ANSI/NFPA 1403 An American National Standard February 10, 1992

NFPA 1403 Live Fire Training Evolutions in Structures 1992 Edition

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The Board of Directors reaffirms that the National Fire Protection Association recognizes that the toxicity of the products of combustion is an important factor in the loss of life from fire. NFPA has dealt with that subject in its technical committee documents for many years.

There is a concern that the growing use of synthetic materials may produce more or additional toxic products of combustion in a fire environment. The Board has, therefore, asked all NFPA technical committees to review the documents for which they are responsible to be sure that the documents respond to this current concern. To assist the committees in meeting this request, the Board has appointed an advisory committee to provide specific guidance to the technical committees on questions relating to assessing the hazards of the products of combustion.

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NFPA 1403

Standard on

Live Fire Training Evolutions in Structures

1992 Edition

This edition of NFPA 1403, *Standard on Live Fire Training Evolutions in Structures*, was prepared by the Technical Committee on Fire Service Training and acted on by the National Fire Protection Association, Inc. at its Fall Meeting held November 18-20, 1991 in Montréal, Québec, Canada. It was issued by the Standards Council on January 17, 1992, with an effective date of February 10, 1992, and supersedes all previous editions.

The 1992 edition of this document has been approved by the American National Standards Institute.

Changes other than editorial are indicated by a vertical rule in the margin of the pages on which they appear. These lines are included as an aid to the user in identifying changes from the previous edition.

Origin and Development of NFPA 1403

Ongoing training for fire fighters is the cornerstone of good fire protection in today's world. However, the benefits derived from live fire training may be negated by the injuries and deaths suffered by fire fighters under unsafe and poorly supervised training conditions. Following a tragic training accident in 1982, which resulted in the deaths of two fire fighters, the Fire Service Training Committee was urged to address the issue of live fire training evolutions in structures. The Fire Service Training Committee proceeded to develop NFPA 1403 in order to provide recognized safe practices for conducting such training evolutions. The document was well received following its adoption and served as the basis for live fire training evolutions throughout the United States. The document was updated by the Committee in 1991.

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

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NFPA 1403

Standard on

Live Fire Training Evolutions in Structures

1992 Edition

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

Information on referenced publications can be found in Chapter 8 and Appendix D.

Chapter 1 Introduction

1-1 Scope. This standard deals with the establishment of procedures for training of fire suppression personnel engaged in structural fire fighting operations under live fire conditions. It is a basic system that can be adapted to local conditions to serve as a standard mechanism of live fire training. Procedures for live fire training evolutions such as those involving flammable liquids, aircraft, marine structures or vessels, ground cover or wildland fires, or other nonstructural-type burns are not covered in this standard.

1-2 Purpose. This standard deals with the training of structural fire fighters under live fire conditions and focuses on training for coordinated interior fire suppression operations with a minimum exposure to risk for the participants. Live fire training evolutions conducted in accordance with this standard shall be managed by means of a documented incident management system (see NFPA 1561, *Standard on Fire Department Incident Management System*). The line of authority shall be made clear to all participants in order that both expected and unforeseen situations will be managed with the most efficiency possible and that reasonable margins of safety will be provided.

1-3* General. Live fire training in a training center burn building or in a suitable acquired building awaiting demolition is an excellent means of training fire fighters. While this type of training provides high levels of realism, it obviously carries with it most of the hazards of interior fire fighting at an actual emergency. Live fire training evolutions must be planned with great care and supervised closely by instructional personnel. The information contained in this standard is designed to ensure adequate levels of safety while allowing the local organization some flexibility to utilize independent judgement based on local situations and the level of training to be accomplished.

1-4 Definitions. Unless expressly stated elsewhere, the following terms shall, for the purposes of this standard, have the meanings indicated below.

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

Authority Having Jurisdiction.* The "authority having jurisdiction" is the organization, office or individual responsible for "approving" equipment, an installation or a procedure.

Demonstration. A practical showing by example of how a principle or method is applied.

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

Instructor. An individual deemed qualified by the authority having jurisdiction to deliver structural fire fighting training; who has the training and experience to supervise students during live fire training evolutions in structures; and is deemed at least equivalent to an Instructor I as defined in NFPA 1041, *Standard for Fire Service Instructor Professional Qualifications*.

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.

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

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

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

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

Training Center Burn Building. A structure specifically designed to conduct live fire training evolutions on a repetitive basis. It shall not include a structure that is primarily used for training in the use of breathing apparatus where only smoke conditions are created, without a live fire, and the trainee is not subjected to risk of the effects of fire other than the smoke produced.

Chapter 2 Student Prerequisites

2-1 Minimum Training.

2-1.1* In order to ensure safe operations during a live fire training exercise, all participating students shall have achieved a minimum level of basic training.

2-1.2 Prior to being permitted to participate in live fire training evolutions, the student shall have received training to meet the performance objectives for Fire Fighter I of the following sections of NFPA 1001, *Standard for Fire Fighter Professional Qualifications*:

3-1 General
3-4 Fire Behavior
3-6 Self-Contained Breathing Apparatus

3-7 Forcible Entry
3-8 Ventilation
3-10 Rescue
3-11 Safety
3-12 Ladders
3-13 Fire Hose, Nozzles, Appliances
3-14 Fire Streams

2-1.3* Students participating in a live fire training evolution who have received the required minimum basic training from other than the authority having jurisdiction shall not be permitted to participate in any live fire training evolution without presenting prior written evidence of having successfully completed the prescribed minimum training to the levels specified in 2-1.2.

Chapter 3 Structures

3-1* General. Strict safety practices shall be applied to all structures selected for live fire training evolutions. These practices will vary greatly in the degree of application when comparing burn building structures to acquired structures. By their nature, burn buildings have been designed specifically for the purpose of repeated live fire training evolutions and include safeguards that only become unacceptably hazardous through misuse or improper maintenance. Acquired structures, on the other hand, were never designed or intended for burn applications and through disrepair may lack even the fundamental elements of fire resistance.

3-2* Preparation of Training Center Burn Buildings.

3-2.1 Training center burn buildings shall be visually inspected for damage prior to live fire training evolutions. Damage shall be documented. The structural integrity of the building shall be evaluated and documented periodically, but at least annually.

3-2.2* All doors, windows and window shutters, 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, where appropriate, prior to any live fire training evolution to ensure they operate correctly. All safety devices, such as thermometers, oxygen and toxic gas monitors, evacuation alarms, and emergency shut-down switches, shall be checked prior to any live fire training evolutions to ensure they operate correctly.

3-2.3 Training center burn buildings shall be left in a safe condition upon completion of live fire training evolutions. Debris hindering the access or egress of fire fighters shall be removed before continuing further operations.

3-3 Procurement of Acquired Buildings.

3-3.1 Any building that is considered for a structural fire training exercise shall be properly prepared for the live fire training evolution. Preparation can include application for proper permits and permissions relinquishing the acquired building after the live fire training evolution is completed. Thoroughly research the permits required for the exercise, including permits for air quality, water runoff, water usage, burning, and traffic.

3-3.2* Ownership of the acquired building shall be determined prior to acceptance by the authority having jurisdiction. Evidence of clear title shall be required for all structures acquired for live fire training evolutions.

3-3.3* Written permission shall be secured from the structure owner for the fire department to conduct live fire training evolutions within the acquired building. A clear indication of the anticipated condition of the acquired building at the completion of the evolution(s) shall be indicated in writing and acknowledged by the structure owner.

3-3.4* Proof of insurance cancellation or a signed statement of nonexistence of insurance shall be provided by the owner of the structure prior to acceptance of the acquired building by the authority having jurisdiction.

3-3.5 All appropriate and required permits to conduct live fire training evolutions shall be obtained.

3-3.6 The permits specified in Section 3-3 shall be provided to outside, contract, or other separate training agencies by the authority having jurisdiction upon the request of those agencies.

3-4 Preparation of Acquired Buildings.

3-4.1 In preparation for live fire training, an inspection of the structure shall be made to determine that the floors, walls, stairs, and other structural components are capable of withstanding the weight of contents, participants, and accumulated water.

3-4.2* Removal or neutralization of all hazardous storage and conditions within the structure shall be accomplished. Closed containers and highly combustible materials shall be removed. Oil tanks and similar closed vessels that cannot easily be removed shall be vented sufficiently to eliminate an explosion or overpressure rupture, and any hazardous or combustible atmosphere within the tank or other vessel shall be rendered inert. Hazards potentially dangerous to participants such as floor openings, missing stair treads and rails, and other such hazards shall be repaired or made inaccessible.

3-4.3* In order to secure optimum participant personal safety from unforeseen environmental hazards, a careful examination of the building or structure shall be conducted to determine that the following items have been addressed, if applicable to the specific evolution:

(a) Floors, railings, and stairs shall be made safe;

(b) Special attention shall be given to potential chimney hazards;

(c) All walls and ceilings shall be intact or patched;

(d) Debris creating or contributing to unsafe conditions shall be removed;

(e) Low-density combustible fiberboard and unconventional interior finishes shall be removed;

(f) Extraordinary weight above the training area shall be removed or the area below it shall be rendered inaccessible;

(g) Adequate ventilation opening(s) shall be made in the roof;

(h) Utilities shall be disconnected;

(i) Consideration shall be given to potential hazards of toxic weeds, insect hives, and vermin; and

(j) All forms of asbestos deemed hazardous to personnel shall be removed by an approved asbestos removal contractor.

3-4.4 Roof ventilation openings that are normally closed but can be opened in the event of emergency may be utilized. These may consist of precut panels or hinged covers.

3-4.5 Buildings that cannot be made safe as required by Section 3-4 shall not be utilized for interior live fire training evolutions.

3-5 Exposures.

3-5.1 Adjacent buildings or property that might become involved shall be properly protected or removed.

3-5.2 Utility services adjacent to the building shall be removed or protected.

3-5.3 Trees, brush, and surrounding vegetation that creates a hazard to participants shall be removed. Combustible materials, other than those intended for the live fire training evolution, shall be removed from the structure or stored in a protected area to preclude accidental ignition.

3-5.4 Property adjacent to the building that could be affected by the smoke from the building, such as railroads, airports, or heliports; nursing homes, hospitals, or other similar facilities shall be identified and the persons-in-charge informed about the date and time of the live fire training evolution.

3-5.5 Streets or highways in the vicinity of the building shall be surveyed for potential effects from live fire training evolutions. Appropriate safeguards shall be taken to eliminate any possible hazard to motorists. Such safeguards may include street closings, traffic rerouting, signs, and police traffic control.

3-5.6 Pedestrian traffic in the vicinity of the building shall be kept clear of the operations area of the live burn. Fire lines shall be established for this purpose.

3-5.7 Awareness of weather conditions, wind velocity, and wind direction shall be maintained. In all cases, immediately before actual ignition, a final check shall be made for possible changes in weather conditions.

3-6 Water Supply.

3-6.1 The water supply for any individual live fire training evolution shall be assessed based on the extent of the evolutions, size and structure of the building and contents to be involved, method of attack to be employed, protection of exposures, and reserves for potential unexpected problems.

3-6.2 The minimum water supply and delivery for the live fire training evolutions shall meet the criteria identified in NFPA 1231, *Standard on Water Supplies for Suburban and Rural Fire Fighting*.

3-6.3 A minimum reserve of additional water in the amount of 50 percent of the fire flow demand in 3-6.2 shall be available to handle exposure protection or unforeseen situations.

3-6.4* Separate sources shall be utilized for supply of attack lines and backup lines in order to preclude the loss of both water supply sources at the same time.

3-7 Vehicle Parking/Staging.

3-7.1 Adequate areas for staging, operating, and parking of fire apparatus that will be used in the live fire training evolution shall be designated.

3-7.2 An area shall be designated to park fire apparatus and vehicles that are not a part of the evolution so as to not interfere with fireground operations. Consideration shall be given to locating this area for prompt response of apparatus in the event of an emergency.

3-7.3 If required or necessary, parking areas for police vehicles or for the press shall be designated.

3-7.4 A parking area for an ambulance or emergency medical services vehicle shall be designated. Consideration shall be given to locating this area for prompt response in the event of a personal injury to participants in the evolution.

3-7.5 Consideration shall be given to the designation and layout of ingress-egress routes in order to assure their availability in the event of an emergency.

3-8 Preburn Briefing Session.

3-8.1 Prior to conducting actual live fire training evolutions in the building, a preburn briefing session shall be conducted for all participants. All facets of all evolutions to be conducted shall be discussed and assignments shall be made for all crews participating in the training session. The location of simulated victims (see 5-2.11) need not be disclosed provided that the possibility of victims is discussed in the preburn briefing.

3-8.2 A preburn plan shall be prepared for the structure and shall be utilized in the preburn briefing sessions. All interior rooms, hallways, and exterior openings shall be indicated on the plan.

3-8.3 Prior to conducting any live fire training in the structure, all participants shall have a knowledge and familiarity with the layout of the building in order to facilitate necessary evacuation of the building.

Prior to conducting any live fire training in the structure, all participants of the evolution shall be required to have a walk-through of the structure.

3-9 Spectator Safety.

3-9.1 All spectators shall be restricted to an area outside the operations area perimeter established by the safety officer.

3-9.2 Appropriate control measures such as ropes, signs, or fire line markings shall be posted to indicate the perimeter of the operations area.

3-9.3 Visitors allowed to observe operations and allowed within the operations area perimeter shall be escorted at all times and shall be equipped with and properly wear complete protective clothing in accordance with Section 5-3.

Chapter 4 Fuel Materials

4-1 Material Types.

4-1.1 The fuels that are utilized in live fire training evolutions shall have known burning characteristics of such a nature to be as controllable as possible. Unidentified materials, such as debris found in or around the structure, which may burn in unanticipated ways, react violently, or create environmental or health hazards, shall not be used.

4-1.2* Class A materials shall be used in only the amounts necessary to create the desired fire size.

Exception: Pressure-treated wood, rubber, and plastic materials shall not be used.

4-1.3 The use of flammable or combustible liquids, as defined in NFPA 30, *Flammable and Combustible Liquids Code*, shall be prohibited for use in live fire training evolutions.

4-2 Fire Growth.

4-2.1* The instructor-in-charge shall assess the selected fire room environment for factors that will affect the growth, development, and spread of fire.

4-2.2* The instructor-in-charge, as a minimum, shall document fuel loading, including furnishings; wall and floor coverings and ceiling materials; type of construction of the structure, including type of roof and combustible void spaces; and dimensions of room.

4-2.3* The training exercise shall be immediately stopped if the instructor-in-charge determines through continuing assessments that the combustible nature of the environment represents a potential hazard. The exercise shall continue only when the appropriate actions have been taken to reduce the hazard.

Chapter 5 Safety

5-1 Safety Officer.

5-1.1 A safety officer shall be appointed for all live fire training evolutions.

5-1.2 The safety officer shall have the authority, regardless of rank, to intervene and control any aspect of the operations when, in his or her judgement, a potential or real danger, accident, or unsafe condition exists.

5-1.3 Responsibilities of the safety officer shall include but not be limited to:

(a) Prevention of unsafe acts;

(b) Elimination of unsafe conditions.

5-1.4 The safety officer shall provide for the safety of all persons on the scene including students, instructors, visitors, and spectators.

5-1.5 The safety officer shall not be assigned other duties that interfere with safety responsibilities.

5-2 Other Safety Requirements.

5-2.1 Sufficient backup lines shall be provided to ensure adequate protection for personnel on training attack lines.

5-2.2* The instructor-in-charge of the live fire training evolutions shall determine, prior to each specific evolution, how many training attack lines and backup lines will be necessary. Each hose line shall be capable of delivering a minimum of 95 gpm (360 L/min). The instructor-in-charge shall then:

(a) Assign one instructor to each functional crew, which shall not exceed 5 students;

(b) Assign one instructor to each "backup line";

(c) Assign sufficient additional personnel to "backup lines" to provide mobility;

(d) Assign one additional instructor for each additional functional assignment.

5-2.3 Additional safety personnel, as deemed necessary by the safety officer, shall be strategically placed within the structure to react to any unplanned or threatening situation or condition.

5-2.4 A method of fireground communications shall be established to allow coordination among the incident commander, the interior and exterior sectors, the safety officer, and external requests for assistance.

5-2.5* A building evacuation plan shall be established and an evacuation signal shall be demonstrated to all participants in the live fire training evolution.

5-2.6 Emergency medical services shall be available on site to handle any injuries. Written reports shall be made on all injuries and on all medical aid rendered.

5-2.7 One person shall be designated as the "ignition officer" to control the materials being burned. The ignition officer shall not be a student.

5-2.8 The ignition officer shall wear full protective clothing, including self-contained breathing apparatus (SCBA) as required in Section 5-3, when performing this function. A charged hoseline shall accompany the ignition officer when igniting any fire.

5-2.9 The decision to ignite the training fire shall be made by the instructor-in-charge in coordination with the safety officer. The fire shall be ignited by the ignition officer in the presence and under the direct supervision of the safety officer. No more than one fire shall be permitted within a building, except in training center burn buildings specifically designed for concurrent, multiple live fire training evolutions.

5-2.10 A thorough search of the structure shall be conducted to ensure that no unauthorized persons, animals, or objects are in the building immediately prior to ignition.

5-2.11 No person(s) shall be placed inside the building to play the role of a victim.

5-3 Protective Clothing and Equipment.

5-3.1 Each participant shall be equipped with full protective clothing and self-contained breathing apparatus (SCBA). All participants shall be inspected by the safety officer prior to entry into a live fire training evolution to ensure that the protective clothing and SCBA are being properly worn and are in serviceable condition.

5-3.1.1 Protective coats and protective trousers shall meet the requirements of NFPA 1971, *Standard on Protective Clothing for Structural Fire Fighting*.

5-3.1.2 Helmets shall meet the requirements of NFPA 1972, *Standard on Helmets for Structural Fire Fighting*.

5-3.1.3 Gloves shall meet the requirements of NFPA 1973, *Standard on Gloves for Structural Fire Fighting*.

5-3.1.4 Self-contained breathing apparatus, SCBA, shall meet the requirements of NFPA 1981, *Standard on Open-Circuit Self-Contained Breathing Apparatus for Fire Fighters*.

5-3.1.5 Protective footwear shall meet the requirements of NFPA 1974, *Standard on Protective Footwear for Structural Fire Fighting*.

5-3.1.6* Where station or work uniforms are worn by any participant, the station or work uniform shall meet the requirements of NFPA 1975, *Standard on Station/Work Uniforms for Fire Fighters*.

5-3.1.7 Personal alarm devices shall meet the requirements of NFPA 1982, *Standard on Personal Alert Safety Systems (PASS) for Fire Fighters*.

5-3.2 All students, instructors, safety personnel, and other personnel shall properly wear all protective clothing and equipment specified in 5-3.1 whenever these persons are involved in any evolution or fire suppression operation during the live fire training evolution.

5-3.3* All students, instructors, safety personnel, and other personnel participating in any evolution or operation of fire suppression during the live fire training evolution shall breathe from an SCBA air supply whenever one or more of the following conditions exist:

(a) Operating in an atmosphere that is oxygen deficient or contaminated by products of combustion, or both;

(b) Operating in an atmosphere that is suspected of being oxygen deficient or contaminated by products of combustion, or both;

(c) Operating in any atmosphere that may become oxygen deficient or contaminated, or both;

(d) Operating below ground level.

Chapter 6 Instructors

6-1 General.

6-1.1 All instructors shall be deemed qualified to deliver structural fire fighting training by the authority having jurisdiction.

6-1.2* The participating student-instructor ratio shall not be greater than 5 to 1.

6-1.3 Other factors such as extreme temperatures, large groups, and long-duration classes shall be taken into consideration, and additional instructors shall be designated as deemed necessary to ensure proper levels of safety.

6-2 Instructor Responsibilities.

6-2.1 The instructor-in-charge shall be responsible for full compliance with this standard.

6-2.2 Prior to the ignition of any fire, instructors shall ensure that all protective clothing and equipment specified in 5-3.1 is being worn and used as specified in 5-3.2 and 5-3.3.

6-2.3 Instructors shall make a head count both when entering and exiting the building during an actual attack evolution conducted in accordance with this standard. Instructors shall closely monitor and supervise all assigned students during the live fire training evolution.

Chapter 7 Reports and Records

7-1 General.

7-1.1 The following records and reports shall be maintained on all live fire training evolutions in accordance with the requirements of this standard:

(a) An accounting of the activities conducted;

(b) A listing of instructors present and their assignments;

(c) A listing of all other participants;

(d) Documentation of unusual conditions encountered;

(e) Any injuries incurred and treatment rendered;

(f) Any changes or deterioration of the structure; and

(g) Documentation of the condition of the premises and adjacent area at the conclusion of the training exercise.

7-1.2* For acquired buildings, records pertaining to the structure shall be completed.

7-1.3 Upon completion of the training session the acquired building shall be formally turned over to the control of the property owner. A standard form shall be completed showing the transfer of authority for the building.

7-1.4 A post-training critique session, complete with documentation, shall be conducted to evaluate student performance and to reinforce the learning experience of all participants.

Chapter 8 Referenced Publications

8-1 The following documents or portions thereof are referenced within this standard and shall be considered part of the requirements of this standard. The edition indicated for each reference is the current editor as of the date of the NFPA issuance of this document.

8-1.1 NFPA Publications. National Fire Protection Association, 1 Batterymarch Park, P.O. Box 9101, Quincy, MA 02269-9101.

NFPA 30, *Flammable and Combustible Liquids Code*, 1990 edition

NFPA 1001, *Standard for Fire Fighter Professional Qualifications*, 1987 edition

NFPA 1041, *Standard for Fire Service Instructor Professional Qualifications*, 1987 edition

NFPA 1231, *Standard on Water Supplies for Suburban and Rural Fire Fighting*, 1989 edition

NFPA 1561, *Standard on Fire Department Incident Management System*,1990 edition

NFPA 1971, *Standard on Protective Clothing for Structural Fire Fighting*, 1991 edition

NFPA 1972, *Standard on Helmets for Structural Fire Fighting*, 1987 edition

NFPA 1973, *Standard on Gloves for Structural Fire Fighting*, 1988 edition

NFPA 1974, *Standard on Protective Footwear for Structural Fire Fighting*, 1987 edition

NFPA 1975, *Standard on Station/Work Uniforms for Fire Fighters*, 1990 edition

NFPA 1981, *Standard on Open-Circuit Self-Contained Breathing Apparatus for Fire Fighters*, 1987 edition

NFPA 1982, *Standard on Personal Alert Safety Systems (PASS) for Fire Fighters*, 1988 edition

Appendix A

This Appendix is not a part of the requirements of this NFPA document, but is included for information purposes only.

A-1-3 Drills conducted for the familiarization of fire fighters with the proper use of self-contained breathing apparatus in a smoke environment should not be conducted under live fire conditions.

A-1-4 Authority Having Jurisdiction. The phrase "authority having jurisdiction" is used in NFPA documents in a broad manner since jurisdictions and "approval" agencies vary as do their responsibilities. Where public safety is primary, the "authority having jurisdiction" may be a federal, state, local or other regional department or individual such as a fire chief, fire marshal, chief of a fire prevention bureau, labor department, health department, building official, electrical inspector, or others having statutory authority. For insurance purposes, an insurance inspection department, rating bureau, or other insurance company representative may be the "authority having jurisdiction." In many circumstances the property owner or his designated agent assumes the role of the "authority having jurisdiction" at government installations: the commanding officer or departmental official may be the "authority having jurisdiction."

A-2-1.1 The actual structural fire attack evolution is normally conducted for one of two purposes. One, as the final phase of basic training; or two, as an ongoing means of maintaining and improving acquired skills. In both instances, the live fire training evolution is a means by which the fire fighter can collectively display many combinations of earlier acquired skills and develop an appreciation of the necessary safety aspects of structural fire fighting.

A-2-1.3 The type of written documentation required can vary depending upon the instructor's familiarity with the student participants' level of training from outside agencies. All outside-agency student participants should be allowed to participate only as official representatives of an established organization. Prior documentation is required in order to facilitate planning of the training session.

A-3-1 When training facility burn buildings are available, it is recommended that they be used instead of acquired structures.

A-3-2 There should be continuing concern for the progressive damage to burn buildings associated with fire intensity during live fire training evolutions. Excessive fire intensity will result in accelerated destruction of the training center burn building and will increase risk to personnel to an unacceptable level.

A-3-2.2 Some training center burn buildings may utilize propane-fueled fires in lieu of Class A-fueled fires and still create a realistic fire training experience. Propane-fueled fires produce less smoke and other by-products than ordinary Class A combustibles and, therefore, create less of a negative environmental impact. Such fires also negate the need to clean up large amounts of burned materials at the end of the exercise because no such materials are used. Such buildings may incorporate emergency shutdown switches and other electronic devices to monitor burn evolutions, which should provide an increased level of safety for fire fighters.

A-3-3.2 Information pertaining to the building ownership should be reviewed by the legal counsel of the authority having jurisdiction prior to accepting the structure.

A-3-3.3 Information relating to the written permission of the building owner should be reviewed by the legal counsel of the authority having jurisdiction prior to accepting the structure.

A-3-3.4 Information relating to the cancellation of insurance by the building owner should be reviewed by the legal counsel of the authority having jurisdiction prior to accepting the structure.

A-3-4.2 Care must be exercised in the neutralization of hazards posed by closed tanks and vessels. Either the vessel or its contents may pose a hazard that must be eliminated. Appropriate references or assistance should be consulted based on the specific circumstances encountered. The area within the tank should be filled with dry sand as a preferred means of rendering the internal atmosphere inert. Under no circumstances should water or other liquids be utilized as a means of inerting a tank or other closed vessel.

A-3-4.3 Low-density combustible fiberboard has been implicated as a major factor in a number of rapidly spreading fires that resulted in fatalities:

(a) Our Lady of the Angels School (Chicago, IL, 1958);

(b) Hartford Hospital (Hartford, CT, 1961);

(c) Opemiska Social Club (Chapais, Quebec, 1980);

(d) Boulder Fire Department training fire (Boulder, CO, 1982).

Unconventional interior finishes include burlap, carpeting, and artificial turf.

Collapse of overhead structural members may result from the combined effect of the weight of both live and dead overhead loads, and the loss of structural integrity caused by fire. Linoleum is a potential fuel source, particularly after being preheated by repeated fire exposure, and thus may contribute to an unanticipated increase in fire intensity.

A-3-6.4 Reliability should be considered when determining what constitutes separate sources. The intent of this section is to prevent the simultaneous loss of both attack lines and backup lines in the event of a pump or water supply failure. If a public water supply system is used, two pumpers on two different hydrants should be used. Two pumpers drafting from the same pond or river would also be appropriate if the source contains sufficient usable water. If tankers or folding tanks, or both, are used, two separate pumpers should be used to supply the attack and backup lines.

A-4-1.2 Acceptable materials include pine excelsior, wooden pallets, straw, hay, and other ordinary combustibles. A reasonable effort should be made to ascertain that straw or hay has not been treated with pesticides or other harmful chemicals.

A-4-2.1 The instructor-in-charge is concerned about the safety of participants and assessing conditions that can lead to rapid, uncontrolled burning, commonly termed flashover. Flashover can trap, injure, and kill fire fighters. Conditions known to be variables affecting attainment of flashover are: the heat release characteristics of materials used as primary fuels; preheating of combustibles; combustibility of wall and ceiling materials; and room geometry, i.e., ceiling height, openings to rooms, etc. In addition, the arrangement of the initial materialsto be ignited, particularly, the proximity to walls and ceilings, and the ventilation openings, are important factors to be considered when assessing the potential fire growth.

A-4-2.2 Plotting the expected avenues of fire spread, and time factors of expected build-up of the fire, provides an extra degree of safety for the participants of the exercise. Voids can result in sudden and unexpected vertical spread of the fire and trap participants by cutting off exit routes, or can result in unexpected weakening of the structural members, leading to collapse. To compensate for this potential, the instructor-in-charge should prescribe primary and secondary exit paths for participants in the exercises.

A-4-2.3 Incidents of injuries and deaths during live fire training exercises have indicated that fire growth dynamics were not considered or were inaccurately assessed prior to the beginning of the exercises. Fire growth is typically linear until the flame height reaches the ceiling; thereafter, rapid acceleration can be expected. To help reduce the unexpected and rapid fire growth that can occur, it may be necessary to remove combustible wall and ceiling materials, reduce the amount of furnishings, etc. Careful consideration must be given to the presence of combustible void spaces and steps taken to assure that the fire will not be able to gain unexpected growth in such areas.

A-5-2.2 A minimum flow rate of 95 gpm (360 L/min) is required in order to have adequate quantities of water available to handle the planned evolution plus a reserve for unanticipated emergencies. The appropriate quantity and exact flow rates that will be needed for fire control and extinguishment should be calculated in advance, and certain factors such as equipment, manpower, fire area, and topography should be taken into consideration. Knowledge of the hose line sizes, types of nozzles, which type of fire stream to be utilized, and the principles of fire attack and deployment will aid in determining the exact flow rates that will be necessary.

A-5-2.5 Participants involved in the live fire training evolutions should be instructed to report to a predetermined location for a roll call should evacuation of the building be signaled. Instructors should report immediately to the instructor-in-charge any personnel not accounted for. Examples of an evacuation signal that could be used include a whistle, apparatus air horn, or high-low electronic siren.

A-5-3.1.6 Clothing worn under protective clothing can degrade and cause injury to the wearer, even without damaging the protective clothing. All persons should be aware of the dangers of clothing made from certain all-synthetic materials melting, adhering to, and burning the wearer even though protective clothing that meets NFPA standards is worn over this clothing. Any clothing, such as shirts, pants, underwear, and sweatshirts, worn under protective clothing should meet the requirements of NFPA 1975, *Standard on Station/Work Uniforms for Fire Fighters*, whenever possible, or at least be selected for the fabric's ability to resist ignition. Fire retardant fabrics and all-natural fibers should be given consideration.

A-5-3.3 No one should be allowed to breathe smoke, toxic vapors or fumes, products of combustion, or other contaminated atmospheres, or be exposed to an oxygen-deficient atmosphere.

A-6-1.2 It is important that the participating student-instructor ratio be monitored so it does not exceed the span of control necessary to provide proper supervision of trainees.

A-7-1.2 Figure A-7-1.2 (a) shows a sample release form that can be used with acquired buildings. The exact form should be approved locally. Figure A-7-1.2 (b) shows a standard notice of cancellation or nonrenewal of insurance.

_____ Fire Department

Address _____

City _____ State _____

Date _____

Having agreed with the Building Official, City of

_____ ,

that a structure owned by me and located at _____

_____ is unfit for human habitation

and is beyond rehabilitation, I further agree that the structure should be demolished. In order that demolition may be accomplished, I give my consent to the

City of _____

to demolish, by burning or other means, the said structure.

I further release the City of _____

_____ from any claim for loss resulting from such demolition.

_____
Owner/Agent

_____
Owner/Agent

_____
Witness

Figure A-7-1.2(a) Sample release (exact form should be approved by local officials).

NOTICE OF CANCELLATION OR NONRENEWAL

OF _____
KIND OF POLICY

POLICY NO.	ISSUED THROUGH AGENCY OR OFFICE AT:	CANCELLATION OR TERMINATION WILL TAKE EFFECT AT. (DATE) (HOUR–STANDARD TIME)	DATE OF NOTICE

INSURANCE COMPANY •

NAME AND ADDRESS OF INSURED •

(Applicable item marked ☒)

CANCELLATION	☐ You are hereby notified in accordance with the terms and conditions of the above mentioned policy that your insurance will cease at and from the hour and date mentioned above. If the premium has been paid, premium adjustment will be made as soon as practicable after cancellation becomes effective. If the premium has not been paid, a bill for the premium earned to the time of cancellation will be forwarded in due course.
	☐ You are hereby notified in accordance with the terms and conditions of the above mentioned policy that your insurance will cease at and from the hour and date mentioned above due to nonpayment of premium. A bill for the premium earned to the time of cancellation will be forwarded in due course.
NON-RENEWAL	☐ You are hereby notified in accordance with the terms and conditions of the above mentioned policy that the above mentioned policy will expire effective at and from the hour and date mentioned above and the policy will NOT be renewed.

IMPORTANT NOTICE ☐ In compliance with the Fair Credit Reporting Act (Public Law 91-508), you are hereby informed that the action taken above is being taken wholly or partly because of information contained in a consumer report from the following consumer reporting agency:

_____ (NAME) _____

_____ (ADDRESS) _____

. . . . . .
Authorized Representative

GU 8811b (Ed. 3-73) Uniform Printing & Supply Div **INSURED'S COPY**

Figure A-7-1.2(b) Notice of cancellation or nonrenewal.

Appendix B
Live Fire Evolution Sample Checklist

This Appendix is not a part of the requirements of this NFPA document, but is included for information purposes only.

Permits, Documents, Notifications, Insurance

- ☐ 1. Written documentation received from owner:
  - ☐ Permission to burn structure
  - ☐ Proof of clear title
  - ☐ Certificate of insurance cancellation
  - ☐ Acknowledgement of postburn property condition
- ☐ 2. Local burn permit received
- ☐ 3. Permission obtained to utilize fire hydrants
- ☐ 4. Notification made to appropriate dispatch office of date, time, and location of burn
- ☐ 5. Notification made to all affected police agencies:
  - ☐ Received authority to block off roads
  - ☐ Received assistance in traffic control
- ☐ 6. Notification made to owners and users of adjacent property of date, time, and location of burn
- ☐ 7. Liability insurance obtained covering damage to other property
- ☐ 8. Written evidence of prerequisite training obtained from participating students from outside agencies

Preburn Planning

- ☐ 1. Preburn plans made, showing the following:
  - ☐ Site plan drawing, including all exposures
  - ☐ Building plan, including overall dimensions
  - ☐ Floor plan detailing all rooms, hallways, and exterior openings
  - ☐ Location of command post
  - ☐ Position of all apparatus
  - ☐ Position of all hoses, including backup lines
  - ☐ Location of emergency escape routes
  - ☐ Location of emergency evacuation assembly area
  - ☐ Location of ingress and egress routes for emergency vehicles
- ☐ 2. Available water supply determined
- ☐ 3. Required fire flow determined for the burn building and exposure buildings
- ☐ 4. Required reserve flow determined (50 percent of fire flow)
- ☐ 5. Apparatus pumps obtained that meet or exceed the required fire flow for the building and exposures
- ☐ 6. Separate water sources established for attack and backup hoselines
- ☐ 7. Periodic weather reports obtained
- ☐ 8. Parking areas designated and marked:
  - ☐ Apparatus staging
  - ☐ Ambulances
  - ☐ Police vehicles
  - ☐ Press vehicles
  - ☐ Private vehicles
- ☐ 9. Operations area established and perimeter marked
- ☐ 10. Communications frequencies established, equipment obtained

Building Preparation

- ☐ 1. Building inspected to determine structural integrity
- ☐ 2. All utilities disconnected (acquired buildings only)
- ☐ 3. Highly combustible interior wall and ceiling coverings removed
- ☐ 4. All holes in walls and ceilings patched
- ☐ 5. Materials of exceptional weight removed from above training area (or area sealed from activity)
- ☐ 6. Ventilation openings of adequate size precut for each separate roof area
- ☐ 7. Windows checked and operated, openings closed
- ☐ 8. Doors checked and operated, opened or closed as needed
- ☐ 9. Building components checked and operated:
  - ☐ Roof scuttles
  - ☐ Automatic ventilators
  - ☐ Mechanical equipment
  - ☐ Lighting equipment
  - ☐ Manual or automatic sprinklers
  - ☐ Standpipes
- ☐ 10. Stairways made safe with railings in place
- ☐ 11. Chimney checked for stability
- ☐ 12. Fuel tanks and closed vessels removed or adequately vented
- ☐ 13. Unnecessary inside and outside debris removed
- ☐ 14. Porches and outside steps made safe
- ☐ 15. Cisterns, wells, cesspools, and other ground openings fenced or filled
- ☐ 16. Hazards from toxic weeds, hives, and vermin eliminated
- ☐ 17. Hazardous trees, brush, and surrounding vegetation removed
- ☐ 18. Exposures such as buildings, trees, and utilities removed or protected

☐ 19. All extraordinary exterior and interior hazards remedied

☐ 20. Fire "sets" prepared:
☐ Class A materials only
☐ No flammable or combustible liquids
☐ No contaminated materials

Preburn Procedures

☐ 1. All participants briefed:
☐ Building layout
☐ Crew and instructor assignments
☐ Safety rules
☐ Building evacuation procedure
☐ Evacuation signal (demonstrate)

☐ 2. All hoselines checked:
☐ Sufficient size for the area of fire involvement
☐ Charged and test flowed
☐ Supervised by qualified instructors
☐ Adequate number of personnel

☐ 3. Necessary tools and equipment positioned

☐ 4. Participants checked:
☐ Approved full protective clothing
☐ Self-contained breathing apparatus
☐ Adequate SCBA air volume
☐ All equipment properly donned

Postburn Procedures

☐ 1. All personnel accounted for

☐ 2. Remaining fires overhauled, as needed

☐ 3. Building inspected for stability and hazards if more training is to follow (see "Building Preparation")

☐ 4. Training critique conducted

☐ 5. Records and reports prepared, as required:
☐ Accounting of activities conducted
☐ List of instructors and assignments
☐ List of other participants
☐ Documentation of unusual conditions or events
☐ Documentation of injuries incurred and treatment rendered
☐ Documentation of changes or deterioration of training center burn building
☐ Acquired building release
☐ Student training records
☐ Certificates of completion

☐ 6. Building and property released to owner, release document signed

Appendix C Responsibilities of Personnel

This Appendix is not a part of the requirements of this NFPA document, but is included for information purposes only.

Instructor-in-Charge

☐ 1. Plan and coordinate all training activities

☐ 2. Monitor activities to ensure safe practices

☐ 3. Inspect building integrity prior to each fire

☐ 4. Assign instructors:
☐ Attack hoselines
☐ Backup hoselines
☐ Functional assignments
☐ Teaching assignments

☐ 5. Brief instructors on responsibilities:
☐ Accounting for assigned students
☐ Assessing student performance
☐ Clothing and equipment inspection
☐ Monitoring safety
☐ Achieving tactical and training objectives

☐ 6. Assign coordinating personnel, as needed:
☐ Emergency medical services
☐ Communications
☐ Water supply
☐ Apparatus staging
☐ Equipment staging
☐ Breathing apparatus
☐ Personnel welfare
☐ Public relations

☐ 7. Ensure adherence to this standard by all persons within the training area

Safety Officer

☐ 1. Prevent unsafe acts

☐ 2. Eliminate unsafe conditions

☐ 3. Intervene and terminate unsafe acts

☐ 4. Supervise additional safety personnel, as needed

☐ 5. Coordinate lighting of fires with instructor-in-charge

☐ 6. Ensure compliance of participants' personal equipment to applicable standards:
☐ Protective clothing
☐ SCBA
☐ Personal alarm devices, if used

☐ 7. Ensure that all participants are accounted for, both before and after each evolution

Instructor

☐ 1. Monitor and supervise assigned students (no more than five per instructor)

☐ 2. Inspect students' protective clothing and equipment

☐ 3. Account for assigned students, both before and after evolutions

Student

☐ 1. Acquire prerequisite training

☐ 2. Familiarize with building layout

☐ 3. Wear approved full protective clothing

☐ 4. Wear approved self-contained breathing apparatus

☐ 5. Obey all instructions and safety rules

☐ 6. Provide documentation of prerequisite training, if from an outside agency

Appendix D Referenced Publications

D-1 The following documents or portions thereof are referenced within this standard for informational purposes only and thus are not considered part of the requirements of this document. The edition indicated for each reference is the current edition as of the date of the NFPA issuance of this document.

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

NFPA 1975, *Standard on Station/Work Uniforms for Fire Fighters.*

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