not transfer into the new document.



Public Input No. 91-NFPA 1400-2023 [Section No. 2.2]

2.2 NFPA Publications.

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

NFPA 14, *Standard for the Installation of Standpipe and Hose Systems*, 2019 edition.

NFPA 15, *Standard for Water Spray Fixed Systems for Fire Protection*, 2022 edition.

NFPA 30, *Flammable and Combustible Liquids Code*, 2021 edition.

NFPA 54, *National Fuel Gas Code*, 2021 edition.

NFPA 58, *Liquefied Petroleum Gas Code*, 2020 edition.

NFPA 59, *Utility LP-Gas Plant Code*, 2021 edition.

NFPA 70[®], *National Electrical Code*[®], 2023 edition.

NFPA 86, *Standard for Ovens and Furnaces*, 2019 edition.

NFPA 414, *Standard for Aircraft Rescue and Fire-Fighting Vehicles*, 2020 edition.

NFPA 1001, *Standard for Fire Fighter Professional Qualifications*, 2019 edition.

NFPA 1002, *Standard for Fire Apparatus Driver/Operator Professional Qualifications*, 2017 edition.

NFPA 1003, *Standard for Airport Fire Fighter Professional Qualifications*, 2019 edition.

NFPA 1021, *Standard for Fire Officer Professional Qualifications*, 2020 edition.

NFPA 1041, *Standard for Fire and Emergency Services Instructor Professional Qualifications*, 2019 edition.

NFPA 1081, *Standard for Facility Fire Brigade Member Professional Qualifications*, 2018 edition.

NFPA 1142, *Standard on Water Supplies for Suburban and Rural Firefighting*, 2017 edition.

NFPA 1403, *Standard on Live Fire Training Evolutions*, 2018 edition.

NFPA 1404, *Standard for Fire Service Respiratory Protection Training*, 2018 edition.

NFPA 1407, *Standard for Training Fire Service Rapid Intervention Crews*, 2020 edition.

NFPA 1500[™], *Standard on Fire Department Occupational Safety, Health, and Wellness Program*, 2021 edition.

NFPA 1521, *Standard for Fire Department Safety Officer Professional Qualifications*, 2020 edition.

NFPA 1561, *Standard on Emergency Services Incident Management System and Command Safety*, 2020 edition.

NFPA 1582, *Standard on Comprehensive Occupational Medical Program for Fire Departments*, 2018 edition.

NFPA 1583, *Standard on Health-Related Fitness Programs for Fire Department Members*, 2015 edition.

NFPA 1584, *Standard on the Rehabilitation Process for Members During Emergency Operations and Training Exercises*, 2015 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*, 2020 edition.

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*, 2020 edition.

NFPA 1801, *Standard on Thermal Imagers for the Fire Service*, 2021 edition.

NFPA 1851, *Standard on Selection, Care, and Maintenance of Protective Ensembles for Structural Fire Fighting and Proximity Fire Fighting*, 2020 edition.

NFPA 1852, *Standard on Selection, Care, and Maintenance of Open-Circuit Self-Contained Breathing Apparatus (SCBA)*, 2019 edition.

NFPA 1901, *Standard for Automotive Fire Apparatus*, 2016 edition.

NFPA 1906, *Standard for Wildland Fire Apparatus*, 2016 edition.

NFPA 1911, *Standard for the Inspection, Maintenance, Testing, and Retirement of In-Service Emergency Vehicles*, 2017 edition.

NFPA 1917, *Standard for Automotive Ambulances*, 2019 edition.

NFPA 1964, *Standard for Spray Nozzles and Appliances*, 2018 edition.

NFPA 1971, *Standard on Protective Ensembles for Structural Fire Fighting and Proximity Fire Fighting*, 2018 edition.

NFPA 1975, *Standard on Emergency Services Work Apparel*, 2019 edition.

NFPA 1981, *Standard on Open-Circuit Self-Contained Breathing Apparatus (SCBA) for Emergency Services*, 2019 edition.

NFPA 1982, *Standard on Personal Alert Safety Systems (PASS)*, 2018 edition.

NFPA 1983, *Standard on Life Safety Rope and Equipment for Emergency Services*, 2017 edition.

NFPA 5000[®], *Building Construction and Safety Code*[®], 2018 edition.

Additional Proposed Changes

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230830_NFPA_1402_2.2.docx	2.2	

Statement of Problem and Substantiation for Public Input

Administrative correction

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Committee: FIY-AAA

Committee Statement

Resolution: [FR-47-NFPA 1400-2024](#)

Statement: The technical committee identified newer editions of NFPA standards.



Public Input No. 93-NFPA 1400-2023 [Section No. 2.2]

2.2 NFPA Publications.

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

NFPA 14, *Standard for the Installation of Standpipe and Hose Systems*, 2019 edition.

NFPA 15, *Standard for Water Spray Fixed Systems for Fire Protection*, 2022 edition.

NFPA 30, *Flammable and Combustible Liquids Code*, 2021 edition.

NFPA 54, *National Fuel Gas Code*, 2021 edition.

NFPA 58, *Liquefied Petroleum Gas Code*, 2020 edition.

NFPA 59, *Utility LP-Gas Plant Code*, 2021 edition.

NFPA 70[®], *National Electrical Code*[®], 2023 edition.

NFPA 86, *Standard for Ovens and Furnaces*, 2019 edition.

NFPA 414, *Standard for Aircraft Rescue and Fire-Fighting Vehicles*, 2020 edition.

NFPA 1001, *Standard for Fire Fighter Professional Qualifications*, 2019 edition.

NFPA 1002, *Standard for Fire Apparatus Driver/Operator Professional Qualifications*, 2017 edition.

NFPA 1003, *Standard for Airport Fire Fighter Professional Qualifications*, 2019 edition.

NFPA 1021, *Standard for Fire Officer Professional Qualifications*, 2020 edition.

NFPA 1041, *Standard for Fire and Emergency Services Instructor Professional Qualifications*, 2019 edition.

NFPA 1081, *Standard for Facility Fire Brigade Member Professional Qualifications*, 2018 edition.

NFPA 1142, *Standard on Water Supplies for Suburban and Rural Firefighting*, 2017 edition.

NFPA 1403, *Standard on Live Fire Training Evolutions*, 2018 edition.

NFPA 1404, *Standard for Fire Service Respiratory Protection Training*, 2018 edition.

NFPA 1407, *Standard for Training Fire Service Rapid Intervention Crews*, 2020 edition.

NFPA 1500[™], *Standard on Fire Department Occupational Safety, Health, and Wellness Program*, 2021 edition.

NFPA 1521, *Standard for Fire Department Safety Officer Professional Qualifications*, 2020 edition.

NFPA 1561, *Standard on Emergency Services Incident Management System and Command Safety*, 2020 edition.

NFPA 1582, *Standard on Comprehensive Occupational Medical Program for Fire Departments*, 2018 edition.

NFPA 1583, *Standard on Health-Related Fitness Programs for Fire Department Members*, 2015 edition.

NFPA 1584, *Standard on the Rehabilitation Process for Members During Emergency Operations and Training Exercises*, 2015 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*, 2020 edition.

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*, 2020 edition.

NFPA 1801, *Standard on Thermal Imagers for the Fire Service*, 2021 edition.

NFPA 1851, *Standard on Selection, Care, and Maintenance of Protective Ensembles for Structural Fire Fighting and Proximity Fire Fighting*, 2020 edition.

NFPA 1852, *Standard on Selection, Care, and Maintenance of Open-Circuit Self-Contained Breathing Apparatus (SCBA)*, 2019 edition.

NFPA 1901, *Standard for Automotive Fire Apparatus*, 2016 edition.

NFPA 1906, *Standard for Wildland Fire Apparatus*, 2016 edition.

NFPA 1911, *Standard for the Inspection, Maintenance, Testing, and Retirement of In-Service Emergency Vehicles*, 2017 edition.

NFPA 1917, *Standard for Automotive Ambulances*, 2019 edition.

NFPA 1964, *Standard for Spray Nozzles and Appliances*, 2018 edition.

NFPA 1971, *Standard on Protective Ensembles for Structural Fire Fighting and Proximity Fire Fighting*, 2018 edition.

NFPA 1975, *Standard on Emergency Services Work Apparel*, 2019 edition.

NFPA 1981, *Standard on Open-Circuit Self-Contained Breathing Apparatus (SCBA) for Emergency Services*, 2019 edition.

NFPA 1982, *Standard on Personal Alert Safety Systems (PASS)*, 2018 edition.

NFPA 1983, *Standard on Life Safety Rope and Equipment for Emergency Services*, 2017 edition.

NFPA 5000[®], *Building Construction and Safety Code*[®], 2018 edition.

Additional Proposed Changes

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230830_NFPA_1402_2.2.1.docx	2.2	

Statement of Problem and Substantiation for Public Input

I do not believe it was the Committee's intent to require compliance with NFPA 5000 and ICC IBC. This would create conflicts in attempting to comply with both model building codes. Under Live Fire Training Structures, 7.1.3.1 calls for structural requirements of the IBC or NFPA 5000 if the AHJ has not adopted a building code. Sections 2.2 and 2.3.4 should be revised to reflect a similar intent: If the AHJ has not adopted a building code, Facilities for Fire Training, including Training Towers, both Live Fire and Non-Live Fire shall be designed to meet the requirements of the current edition of the International Building Code. Compliance with the IBC provides a minimum level of construction standards, structural integrity, and life safety. Reference to NFPA 5000 is not included as it has no Use Group equal to IBC's U Utility and Miscellaneous Structures. All NFPA 5000 Use Groups have provisions that conflict with the construction of a practical and functional Fire Training Structure such as emergency egress lighting, exit signs, accessible door hardware that conflicts with hardware for Class A burn rooms, fire extinguishers, fire detection and alarm systems, and in some cases, full automatic fire suppression systems. See also comments new section 4.1.2.4 and A.4.1.2.4.

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Committee: FIY-AAA

Committee Statement

Resolution: [FR-48-NFPA 1400-2024](#)

Statement: Updated edition for the International Building Code



Public Input No. 92-NFPA 1400-2023 [Sections 2.3, 2.4]

Sections 2.3, 2.4

2.3 Other Publications.

2.3.1 ANSI Publications.

American National Standards Institute, Inc., 25 West 43rd Street, 4th Floor, New York, NY 10036.

ANSI Z21.21/CSA 6.5, *Automatic valves for gas appliances*, 2017.

2.3.2 ASCE Publications.

American Society of Civil Engineers, 1801 Alexander Bell Drive, Reston, VA 20191-4400.

ASCE/SEI 7, *Minimum Design Loads for Buildings and Other Structures*, 2010.

2.3.3 FAMA Publications.

Fire Apparatus Manufacturers Association, P.O. Box 3065, Ocala, FL 34478

Fire Apparatus Safety Guide, 2017 edition.

2.3.4 ICC Publications.

International Code Council, 500 New Jersey Avenue, NW, 6th Floor, Washington, DC 20001.

International Building Code, 2015.

2.3.5 UL Publications.

Underwriters Laboratories Inc., 333 Pfingsten Road, Northbrook, IL 60062-2096.

UL 508A, *Standard for Industrial Control Panels*, 2001, revised 2014.

2.3.6 US Government Publications.

US Government Publishing Office, 732 North Capitol Street, NW, Washington, DC 20401-0001.

NIOSH Letters to all Respirator Manufacturers.

Title 42, Code of Federal Regulations, Part 84.

Title 49, Code of Federal Regulations, Part 383, "Commercial Motor Vehicle Safety Act," 2003.

US General Service Administration KKK-A-1822-F, "Star of Life Ambulance Specifications," August 2007.

2.3.7 Other Publications.

Merriam-Webster's Collegiate Dictionary, 11th edition, Merriam-Webster, Inc., Springfield, MA, 2020.

2.4 References for Extracts in Mandatory Sections.

NFPA 55, *Compressed Gases and Cryogenic Fluids Code*, 2016 edition.

NFPA 68, *Standard on Explosion Protection by Deflagration Venting*, 2013 edition.

NFPA 101[®], *Life Safety Code*[®], 2018 edition.

NFPA 318, *Standard for the Protection of Semiconductor Fabrication Facilities*, 2018 edition.

NFPA 402, *Guide for Aircraft Rescue and Fire-Fighting Operations*, 2013 edition.

NFPA 472, *Standard for Competence of Responders to Hazardous Materials/Weapons of Mass Destruction Incidents*, 2018 edition.

NFPA 600, *Standard on Facility Fire Brigades*, 2015 edition.

NFPA 654, *Standard for the Prevention of Fire and Dust Explosions from the Manufacturing, Processing, and Handling of Combustible Particulate Solids*, 2017 edition.

NFPA 921, *Guide for Fire and Explosion Investigations*, 2017 edition.

NFPA 1001, *Standard for Fire Fighter Professional Qualifications*, 2013 edition.

NFPA 1002, *Standard for Fire Apparatus Driver/Operator Professional Qualifications*, 2017 edition.

NFPA 1006, *Standard for Technical Rescue Personnel Professional Qualifications*, 2017 edition.

NFPA 1201, *Standard for Providing Fire and Emergency Services to the Public*, 2015 edition.

NFPA 1500[™], *Standard on Fire Department Occupational Safety and Health Program*, 2018 edition.

NFPA 1500[™], *Standard on Fire Department Occupational Safety, Health, and Wellness Program*, 2021 edition.

NFPA 1561, *Standard on Emergency Services Incident Management System and Command Safety*, 2020 edition.

NFPA 1670, *Standard on Operations and Training for Technical Search and Rescue Incidents*, 2014 edition.

NFPA 1670, *Standard on Operations and Training for Technical Search and Rescue Incidents*, 2017 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*, 2020 edition.

NFPA 1801, *Standard on Thermal Imaging for the Fire Service*, 2018 edition.

NFPA 1901, *Standard for Automotive Fire Apparatus*, 2016 edition.

NFPA 1981, *Standard on Open-Circuit Self-Contained Breathing Apparatus (SCBA) for Emergency Services*, 2013 edition.

NFPA 1981, *Standard on Open-Circuit Self-Contained Breathing Apparatus (SCBA) for Emergency Services*, 2019 edition.

NFPA 1982, *Standard on Personal Alert Safety Systems (PASS)*, 2013 edition.

Additional Proposed Changes

<u>File Name</u>	<u>Description</u>	<u>Approved</u>
230830_NFPA_1402_2.3_and_2.4.docx	2.3 and 2.4	

Statement of Problem and Substantiation for Public Input

Administrative correction

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Committee: FIY-AAA

Committee Statement

Resolution: [FR-49-NFPA 1400-2024](#)

Statement: The technical committee identified newer editions of referenced NFPA standards



Public Input No. 55-NFPA 1400-2023 [Chapter 3]

Chapter 3—Definitions Definitions Consider revising and adding definitions to align with NFPA 1700 if NFPA 1700 is adopted.

3.1 General.

3.1.1

The definitions contained in this chapter shall apply to the terms used in this standard.

3.1.2

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.

3.1.3

Merriam-Webster's Collegiate Dictionary, 11th edition, shall be the source for the ordinarily accepted meaning.

3.2 NFPA Official Definitions.

3.2.1* 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.

3.2.2 Labeled.

Equipment or materials to which has been attached a label, symbol, or other identifying mark of an organization that is acceptable to the authority having jurisdiction and concerned with product evaluation, that maintains periodic inspection of production of labeled equipment or materials, and by whose labeling the manufacturer indicates compliance with appropriate standards or performance in a specified manner.

3.2.3* 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.

3.2.4 Shall.

Indicates a mandatory requirement.

3.2.5 Should.

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

3.2.6 Standard.

An NFPA standard, the main text of which contains only mandatory provisions using the word "shall" to indicate requirements and that is in a form generally suitable for mandatory reference by another standard or code or for adoption into law. Nonmandatory provisions are not to be considered a part of the requirements of a standard and shall be located in an appendix, annex, footnote, informational note, or other means as permitted in the NFPA manuals of style. When used in a generic sense, such as in the phrase "standards development process" or "standards development activities," the term "standards" includes all NFPA standards, including codes, standards, recommended practices, and guides.

3.3 General Definitions.

3.3.1 Acquired Prop.

A piece of equipment acquired by the AHJ for the purposes of conducting fire training evolutions, technical rescue training, hazardous materials training, or other fire rescue training whether including live fire or not.

3.3.2 Acquired Structure.

A building or structure acquired by the AHJ from a property owner for the purposes of conducting fire training evolutions, technical rescue training, hazardous materials training, or other fire rescue training whether including live fire training or not.

3.3.3 Air-Purifying Respirator (APR).

A respirator with an air-purifying filter, cartridge, or canister that removes specific air contaminants by passing ambient air through the air-purifying element.

3.3.4 Apparatus.**3.3.4.1 Aerial Fire Apparatus.**

A vehicle equipped with an aerial ladder, elevating platform, or water tower that is designed and equipped to support firefighting and rescue operations by positioning personnel, handling materials, providing continuous egress, or discharging water at positions elevated from the ground. [1901, 2016]

3.3.4.2 Mobile Water Supply Apparatus (Tanker, Tender).

A vehicle designed primarily for transporting (pickup, transporting, and delivering) water to fire emergency scenes to be applied by other vehicles or pumping equipment. [1901, 2016]

3.3.5 Appliance.

See 3.3.61, Gas-Fueled Training Appliance.

3.3.6 Backdraft.

A deflagration resulting from the sudden introduction of air into a confined space containing oxygen-deficient products of incomplete combustion.

3.3.7 Burn Room.

Space or compartment inside a live fire training structure in which live fires are conducted.

3.3.8 CBRN.

Acronym for Chemical, Biological, Radiological, and Nuclear. This refers specifically to a NIOSH certification on the protective capabilities of a respirator.

3.3.9 CBRNE.

Acronym for Chemical, Biological, Radiological, Nuclear, and Explosives. This term refers to the general types of terrorist attacks, or WMD events.

3.3.10 Closed-Circuit SCBA.

See 3.3.129, Self-Contained Breathing Apparatus (SCBA).

3.3.11 Combustible.

Capable of burning, generally in air under normal conditions of ambient temperature and pressure, unless otherwise specified. Combustion can occur in cases where an oxidizer other than oxygen in air is present (e.g., chlorine, fluorine, or chemicals containing oxygen in their structure).

3.3.12 Company.

The basic firefighting organizational unit staffed by various grades of firefighters under the supervision of an officer and assigned to one or more specific pieces of apparatus.

3.3.12.1 Engine Company.

A group of firefighters who work as a unit and are equipped with one or more pumping engines that have rated capacities of 750 gpm (2840 L/min) or more.

3.3.12.2 Rescue Company.

A group of firefighters who work as a unit and are equipped with one or more rescue vehicles.

3.3.12.3 Truck Company.

A group of firefighters who work as a unit and are equipped with one or more pieces of aerial fire apparatus.

3.3.13 Compliance/Compliant.

Meeting or exceeding all applicable requirements of this standard.

3.3.14 Component.

Any material, part, or subassembly used in the construction of the compliant product. [1801, 2018]

3.3.15 Conduction.

Heat transfer to another body or within a body by direct contact.

3.3.16* Confined Space.

An area large enough and so configured that a member can bodily enter and perform assigned work but which has limited or restricted means for entry or exit and is not designed for continuous human occupancy. [1500, 2018]

3.3.17 Containerized Training Structure.

A structure consisting of one or more shipping (intermodal) containers assembled together for the purpose of conducting live fire, nonlive fire, rescue, hazmat, and/or other related training evolutions. If the containerized training structure is to support live fire training, then it is classified as a live fire training structure.

3.3.18 Contaminant.

A harmful, irritating, or nuisance material foreign to the normal atmosphere. [1500, 2018]

3.3.19 Convection.

Heat transfer by circulation within a medium such as a gas or a liquid.

3.3.20 Corrective Lens.

A lens designed to fit the specifications of the wearer's individual corrective prescription.

3.3.21 Dead Loads.

Dead loads consist of the weight of all materials of construction incorporated into the building including but not limited to walls, floors, roofs, ceilings, stairways, built-in partitions, finishes, cladding and other similarly incorporated architectural and structural items, and fixed service equipment including the weight of cranes. [ASCE/SEI 7:3.1.1]

3.3.22 Decay Stage.

The stage of fire development within a structure characterized by either a decrease in the fuel load or available oxygen to support combustion, resulting in lower temperatures and lower pressure in the fire area.

3.3.23 Deflagration.

Propagation of a combustion zone at a velocity that is less than the speed of sound in the unreacted medium.

3.3.24 Demonstration.

The act of showing a skill.

3.3.25* Designed Anchor Point.

An anchor point designed by an engineer or other qualified person, and installed in accordance with the manufacturer's recommendations, to support the forces generated in rope rescue systems.

3.3.26* Door Control.

The process of ensuring the entrance door providing access to the fire area is controlled and closed as much as possible after the search team enters without the protection of a hose line.

3.3.27 EBSS.

Abbreviation for emergency breathing safety system. [1981, 2018]

3.3.28 Effective Operation.

The accomplishment of or ability to accomplish the intended task.

3.3.29 Effective Stream.

A fire stream that has achieved and sustained the proper flow.

3.3.30 Emergency Breathing Safety System (EBSS).

A device on an SCBA that allows a user to share their available air supply in an emergency situation.

3.3.31 Emergency Escape Respirators (EER).

Units used by the general working population to afford effective respiratory protection in escaping from hazardous environments. These units can be either air-purifying or self-contained escape respirators.

3.3.32 Emergency Medical Services.

The provision of treatment, such as first aid, cardiopulmonary resuscitation, basic life support, advanced life support, and other pre-hospital procedures including ambulance transportation, to patients. [1500, 2018]

3.3.33 Emissivity.

The ratio of the radiation emitted by a surface to the radiation emitted by a blackbody at the same temperature. [1801, 2018]

3.3.34 End-of-Service-Time Indicator (EOSTI).

A warning device on an SCBA that alerts the user that the reserve air supply is being utilized. [1981, 2013]

3.3.35 Engine.

A fire department pumper that has a rated capacity of 750 gpm (2840 L/min) or more.

3.3.36 Evolution.

A set of prescribed actions that result in an effective fireground activity.

3.3.37 Exhalation Valve.

A device that allows exhaled air to leave a facepiece and prevents outside air from entering through the valve.

3.3.38* Facepiece.

Describes both full facepieces that cover the nose, mouth, and eyes and half facepieces that cover the nose and mouth.

3.3.39 Factored Load.

Working load multiplied by a factor of safety that is greater than 1.

3.3.40 FESO Vehicle.

Any vehicle operated by an FESO.

3.3.41 Fire and Emergency Service Organization (FESO).

Any public, private, governmental, or military organization that provides emergency response, fire suppression, and related activities, whether for profit or government owned and operated. [1201, 2015]

3.3.42 Fire Apparatus.

A vehicle designed to be used under emergency conditions to transport personnel and equipment, and to support the suppression of fires and mitigation of other hazardous situations. [1901, 2016]

3.3.43 Fire Apparatus Driver/Operator.

A fire department member who is authorized by the authority having jurisdiction to drive, operate, or both drive and operate fire department vehicles.

3.3.44* Fire Department.

An organization providing rescue, fire suppression, emergency medical services, hazardous materials operations, special operations, and related activities.

3.3.44.1 Fire Department.

An organization providing rescue, fire suppression, and related activities, including any public, governmental, private, industrial, or military organization engaging in this type of activity. [1002, 2017]

3.3.45 Fire Growth Potential.

The potential size or intensity of a fire based on the available fuel load.

3.3.46 Fire Investigation Burn Cell (Burn Cell).

A smaller subdivision of either a fire investigation training structure or fire investigation training prop, designed or intended to contain the arrangement of fuels used in fire investigation training.

3.3.47 Fire Investigation Set (Set).

The constructed, arranged, or adapted use of furniture, fixtures, equipment, and fuels intended for burning as part of fire investigation training, within a fire investigation burn cell.

3.3.48 Fire Investigation Training Prop.

A vehicle, vessel, equipment, or fabricated mock-up acquired or specifically built or manufactured to facilitate fire conditions, behavior, and patterns for conducting fire investigation training. This prop is not used for live fire training.

3.3.49 Fire Investigation Training Structure.

A permanent structure acquired or specifically built to facilitate fire conditions, behavior, and patterns for conducting fire investigation training on a repetitive basis, with each use being a single burn. This structure is not used for live fire training.

3.3.50 Fire Prop.

A noncombustible assembly used for repeatable live fire training exercises containing the gas burners of the gas-fueled training appliance and located inside the burn space.

3.3.51 Fire Service.

Career or volunteer service groups that are organized and trained for the prevention and control of loss of life and property from any fire or disaster.

3.3.52* Flameover (Rollover).

The condition in which unburned fuel (pyrolysate) from the originating fire has accumulated in the ceiling layer to a sufficient concentration (i.e., at or above the lower flammable limit) that it ignites and burns. Flameover can occur without ignition of or prior to the ignition of other fuels separate from the origin.

3.3.53 Flashover.

A transition phase in the development of a compartment fire in which surfaces exposed to thermal radiation reach ignition temperature more or less simultaneously and fire spreads rapidly throughout the space, resulting in full room involvement or total involvement of the compartment or enclosed space.

3.3.54 Flow Path.

A path composed of at least one intake opening, one exhaust opening, and the connecting volume between the openings with the direction of the flow within the path determined by the difference in pressure where heat and smoke in a higher-pressure area will flow through openings toward areas of lower pressure, and cool, dense ambient air at atmospheric pressure will flow through openings into areas of lower pressure.

3.3.55 Flow Path Control.

The tactic of controlling or closing ventilation points to limit additional oxygen into the space thereby limiting fire development, heat release rate, and smoke production, and to control the movement of the heat and smoke conditions out of the fire area to the exterior and to other areas within the building.

3.3.56 Fuel-Limited Fire.

A fire in which the heat release rate and fire growth are controlled by the characteristics of the fuel because there is adequate oxygen available for combustion.

3.3.57 Fuel Load.

The total quantity of combustible contents of a building, space, or fire area, including interior finish and trim, expressed in heat units or the equivalent weight in wood.

3.3.57.1* Fuel Load.

The total quantity of combustible contents of a building, space, or fire area, including interior finish and trim, expressed in terms of heat release rate.

3.3.58* Fully Developed Stage.

The stage of fire development where heat release rate has reached its peak within a compartment.

3.3.59 Gas.

The state of matter characterized by complete molecular mobility and unlimited expansion; used synonymously with the term *vapor*. [68, 2013]

3.3.60* Gas-Fueled Live Fire Training System.

An engineered system comprised of the gas-fueled training appliance(s), the associated piping, and the fire prop(s).

3.3.61 Gas-Fueled Training Appliance.

An engineered product comprised of burner controls, safety systems, and ignition system used to operate the fire prop.

3.3.62 gpm.

Gallons per minute.

3.3.63 Growth Stage.

The stage of fire development where the heat release rate from an incipient fire has increased to the point where heat transferred from the fire and the combustion products are pyrolyzing adjacent fuel sources and the fire begins to spread across the ceiling of the fire compartment (rollover).

3.3.64* Hazard.

Any arrangement of materials that presents the potential for harm. [921, 2017]

3.3.65 Heads-Up Display (HUD).

Visual display of information and system condition status visible to the wearer. [1981, 2013]

3.3.66* Heat Release Rate.

The rate at which energy is generated by the burning of a fuel and oxygen mixture. As the heat release rate increases, the heat, smoke production, and pressure within the area will increase and spread along available flow paths toward low-pressure areas (such as open doors, windows, and roof openings).

3.3.67 Highline System.

A system of using rope or cable suspended between two points for movement of persons or equipment over an area that is a barrier to the rescue operation, including systems capable of movement between points of equal or unequal height. [1006, 2017]

3.3.68 High-Temperature Environment.

An environment with a temperature above 104°F (40°C).

3.3.69* Immediately Dangerous to Life or Health (IDLH).

Any condition that would pose an immediate or delayed threat to life, cause irreversible adverse health effects, or interfere with an individual's ability to escape unaided from a hazardous environment. [1670, 2014]

3.3.70 Incident Action Plan.

The objectives reflecting the overall incident strategy, tactics, risk management, and member safety that are developed by the incident commander. Incident action plans are updated throughout the incident. [1500, 2021]

3.3.71 Incident Commander (IC).

The individual responsible for all incident activities, including the development of strategies and tactics and the ordering and the release of resources. [472, 2018]

3.3.72 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, 2020]

3.3.73 Incipient Stage.

The early stage of fire development where the fire's progression is limited to a fuel source and the thermal hazard is localized to the area of the burning material.

3.3.74 Individual Air Management Program.

A program to develop an individual's awareness of his or her personal air consumption rate while wearing respiratory protection equipment in a work mode.

3.3.75 Industrial Fire Brigade.

An organized group of employees within an industrial occupancy who are knowledgeable, trained, and skilled in at least basic firefighting operations, and whose full-time occupation might or might not be the provision of fire suppression and related activities for their employer. [600, 2015]

3.3.76 Initial Safety Team (IST).

A dedicated crew of a minimum of two firefighters, located outside the IDLH, assigned to rescue injured or trapped firefighters prior to the assignment of a rapid intervention crew (RIC).

3.3.77 Instructor.

An individual qualified by the authority having jurisdiction to deliver firefighter training, who has the training and experience to supervise students during live fire training evolutions, and who has met the requirements of an Instructor I in accordance with NFPA 1041.

3.3.77.1 Instructor.

An individual deemed qualified by the authority having jurisdiction to deliver training in the operation of fire service vehicles.

3.3.78 Instructor-in-Charge.

An individual qualified as an instructor and designated by the authority having jurisdiction to be in charge of the live fire training evolution, and who has met the requirements of an Instructor II in accordance with NFPA 1041.

3.3.79 Intermittent Pilot.

A pilot that burns during light-off and while the main burner is firing.

3.3.80 Interrupted Pilot.

A pilot that is ignited and burns during light-off and is automatically shut off at the end of the trial-for-ignition period of the main burner(s).

3.3.81 kPa.

Kilopascals.

3.3.82 Large-Diameter Hose.

A hose 3.5 in. (89 mm) or larger that is designed to move large volumes of water to supply master stream appliances, portable hydrants, manifolds, standpipe and sprinkler systems, and fire department pumpers from hydrants and in relay.

3.3.83 Line.

One or more lengths of connected fire hose.

3.3.83.1 Attack Line.

A hose line used primarily to apply water directly onto a fire and operated by a sufficient number of personnel so that it can be maneuvered effectively and safely.

3.3.83.2 Backup Line.

An additional hose line used to reinforce and protect personnel in the event the initial attack proves inadequate.

3.3.83.3 Initial Attack Line.

The first hose stream placed in service by a company at the scene of a fire in order to protect lives or to prevent further extension of fire while additional lines are laid and placed in position.

3.3.83.4* Leader Line.

A hose line supplying one or more smaller lines, as in a wyed line.

3.3.83.5 Preconnected Line.

A discharge hose line already attached to an engine outlet.

3.3.83.6 Supply Line.

One or more lengths of connected fire hose, also called a leader line, used to provide water to wyed lines or to the intake of a pump.

3.3.84 L/min.

Liters per minute.

3.3.85 Liquid-Fueled Live Fire Training System.

A training prop used for live fire training on a repetitive basis, fueled by gasoline, diesel, kerosene, reduced-emissions flammable liquid, or other flammable or combustible liquid.

3.3.86 Live Fire.

Any open flame capable of emitting thermal load or toxic by-products of combustion that would necessitate the use of personal protective equipment (PPE).

3.3.86.1 Live Fire.

Any unconfined open flame or device that can propagate fire to the building, structure, or other combustible materials.

3.3.87 Live Fire Training Prop.

A training prop utilized for conducting live fire training evolutions on a repetitive basis.

3.3.88* Live Fire Training Structure.

A structure utilized for conducting live fire training evolutions on a repetitive basis.

3.3.89 Live Loads.

Live loads are those produced by the use and occupancy of the building or other structure and do not include construction or environmental loads such as wind load, snow load, rain load, earthquake load, flood load, or dead load. Live loads on a roof are those produced (1) during maintenance by workers, equipment, and materials; and (2) during the life of the structure by movable objects such as planters and by people. [ASCE/SEI 7:4.1]

3.3.90 Maintenance.

Work performed to ensure that equipment operates as directed by the manufacturer.

3.3.91 Manufacturer.

The entity that directs and controls any of the following: compliant product design, compliant product manufacturing, or compliant product quality assurance; also, the entity that assumes liability for the compliant product or provides the warranty for the compliant product. [1801, 2018]

3.3.92 Means of Egress.

A continuous and unobstructed way of travel from any point in a building or structure to a public way consisting of three separate and distinct parts: (1) the exit access, (2) the exit, and (3) the exit discharge. [101, 2018]

3.3.93 Means of Escape.

A way out of a building or structure that does not conform to the strict definition of means of egress but does provide an alternate way out. [101, 2018]

3.3.94* Member.

A person involved in performing the duties and responsibilities of a fire department under the auspices of the organization. [1500, 2018]

3.3.95 Member Assistance Program (MAP).

A generic term used to describe the various methods used in the FESO for the control of alcohol and other substance abuse, stress, and personal problems that adversely affect member performance. [1500, 2018]

3.3.96 Mobile Training Prop.

A training prop intended to be transported over roads for conducting fire, rescue, hazmat, or related training evolutions on a repetitive basis, whether including live fire or not, at different locations.

3.3.97 Mock-Up.

A noncombustible assembly that can be used in association with the fire prop to change its appearance to enhance training realism.

3.3.98 NIOSH.

National Institute for Occupational Safety and Health of the US Department of Health and Human Services.

3.3.99* NIOSH Approved.

Tested and certified by the National Institute for Occupational Safety and Health (NIOSH) of the US Department of Health and Human Services.

3.3.100 Open-Circuit SCBA.

See 3.3.129, Self-Contained Breathing Apparatus (SCBA).

3.3.101 OSHA.

The Occupational Safety and Health Administration of the US Department of Labor. [55, 2016]

3.3.102 Overhaul.

The process of final extinguishment after the main body of a fire has been knocked down. All traces of fire must be extinguished at this time. [402, 2013]

3.3.103 Owner/Operator.

The organization with fiscal responsibility for the operation, maintenance, and profitability of the facility. [654, 2017]

3.3.104 Participant.

Any student, instructor, safety officer, visitor, or other person who is involved in the live fire training evolution within the operations area.

3.3.105 Personal Accountability Report (PAR).

A report requested by and communicated to the incident commander from fire crews operating at a scene as to their location and situation.

3.3.106 Personal Protective Clothing.

The full complement of garments firefighters are normally required to wear while on emergency scene, including turnout coat, protective trousers, firefighting boots, firefighting gloves, a protective hood, and a helmet with eye protection. [1001, 2013]

3.3.107 Personal Protective Equipment (PPE).

Consists of full personal protective clothing, plus a self-contained breathing apparatus (SCBA) and a personal alert safety system (PASS) device. [1001, 2013]

3.3.108 Portable Training Prop.

A training prop that is not permanently mounted to a trailer or fixed to the ground and can be moved around the training site. Transportation on roadways requires a trailer or transport vehicle.

3.3.109 psi.

Pounds per square inch gauge.

3.3.110 Pyrolysate.

Product of decomposition through heat; a product of a chemical change caused by heating.

3.3.111* Pyrolysis.

The breakdown of fuels such as wood and foam plastics into their basic compound when subjected to heat.

3.3.112 Qualified Person.

A person who, by possession of a recognized degree, certificate, professional standing, or skill, and who, by knowledge, training, and experience, has demonstrated the ability to deal with problems related to the subject matter, the work, or the project.

3.3.113 Radiation.

Heat transfer by way of electromagnetic energy.

3.3.114* Rapid Intervention Crew/Company (RIC).

A dedicated crew of firefighters who are assigned for rapid deployment to rescue lost or trapped members.

3.3.115 Rapid Intervention Crew/Company Universal Air Connection (RIC/UAC).

A system that allows emergency replenishment of breathing air to the SCBA of disabled or entrapped fire or emergency services personnel.

3.3.116 Recruit.

An individual who has passed beyond the candidate level and who has actively commenced duties as a member of the organization.

3.3.117 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. [1500, 2021]

3.3.118 Rescue Vehicle.

A special vehicle, also known as a heavy rescue or squad, equipped with tools and equipment to perform one or more types of special rescue such as building collapse, confined space, high angle, vehicle extrication, and water rescue.

3.3.119 Residual Pressure.

The pressure that exists in the distribution system, measured at the residual hydrant at the time the flow readings are taken at the flow hydrants.

3.3.120 Respiratory Hazard.

Any exposure to products of combustion, superheated atmospheres, toxic gases, vapors, or dust, or potentially explosive or oxygen-deficient atmospheres, or any condition that creates a hazard to the respiratory system.

3.3.121* Respiratory Protection Equipment.

Devices that are designed to protect the respiratory system against exposure to gases, vapors, or particulates.

3.3.122 Respiratory Protection Program.

A systematic and comprehensive program of training in the use and maintenance of respiratory protection devices and related equipment.

3.3.123 Risk.

A measure of the probability and severity of adverse effects that result from exposure to a hazard.

3.3.124 Room Orientation.

The set of skills that allow an interior structural firefighter to move into and through interior rooms while remaining aware of their position in the room relative to their entry point, furnishings, alternate exit routes, and other connected rooms/areas.

3.3.125 Safety Officer.

An individual appointed by the authority having jurisdiction as qualified to maintain a safe working environment at all live fire training evolutions.

3.3.126 Sanitize.

The removal of dirt and the inhibiting of the action of agents that cause infection or disease.

3.3.127 SCBA.

Acronym for Self-Contained Breathing Apparatus. [1982, 2013]

3.3.128 Seismic Forces.

The assumed forces prescribed herein [ASCE/SEI 7], related to the response of the structure to earthquake motions, to be used in the design of the structure and its components. [ASCE/SEI 7:11.2]

3.3.129 Self-Contained Breathing Apparatus (SCBA).

A respirator worn by the user that supplies a respirable atmosphere, that is either carried in or generated by the apparatus, and that is independent of the ambient environment.

3.3.129.1 Closed-Circuit SCBA.

A recirculation-type SCBA in which the exhaled gas is rebreathed by the wearer after the carbon dioxide has been removed from the exhalation and after the oxygen content within the system has been restored from sources such as compressed breathing gas, chemical oxygen, and liquid oxygen.

3.3.129.2 Open-Circuit SCBA.

An SCBA in which exhalation is vented to the atmosphere and not rebreathed. There are two types of open-circuit SCBA: negative pressure or demand type and positive pressure or demand type.

3.3.130* Situational Awareness.

The ongoing activity of assessing what is going on around you during the complex and dynamic environment of a fire incident.

3.3.131 Size-Up.

The process of gathering and analyzing information to help fire officers make decisions regarding the deployment of resources and the implementation of tactics.

3.3.132 Smoke.

The airborne solid and liquid particulates and gases evolved when a material undergoes pyrolysis or combustion, together with the quantity of air that is entrained or otherwise mixed into the mass. [318, 2018]

3.3.132.1* Smoke.

The combination of airborne solid particulates, liquid particulates, and gases emitted when a material undergoes pyrolysis or combustion.

3.3.133 Standard Operating Procedures (SOPs).

Written instructions that document and define the manner in which activities should be conducted.

3.3.134 Student.

Any person who is present at the live fire training evolution for the purpose of receiving training.

3.3.135 Supplied-Air Respirator (SAR) or Air-Line Respirator.

An atmosphere-supplying respirator for which the source of breathing air is not designed to be carried by the user.

3.3.136 Technical Search and Rescue.

The application of special knowledge, skills, and equipment to resolve unique and/or complex search and rescue situations. [1006, 2017]

3.3.137* Training Prop.

A facility utilized for conducting fire, rescue, hazmat, or related training evolutions on a repetitive basis, whether including live fire or not.

3.3.138 Training Structure.**3.3.138.1** *Acquired Structure.*

A building or structure acquired by the authority having jurisdiction from a property owner for the purpose of conducting live fire training evolutions.

3.3.138.2* *Live Fire Training Structure.*

A structure specifically designed for conducting live fire training evolutions on a repetitive basis.

3.3.139 Training Tower.

A multistory building or structure specifically built for conducting fire, rescue, hazmat, and/or other related training evolutions on a repetitive basis, without the use of live fire. A training tower could be constructed of conventional materials (masonry, concrete, steel, or wood), or it could be a containerized training structure. If the multistory building or structure is to support live fire training, then it is classified as a live fire training structure.

3.3.140 Trial-for-Ignition Period (Flame-Establishing Period).

The interval of time during light-off that a combustion safeguard allows the fuel safety shutoff valve to remain open before the flame detector is required to supervise the flame.

3.3.141 Truck.

A common fire service term for aerial fire apparatus.

3.3.142 Unconventional Means of Transportation.

Can include, but are not limited to, bicycles, motorcycles, scooters, skateboards, and rollerblades.

3.3.143* Vent, Entry, Isolate, Search (VEIS).

The approved tactic for entering a structure through an opening (door or window) to locate possible victims.

3.3.144* Ventilation.

The controlled and coordinated removal of heat and smoke from a structure, replacing the escaping gases with fresh air.

3.3.144.1 Horizontal Ventilation.

The opening or removal of windows or doors on any floor of a fire building to create flow paths for fire conditions.

3.3.144.2 Mechanical Ventilation.

The use of mechanical fans to accelerate air flow or reverse air flow to assist in the movement of smoke throughout a structure.

3.3.144.3 Vertical Ventilation.

The vertical venting of structures involving the opening of bulkhead doors, skylights, scuttles, and roof cutting operations to release smoke and heat from inside the fire building.

3.3.145 Ventilation-Controlled Fire.

A fire in which the heat release rate or growth is controlled by the amount of air available to the fire.

3.3.146 Ventilation for Extinguishment.

The controlled and coordinated ventilation tactic that should coincide with the engine company extinguishment of the fire.

3.3.147 Ventilation for Search.

The controlled and coordinated ventilation tactic performed to facilitate the movement of a firefighter into an area to conduct a search for victims.

3.3.148* Ventilation-Induced Flashover.

A flashover initiated by the introduction of oxygen into a preheated, fuel-rich (smoke filled), oxygen-deficient area.

3.3.149 Ventilation-Limited Fire.

A fire in which the heat release rate and fire growth are regulated by the available oxygen within the space.

3.3.150 Ventilation Profile.

The appearance of the fire building's ventilation points showing the flow paths of heat and smoke out of the structure as well as any air movement into the structure.

3.3.151 Ventilation Tactics.

The coordinated and controlled opening of ventilation points in a structure to facilitate fire operations.

3.3.152 Weapons of Mass Destruction (WMD).

A WMD is any device, material, or substance used in a manner, in a quantity or type, or under circumstances evidencing an intent to cause death or serious injury to persons or significant damage to property. A weapon of mass destruction includes chemical, biological, radiological, nuclear, and explosive components.

3.3.153* Working Load.

The force specified for weight of materials and personnel, actions, environmental effects, differential movement, and restrained dimensional changes with no factor of safety applied.

Additional Proposed Changes

<u>File Name</u>	<u>Description</u>	<u>Approved</u>
1403_PI_No_22.pdf	NFPA 1403 Public Input No. 22	

Statement of Problem and Substantiation for Public Input

Continue to standardize terminology between training standards and NFPA 1700 Guide to Structural Firefighting.

Submitter Information Verification

Submitter Full Name: Daniel Madrzykowski
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City:
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Submittal Date: Thu Aug 24 09:04:08 EDT 2023
Committee: FIY-AAA

Committee Statement

Resolution: No suggestions were supplied and the submitter is encourage to submit any necessary terminology related to NFPA 1700 as necessary.



Public Input No. 50-NFPA 1400-2023 [Section No. 3.3.2]

3.3.2 Acquired Structure.

A building or structure acquired by the AHJ from a property owner for the purposes of conducting fire training evolutions, technical rescue training, hazardous materials training, or other fire rescue training whether including live fire training or not. This is to include abandon structures without owners that have claimed by AHJ and been inspected and deemed structurally sound.

Additional Proposed Changes

<u>File Name</u>	<u>Description</u>	<u>Approved</u>
NFPA14_1.PDF	NFPA 1402 - Public Input No. 2	

Statement of Problem and Substantiation for Public Input

Many abandon structures with no property owner are claimed by the AHJ and demolished without any training taking place. These are prime opportunities for companies to train in real world scenarios.

Submitter Information Verification

Submitter Full Name: Brian Hoffman
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Street Address:
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Submittal Date: Wed Aug 23 13:25:35 EDT 2023
Committee: FIY-AAA

Committee Statement

Resolution: Current definition meets the need of the standards. All properties are assumed to have a current owner, even if a county has taken possession of it.



Public Input No. 1-NFPA 1400-2023 [Section No. 3.3.24]

3.3.24 Demonstration.

~~The act of showing a skill~~ A practical exhibition and explanation of how something works or is performed.

Statement of Problem and Substantiation for Public Input

The current definition is not broad enough. Many demonstrations during live fire training do not involve skills development but instead are used to show or have the students experience different fire behavior or effects. For example, a flashover container is not used to show a skill but rather to show the stages leading up to flashover so that students can develop a visual "slide" so that they can recognize when these conditions are developing in a real fire.

The proposed definition is from the Oxford English dictionary.

Submitter Information Verification

Submitter Full Name: Ian Bennett

Organization: Seattle Fire Department

Affiliation: Seattle Fire Department

Street Address:

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Submittal Date: Sun May 28 11:57:49 EDT 2023

Committee: FIY-AAA

Committee Statement

Resolution: FR-51-NFPA 1400-2024

Statement: The technical committee determined that the current definition is not broad enough. Many demonstrations during live fire training do not involve skills development but instead are used to show or have the students experience different fire behavior or effects. For example, a flashover container is not used to show a skill but rather to show the stages leading up to flashover so that students can develop a visual "slide" so that they can recognize when these conditions are developing in a real fire.

The proposed definition is from the Oxford English dictionary.



Public Input No. 2-NFPA 1400-2023 [Section No. 3.3.26]

3.3.26* Door Control.

The process of ~~ensuring the entrance door providing access to the fire area is controlled and closed~~ closing a door as much as possible ~~after the search team enters without the protection of a hose line~~ to limit the flow of smoke and fire gases into other spaces and/or air to the fire .

Statement of Problem and Substantiation for Public Input

The definition as written is too narrow as it does not capture many of the common uses of the term "door control."

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Submittal Date: Sun May 28 13:54:31 EDT 2023

Committee: FIY-AAA

Committee Statement

Resolution: FR-52-NFPA 1400-2024

Statement: The technical committee determined the definition of door control currently in NFPA 1700 is best suited for the document.



Public Input No. 18-NFPA 1400-2023 [Section No. 3.3.57.1]

3.3.57.1* Fuel Load.

The total quantity of combustible contents of a building, space, or fire area, including interior finish and trim, ~~expressed in terms of heat release rate~~.

Statement of Problem and Substantiation for Public Input

It is impractical to express the fuel load in terms of heat release rate. Individuals in the field do not have ready access to HRR values for a variety of products and even then they would not be accurate due to the wide variety of shapes, densities and types of fuels used in live fire training.

Submitter Information Verification

Submitter Full Name: Ian Bennett

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Submittal Date: Mon Jun 19 19:41:15 EDT 2023

Committee: FIY-AAA

Committee Statement

Resolution: [FR-85-NFPA 1400-2024](#)

Statement: The technical committee determined that it is impractical to express the fuel load in terms of heat release rate. Individuals in the field do not have ready access to HRR values for a variety of products and even then they would not be accurate due to the wide variety of shapes, densities and types of fuels used in live fire training.



Public Input No. 5-NFPA 1400-2023 [Section No. 3.3.64]

3.3.64* Hazard.

~~Any arrangement of materials that presents the potential for harm. [921, -2017] A source of~~
danger.

Statement of Problem and Substantiation for Public Input

The previous definition is not the commonly understood definition of the word hazard. The proposed definition is from Merrian-Webster

Submitter Information Verification

Submitter Full Name: Ian Bennett

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Submittal Date: Mon Jun 19 11:58:49 EDT 2023

Committee: FIY-AAA

Committee Statement

Resolution: [FR-79-NFPA 1400-2024](#)

Statement: The previous definition is not the commonly understood definition of the word hazard.
The proposed definition is from Merrian-Webster



Public Input No. 6-NFPA 1400-2023 [New Section after 3.3.68]

Routine Thermal Conditions:

Where the surrounding temperature is between 68 degrees F and 158 degrees F. These conditions translate approximately to ambient conditions, not necessarily requiring any thermal protection.

Statement of Problem and Substantiation for Public Input

The Utech thermal conditions regularly referenced by UL are not referenced in the NFPA standard.

Submitter Information Verification

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Submittal Date: Mon Jun 19 12:11:02 EDT 2023

Committee: FIY-AAA

Committee Statement

Resolution: Proposed definition is not a term used within the mandatory sections of the proposed standard



Public Input No. 7-NFPA 1400-2023 [New Section after 3.3.68]

Ordinary Thermal Conditions

Temperatures between 158 degrees F and 392 degrees F and between 2 and 12 kW/m2. Firefighters should be able to function under ordinary operating conditions from 10-20 minutes at a time, or in other words for the working duration of an SCBA cylinder. Ordinary operating conditions are considered those that are typical of a house fire.

Statement of Problem and Substantiation for Public Input

The Utech thermal conditions regularly referenced by UL are not found in the NFPA standard.

Submitter Information Verification

Submitter Full Name: Ian Bennett

Organization: Seattle Fire Department

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Submittal Date: Mon Jun 19 12:14:57 EDT 2023

Committee: FIY-AAA

Committee Statement

Resolution: Term is not currently used in a mandatory section of the proposed draft.



Public Input No. 8-NFPA 1400-2023 [New Section after 3.3.68]

Emergency Thermal Conditions

Thermal conditions exceeding 12 kW/m² and 392°F. s This zone as one in which a firefighter's PPE would only be able to withstand an exposure on the order of a few seconds.

Additional Proposed Changes

<u>File Name</u>	<u>Description</u>	<u>Approved</u>
Capture.PNG	Thermal ranges	

Statement of Problem and Substantiation for Public Input

The Utech thermal ranges regularly reference by UL are not contained in the NFPA standard.

Submitter Information Verification

Submitter Full Name: Ian Bennett
Organization: Seattle Fire Department
Street Address:
City:
State:
Zip:
Submittal Date: Mon Jun 19 12:18:28 EDT 2023
Committee: FIY-AAA

Committee Statement

Resolution: Proposed definition is not a term currently used in a mandatory section of the proposed standard



Public Input No. 12-NFPA 1400-2023 [Section No. 3.3.68]

~~3.3.68 High-Temperature Environment:~~

~~An environment with a temperature above 104°F~~

Dangerous Heat Index

A heat index above 103°F (40°C). Heat indices meeting or exceeding 103 ° F can lead to dangerous heat disorders with prolonged exposure and/or physical activity in the heat.

Statement of Problem and Substantiation for Public Input

The term "high-temperature environment" is misleading. Heat index is the accepted term when discussing environmental heat conditions that effect work capacity outside of a burning building or live fire training structure.

Submitter Information Verification

Submitter Full Name: Ian Bennett

Organization: Seattle Fire Department

Street Address:

City:

State:

Zip:

Submittal Date: Mon Jun 19 13:12:19 EDT 2023

Committee: FIY-AAA

Committee Statement

Resolution: FR-83-NFPA 1400-2024

Statement: The technical committee recognizes "Heat index" is the accepted term when discussing environmental heat conditions that effect work capacity outside of a burning building or live fire training.



Public Input No. 28-NFPA 1400-2023 [Section No. 3.3.86]

3.3.86 Live Fire.

Any open flame capable of emitting thermal load or toxic by-products of combustion that would necessitate the use of personal protective equipment (PPE).

~~3.3.86.1 – Live Fire:~~

~~Any unconfined open flame or device that can propagate fire to the building, structure, or other combustible materials.~~

Statement of Problem and Substantiation for Public Input

This deletes the redundant definition and leaves only one definition of Live Fire. The definition being kept is from 1402 and the one being deleted is from 1403.

In 2018, when converting 1402 from a guide to a standard, the 1402 Committee wrote a new definition for Live Fire because the 1403 definition appeared to be intended for acquired structures and included a potential loophole for non-combustible live fire training structures. The 1402 Committee thought that if a live fire training structure is non-combustible, and if there are no other combustible materials in the live fire training structure, then the training fire could not propagate to those items and therefore, by 1403's definition, the training fire would not be a "live fire". That might allow instructors to disregard 1403 Chapters 4 through 8 (now Chapters 15 through 19) while burning in a non-combustible live fire training structure. The 1402 definition broadens what "live fire" includes and closes that loophole as well as requires the stricter design requirements found in Chapter 7 (live fire training structures) to be followed more often when designing and building live fire training structures.

Submitter Information Verification

Submitter Full Name: Roger LeBoeuf

Organization: Elliott, LeBoeuf & McElwain

Street Address:

City:

State:

Zip:

Submittal Date: Wed Aug 23 00:23:58 EDT 2023

Committee: FIY-AAA

Committee Statement

Resolution: [FR-78-NFPA 1400-2024](#)

Statement: The technical committee reviewed and determined the best Live Fire definition. Additional definitions were determined for Live Fire Instructor and Instructor-in-charge

**Public Input No. 84-NFPA 1400-2023 [Section No. 3.3.129.2]****3.3.129.2 Open-Circuit SCBA.**

An SCBA in which exhalation is vented to the atmosphere and not rebreathed. There are two types of open-circuit SCBA: negative pressure or demand type and positive pressure or pressure- demand type.

Statement of Problem and Substantiation for Public Input

The definition was incorrect. The correct way to describe the SCBA is open circuit pressure-demand.

Submitter Information Verification

Submitter Full Name: Michael Shahan

Organization: NIOSH

Street Address:

City:

State:

Zip:

Submittal Date: Mon Aug 28 15:14:29 EDT 2023

Committee: FIY-AAA

Committee Statement

Resolution: [FR-77-NFPA 1400-2024](#)

Statement: The technical committee identified the correct way to describe the SCBA is open circuit pressure-demand.



Public Input No. 24-NFPA 1400-2023 [Section No. 3.3.138]

~~3.3.138.2 * – Live Fire Training Structure:~~

~~A structure specifically designed for conducting live fire training evolutions on a repetitive basis.~~

3.3.138 Training Structure.

~~3.3.138.1 – Acquired Structure:~~

~~A building or structure acquired by the authority having jurisdiction from a property owner for the purpose of conducting live fire training evolutions.~~

A structure utilized for conducting fire, rescue, hazmat, or related training evolutions on a repetitive basis, whether including live fire or not. This includes but is not limited to live fire training structures, training towers, and containerized training structures.

Statement of Problem and Substantiation for Public Input

These definitions for Acquired Structure and Live Fire Training Structure (which were from 1403) are redundant with the already-listed definitions (which were from 1402). The 1402 definitions are clearer than the 1403 definitions, so deleting the 1403 definitions and using the 1402 definitions will provide greater clarity and remove the redundancy.

In addition, moving the definitions for Acquired Structure and Live Fire Training Structure out from underneath the definition of Training Structure will make it easier to find the definitions because most readers would look under "A" and "L" instead of "T" to find those definitions.

The new definition of Training Structure is a modification of the current 1402 definition. The existing 1402 definition does not include all possible training structures, such as a one-story, non-live-fire, non-containerized training structure. This revised definition of what was in 1402, which is a new definition in 1400, adds clarity.

Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
<u>Public Input No. 67-NFPA 1400-2023 [Section No. A.3.3.138.2]</u>	

Submitter Information Verification

Submitter Full Name: Roger LeBoeuf
Organization: Elliott, LeBoeuf & McElwain
Street Address:
City:
State:
Zip:
Submittal Date: Tue Aug 22 23:15:10 EDT 2023
Committee: FIY-AAA

Committee Statement

Resolution: FR-76-NFPA 1400-2024

Statement: The technical committee identified there were some redundancy and overlap with multiple definitions of training structures, or versions of them.



Public Input No. 3-NFPA 1400-2023 [Section No. 3.3.143]

3.3.143* Vent, ~~Entry~~ Enter , Isolate, Search (VEIS).

The ~~approved tactic for~~ of entering a structure through an opening (door or window) to locate possible victims: a window to search a room. Also referred to as VES or window initiated search.

Statement of Problem and Substantiation for Public Input

The current definition states that entry through a door could be considered VEIS. This is not accurate. All industry publications and training materials refer to VEIS as an entry made through a window. This is what differentiates this method of entry from standard searches started by making entry through a door.

The terms VES and window initiated search should be added. VES is the historical term used instead of VEIS and is still in common usage. ULFSRI has begun using window initiated search in their technical publications.

Submitter Information Verification

Submitter Full Name: Ian Bennett

Organization: Seattle Fire Department

Affiliation: Seattle Fire Department

Street Address:

City:

State:

Zip:

Submittal Date: Mon May 29 10:19:25 EDT 2023

Committee: FIY-AAA

Committee Statement

Resolution: FR-75-NFPA 1400-2024

Statement: The technical committee recognized that the current definition states that entry through a door could be considered VEIS. This is not accurate. All industry publications and training materials refer to VEIS as an entry made through a window. This is what differentiates this method of entry from standard searches started by making entry through a door. The terms VES and window initiated search should be added. VES is the historical term used instead of VEIS and is still in common usage. ULFSRI has begun using window initiated search in their technical publications.



Public Input No. 4-NFPA 1400-2023 [New Section after 3.3.144]

Hydraulic Ventilation

Using the entrained air in the nozzle pattern to move the by-products of combustion out through a ventilation opening.

Statement of Problem and Substantiation for Public Input

Hydraulic ventilation is one of the most commonly used types of ventilation. Proper application of hydraulic ventilation is a common lesson during live fire training.

Submitter Information Verification

Submitter Full Name: Ian Bennett

Organization: Seattle Fire Department

Affiliation: Seattle Fire Department

Street Address:

City:

State:

Zip:

Submittal Date: Mon May 29 10:29:56 EDT 2023

Committee: FIY-AAA

Committee Statement

Resolution: Term is not currently used in a mandatory section of the document.



Public Input No. 39-NFPA 1400-2023 [Chapter 15 [Title Only]]

Live Fire Training Evolutions - General (NFPA 1403)

Statement of Problem and Substantiation for Public Input

This adds clarity that this chapter is solely for live fire training evolutions, not for designing/building facilities and not for training on respiratory protection, thermal imagers, RIC, etc.

Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
Public Input No. 40-NFPA 1400-2023 [Chapter 16 [Title Only]]	
Public Input No. 41-NFPA 1400-2023 [Chapter 17 [Title Only]]	
Public Input No. 42-NFPA 1400-2023 [Chapter 18 [Title Only]]	
Public Input No. 43-NFPA 1400-2023 [Chapter 19 [Title Only]]	
Public Input No. 44-NFPA 1400-2023 [Chapter 20 [Title Only]]	

Submitter Information Verification

Submitter Full Name: Roger LeBoeuf
Organization: Elliott, LeBoeuf & McElwain
Street Address:
City:
State:
Zip:
Submittal Date: Wed Aug 23 02:16:50 EDT 2023
Committee: FIY-AAA

Committee Statement

Resolution: [FR-68-NFPA 1400-2024](#)

Statement: The technical committee determined that a title change is needed for clarity as this chapter is solely for live fire training evolutions, not for designing/building facilities and not for training on respiratory protection, thermal imagers, RIC, etc.



Public Input No. 16-NFPA 1400-2023 [Section No. 15.1.2.1]

15.1.2.1

The purpose of Chapters 15 through 20 shall be to provide a ~~process- framework~~ for conducting live fire training evolutions ~~to ensure that that manages and mitigates the risks associated with live fire training while ensuring that~~ training objectives are achieved ~~and that exposure to health and safety hazards for the firefighters receiving the training is minimized~~.

Statement of Problem and Substantiation for Public Input

This is more concise. Also, the standard is not designed to reduce hazard but manage risk. Hazards can be large while the risk of those hazards is effectively mitigated.

Submitter Information Verification

Submitter Full Name: Ian Bennett

Organization: Seattle Fire Department

Street Address:

City:

State:

Zip:

Submittal Date: Mon Jun 19 19:06:37 EDT 2023

Committee: FIY-AAA

Committee Statement

Resolution: [FR-101-NFPA 1400-2024](#)

Statement: The technical committee recognizes that the standard is not designed to reduce hazard but manage risk. Hazards can be large while the risk of those hazards is effectively mitigated. Changes also include the importance of health and safety hazards to firefighters.



Public Input No. 9-NFPA 1400-2023 [Section No. 15.4.1]

15.4.1* Required Minimum Training.

Prior to being permitted to participate in live fire training evolutions, the student shall have received training to meet the minimum job performance requirements for Firefighter I in NFPA 1001 related to the following subjects:

- (1) ~~Safety~~
- (2) ~~Fire behavior~~
- (3) ~~Portable extinguishers~~
- (4) ~~Personal protective equipment (PPE)~~
- (5) ~~Ladders~~
- (6) ~~Fire hose, appliances, and streams~~
- (7) ~~Overhaul~~
- (8) ~~Water supply~~
- (9) ~~Ventilation~~
- (10) ~~Forcible entry~~
- (11) ~~Building construction~~

tasks that they will be required to perform.

Statement of Problem and Substantiation for Public Input

AHJ's with access to live fire training facilities often wish to incorporate live fire exposure training early in a recruit firefighters training. By being less prescriptive in the requirements recruits who are competent at donning and working in their gear but had not yet received training on extinguishers or building construction, could be permitted to observe and experience live fire conditions without violating the standard.

Submitter Information Verification

Submitter Full Name: Ian Bennett

Organization: Seattle Fire Department

Street Address:

City:

State:

Zip:

Submittal Date: Mon Jun 19 12:41:09 EDT 2023

Committee: FIY-AAA

Committee Statement

Resolution: FR-198-NFPA 1400-2024

Statement: The technical committee determined the need for the participant to understand the intended learning objectives of witnessing the fire dynamics demonstration and to utilize the proper PPE based on the their proximity and interaction to the demonstration.

The technical rejected a PI due to the submission removing the requirement for personnel who engage in live fire training not to have necessary fire dynamics training. Additionally, not all personnel who may engage in live fire training may have firefighter 1 so this current language will ensure those personnel have necessary fire dynamics education. This new section is an effort to clarify that.



Public Input No. 10-NFPA 1400-2023 [Section No. 15.4.2 [Excluding any Sub-Sections]]

Prior to being permitted to participate in live fire training evolutions, all participants shall have received training to meet the requirements ~~in accordance with 15.4.2.1 through 15.4.2.5~~ of firefighter 1.

Statement of Problem and Substantiation for Public Input

The information referenced in these subsections should be contained in the firefighter 1 standard not in the live fire training standard.

Submitter Information Verification

Submitter Full Name: Ian Bennett
Organization: Seattle Fire Department
Street Address:
City:
State:
Zip:
Submittal Date: Mon Jun 19 13:01:10 EDT 2023
Committee: FIY-AAA

Committee Statement

Resolution: The technical committee rejected the PI due to the submission removing the requirement for personnel who engage in live fire training not to have necessary fire dynamics training. Additionally, not all personnel who may engage in live fire training may have firefighter 1 so this current language will ensure those personnel have necessary fire dynamics education.



Public Input No. 51-NFPA 1400-2023 [Section No. 15.4.2.2]

15.4.2.2 Health and Safety.

All participants shall have received training for the following:

- (1) The components of their protective clothing and equipment required for use during operational evolutions
- (2) The thermal and air supply capabilities and limitations of their protective clothing and equipment

Additional Proposed Changes

<u>File Name</u>	<u>Description</u>	<u>Approved</u>
1403_PI_No_16.pdf	NFPA 1403_Public Input No. 16	

Statement of Problem and Substantiation for Public Input

Specifying which capabilities and limitations need to be taught or addressed prior to participating in Live Fire Training.

Submitter Information Verification

Submitter Full Name: Daniel Madrzykowski
Organization: UI Firefighter Safety Research
Street Address:
City:
State:
Zip:
Submittal Date: Thu Aug 24 08:44:49 EDT 2023
Committee: FIY-AAA

Committee Statement

Resolution: FR-105-NFPA 1400-2024

Statement: The technical committee determined that understanding the thermal capabilities and the construction of PPE is important for live fire training participants. Task group members will work an annex to explain specific characteristics of PPE and exposure considerations to contaminants. The technical committee plans to draft additional explanatory text to explain specific characteristics of PPE and exposure considerations to contaminants.



Public Input No. 52-NFPA 1400-2023 [Section No. 15.4.2.4]

15.4.2.4 Fire Development in a Compartment.

All participants shall have received training for the following:

- (1) The general development of a fire and extension beyond a single room or compartment, including heat transfer methods, pressurization within the space, stages of fire development, and transition from fuel-controlled to ventilation-controlled combustion
- (2) Building factors influencing fire development
- (3) The ~~stage~~ stages of fire growth for fuel-limited fire
- (4) The stages of fire growth for a ventilation-limited fire
- (5) The significance of the transition from a contents fire to a structural fire
- (6) Terminology related to fire development, including plume, ceiling jet, hot gas layer, neutral plane, flow path, and gravity current
- (7) The impact of the following factors on fire development in a compartment:
 - (8) Type of fuel
 - (9) Availability and locations of additional fuel
 - (10) Volume of the compartment
 - (11) Ceiling height and size, number, and arrangement of ventilation openings
 - (12) Thermal properties of the enclosure (i.e., insulation)
- (13) The hazards presented by fire behavior that impact a singular or multiple compartment(s)
- (14) How the following fire behavior phenomena occur:
 - (15) Flashover
 - (16) Backdraft
 - (17) Smoke explosion
- (18) The influence of changes in ventilation in each of the following burning regimes:
 - (19) Fuel-controlled
 - (20) Ventilation-controlled
- (21) Differences among ventilation, unplanned ventilation, and tactical ventilation
- (22) The significance of fire behavior indicators in each of the following categories:
 - (23) Building
 - (24) Smoke
 - (25) Flow path
 - (26) Heat
 - (27) Flame
 - (28) Impact of wind

Additional Proposed Changes

<u>File Name</u>	<u>Description</u>	<u>Approved</u>
1403_PI_No_17.pdf	NFPA 1403_Public Input No. 17	

Statement of Problem and Substantiation for Public Input

editorial replaced Stage with Stages

Submitter Information Verification

Submitter Full Name: Daniel Madrzykowski

Organization: UI Firefighter Safety Research

Street Address:

City:

State:

Zip:

Submittal Date: Thu Aug 24 08:47:43 EDT 2023

Committee: FIY-AAA

Committee Statement

Resolution: [FR-106-NFPA 1400-2024](#)

Statement: The technical committee identified a minor editorial correction to change stage to stages.
The technical committee determined that fire dynamic should replace fire behavior,



Public Input No. 53-NFPA 1400-2023 [Section No. 15.4.2.5]

15.4.2.5 Nozzle Techniques and Door Control.

All participants shall have received training for the following:

- (1) Factors influencing the effectiveness of extinguishment by cooling
- (2) The application of ~~indirect attack and direct attack~~ a rotating solid stream or fog stream
- (3) Key door entry size-up and risk assessment factors
- (4) Integrated door control and fire gas cooling to reduce the risk of flashover during door entry
- (5) Effective door entry and control procedures

Additional Proposed Changes

<u>File Name</u>	<u>Description</u>	<u>Approved</u>
1403_PI_No_18.pdf	NFPA 1403_Public Input No. 18	

Statement of Problem and Substantiation for Public Input

Added specifics to go beyond the traditional fire attack approaches. Adding types of hose stream uses to address water distribution, air entrainment, and pressure development.

References: <https://ulfirefightersafety.org/research-projects/impact-of-fire-attack-on-firefighter-safety-andoccupant-survival.html>

<https://ulfirefightersafety.org/research-projects/coordinated-fire-attack-utilizing-acquired-structures.html>

Submitter Information Verification

Submitter Full Name: Daniel Madrzykowski

Organization: UI Firefighter Safety Research

Street Address:

City:

State:

Zip:

Submittal Date: Thu Aug 24 08:50:56 EDT 2023

Committee: FIY-AAA

Committee Statement

Resolution: FR-107-NFPA 1400-2024

Statement: The technical committee recognized that this section should go beyond the traditional fire attack approaches. Adding types of hose stream uses to address water distribution, air entrainment, and pressure development.



Public Input No. 11-NFPA 1400-2023 [Section No. 15.4.3]

15.4.3* Documentation of Prescribed Minimum Training.

All participants in a live fire training evolution who have received the required minimum training from other than the AHJ shall not be permitted to participate in any live fire training evolution without first presenting ~~written evidence~~ documentation of having successfully completed the prescribed minimum training to the levels specified in 15.4.1.

Statement of Problem and Substantiation for Public Input

Most training records are stored, and can be accessed, digitally. Written documentation is cumbersome and no longer necessary.

Submitter Information Verification

Submitter Full Name: Ian Bennett

Organization: Seattle Fire Department

Street Address:

City:

State:

Zip:

Submittal Date: Mon Jun 19 13:04:33 EDT 2023

Committee: FIY-AAA

Committee Statement

Resolution: FR-108-NFPA 1400-2024

Statement: The technical committee recognizes most training records are stored, and can be accessed, digitally. Written documentation is cumbersome and no longer necessary.



Public Input No. 20-NFPA 1400-2023 [Section No. 15.5.1]

15.5.1

Instructors and participants shall be rehabbed in accordance with the provisions of NFPA 1584, Chapter 6, and any necessary medical evaluation and treatment, food and fluid replenishment, and relief from climatic conditions . (See *Annex G*.)

Statement of Problem and Substantiation for Public Input

This section and 15.8.6 should be consolidated for brevity.

Submitter Information Verification

Submitter Full Name: Ian Bennett

Organization: Seattle Fire Department

Street Address:

City:

State:

Zip:

Submittal Date: Mon Jun 19 19:51:51 EDT 2023

Committee: FIY-AAA

Committee Statement

Resolution: [FR-82-NFPA 1400-2024](#)

Statement: The previous section 15.8.6 was consolidated into this section for brevity



Public Input No. 13-NFPA 1400-2023 [Section No. 15.8.1]

15.8.1

The instructor shall meet the minimum job performance requirements for Live Fire Instructor-In-Charge in NFPA 1041.

Statement of Problem and Substantiation for Public Input

NFPA 1041 has a qualification for Live Fire Instructor. This is the standard that should be referenced not Instructor 1.

Submitter Information Verification

Submitter Full Name: Ian Bennett

Organization: Seattle Fire Department

Street Address:

City:

State:

Zip:

Submittal Date: Mon Jun 19 13:21:38 EDT 2023

Committee: FIY-AAA

Committee Statement

Resolution: FR-112-NFPA 1400-2024

Statement: The technical committee recognizes that NFPA 1041 has professional qualifications for live fire instructor-in-charge and live fire instructor.



Public Input No. 14-NFPA 1400-2023 [Section No. 15.8.2]

15.8.2

The instructor-in-charge shall meet the minimum job performance requirements for Live Fire Instructor ~~†~~ in Charge in NFPA 1041.

Statement of Problem and Substantiation for Public Input

NFPA 1041 has a qualification for Live Fire Instructor in Charge. This is the standard that should be referenced.

Submitter Information Verification

Submitter Full Name: Ian Bennett

Organization: Seattle Fire Department

Street Address:

City:

State:

Zip:

Submittal Date: Mon Jun 19 13:27:39 EDT 2023

Committee: FIY-AAA

Committee Statement

Resolution: FR-112-NFPA 1400-2024

Statement: The technical committee recognizes that NFPA 1041 has professional qualifications for live fire instructor-in-charge and live fire instructor.



Public Input No. 60-NFPA 1400-2023 [Section No. 15.8.2]

15.8.2

The instructor-in-charge shall meet the minimum job performance requirements for Fire Instructor II in NFPA 1041.

Additional Proposed Changes

<u>File Name</u>	<u>Description</u>	<u>Approved</u>
1403_PI_No_15.pdf	NFPA 1403 Public Input No. 15	

Statement of Problem and Substantiation for Public Input

The issue surrounding fire instructor 2 requirement, specifically in our area, is there are a very limited number of instructor 2's. We are in central Wisconsin and most of our departments are rural, volunteer. The requirements for obtaining and maintaining instructor 2 are not realistic for many, if not most, of the small volunteer/paid-on-call departments. Even in the smaller career departments, to be required to have instructor 2 in charge can be difficult; the need to send staff to school to become certified in Instructor 1 and the State requirements to become and maintain instructor 2 are cost prohibitive in a small union environment. It is very costly to send members to school to obtain and maintain these certifications. In this day and age of dwindling volunteers and greater expectations many have little desire or time to take on additional educational requirements. With the requirement of instructor 2 I know there are live fire training sessions happening where no instructor 2 is present because there simply are a limited number around. I don't agree with the training currently happening not in accordance with 1403 but I do understand it. The biggest difference I see between fire instructor 1 and 2 is an instructor 2 knows how to build a curriculum on a computer. Maybe instead of requiring a fire instructor 2 to be in charge, we change the curriculum and requirements for instructor 1 to include curriculum design. In summary, I am opposed to the fire instructor 2 requirement. I would prefer if it to revert to fire instructor 1. I think you would see better compliance.

Submitter Information Verification

Submitter Full Name: Scott Owen
Organization: Marshfield Fire and Rescue Dept
Street Address:
City:
State:
Zip:
Submittal Date: Fri Aug 25 13:39:52 EDT 2023
Committee: FIY-AAA

Committee Statement

Resolution: FR-112-NFPA 1400-2024

Statement: The technical committee recognizes that NFPA 1041 has professional qualifications for live fire instructor-in-charge and live fire instructor.



Public Input No. 19-NFPA 1400-2023 [Section No. 15.8.6 [Excluding any Sub-Sections]]

~~The instructor in charge shall provide for rest and rehabilitation of participants operating at the scene, including any necessary medical evaluation and treatment, food and fluid replenishment, and relief from climatic conditions. (See Annex G.)~~

Statement of Problem and Substantiation for Public Input

This section should be combined with 15.5.1 for brevity. The IIC's responsibility to ensure proper rehab, etc. is implied by 15.8.3

Submitter Information Verification

Submitter Full Name: Ian Bennett

Organization: Seattle Fire Department

Street Address:

City:

State:

Zip:

Submittal Date: Mon Jun 19 19:51:18 EDT 2023

Committee: FIY-AAA

Committee Statement

Resolution: The technical committee recognizes the importance of the instructor in charge understanding the need for the listed tasks outweighs the need to reduce the repeating tasks within the document. The other section of the document where these tasks are listed could be overlooked by the instructor in charge



Public Input No. 15-NFPA 1400-2023 [Section No. 15.8.6.1]

~~15.8.6.1~~ * –

~~Instructors shall be rotated through duty assignments. An instructor shall not serve as the ignition officer for more than one evolution in a row.~~

Statement of Problem and Substantiation for Public Input

Mandating the rotation of instructors, especially ignition officers, can lead to inexperienced instructors being placed in the ignition officer position. It also makes it difficult to provide the necessary instruction to newer instructors. Concerns about overheating of instructors, including ignition officers, should be dealt with through medical monitoring and providing adequate rest/rehab times. This should be left up to the direction of the AHJ and the instructors involved. This is already addressed in sections 15.8.6.2 and 15.8.8

Submitter Information Verification

Submitter Full Name: Ian Bennett

Organization: Seattle Fire Department

Street Address:

City:

State:

Zip:

Submittal Date: Mon Jun 19 18:57:45 EDT 2023

Committee: FIY-AAA

Committee Statement

Resolution: The technical committee determined the need to reduce the thermal and contaminant exposure to the instructors.



Public Input No. 22-NFPA 1400-2023 [Section No. 15.8.7]

15.8.7

All instructors shall be qualified by the AHJ to deliver live fire training.

There should be a deference made between Rookie/Probationary firefighters and normal firefighters when in a paid full-time department.

Training associated with any number of recruit or probationary fighter, paid or volunteer, shall require all instructors be qualified by the AHJ to deliver live fire training.

Training associated with only paid, full-time, personnel who have completed their probationary time and packet, may substitute instructors for fire personnel tasked with incident command responsibilities during normal fireground operations.

Statement of Problem and Substantiation for Public Input

Smaller departments have a very difficult time putting on live fire training when so many live fire instructors are required. By limiting the experience firefighters may gain through live fire training we are making the more dangerous, real fire, incident, even more dangerous.

Submitter Information Verification

Submitter Full Name: Greg Carter

Organization: City of Milton Fire Rescue

Street Address:

City:

State:

Zip:

Submittal Date: Fri Jul 07 09:47:51 EDT 2023

Committee: FIY-AAA

Committee Statement

Resolution: The technical committee rejected this PI because the request is unclear and without supporting information. Additionally, the AHJ has the final decision to decide whom and how many will deliver live fire training but the TC does not accept lessening the leadership and oversight of this training exercise



Public Input No. 17-NFPA 1400-2023 [Section No. 15.9]

~~15.9 Fire Control Team~~ Ignition Team .

15.9.1

~~A fire control team~~ An ignition team shall consist of a minimum of two personnel, the Ignition Officer and Ignition Support .

15.9.1.1

~~One person who is not a student or safety~~ The ignition officer shall be ~~designated as the~~ "ignition officer" to one to ignite, maintain, and control the materials being burned.

15.9.1.1.1

~~The ignition officer shall~~ officer shall not be a ~~member of the fire control team~~ student or the safety officer and shall meet the minimum job performance requirements for Live Fire Instructor in NFPA 1041 .

15.9.1.2*

~~One member of the fire control team~~ The ignition support shall be in the area to observe the ignition officer ignite and maintain the fire, and to recognize, report, and respond to any adverse conditions.

15.9.2

The decision to ignite the training fire shall be made by the instructor-in-charge in coordination with the safety officer.

15.9.3

~~The fire shall be ignited by the ignition officer.~~

~~15.9.4~~ –

~~The fire control team shall wear full personal protective clothing, including SCBA, when performing this control function.~~

~~15.9.5~~ –

A charged hose line shall be available when the fire control team is igniting or tending to any fire.

~~15.9.6~~ 4

Fires shall not be ignited without an instructor visually confirming that the flame area is clear of personnel being trained.

Statement of Problem and Substantiation for Public Input

Ignition team is a much more widely recognized term for this functional group. The ignition officer should be trained at minimum to the Live Fire Instructor Level. The addition of a name for the other member of the team is for clarity. 15.9.3 is contained in 15.9.1.1 and so was deleted. 15.9.4 is implied in 15.8.9 and so was deleted.

Submitter Information Verification

Submitter Full Name: Ian Bennett

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City:**State:****Zip:****Submittal Date:** Mon Jun 19 19:18:25 EDT 2023**Committee:** FIY-AAA

Committee Statement

Resolution: [FR-109-NFPA 1400-2024](#)**Statement:** The technical committee renamed ignition officer to ignition group supervisor and ignition group.



Public Input No. 68-NFPA 1400-2023 [Section No. 15.14]

15.14 Fuel Materials.

GENERAL COMMENT TO TASK GROUP: Clarify and reorganize Section 15.14 to distinguish requirements for solid fuels, flammable liquid fuels, flammable gas fuels, liquified versions of flammable gas fuels, as well as maintain the general requirements that apply to all fuel types (such as 15.14.2, 15.14.4 and 15.14.6 through 15.14.10). 15.14 is a bit confusing and needs to be cleaned up.

15.14.1*

The fuels that are utilized in live fire training evolutions shall only be wood products.

15.14.1.1

Fuel-fired buildings and props are permitted to use the appropriate fuels for the design of the building or prop.

15.14.2

Pressure-treated wood, rubber, plastic, polyurethane foam, tar paper, upholstered furniture, carpeting, and chemically treated or pesticide-treated straw or hay shall not be used as part of the fuel load.

15.14.3

Flammable or combustible liquids, as defined in NFPA 30, shall not be used in live fire training evolutions.

15.14.3.1

Combustible liquid with a flash point above 100°F (38°C) shall be permitted to be used in a live fire training structure or prop that has been specifically engineered to accommodate a defined quantity of the fuel.

15.14.4

Unidentified materials, such as debris found in or around the structure or prop that could burn in unanticipated ways, react violently, or create environmental or health hazards, shall not be used.

15.14.5

Propane lighters, butane lighters, fusees (safety flares), kitchen-type matches, and similar devices are permitted to be used to ignite training fires if the device is removed immediately after ignition of the training fire.

15.14.6*

Fuel materials shall be used only in the amounts necessary to create the desired fire size.

15.14.7*

The fuel load shall be limited to avoid conditions that could cause an uncontrolled flashover or backdraft. If a controlled flashover is designed to occur for training purposes, additional safety measures for providing a safe observation space for instructors and students shall be documented and followed.

15.14.8*

The instructor-in-charge and the safety officer shall assess the selected fire room environment for factors that can affect the growth, development, and spread of fire.

15.14.9*

The instructor-in-charge and the safety officer shall document fuel loading, including all of the following:

- (1) Fuel material
- (2) Wall and floor coverings and ceiling materials
- (3) Type of construction of the structure, including type of roof and combustible void spaces
- (4) Dimensions of the room

15.14.10*

The training exercise shall be stopped immediately when the instructor-in-charge or the safety officer determines through ongoing assessment that the combustible nature of the environment represents a potential hazard.

15.14.10.1

An exercise stopped as a result of an assessed hazard according to 15.14.10 shall continue only when actions have been taken to reduce the hazard.

15.14.11*

The use of flammable gas, such as propane and natural gas, shall be permitted only in live fire training structures specifically designed for their use.

15.14.11.1

Liquefied versions of the gases specified in 15.14.11 shall not be permitted inside the live fire training structure.

15.14.11.2*

All props that use pressure to move fuel to the fire shall be equipped with remote fuel shutoffs outside of the safety perimeter but within sight of the prop and the entire field of attack for the prop.

15.14.11.3

During the entire time the prop is in use, the remote shutoff shall be continuously attended by safety personnel who are trained in its operation and who have direct communications with the safety officer and instructors.

15.14.11.4

Liquefied petroleum gas props shall be equipped with all safety features as described in NFPA 58 and NFPA 59.

15.14.11.5

Where the evolution involves the failure of a safety feature, the failed part shall be located downstream from the correctly functioning safety feature.

15.14.11.6

Where flammable or combustible liquids are used, measures shall be taken to prevent runoff from contaminating the surrounding area.

15.14.11.6.1

There shall be oil separators for cleaning the runoff water.

15.14.11.7*

Vehicles used as props for live fire training shall have all fluid reservoirs, tanks, shock absorbers, drive shafts, and other gas-filled closed containers removed, vented, or drained prior to any ignition.

15.14.11.8

For flammable metal fires, there shall be a sufficient quantity of the proper extinguishing agent available so that all attack crews have the required supply as well as a 150 percent reserve for use by the backup crews.

15.14.11.9

All possible sources of ignition, other than those that are under the direct supervision of the ignition officer, shall be removed from the operations area.

Statement of Problem and Substantiation for Public Input

The following are examples of how 15.14 can be confusing as currently worded:

15.14.1 states that only wood products are allowed.

15.14.3.1 allows combustible liquids for live fire training evolutions and 15.14.11 allows flammable gas to fuel fires in live fire training structures and props specifically designed for such uses. All of that is reasonable but is a bit confusing given the current wording of 15.14.1, which allows only wood products. So, some revision is recommended.

A separate PI for editing 15.14.3.1 will also be submitted to clarify that language.

15.14.11 addresses the use of flammable gas but several subsections of 15.14.11 address flammable liquids / combustible liquids instead of flammable gas. The flammable liquids / combustible liquids language should be within their own subsection outside of 15.14.11.

15.14.11.7 addresses preparing vehicles for burns, which does not belong under 15.14 "Fuel Materials". Instead, the content of 15.14.11.7 should be moved to its own section in Chapter 15 (for example, "15.15 - Preparing Vehicles to be used as Live Fire Training Props").

15.14.3 should apply only to interior live fire training evolutions, and 15.14.3.1 should be clearly identified as an exception for interior live fire training evolutions. There should not be a ban on using flammable / combustible liquids in outdoor live fire training evolutions, such as fuel spill props. Parts of 15.14.11 already imply that flammable/combustible liquids are allowed in some circumstances, and Chapter 13 includes requirements for outdoor flammable/combustible liquids fire training props, which further implies that such fuels can be used for live fire training evolutions in certain types of props.

13.1.3 does not allow interior props that use flammable liquids but 15.14.3.1 does. This needs to be coordinated. There are some live fire training structures in the country that use flammable liquids for interior burns, so this needs to be considered carefully.

15.14.5 should be clarified to be only for wood fuels (interior and exterior fires) and flammable gas fuels when outdoors but not indoors (indoor manual ignition is prohibited by 17.1.4).

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Submittal Date: Fri Aug 25 17:19:49 EDT 2023

Committee: FIY-AAA

Committee Statement

Resolution: [FR-100-NFPA 1400-2024](#)

Statement: The technical committee reformatted the section on fuel materials.



Public Input No. 54-NFPA 1400-2023 [Section No. 15.14.1 [Excluding any Sub-Sections]]

The fuels that are utilized in live fire training evolutions shall ~~only be wood~~ include excelsior (wood fibers or shavings), wooden pallets, straw, hay, and other wood-based building products.

Additional Proposed Changes

<u>File Name</u>	<u>Description</u>	<u>Approved</u>
1403_PI_No_20.pdf	NFPA 1403_Public Input No. 20	

Statement of Problem and Substantiation for Public Input

Moved text from appendix in order to clarify the types of fuels that are acceptable for use in live fire training. Straw and hay are not wood but are acceptable. Also engineered lumber materials such as plywood, particle board, wood fiber board, and oriented strand board which are widely used in fire props, Class A burn building, and flash over simulators would technically not be allowed under the 2018 standard as the definition of "wood" is in the appendix note. Further excelsior is typically made from aspen as opposed to pine.

Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
<u>Public Input No. 56-NFPA 1400-2023 [Section No. A.15.14.1]</u>	

Submitter Information Verification

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Submittal Date: Thu Aug 24 08:56:57 EDT 2023
Committee: FIY-AAA

Committee Statement

Resolution: FR-100-NFPA 1400-2024
Statement: The technical committee reformatted the section on fuel materials.



Public Input No. 69-NFPA 1400-2023 [Section No. 15.14.1.1]

15.14.1.1

~~Fuel-fired buildings and props are permitted to use the appropriate fuels for the design of the building or prop.~~ See below for exceptions for flammable/combustible liquids and flammable gas.

Statement of Problem and Substantiation for Public Input

15.14.1.1 was intended to allow liquid and gas fuels to be used for live fire training structures and props that are designed for such use, but it reads "fuel-fired" instead of "liquid fuel-fired and gas fired". Because wood is a fuel, "fuel-fired" could cause confusion and make one believe that 15.14.1.1 only applies to wood fuels, not to liquid and gas fuels.

Furthermore, the exceptions for combustible liquids are written in 15.14.3.1 and the exceptions for flammable gas are written in 15.14.11. To delete redundancy and to eliminate a potential for conflicting wording between sections, it would be good to delete the current wording of 15.14.1.1 and to use that section to simply alert the reader that exceptions exist and are written later.

If this PI is rejected, the use of "building" in 15.14.1.1 needs to be revised to "live fire training structure" to be consistent with the rest of the document, and "fuel-fired" needs to be revised to "liquid fuel-fired and gas-fired" to more accurately reflect the intent.

Submitter Information Verification

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Submittal Date: Fri Aug 25 18:10:38 EDT 2023

Committee: FIY-AAA

Committee Statement

Resolution: [FR-100-NFPA 1400-2024](#)

Statement: The technical committee reformatted the section on fuel materials.



Public Input No. 59-NFPA 1400-2023 [Section No. 15.14.2]

15.14.2

Pressure-treated wood, oriented strand board containing Polymethylene Polyphenylisocyanate/ Polymeric Diphenylmethane Diisocyanate (PMDI), rubber, plastic, polyurethane foam, tar paper, upholstered furniture, carpeting, and chemically treated or pesticide-treated straw or hay shall not be used as part of the fuel load.

Additional Proposed Changes

<u>File Name</u>	<u>Description</u>	<u>Approved</u>
1403_PI_No_14.pdf	NFPA 1403 Public Input No. 14	
MSDS-8825471445461.1590940419219.pdf	BASF P-MDI SDS SDS for OSB showing 1A carcinogen along with	
Weyerhaeuser_Oriented_Strand_Board_OSB_Products.1590940465276.pdf	same CAS# 9016-87-9 same as the BASF P-MDI	
LP_SDS.1590940810150.pdf	LP OSB SDS showing same CAS # 9016-87-9 as BASF P-MDI	
SDS_Polyurethane-Foam-System-GUN-Can_US- English.1590943972246.pdf	Polyurethane Foam SDS CAS # 9016- 87-9	
MSDS_Sheets_Polyurethane_Mixture_A_538_00.1590944023510.pdf	Polyurethane Foam SDS CAS # 9016- 87-9	
OSB_Study.1590944097917.pdf	Firefighters and Instructors absorption of PAHs and benzene during training fires	
EPA_MDI_and_related_compunds_action_plan.1590944830097.pdf	EPA action plan for MDI/	

Polyurethane foam. This shows that P-MDI the binding agent in OSB is the same thing as Polyurethane foam. See page 3 section IV.

Statement of Problem and Substantiation for Public Input

Training fires along with continuing education are a major portion of firefighters' occupational exposures to smoke; however, the magnitude and composition of those exposures were not well understood and may vary by the type of training scenario and the fuel package used.

To understand how live fire training contributes to firefighters' and instructors' cancer-causing chemical exposures, a study was conducted and was then published in the International Journal of Hygiene and Environmental Health. The study titled "Firefighters' and instructors' absorption of PAHs and benzene during training exercises" measured biomarkers and chemical concentrations based on level of exposure to the burning of pallet and straw, oriented strand board (OSB), and simulated smoke.

Urine samples were analyzed for metabolites of polycyclic aromatic hydrocarbons (PAHs) and breath samples were analyzed for volatile organic compounds (VOCs) including benzenes. Dermal absorption likely contributed to the biological levels as the respiratory route was well protected.

Median concentrations of nearly all PAH metabolites in urine increased from pre-to 3-hr post-training for each scenario and were highest for OSB, followed by pallet and straw, and then simulated smoke.

For instructors who supervised three trainings per day, median concentrations increased with collections after each scenario. A single day of OSB exercises led to a 30-fold increase in 1-hydroxypyrene for instructors, culminating in a median end-of-shift concentration 3.5 times greater than median levels measured from firefighters in a previous controlled, residential fire study. Breath concentrations of benzene increased 2 to 7-times immediately after the training exercises except for simulated smoke training. Measured levels of PAHs and VOCs were highest in scenarios where fuel packages contained OSB and instructors' levels were magnified with accumulated PAHs when taking part in repeated daily exercises.

Further analysis of the make-up of OSB has found that identical chemicals are used in the manufacturing of OSB and polyurethane foam, which has already been banned under 1403. Polymeric Diphenylmethane Diisocyanate (P-MDI) is noted on the Safety Data Sheet (SDS) for both OSB and the polyurethane foam as the chemical used in the manufacturing process. Both polyurethane foam, OSB, and PMDI have the same CAS number on their SDS sheet, CAS # 9016-87-9. The SDS documents were provided by Weyerhaeuser and Louisiana Pacific for OSB. The P-MDI SDS document was provided by BASF. Additionally, this information was cross checked for factuality utilizing the Environmental Protection Agencies Methylene Diphenyl Diisocyanate (MDI) and related compounds action plan April 2011. All supporting documents are being submitted as an attachment.

By adding OSB that contains P-MDI to the list of materials banned under 1403 4.13.2 this would help reduce the toxic exposure firefighter are receiving during training. It is our belief that OSB that contains P-MDI was unintentionally left out of previous drafts of NFPA 1403 due to the lack of supporting information relating to P-MDI as used in Polyurethane foam and OSB.

Submitter Information Verification

Submitter Full Name: Ryan McGill

Organization: Fairfax County Fire and Rescue

Affiliation: IAFF Local 2068

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Zip:**Submittal Date:** Fri Aug 25 13:28:22 EDT 2023**Committee:** FIY-AAA

Committee Statement

Resolution: The technical committee resolved the PI based on the review and assessment of the materials submitted with the PI and the findings of the peer-reviewed journal article, Exposure Risks and Potential Control Measures for a Fire Behavior Lab Training Structure: Part B – Chemical Gas Concentrations, and the review of the other submitted materials. The suggestion that OSB as a fuel constitutes a higher hazard due solely to an ingredient related to CAS# 9016-87-9 could not be supported. The TC understands that IARC has determined that occupational exposure as a firefighter is carcinogenic to humans (Group 1). Hence the TC is focused reducing chemical exposures through engineering controls, administrative controls, the use of PPE, and gross on-scene decontamination.



Public Input No. 71-NFPA 1400-2023 [Section No. 15.14.6]

15.14.6*

Fuel materials shall be used only in the amounts necessary to create the desired fire size while maintaining a safe training environment for participants .

Statement of Problem and Substantiation for Public Input

The existing language allows a large fuel load that could endanger participants (students and instructors) if the "desired fire size" is a dangerously large fire in the burn room of the live fire training structure.

I have heard many anecdotal stories through the years, including in 2023, in which fuel loads were enlarged or fuel was added to an already burning fire for dramatic effect, to intimidate students, to expose students to the end-of-academy "hell day" or "hell burn", or to make large flames visible from the outside through the exterior window even though the interior was becoming too hot for the safety of inside participants. A strict interpretation of the existing language would allow for such dangerous conditions.

By adding the phrase about maintaining a safe training environment for the participants, the chances of dangerous, oversized training fires will be reduced. Hopefully this will also reduce the number of times we hear this statement from firefighters: "The hottest fire I've ever felt was in a burn building during training. If it gets that hot in the real world, we back out and take a defensive position outside."

Submitter Information Verification

Submitter Full Name: Roger LeBoeuf

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Submittal Date: Fri Aug 25 18:17:51 EDT 2023

Committee: FIY-AAA

Committee Statement

Resolution: [FR-100-NFPA 1400-2024](#)

Statement: The technical committee reformatted the section on fuel materials.



Public Input No. 70-NFPA 1400-2023 [Section No. 15.14.11 [Excluding any Sub-Sections]]

The use of flammable gas, such as propane and natural gas, shall be permitted only in live fire training structures and props specifically designed for their use.

Statement of Problem and Substantiation for Public Input

Without this revision, a strict interpretation would allow only wood fuels (per 15.14.1) to be used in automobile fire props, dumpster fire props, and aircraft fire props. In addition, this revision makes the wording of 15.14.11 consistent with 15.14.3.1, which also reads "live fire training structure or prop".

Submitter Information Verification

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Submittal Date: Fri Aug 25 18:15:43 EDT 2023
Committee: FIY-AAA

Committee Statement

Resolution: [FR-100-NFPA 1400-2024](#)
Statement: The technical committee reformatted the section on fuel materials.



Public Input No. 46-NFPA 1400-2023 [New Section after 15.18]

15.19 Fire Locations

15.19.1* Within live fire training structures, if there are adjoining burn rooms that share a door that serves as a mandatory exit for either room, live fires shall not be burned in both rooms simultaneously.

A.15.19.1 Live fires should not be burned simultaneously in adjoining rooms if they share an exit door that is one of the mandatory burn room exits defined by Chapter 7. The way out of an active burn room should not be into an adjoining room that also has a live fire burning. The intent is for the adjoining room to be less hazardous than the active burn room, to provide a higher level of safety should an emergency exist in the active burn room.

Statement of Problem and Substantiation for Public Input

In March 2018, the Technical Committee on Facilities for Fire Training and Associated Props (the 1402 Committee) had its second draft meeting in Austin and finalized the first edition of the new 1402 Standard. During that meeting, this item was identified as something that requires coordination with 1403 (now Chapters 15 through 20).

In the 2019 edition of 1402, new, stricter requirements for exits from burn rooms were added. The 1402 Committee didn't want the way out of an active burn room to be into another active burn room and wanted to add this language to 1402. The language could not go into 1402, however, because it was operational in nature and 1402 was a facilities document. It could go into 1403 (now Chapters 15 through 20), however, and is recommended to help ensure that the safety benefit gained by designing the burn rooms per 1402 (now Chapter 7) is sustained operationally while training in accordance with 1403.

Note this does not apply to acquired structures because Chapter 16 specifically states, "Only one fire at a time shall be permitted within an acquired structure." (16.1.12).

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Submittal Date: Wed Aug 23 03:06:24 EDT 2023
Committee: FIY-AAA

Committee Statement

Resolution: FR-70-NFPA 1400-2024

Statement: The technical committee identified that appropriate language for live fire training in mobile and fixed training facilities but not in acquired structures on adjoining rooms.



Public Input No. 40-NFPA 1400-2023 [Chapter 16 [Title Only]]

Live Fire Training in Acquired Structures (NFPA 1403)

Statement of Problem and Substantiation for Public Input

This adds clarity that this chapter is solely for live fire training evolutions, not for designing/building facilities and not for training on respiratory protection, thermal imagers, RIC, etc.

Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
Public Input No. 39-NFPA 1400-2023 [Chapter 15 [Title Only]]	Similar edit for similar reason.
Public Input No. 41-NFPA 1400-2023 [Chapter 17 [Title Only]]	
Public Input No. 42-NFPA 1400-2023 [Chapter 18 [Title Only]]	
Public Input No. 43-NFPA 1400-2023 [Chapter 19 [Title Only]]	
Public Input No. 44-NFPA 1400-2023 [Chapter 20 [Title Only]]	

Submitter Information Verification

Submitter Full Name: Roger LeBoeuf
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Submittal Date: Wed Aug 23 02:23:45 EDT 2023
Committee: FIY-AAA

Committee Statement

Resolution: [FR-69-NFPA 1400-2024](#)
Statement: The technical committee changed the title to add clarity that this chapter that is solely for live fire training evolutions



Public Input No. 47-NFPA 1400-2023 [Section No. 16.1.11]

16.1.11 –

~~No person(s) shall play the role of a victim inside the acquired structure.~~

Statement of Problem and Substantiation for Public Input

This section is redundant with 15.18.1. Because Chapter 15 applies to all subsequent chapters, the repeated language in Chapter 16 is the redundant language that should be deleted.

Submitter Information Verification

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Submittal Date: Wed Aug 23 03:22:07 EDT 2023

Committee: FIY-AAA

Committee Statement

Resolution: The technical committee determined that despite this section being redundant with Chapter 15, the importance, and history behind the formation of this standard, dictates the restatement of not using live victims. The TC determined that this is an important life safety requirement to remain in place



Public Input No. 48-NFPA 1400-2023 [Chapter 17]

Chapter 17 Gas-Fired Live Fire Training Structures and Mobile Enclosed Live Fire Training Props (NFPA 1403)

17.1 Structures, Props, and Facilities.

17.1.1

This section pertains to all interior spaces where gas-fired live fire training exercises occur.

17.1.2

Live fire training structures and mobile enclosed live fire training props shall be left in a safe condition upon completion of live fire training evolutions.

17.1.3

Debris hindering the access or egress of firefighters shall be removed prior to the beginning of the training exercises.

17.1.4

Flammable gas fires shall not be ignited manually.

17.2 Inspection and Testing.

17.2.1*

Live fire training structures and mobile enclosed live fire training props shall be inspected visually for damage prior to live fire training evolutions.

17.2.1.1*

Damage shall be documented and the building/prop owner or AHJ shall be notified.

17.2.2

Where the ~~live fire training structure~~ damage is severe enough to affect the safety of the participants, training shall not be permitted.

17.2.3

All doors, windows and window shutters, railings, roof scuttles and automatic ventilators, mechanical equipment, lighting, manual or automatic sprinklers, and standpipes necessary for the live fire training evolution shall be checked and operated prior to any live fire training evolution to ensure they operate correctly.

17.2.4

All safety devices, ~~such as thermal~~ including but not limited to thermal sensors, combustible gas monitors, evacuation alarms, and emergency shutdown switches, shall be checked prior to any live fire training evolutions to ensure they operate correctly.

17.2.5

The instructors shall run the training system prior to exposing students to live flames in order to ensure the correct operation of devices ~~such as the~~ including but not limited to the gas valves, flame safeguard units, agent sensors, combustion fans, and ventilation fans.

17.2.6*

The structural integrity of the live fire training structure shall be evaluated and documented annually by the building owner or AHJ.

17.2.6.1

If visible structural defects are found, such as cracks, rust, spalls, or warps in structural floors, columns, beams, walls, or metal panels, the building owner shall have a follow-up evaluation conducted by a licensed professional engineer with live fire training structure experience and expertise, or by another competent professional as determined by the building owner or AHJ.

17.2.7*

The structural integrity of the live fire training structure shall be evaluated and documented by a licensed professional engineer with live fire training structure experience and expertise, or by another competent professional as determined by the AHJ, at least once every 10 years, or more frequently if determined to be required by the evaluator.

17.2.8*

All structures constructed with calcium aluminate refractory structural concrete shall be inspected by a structural engineer with expertise in live fire training structures every 3 years.

17.2.8.1

The structural inspection shall include removal of concrete core samples from the structure to check for delaminations within the concrete.

17.2.9*

Part of the live fire training structure evaluation shall include, at least once every 10 years, the removal and reinstallation of a representative area of thermal linings (if any) to inspect the hidden conditions behind the linings.

Statement of Problem and Substantiation for Public Input

These revisions were approved by the Training Committee at the October 2015 meeting. For some reason, presumably a mistake during final editing, the only approved revision that was incorporated into the final version of 1403 was the revision to the chapter title to include Mobile Enclosed Live Fire Training Props. The rest of the revisions to add mobile enclosed live fire training props to the chapter, however, were not incorporated. Those revisions are necessary to make Chapter 17 apply to mobile enclosed live fire training props in addition to live fire training structures.

Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
Public Input No. 49-NFPA 1400-2023 [Chapter 18]	

Submitter Information Verification

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Submittal Date: Wed Aug 23 03:25:41 EDT 2023
Committee: FIY-AAA

Committee Statement

Resolution: [FR-92-NFPA 1400-2024](#)

Statement: The technical committee identified some minor edits to include mobile enclosed live fire training props.



Public Input No. 41-NFPA 1400-2023 [Chapter 17 [Title Only]]

Live Fire Training in Gas-Fired Live Fire Training Structures and Mobile Enclosed Live Fire Training Props (NFPA 1403)

Statement of Problem and Substantiation for Public Input

This adds clarity that this chapter is solely for live fire training evolutions, not for designing/building facilities and not for training on respiratory protection, thermal imagers, RIC, etc.

Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
Public Input No. 39-NFPA 1400-2023 [Chapter 15 [Title Only]]	Similar edit for similar reason.
Public Input No. 40-NFPA 1400-2023 [Chapter 16 [Title Only]]	Similar edit for similar reason.
Public Input No. 42-NFPA 1400-2023 [Chapter 18 [Title Only]]	
Public Input No. 43-NFPA 1400-2023 [Chapter 19 [Title Only]]	
Public Input No. 44-NFPA 1400-2023 [Chapter 20 [Title Only]]	

Submitter Information Verification

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Submittal Date: Wed Aug 23 02:25:35 EDT 2023
Committee: FIY-AAA

Committee Statement

Resolution: [FR-91-NFPA 1400-2024](#)

Statement: The technical committee identified a change to add clarity that this chapter is solely for live fire training evolutions, not for designing/building facilities and not for training on respiratory protection, thermal imagers, RIC, etc.



Public Input No. 33-NFPA 1400-2023 [Section No. 17.2]

17.2 Inspection and Testing.

17.2.1*

Live fire training structures shall be inspected visually for damage prior to live fire training evolutions.

17.2.1.1*

Damage shall be documented and the building owner or AHJ shall be notified.

17.2.2

Where the live fire training structure damage is severe enough to affect the safety of the participants, training shall not be permitted.

17.2.3

All doors, windows and window shutters, railings, roof scuttles and automatic ventilators, mechanical equipment, lighting, manual or automatic sprinklers, and standpipes necessary for the live fire training evolution shall be checked and operated prior to any live fire training evolution to ensure they operate correctly.

17.2.4

All safety devices, such as thermal sensors, combustible gas monitors, evacuation alarms, and emergency shutdown switches, shall be checked prior to any live fire training evolutions to ensure they operate correctly.

17.2.5

The instructors shall run the training system prior to exposing students to live flames in order to ensure the correct operation of devices such as the gas valves, flame safeguard units, agent sensors, combustion fans, and ventilation fans.

~~17.2.6 *~~

~~The structural integrity of the live fire training structure shall be evaluated and documented annually by the building owner or AHJ.~~

~~17.2.6.1 -~~

~~If visible structural defects are found, such as cracks, rust, spalls, or warps in structural floors, columns, beams, walls, or metal panels, the building owner shall have a follow-up evaluation conducted by a licensed professional engineer with live fire training structure experience and expertise, or by another competent professional as determined by the building owner or AHJ.~~

~~17.2.7 *~~

~~The structural integrity of the live fire training structure shall be evaluated and documented by a licensed professional engineer with live fire training structure experience and expertise, or by another competent professional as determined by the AHJ, at least once every 10 years, or more frequently if determined to be required by the evaluator.~~

~~17.2.8 *~~

~~All structures constructed with calcium aluminate refractory structural concrete shall be inspected by a structural engineer with expertise in live fire training structures every 3 years.~~

~~17.2.8.1 -~~

~~The structural inspection shall include removal of concrete core samples from the structure to check for delaminations within the concrete.~~

17.2.9 * –

~~Part of the live fire training structure evaluation shall include, at least once every 10 years, the removal and reinstallation of a representative area of thermal linings (if any) to inspect the hidden conditions behind the linings.~~

Statement of Problem and Substantiation for Public Input

Since its 2002 edition, 1403 included these structural integrity evaluation requirements, which relate to training facilities and not to live fire training evolutions. These requirements were in 1403 because the Training Committee deemed them important enough for firefighter safety to include them in 1403 even though they would have been better suited in a standard on training facilities, which did not exist in 2002.

In 2019, 1402 became a standard on training facilities and the requirements for structural integrity evaluations of live fire training structures was included in Chapter 7 of that document, with nearly identical language with what was in the 2018 edition of 1403. The intent was to then delete these requirements from 1403 in its next cycle.

Now that 1402 and 1403 have been merged into the 1400 Standard, these requirements are found in Chapters 7, 17, and 18 of the draft and should be trimmed to only one location for clarity and to eliminate risk of contradicting language from one chapter to the next. Given the scopes of the chapters, the requirements for structural integrity evaluations of live fire training structures are better suited for Chapter 7 (a facilities chapter) than for Chapters 17 and 18 (training operations chapters).

Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
<u>Public Input No. 34-NFPA 1400-2023 [Section No. 18.2]</u>	
<u>Public Input No. 36-NFPA 1400-2023 [Sections A.17.2.6, A.17.2.7, A.17.2.8, A.17.2.9]</u>	

Submitter Information Verification

Submitter Full Name: Roger LeBoeuf
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Submittal Date: Wed Aug 23 01:17:34 EDT 2023
Committee: FIY-AAA

Committee Statement

Resolution: FR-93-NFPA 1400-2024
Statement: The technical committee identified some additional text to address mobile enclosed live fire training props.



Public Input No. 49-NFPA 1400-2023 [Chapter 18]

Chapter 18 Non-Gas-Fired Live Fire Training Structures and Mobile Enclosed Live Fire Training Props (NFPA 1403)

18.1 Structures, Props, and Facilities.

18.1.1

This section pertains to all interior spaces where non-gas-fired live fire training exercises occur.

18.1.2

Live fire training structures and mobile enclosed live fire training props shall be left in a safe condition upon completion of live fire training evolutions.

18.1.3

Debris hindering the access or egress of firefighters shall be removed prior to the beginning of the training exercises.

18.2 Inspection and Testing.

18.2.1*

Live fire training structures and mobile enclosed live fire training props shall be inspected visually for damage prior to live fire training evolutions.

18.2.1.1*

Damage shall be documented, and the building/prop owner or AHJ shall be notified.

18.2.2

Where the ~~live fire training structure~~ damage is severe enough to affect the safety of the participants, training shall not be permitted.

18.2.3

All doors, windows and window shutters, railings, roof scuttles and automatic ventilators, mechanical equipment, lighting, manual or automatic sprinklers, and standpipes necessary for the live fire training evolution shall be checked and operated prior to any live fire training evolution to ensure they operate correctly.

18.2.4

All safety devices, ~~such as~~ including but not limited to thermal sensors, oxygen and toxic and combustible gas monitors, evacuation alarms, and emergency shutdown switches, shall be checked prior to any live fire training evolutions to ensure they operate correctly.

18.2.5*

The structural integrity of the live fire training structure shall be evaluated and documented annually by the building owner or AHJ.

18.2.5.1

If visible structural defects are found, such as cracks, rust, spalls, or warps in structural floors, columns, beams, walls, or metal panels, the building owner shall have a follow-up evaluation conducted by a licensed professional engineer with live fire training structure experience and expertise or by another competent professional as determined by the AHJ.

18.2.6*

The structural integrity of the live fire training structure shall be evaluated and documented by a licensed professional engineer with live fire training structure experience and expertise or by another competent professional as determined by the AHJ at least once every 5 years or more frequently if determined to be required by the evaluator.

18.2.7*

All structures constructed with calcium aluminate refractory structural concrete shall be inspected by a structural engineer with expertise in live fire training structures every 3 years.

18.2.7.1

The structural inspection shall include removal of concrete core samples from the structure to check for delaminations within the concrete.

18.2.8*

Part of the live fire training structure evaluation shall include, once every five years, the removal and reinstallation of a representative area of thermal linings (if any) to allow inspections of the conditions hidden behind the linings.

18.3 Sequential Live Fire Burn Evolutions.**18.3.1**

The AHJ shall develop and utilize a safe live fire training action plan when multiple sequential burn evolutions are to be conducted per day in each burn room.

18.3.2

A burn sequence matrix chart shall be developed for the burn rooms ~~in a~~ in live fire training structures and mobile enclosed live fire training ~~structure props~~ .

18.3.2.1

The burn sequence matrix chart shall include the maximum fuel loading per evolution and maximum number of sequential live fire evolutions that can be conducted per day in each burn room.

18.3.3*

The burn sequence for each burn room shall define the maximum fuel load that can be used for the first burn and each successive burn.

18.3.4*

The burn sequence matrix for each burn room shall also specify the maximum number of evolutions that can be safely conducted during a given training period before the burn room is allowed to cool.

18.3.5

The fuel loads per evolution and the maximum number of sequential evolutions in each burn room shall not be exceeded under any circumstances.

Statement of Problem and Substantiation for Public Input

These revisions were approved by the Training Committee at the October 2015 meeting. For some reason, presumably a mistake during final editing, the only approved revision that was incorporated into the final version of 1403 was the revision to the chapter title to include Mobile Enclosed Live Fire Training Props. The rest of the revisions to add mobile enclosed live fire training props to the chapter, however, were not incorporated. Those revisions are necessary to make Chapter 18 apply to mobile enclosed live fire training props in addition to live fire training structures.

Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
<u>Public Input No. 48-NFPA 1400-2023 [Chapter 17]</u>	Similar edits for similar reasons.

Submitter Information Verification

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Submittal Date: Wed Aug 23 03:31:42 EDT 2023

Committee: FIY-AAA

Committee Statement

Resolution: [FR-12-NFPA 1400-2024](#)

Statement: The technical committee identified that mobile enclosed live fire training props should be addressed in this section.



Public Input No. 42-NFPA 1400-2023 [Chapter 18 [Title Only]]

Live Fire Training in Non-Gas-Fired Live Fire Training Structures and Mobile Enclosed Live Fire Training Props (NFPA 1403)

Statement of Problem and Substantiation for Public Input

This adds clarity that this chapter is solely for live fire training evolutions, not for designing/building facilities and not for training on respiratory protection, thermal imagers, RIC, etc.

Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
Public Input No. 39-NFPA 1400-2023 [Chapter 15 [Title Only]]	Similar edit for similar reason.
Public Input No. 40-NFPA 1400-2023 [Chapter 16 [Title Only]]	Similar edit for similar reason.
Public Input No. 41-NFPA 1400-2023 [Chapter 17 [Title Only]]	Similar edit for similar reason.
Public Input No. 43-NFPA 1400-2023 [Chapter 19 [Title Only]]	
Public Input No. 44-NFPA 1400-2023 [Chapter 20 [Title Only]]	

Submitter Information Verification

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Submittal Date: Wed Aug 23 02:27:54 EDT 2023
Committee: FIY-AAA

Committee Statement

Resolution: [FR-7-NFPA 1400-2024](#)

Statement: The technical committee identified this chapter is solely for live fire training evolutions, not for designing/building facilities and not for training on respiratory protection, thermal imagers, RIC.



Public Input No. 34-NFPA 1400-2023 [Section No. 18.2]

18.2 Inspection and Testing.

18.2.1*

Live fire training structures shall be inspected visually for damage prior to live fire training evolutions.

18.2.1.1*

Damage shall be documented, and the building owner or AHJ shall be notified.

18.2.2

Where the live fire training structure damage is severe enough to affect the safety of the participants, training shall not be permitted.

18.2.3

All doors, windows and window shutters, railings, roof scuttles and automatic ventilators, mechanical equipment, lighting, manual or automatic sprinklers, and standpipes necessary for the live fire training evolution shall be checked and operated prior to any live fire training evolution to ensure they operate correctly.

18.2.4

All safety devices, such as thermal sensors, oxygen and toxic and combustible gas monitors, evacuation alarms, and emergency shutdown switches, shall be checked prior to any live fire training evolutions to ensure they operate correctly.

~~18.2.5 *~~

~~The structural integrity of the live fire training structure shall be evaluated and documented annually by the building owner or AHJ.~~

~~18.2.5.1 -~~

~~If visible structural defects are found, such as cracks, rust, spalls, or warps in structural floors, columns, beams, walls, or metal panels, the building owner shall have a follow-up evaluation conducted by a licensed professional engineer with live fire training structure experience and expertise or by another competent professional as determined by the AHJ.~~

~~18.2.6 *~~

~~The structural integrity of the live fire training structure shall be evaluated and documented by a licensed professional engineer with live fire training structure experience and expertise or by another competent professional as determined by the AHJ at least once every 5 years or more frequently if determined to be required by the evaluator.~~

~~18.2.7 *~~

~~All structures constructed with calcium aluminate refractory structural concrete shall be inspected by a structural engineer with expertise in live fire training structures every 3 years.~~

~~18.2.7.1 -~~

~~The structural inspection shall include removal of concrete core samples from the structure to check for delaminations within the concrete.~~

~~18.2.8 *~~

~~Part of the live fire training structure evaluation shall include, once every five years, the removal and reinstallation of a representative area of thermal linings (if any) to allow inspections of the conditions hidden behind the linings.~~

Statement of Problem and Substantiation for Public Input

Since its 2002 edition, 1403 included these structural integrity evaluation requirements, which relate to training facilities and not to live fire training evolutions. These requirements were in 1403 because the Training Committee deemed them important enough for firefighter safety to include them in 1403 even though they would have been better suited in a standard on training facilities, which did not exist in 2002.

In 2019, 1402 became a standard on training facilities and the requirements for structural integrity evaluations of live fire training structures was included in Chapter 7 of that document, with nearly identical language with what was in the 2018 edition of 1403. The intent was to then delete these requirements from 1403 in its next cycle.

Now that 1402 and 1403 have been merged into the 1400 Standard, these requirements are found in Chapters 7, 17, and 18 of the draft and should be trimmed to only one location for clarity and to eliminate risk of contradicting language from one chapter to the next. Given the scopes of the chapters, the requirements for structural integrity evaluations of live fire training structures are better suited for Chapter 7 (a facilities chapter) than for Chapters 17 and 18 (training operations chapters).

Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
<u>Public Input No. 33-NFPA 1400-2023 [Section No. 17.2]</u>	Same deletion for each section for same reasons.
<u>Public Input No. 37-NFPA 1400-2023 [Sections A.18.2.5, A.18.2.6, A.18.2.7, A.18.2.8]</u>	

Submitter Information Verification

Submitter Full Name: Roger LeBoeuf
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Submittal Date: Wed Aug 23 01:29:02 EDT 2023
Committee: FIY-AAA

Committee Statement

Resolution: FR-11-NFPA 1400-2024

Statement: The technical committee recognize structural inspections are addressed in chapter 7.



Public Input No. 58-NFPA 1400-2023 [Sections

18.2.4, 18.2.5, 18.2.6, 18.2.7, 18.2.8]

~~Sections 18.2.4, 18.2.5, 18.2.6, 18.2.7, 18.2.8~~

~~18.2.4 –~~

~~All safety devices, such as thermal sensors, oxygen and toxic and combustible gas monitors, evacuation alarms, and emergency shutdown switches, shall be checked prior to any live fire training evolutions to ensure they operate correctly.~~

~~18.2.5 * –~~

~~The structural integrity of the live fire training structure shall be evaluated and documented annually by the building owner or AHJ.~~

~~18.2.5.1 –~~

~~If visible structural defects are found, such as cracks, rust, spalls, or warps in structural floors, columns, beams, walls, or metal panels, the building owner shall have a follow-up evaluation conducted by a licensed professional engineer with live fire training structure experience and expertise or by another competent professional as determined by the AHJ.~~

~~18.2.6 * –~~

~~The structural integrity of the live fire training structure shall be evaluated and documented by a licensed professional engineer with live fire training structure experience and expertise or by another competent professional as determined by the AHJ at least once every 5 years or more frequently if determined to be required by the evaluator.~~

~~18.2.7 * –~~

~~All structures constructed with calcium aluminate refractory structural concrete shall be inspected by a structural engineer with expertise in live fire training structures every 3 years.~~

~~18.2.7.1 –~~

~~The structural inspection shall include removal of concrete core samples from the structure to check for delaminations within the concrete.~~

~~18.2.8 * –~~

~~Part of the live fire training structure evaluation shall include, once every five years, the removal and reinstallation of a representative area of thermal linings (if any) to allow inspections of the conditions hidden behind the linings.~~

Additional Proposed Changes

<u>File Name</u>	<u>Description</u>	<u>Approved</u>
1403_PI_No_2.pdf	NFPA 1403 Public Input No. 2	

Statement of Problem and Substantiation for Public Input

In March 2018, the 1402 Committee had its second draft meeting in Austin and finalized the first edition of the new 1402 Standard. During that meeting, this item was identified as something that requires coordination with 1403.

Structural evaluations of live fire training structures are now listed in Chapter 7 of the 1402 Standard with mandatory (shall) language. Given the scopes of the two documents, this requirement is better

suited for 1402 (a facilities document) than for 1403 (a training document). Therefore, it should be deleted from 1403.

Submitter Information Verification

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Submittal Date: Thu Aug 24 09:24:02 EDT 2023

Committee: FIY-AAA

Committee Statement

Resolution: [FR-11-NFPA 1400-2024](#)

Statement: The technical committee recognize structural inspections are addressed in chapter 7.



Public Input No. 43-NFPA 1400-2023 [Chapter 19 [Title Only]]

Live Fire Training at Exterior Live Fire Training Props (NFPA 1403)

Statement of Problem and Substantiation for Public Input

This adds clarity that this chapter is solely for live fire training evolutions, not for designing/building facilities and not for training on respiratory protection, thermal imagers, RIC, etc.

Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
Public Input No. 39-NFPA 1400-2023 [Chapter 15 [Title Only]]	Similar edit for similar reason.
Public Input No. 40-NFPA 1400-2023 [Chapter 16 [Title Only]]	Similar edit for similar reason.
Public Input No. 41-NFPA 1400-2023 [Chapter 17 [Title Only]]	Similar edit for similar reason.
Public Input No. 42-NFPA 1400-2023 [Chapter 18 [Title Only]]	Similar edit for similar reason.
Public Input No. 44-NFPA 1400-2023 [Chapter 20 [Title Only]]	

Submitter Information Verification

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Submittal Date: Wed Aug 23 02:29:40 EDT 2023
Committee: FIY-AAA

Committee Statement

Resolution: [FR-41-NFPA 1400-2024](#)

Statement: The technical committee determined that this chapter is solely for live fire training evolutions, not for designing/building facilities and not for training on respiratory protection, thermal imagers, RIC, etc



Public Input No. 44-NFPA 1400-2023 [Chapter 20 [Title Only]]

Live Fire Training Reports and Records (NFPA 1403)

Statement of Problem and Substantiation for Public Input

This adds clarity that this chapter is solely for live fire training evolutions, not for designing/building facilities and not for training on respiratory protection, thermal imagers, RIC, etc.

Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
Public Input No. 39-NFPA 1400-2023 [Chapter 15 [Title Only]]	Similar edit for similar reason.
Public Input No. 40-NFPA 1400-2023 [Chapter 16 [Title Only]]	Similar edit for similar reason.
Public Input No. 41-NFPA 1400-2023 [Chapter 17 [Title Only]]	Similar edit for similar reason.
Public Input No. 42-NFPA 1400-2023 [Chapter 18 [Title Only]]	Similar edit for similar reason.
Public Input No. 43-NFPA 1400-2023 [Chapter 19 [Title Only]]	Similar edit for similar reason.

Submitter Information Verification

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Submittal Date: Wed Aug 23 02:32:05 EDT 2023
Committee: FIY-AAA

Committee Statement

Resolution: [FR-40-NFPA 1400-2024](#)

Statement: The technical committee determined that this chapter is solely for live fire training evolutions, not for designing/building facilities and not for training on respiratory protection, thermal imagers, RIC, etc



Public Input No. 61-NFPA 1400-2023 [New Section after 22.1.5.1]

Emergency Breathing Procedures

Both sections 5.1.5 and 5.1.4 indicate that the AHJ should establish and enforce written standard operating procedures for training in the use of respiratory protection equipment.

Section 5.1.4 (2) mentions Emergency Evacuation Procedures and 5.1.5 makes reference to the importance of establishing an IAM (Individual Air Management) program.

Section 5.1.5.2 (3) states that immediate actions should be taken upon activation of the EOSTI and that the corresponding department's SOP/SOG should be followed.

As NFPA 1404 standard does not indicate two situations that can be faced while wearing an SCBA (1. Spatial disorientation of the wearer. 2. Mobility impairment or disability due to injury or entrapment) and that these scenarios represent potential risks, I suggest that a new subsection/text be added to section 5.1.5.1:

The SCBA wearer should be trained in emergency breathing procedures (maximum use of available air), such as: Skip Breathing, Box Breathing (Tactical Breathing) or Wheel Breathing.

Note: It should be taken into consideration that when any of these techniques is used, the remaining air duration can be extended up to five times. On SCBA's that meet NFPA 1981, 2018 Edition, the EOSTI alarm is activated when the cylinder air content reaches 35%. In the case of a 45-minute breathing apparatus, this would mean about 15 minutes. If one of the above emergency breathing procedures is applied ONCE THE ALARM IS ACTIVATED, THOSE 15 MINUTES WOULD TURN INTO 75 MINUTES, which is more than the nominal SCBA full cylinder duration.

Additional Proposed Changes

<u>File Name</u>	<u>Description</u>	<u>Approved</u>
1404_PI_No._2.pdf	NFPA 1404 Public Input No. 2	

Statement of Problem and Substantiation for Public Input

For SCBA wearer's safety during structural firefighting and confined space operations, firefighters should be trained in emergency breathing procedures in case of disorientation or mobility impairment or disability. NFPA 1404 standard does not include guidelines or recommendations in that respect. Personally, as a firefighter, I have conducted training sessions on these procedures at my fire department and the results have always been successful: the remaining air duration has been extended by 5 times. Although NFPA 1404 standard indicates that individual air management should be incorporated into the SOP/SOG, given its importance, I suggest that it be added to this standard. Below you will find links referring to the importance and effectiveness of the indicated emergency breathing procedures:

<https://mntactical.com/research/mini-study-comparing-scba-emergency-breathing-techniques/>
<https://www.youtube.com/watch?v=yVQMDtmZiLo>
<http://www.cfbt-be.com/images/teksten/brand/The-ideal-breathing-for-firefighters-on-the-fireground.pdf>
<https://www.fireengineering.com/2008/04/01/229293/rethinking-emergency-air-management-the-reilly-emergency-breathing-technique/>

Submitter Information Verification

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Submittal Date: Fri Aug 25 14:45:52 EDT 2023

Committee: FIY-AAA

Committee Statement

Resolution: The technical committee identified the standard already requires the AHJ to establish and enforce a written operating procedure for the use of respiratory protection equipment that includes individual air management.



Public Input No. 85-NFPA 1400-2023 [Section No. 23.3.4]

23.3.4

SCBA shall have been manufactured to meet the requirements of NFPA 1981 or NFPA 1970 .

Statement of Problem and Substantiation for Public Input

The addition of NFPA 1970 will cover SCBAs manufactured under the consolidated standard.

Submitter Information Verification

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Submittal Date: Mon Aug 28 15:29:57 EDT 2023

Committee: FIY-AAA

Committee Statement

Resolution: FR-32-NFPA 1400-2024

Statement: The technical committee identified the new consolidated standard of NFPA 1970 consists of NFPA 1971, 1975, 1981 & 1982.



Public Input No. 104-NFPA 1400-2023 [Section No. 42.2.2]

42.2.2

~~The initial attack line shall provide~~ Establishment of an effective water flow application rate of 300 gpm (1140 L/min) from two handlines, each of which has a minimum flow rate of 100 gpm (379- 380 L/min) from the nozzle with each handline operated by a minimum of two members to effectively and safely maintain the line .

Additional Proposed Changes

<u>File Name</u>	<u>Description</u>	<u>Approved</u>
1410_F2019_Held_PC_2.pdf	1410_HELD Public Comment No. 2	

Statement of Problem and Substantiation for Public Input

NOTE: This Public Input appeared as "Rejected but Held" in Public Comment No. 2 of the (F2019) Second Draft Report for NFPA 1410 and per the Regs. at 4.4.8.3.1.

Substantiation:

Submitted through me because government has single NFPA account.

Chief Buchanan,

It's the same change I sent to you previously, dealing with the primary and backup lines flow rates. Changing the wording to say the same as NFPA 1710.

Current version: Section 8.2.2, The initial attack line shall provide a minimum flow of 100 gpm (400 L/min) from the nozzle. Section 8.2.3, The required flow from the backup line shall be a minimum of 200 gpm (750 L/min).

Change to: Establishment of an effective water flow application rate of 300 gpm (1140 L/min) from two handlines, each of which has a minimum flow rate of 100 gpm (380 L/min) with each handline operated by a minimum of two members to effectively and safely maintain the line.

Thank you again.

V/R
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Submittal Date: Thu Aug 31 13:00:42 EDT 2023

Committee: FIY-AAA

Committee Statement

Resolution: [FR-21-NFPA 1400-2024](#)

Statement: The technical committee changed the section for alignment with NFPA 1710.



Public Input No. 103-NFPA 1400-2023 [Chapter 44]

Chapter 44 Required Performance for Automatic Sprinkler System Support (NFPA 1410)

44.1 General.

44.1.1*

The required performance for automatic sprinkler system support shall consist of providing two supply lines to an automatic sprinkler connection.

44.1.2

Automatic sprinkler system support evolutions shall be performed by the first arriving unit(s) staffed with the average number of personnel that ordinarily respond.

44.1.3*

For evolutions employing two or more companies, there shall be a 30-second delay between the arrival of each company.

44.2 Required Flow.

44.2.1

The total flow of the required lines to the sprinkler connection shall be 500 gpm (1900 L/min).

44.2.2*

The evaluator shall determine that required pressures and flows, in accordance with 44.2.1 and 44.2.2.1, are provided to the sprinkler connections.

44.2.2.1

A minimum of 150 psi (1035 kPa) pump discharge pressure shall be used to supply the sprinkler system.

44.2.2.2

Pressures shall be within a range of ± 10 percent.

44.3 Hose Evolutions.

44.3.1

The supply lines shall be laid by an engine for a distance of 300 ft (90 m) to or from the water source, and for a distance of 100 ft (30 m) from an engine to the sprinkler connection.

44.3.2

Apparatus water tanks shall not be used as a water supply for these evolutions.

44.4 Method of Evaluation.

44.4.1

When the order to begin the evolution is given, a water supply shall be established for the engine(s) and two supply lines laid to the sprinkler connection.

44.4.2*

The evaluation shall be based on the ability to deliver a minimum of 500 gpm (1900 L/min) through two supply lines to the sprinkler connections.

44.4.3

The flows shall continue until the evaluation is complete.

44.4.4

Failure to supply the sprinkler system shall be considered a serious deficiency in operations.

44.4.5* Interruptions.**44.4.5.1**

Failure to maintain water pressure in any line until all lines are operating as required shall be considered an unacceptable interruption.

44.4.5.2

Interruptions of less than 10 seconds shall be considered acceptable.

44.4.6

The evolution shall not be concluded until the evaluator is satisfied that the required flows have been provided.

44.5 Evaluation.*

Performance shall be evaluated in accordance with Figure 44.5.

Figure 44.5 Example of an Evaluation Form for Automatic Sprinkler System Support.

	Satisfactory	Unsatisfactory
Was a minimum of 300 gpm (1135 L/min) delivered?	☐	☐
Was the pump discharge pressure correct?	☐	☐
Were flows obtained within the recommended time?	☐	☐
Were the hose layouts from the water source adequate?	☐	☐
Were flows obtained without major interruption?	☐	☐

[Add new Chapter \(following chapter 44.\)](#)

Required Performance for Standpipe System Support (NFPA 1410)

45.1 General

45.1.1 The required performance for standpipe system support shall consist of providing two initial supply lines to a standpipe or combined fire department connection.

45.1.1.2 Standpipe system support shall consist of supplying all inlets needed to provide standpipe system demand.

45.1.2 Standpipe system support evolutions shall be performed by the first arriving unit(s) staffed with the average number of personnel that ordinarily respond.

45.1.3 For evolutions employing two or more companies, there shall be a 30-second delay between the arrival of each company.

45.2 Required Flow.

10.2.1 The total flow of the required lines to the standpipe or combined fire department connection shall provide standpipe system demand.

45.2.2 The evaluator shall determine that required pressures and flows, in accordance with 45.2.1, 45.2.1.2 and 45.2.2.1, are provided to the standpipe or combined fire department connections.

45.2.2.1 A minimum of 150 psi plus 5psi per floor of elevation of pump discharge pressure shall be used to supply the standpipe or combined system.

45.2.2.2 Pressures shall be within a range of ± 10 percent.

45.3 Hose Evolutions.

45.3.1 The supply lines shall be laid by an engine for a distance of 300 ft (90 m) to or from the water source, and for a distance of 100 ft (30 m) from an engine to the standpipe or combine fire department connection.

45.3.2 Apparatus water tanks shall not be used as a water supply for these evolutions.

45.4 Method of Evaluation.

45.4.1 When the order to begin the evolution is given, a water supply shall be established for the engine(s) and two supply lines laid to the standpipe or combined fire department connection.

45.4.2 The evaluation shall be based on the ability to deliver a minimum of 500 gpm through two supply lines to the standpipe or combined fire department connections.

45.4.3 The flows shall continue until the evaluation is complete.

45.4.4 Failure to supply the standpipe or combined system shall be considered a serious deficiency in operations.

45.4.5 Interruptions.

45.4.5.1 Failure to maintain water pressure in any line until all lines are operating as required shall be considered an unacceptable interruption.

45.4.5.2 Interruptions of less than 10 seconds shall be considered acceptable.

45.4.6 The evolution shall not be concluded until the evaluator is satisfied that the required flows have been provided.

45.5 Evaluation. Performance shall be evaluated in accordance with Figure 45.5.

Figure 45.5 (add).

	Satisfactory	Unsatisfactory
Was a minimum of 300 gpm (1135 L/min) delivered?	☐	☐
Was the pump discharge pressure correct?	☐	☐
Were flows obtained within the recommended time?	☐	☐
Were the hose layouts from the water source adequate?	☐	☐
Were flows obtained without major interruption?	☐	☐

Statement of Problem and Substantiation for Public Input

Substantiation: Standpipes are an integral part of fire department operations in high-rise and large structures. Currently the standard does not include standpipe system training guidance which is regularly conducted in the fire service. While there are similarities with fire sprinkler systems, as they are both water based fire protection systems, incorporating into chapter 44 might be confusing. Having it standalone clarifies the specific requirements for standpipes.

Submitter Information Verification

Submitter Full Name: Terin Hopkins

Organization: National Fire Sprinkler Associ

Street Address:

City:

State:

Zip:

Submittal Date: Thu Aug 31 12:46:05 EDT 2023

Committee: FIY-AAA

Committee Statement

Resolution: [FR-18-NFPA 1400-2024](#)

Statement: The technical committee determined that there is a need to have a training section for standpipes within NFPA 1400. The proposed chapter will be revisited at the second draft. A task group will work to refine the content for the 2nd draft and public comment is encouraged.

**Public Input No. 102-NFPA 1400-2023 [Section No. 44.2.2.1]**

44.2.2.1 – A minimum of

150 psi (1035 kPa)

150psi pump discharge pressure shall be ~~used~~ maintained to supply the sprinkler system.

Statement of Problem and Substantiation for Public Input

Substantiation: NFPA 13 requires fire department connection on sprinkler systems to be able to provide supplemental water supply for automatic fire sprinklers. The pressure should be maintained to provide a supplemented water supply as more sprinklers activate beyond the design area, exceeding the automatic water supply.

Submitter Information Verification

Submitter Full Name: Terin Hopkins

Organization: National Fire Sprinkler Associ

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City:

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Submittal Date: Thu Aug 31 12:20:43 EDT 2023

Committee: FIY-AAA

Committee Statement

Resolution: [FR-19-NFPA 1400-2024](#)

Statement: The technical committee determined that NFPA 13 requires fire department connection on sprinkler systems to be able to provide supplemental water supply for automatic fire sprinklers. The pressure should be maintained to provide a supplemented water supply as more sprinklers activate beyond the design area, exceeding the automatic water supply.



Public Input No. 66-NFPA 1400-2023 [Section No. 47.2.1]

47.2.1

All ~~FESO vehicles~~ FESO vehicles (except Off Highway Vehicles) shall meet the minimum safety standards outlined in the 2017 edition of NFPA 414 and the 2016 edition of NFPA 1901 for fire apparatus; US General Service Administration KKK-A-1822-F, "Star of Life Ambulance Specifications," and the 2016 edition of NFPA 1917 for ambulance specifications; and US Department of Transportation (DOT) regulations as applicable on the date of construction.

Additional Proposed Changes

<u>File Name</u>	<u>Description</u>	<u>Approved</u>
1451_PI_No._1.pdf	NFPA 1451 Public Input No. 1	

Statement of Problem and Substantiation for Public Input

In recent years Off highway vehicles like ATVs and UTVs have become increasingly popular and in wide spread use by fire services. Although these vehicles may meet DOT/CMVSS requirements, they are not, nor can be NFPA 1901 or 414 compliant.

Operator training or these Off Highway Vehicles is a challenge for fire services in many areas.

Submitter Information Verification

Submitter Full Name: Paul Prevost

Organization: [Not Specified]

Street Address:

City:

State:

Zip:

Submittal Date: Fri Aug 25 15:57:19 EDT 2023

Committee: FIY-AAA

Committee Statement

Resolution: The technical committee identified this exception as being too broad in application. The submitter is encouraged to resubmit accompanying annex text to illustrate the exact type of vehicles to be addressed.

**Public Input No. 63-NFPA 1400-2023 [Section No. 48.3.9]****48.3.9**

FESOs shall train operators for inclement weather driving conditions, with emphasis on handling of vehicles, particularly where auxiliary braking devices are to be used. Driver Training Simulator (DTS) training can be of valuable assistance allowing the student to train prior to actual inclement weather begins and affords the training department to preschedule the training in advance of any unforeseeable weather conditions.

Additional Proposed Changes

<u>File Name</u>	<u>Description</u>	<u>Approved</u>
1451_PI_No._8.pdf	NFPA 1451 Public Input No. 8	

Statement of Problem and Substantiation for Public Input

Informational statement intended to assist the training staff into considering adding simulation training to their curriculum.

Submitter Information Verification

Submitter Full Name: Robert Raheb
Organization: FAAC, Inc.
Street Address:
City:
State:
Zip:
Submittal Date: Fri Aug 25 15:33:07 EDT 2023
Committee: FIY-AAA

Committee Statement

Resolution: The technical committee identified the proposed text is not written as enforceable text.



Public Input No. 62-NFPA 1400-2023 [New Section after 48.3.15]

Minimum Training Requirements

The FESO driver training program shall consist of the following elements:

- Classroom training on the general principles of operating emergency vehicles operated by the AHJ,
- State regulations applicable to the safe operation of emergency vehicles in the state of the AHJ,
- Hands-on training relating to emergency vehicle inspection process and procedures for vehicles operated by the FESO,
- Hands-on training on a road (cone) course as determined by the AHJ,
- Hands-on training of emergency response situations on a driver training simulator; simulation shall be no less than 10% of the overall program. Simulator requirements are listed in the appendix C of 1451.
- Hands-on training on an over the road course under direct supervision of an AHJ qualified driver training instructor, after successful completion of the cone course.

The FESO driver training program shall consist of a minimum of 16 hours of classroom, hands-on, simulator, and road course driving as required by Table 5.3.X

TABLE 5.3.X

<u>Format</u>	<u>Lesson</u>	<u>Minimum Time Required</u>
<u>Classroom</u>	<u>General Operating Principles for Fire and Emergency Vehicles</u>	<u>6 hours</u>
<u>Classroom</u>	<u>State Specific Regulations Module</u>	<u>1 hour</u>
<u>Hands -on</u>	<u>Pre-Trip Inspection Process/Procedures (AHJ Skill Sheet)</u>	<u>2 hours</u>
<u>Hands-on</u>	<u>Cone Course (AHJ developed Skill Sheet) and Driver Training Simulator</u>	<u>4 hours</u>
<u>Hands-on</u>	<u>Road Course (AHJ developed Skill Sheet)</u>	<u>3 hours</u>

Additional Proposed Changes

<u>File Name</u>	<u>Description</u>	<u>Approved</u>
1451_PI_No._3.pdf	NFPA 1451 Public Input No. 3	

Statement of Problem and Substantiation for Public Input

This outlines the minimum time and curriculum standard for Driver Training. Currently there is no standard for the training.

Submitter Information Verification

Submitter Full Name: Robert Raheb

Organization: FAAC, Inc.

Street Address:

City:

State:

Zip:

Submittal Date: Fri Aug 25 15:28:13 EDT 2023

Committee: FIY-AAA

Committee Statement

Resolution: The technical committee is concerned that the shall "mandatory "requirement for driver simulation may be difficult to achieve. There is also a concern of mandating specific hours for training and that should be left to the AHJ.



Public Input No. 25-NFPA 1400-2023 [Section No. A.3.3.88]

A.3.3.88 Live Fire Training Structure. [🔗](#)

Commonly referred to as *burn buildings* or *burn towers*, live fire training structures include structures built of noncombustible conventional building materials, such as concrete, masonry, and steel, as well as containerized training structures in which live fire training evolutions are conducted. This includes fixed structures that are marketed as *mobile props*, such as the following:

- (1) Pre-engineered metal structures that can be disassembled- ~~and transported to~~ , transported to, and reassembled at a new site
- (2) Containerized structures in which one or more containers are assembled, whether single story or multistory

Live fire training structures do not include the following:

- (1) Fire behavior labs (also known as *flashover containers*) that are made from two offset shipping containers for the sole purpose of demonstrating fire behavior
- (2) Mobile live fire training props
- (3) Fire investigation training structures and props
- (4) Acquired structures used for live fire training unless the acquired structure is intended to be used for live fire training evolutions for more than 3 days total, in which case it would need to follow the requirements of Chapter 7 of this standard
- (5) Structures that are used for training in the use of SCBA where only smoke conditions are created, without a live fire, and the participants are not subjected to risk of the effects of fire other than the smoke produced
- (6) Structures that simulate industrial applications under live fire conditions in which no personnel enter or stand upon the structure, such as a refinery fire simulation

Live fire training structures could be designed to support the following training objectives:

- (1) Fire behavior
- (2) Fire spread or extension
- (3) Interior fire attack
- (4) Rescue
- (5) Ventilation
- (6) Forced entry
- (7) Laddering
- (8) Various simulated occupancies similar to those found in the surrounding region

Statement of Problem and Substantiation for Public Input

The first edit provides clarity because if it is not reassembled at the new site, then it is no longer a structure.

The second edit provides clarity because the previous wording, which was in 1402, referenced just 1402, not all of 1400.

Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
Public Input No. 67-NFPA 1400-2023 [Section No. A.3.3.138.2]	

Submitter Information Verification

Submitter Full Name: Roger LeBoeuf
Organization: Elliott, LeBoeuf & McElwain
Street Address:
City:
State:
Zip:
Submittal Date: Tue Aug 22 23:38:18 EDT 2023
Committee: FIY-AAA

Committee Statement

Resolution: FR-90-NFPA 1400-2024
Statement: The technical committee determined that if it is not reassembled at the new site, then it is no longer a structure. The technical committee also wanted to isolate compliance to chapter 7 of NFPA 1400.



Public Input No. 67-NFPA 1400-2023 [Section No. A.3.3.138.2]

~~A.3.3.138.2 – Live Fire Training Structure. –~~ [🔗](#)

~~Live fire training structures include structures built of conventional building materials, such as concrete, masonry, and steel, as well as structures built of containers, in which live fire training evolutions are conducted. This includes fixed structures that are marketed as mobile props, such as the following:~~

- ~~(1) Pre-engineered metal structures that can be disassembled and transported to a new site~~
- ~~(2) Containerized structures in which one or more containers are assembled, whether single story or multistory, for purposes of interior live fire training evolutions~~

~~Live fire training structures also include fire behavior labs (also known as flashover containers) and mobile live fire training props.~~

~~Live fire training structures do not include structures that are used for training in the use of SCBA where only smoke conditions are created, without a live fire, and the participants are not subjected to risk of the effects of fire other than the smoke produced.~~

Statement of Problem and Substantiation for Public Input

The definition was deleted in the main body of the standard because it was redundant and should be deleted from Annex A, too. A.3.3.88 provides better explanatory language for the definition of Live Fire Training Structure, especially because the definition of a live fire training structure should NOT include fire behavior labs (flashover containers) and mobile live fire training props.

Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
<u>Public Input No. 24-NFPA 1400-2023 [Section No. 3.3.138]</u>	Deleted section in standard to which this should-be-deleted annex language is tied.
<u>Public Input No. 25-NFPA 1400-2023 [Section No. A.3.3.88]</u>	PI 25 is the better Annex language for live fire training structure definition that should be kept.

Submitter Information Verification

Submitter Full Name: Roger LeBoeuf
Organization: Elliott, LeBoeuf & McElwain
Street Address:
City:
State:
Zip:
Submittal Date: Fri Aug 25 16:55:47 EDT 2023
Committee: FIY-AAA

Committee Statement

Resolution: FR-76-NFPA 1400-2024

Statement: The technical committee identified there were some redundancy and overlap with multiple definitions of training structures, or versions of them.



Public Input No. 56-NFPA 1400-2023 [Section No. A.15.14.1]

A.15.14.1



Acceptable fuels include pine excelsior, wooden pallets, straw, hay, and other wood-based products.

Additional Proposed Changes

<u>File Name</u>	<u>Description</u>	<u>Approved</u>
1403_PI_No_19.pdf	NFPA 1403 Public Input No. 19	

Statement of Problem and Substantiation for Public Input

Delete appendix note and move info to text with in the standard

Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
Public Input No. 54-NFPA 1400-2023 [Section No. 15.14.1 [Excluding any Sub-Sections]]	

Submitter Information Verification

Submitter Full Name: Daniel Madrzykowski
Organization: UI Firefighter Safety Research
Street Address:
City:
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Zip:
Submittal Date: Thu Aug 24 09:10:20 EDT 2023
Committee: FIY-AAA

Committee Statement

Resolution: [FR-100-NFPA 1400-2024](#)
Statement: The technical committee reformatted the section on fuel materials.



Public Input No. 57-NFPA 1400-2023 [Section No. A.15.14.6]

A.15.14.6

An excessive fuel load can contribute to conditions that create unusually dangerous fire behavior. This can jeopardize structural stability, egress, and the safety of participants.

Excess fuel load can result in a ventilation-controlled fire, which can result in flameover (rollover) or flashover. These fire conditions increase the amount of thermal energy (the heat release rate of the fire) that is being transferred by conduction, convection, and radiation to any firefighters in the compartment, which can lead to the degradation of protective equipment and injury or death. Venting a ventilation-controlled fire can result in an increase in heat release rate in the fire structure.

UL FSRI examined the burning properties of training fuel packages ranging from a bale of hay opened up on a fire grate to combinations of pallets and hay with oriented strand board (OSB). The range of training fuel packages tested had peak heat release rates (HRRs) of 1 MW to 3.6 MW with total heat release values ranging from 210 MJ to 1815 MJ. The effective heat of combustion for all of the training fuel packages was found to be 14.2 MJ/kg. Table XXXX provides a description of training fuel package arrangement and components, the peak HRR, the total heat released, and the peak burning duration in minutes. The peak burning duration was defined as the time period where the HRR was greater than or equal to 80% of the peak HRR. These fuel configurations and burning characteristics may be used by instructors to assess the fuel package they are using in terms of safely meeting the needs of the training objective.

Additional Proposed Changes

<u>File Name</u>	<u>Description</u>	<u>Approved</u>
1403_PI_No_21.pdf	NFPA 1403 Public Input No. 21	
Training_Fuel_Package_Table.1593561753218.docx	UL FSRI Training Fuel Package Table	
Training_Fuel_Packages.1593561844834.JPG	Photos of Training Fuel Packages	

Statement of Problem and Substantiation for Public Input

Adding information to the appendix to quantify burning characteristics of training fuel packages ranging from a bale of straw up through 3 to 7 pallets with straw. This can be useful to aid instructors in determining the appropriate fuel package to use for a given training objective. Ref: Heat Release Rate Characterization of NFPA 1403 Compliant Training Fuels, by John W. Regan, UL FSRI , submitted to Fire Technology, May 2020.

Submitter Information Verification

Submitter Full Name: Daniel Madrzykowski
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Zip:

Submittal Date: Thu Aug 24 09:13:47 EDT 2023

Committee: FIY-AAA

Committee Statement

Resolution: [FR-100-NFPA 1400-2024](#)

Statement: The technical committee reformatted the section on fuel materials.



Public Input No. 36-NFPA 1400-2023 [Sections

A.17.2.6, A.17.2.7, A.17.2.8, A.17.2.9]

~~Sections A.17.2.6, A.17.2.7, A.17.2.8, A.17.2.9~~

~~A.17.2.6~~ —

~~Personnel making the annual structural integrity evaluation should understand the structural system that is being evaluated and where damage is most likely to occur, given the unique design of that live fire training structure. For example, live fire training structures constructed of hollow-core plank roofs and floors supported on masonry bearing walls tend to exhibit several problems, such as the following, listed below, which would be helpful to know when conducting the evaluation:~~

- ~~(1) Cracks occur in the topping slabs directly over the joints between the planks, causing leaks into the structure and onto thermal linings below.~~
- ~~(2) Cracks occur in the ends of the planks and at the two courses of masonry block below the plank bearing points.~~
- ~~(3) Vertical cracks occur in masonry bearing walls at building corners.~~
- ~~(4) Cracks in the bottoms of the planks occur below the hollow cells and at the bottom corners of the planks.~~
- ~~(5) Topping slabs separate from the tops of the planks, reducing the structural capacity of the structural system.~~
- ~~(6) Cracks in the topping slabs near guardrail anchor points could cause guardrails to loosen.~~

~~Ideally, the architect/engineer that designed the live fire training structure would have provided a description of what to look for during the periodic evaluations. If no such description was obtained when the live fire training structure was first built, then the AHJ should retain a licensed professional engineer with live fire training structure experience and expertise or other competent professional as determined by the building owner or AHJ to help create such a description.~~

A.17.2.7 —

Routine maintenance is important to providing a safe, durable live fire training structure for live fire training. Periodic engineering evaluations are one step in that process. Live fire training structures present unique engineering problems that are not taught to engineers in college or in their daily practice of engineering office buildings, schools, and fire stations. Before a registered (licensed) Professional Engineer (P.E.) understands live fire training structure engineering, it takes significant efforts on the part of the P.E. to learn how live fire training structures are used, how repetitive live fire training affects structural and nonstructural elements within the live fire training structure, and what materials have been proven to work (or not work) within such a harsh environment. This effort typically requires research and educational efforts and experience with live fire training structure projects.

Because the required evaluation is for structural integrity, the P.E. performing the evaluation should be a structural engineer or teamed with a structural engineer to perform the evaluation. Many states do not license P.E.s by discipline; "P.E." could refer to a structural engineer or to some other engineering discipline, such as electrical, mechanical, fire protection, or aeronautical. State laws require P.E.s to offer engineering services for only those branches of engineering for which they are qualified. Therefore, a P.E. who is an electrical engineer or fire protection engineer with no structural qualifications would not be allowed, under law, to evaluate the structural integrity of a live fire training structure.

Note that a P.E. with refractive materials experience and expertise, but not live fire training structure experience and expertise, might not have sufficient understanding of how refractory concrete performs in a live fire training structure environment. Many P.E.s with refractive materials experience have gained that experience working with industrial applications in which furnaces are heated and cooled slowly. Certain applications of refractory concrete work well under those furnace conditions. However, the same applications of refractory concrete at times work poorly in the live fire training structure environment, where rapid heating, rapid cooling, and thermal shock deteriorate refractory concrete differently than a furnace application would. Many P.E.s with only refractive materials experience, but no live fire training structure experience, do not know this. As a result, the requirement for live fire training structure experience and expertise has been added to the standard. In many cases, the P.E. retained to evaluate the integrity can also, under the same contract, be required to make recommendations for how to repair, maintain, or improve the live fire training structure.

The phrase "with live fire training structure experience and expertise" must be interpreted by each entity following its own local and state laws and guidelines. The intent is for the P.E. to have performed at least one live fire training structure project previously, so that the entity hiring the P.E. will benefit from the educational and research efforts performed, and experience gained, by the P.E. for the previous live fire training structure project(s). This experience could include a previous live fire training structure evaluation, the repair or renovation to an existing live fire training structure, or the design of a new live fire training structure. In many cases, it would be acceptable for a P.E. without live fire training structure experience or expertise to perform the evaluation as long as he or she has teamed with a P.E. with live fire training structure experience or expertise.

A.17.2.8 —

Refractory concrete should not be used as a structural element. Structural calcium aluminate refractory concrete has been found to delaminate (crack and lose bond) along the lines of reinforcing within walls and suspended slabs, presenting serious structural deficiencies that threaten the life and safety of training personnel.

A.17.2.9 —

Heat can soak through thermal linings and reach the protected structure, especially if the linings are cracked or otherwise require maintenance when live fire training occurs. This heat could damage the structure, a hidden condition that would otherwise go undetected if the panels are not occasionally removed to expose the hidden conditions.

Statement of Problem and Substantiation for Public Input

Deleting Annex A material for sections that were deleted from the standard because they are already covered in 7.2.

Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
<u>Public Input No. 33-NFPA 1400-2023</u> <u>[Section No. 17.2]</u>	Deleting Annex A material for sections that were deleted from the standard.

Submitter Information Verification

Submitter Full Name: Roger LeBoeuf
Organization: Elliott, LeBoeuf & McElwain
Street Address:
City:
State:
Zip:
Submittal Date: Wed Aug 23 01:54:21 EDT 2023
Committee: FIY-AAA

Committee Statement

Resolution: FR-95-NFPA 1400-2024
Statement: The technical committee identified that these provisions are found in other chapters of NFPA 1400 as a result the consolidation of NFPA 1402 & 1403.



Public Input No. 37-NFPA 1400-2023 [Sections A.18.2.5, A.18.2.6, A.18.2.7, A.18.2.8]

~~Sections A.18.2.5, A.18.2.6, A.18.2.7, A.18.2.8~~

~~A.18.2.5~~ —

~~See A.17.2.6 :~~

~~A.18.2.6~~ —

~~See A.17.2.7 :~~

~~A.18.2.7~~ —

~~See A.17.2.8 :~~

~~A.18.2.8~~ —

~~See A.17.2.9 :~~

Statement of Problem and Substantiation for Public Input

Deleting Annex A material for sections that were deleted from the standard because they are already covered in 7.2.

Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
<u>Public Input No. 34-NFPA 1400-2023</u> <u>[Section No. 18.2]</u>	Deleting Annex A material for sections that were deleted from the standard.

Submitter Information Verification

Submitter Full Name: Roger LeBoeuf
Organization: Elliott, LeBoeuf & McElwain
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City:
State:
Zip:
Submittal Date: Wed Aug 23 01:58:28 EDT 2023
Committee: FIY-AAA

Committee Statement

Resolution: FR-11-NFPA 1400-2024

Statement: The technical committee recognize structural inspections are addressed in chapter 7.



Public Input No. 64-NFPA 1400-2023 [New Section after A.50.1.1]

Use of Driver Training Simulation

A.7.1

Simulators and simulation training are an integral part of the professional skills training. Simulation training is conducted in all professional fields for cognitive, decision, and judgment training, allowing students to experience real world situations without real world consequences of their actions (i.e. hazard recognition and avoidance, vehicle failure, etc.). Studies have proven that organizations that utilize simulation training within the scope of their driver training program have had on average a 38 percent reduction in collisions. Simulation can also be utilized for various types of driving conditions that cannot be predicted or foreseen (i.e. rain, snow, etc.)

Additional Proposed Changes

<u>File Name</u>	<u>Description</u>	<u>Approved</u>
1451_PI_No._5.pdf	NFPA 1451 Public Input No. 5	

Statement of Problem and Substantiation for Public Input

Simulation is an effective and efficient method of training personnel in dangerous conditions. Training how to clear an intersection or drive left of center in the real world is both dangerous and illegal unless responding to an actual emergency. Doing so is both the wrong time for the driver to be learning and the wrong time for the officer to be training.

Submitter Information Verification

Submitter Full Name: Robert Raheb
Organization: FAAC, Inc.
Street Address:
City:
State:
Zip:
Submittal Date: Fri Aug 25 15:51:16 EDT 2023
Committee: FIY-AAA

Committee Statement

Resolution: The TC recognizes this text is already provided in Annex M.



Public Input No. 65-NFPA 1400-2023 [New Section after M.1.1.7]

RFP Requirements

Authority having jurisdiction (AHJ) can use this section when developing a Request for Proposal (RFP) for a Driver Training Simulator (DTS). Requirements can be enforced by changing the language from "should" to "shall" within the body to help meet the specifications when purchasing a Driver Training Simulator (DTS).

Additional Proposed Changes

<u>File Name</u>	<u>Description</u>	<u>Approved</u>
1451_PI_No._7.pdf	NFPA 1451 Public Input No. 7	

Statement of Problem and Substantiation for Public Input

This is an informational statement to help the AHJ when deciding to write and RFP for purchase of a driver training simulator.

Submitter Information Verification

Submitter Full Name: Robert Raheb
Organization: FAAC, Inc.
Street Address:
City:
State:
Zip:
Submittal Date: Fri Aug 25 15:53:59 EDT 2023
Committee: FIY-AAA

Committee Statement

Resolution: The technical committee determined that suggested enforceable text cannot be inserted into Annex M.