

UTAH LIVE FIRE TRAINING STANDARD



OFFICE OF THE
UTAH FIRE AND RESCUE ACADEMY
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SOURCE NOTE

The primary source for this Utah Live Fire Training Standard is NFPA 1403, *Standard on Live Fire Training Evolutions* (National Fire Protection Association, 2018 Edition). Citations within this standard primarily refer to the NFPA 1403 sections quoted. Paragraphs without such citations, and bracketed insertions, were added by the review committee, the Utah Fire and Rescue Academy, and approved by the Utah Fire Service Certification Council (UFSCC).

INTRODUCTION

The state recognizes that Live Fire Training is inherently dangerous, and vital to firefighters to hone their skills and learn new skills. There was a need for a standard that is attainable by departments across the state, including career, combination, and volunteer departments. The state recognizes the need to limit the risk of line-of-duty deaths or injury in a Live Fire Training environment.

The Fire Prevention Board, the Utah State Fire Chiefs Association, and the Utah Fire and Rescue Academy assembled a committee to create this Utah Live Fire Training Standard. This standard was created by a review committee of professionals from across the state. These individuals devoted many hours to reviewing and discussing the National Fire Protection Association (NFPA) 1403 standard (2018), along with other standards. This standard they have created contains a considerable amount of material from NFPA 1403. The committee members also used supplementary sources, including test banks curriculum textbooks, in writing the Utah Live Fire Training Standard.

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SECTION 1: OBJECTIVE

1.1 Scope.

1.1.1 [The Utah Live Fire Training Standard] shall contain the minimum requirements for training all fire [service] personnel engaged in fire-fighting operations under live fire conditions [in Utah] (NFPA 1403, 1.1.1).

1.1.2 The minimum requirements for training shall comprise a basic system that can be adapted to local conditions to serve as a standard mechanism for live fire training (1.1.2).

Live fire training of entry level and experienced fire [service] personnel are high-risk activities. This risk can be effectively managed through compliance with [Utah Live Fire Training Standard] (A.1.1).

1.2 Purpose.

1.2.1 The purpose of [the Utah Live Fire Training Standard] shall be to 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 fire fighters receiving the training is minimized (1.2.1).

Drills conducted to familiarize fire fighters with the proper use of self-contained breathing apparatus (SCBA) in a smoke environment should not be conducted under live fire conditions (A.1.2).

1.2.2 The Utah Live Fire Training Standard establishes statewide uniform Live Fire training and testing procedures for a consistent means of evaluation.

1.2.3 The Utah Live Fire Training Standard aids in the development of competent, safe, and effective fire service personnel by establishing minimum Live Fire certification standards.

1.3 Application.

1.3.1 All live fire training shall be conducted in compliance with the current edition of this standard (1.3.1).

1.3.2 Procedures for live fire training evolutions that involve ground cover or wildland fires shall not be covered in this standard (1.3.2).

1.3.3 Procedures for suppression of fires set for the sole purpose of training individuals for fire cause and origin investigation shall not be covered in this standard (1.3.3).

While [the Utah Live Fire Training Standard] does not deal with the suppression of fires set to train individuals on fire cause and origin, this standard does contain procedures that can be adapted to [help ensure] safety during those types of operations (A.1.3.3).

- 1.3.4 Live fire training shall only be conducted using standard operating procedures (SOPs) developed by the authority having jurisdiction in compliance with this standard (NFPA 1403, 1.3.4).

SECTION 2: REFERENCES

- 2.1 **General.** The documents or portions thereof listed in this [section] are referenced within this standard and [should be] considered part of the requirements of this document (2.1).

2.2 Referenced NFPA Publications.

- NFPA 1403, *Standard on Live Fire Training Evolutions*, 2018 edition.
- NFPA 1001, *Standard for Fire Fighter Professional Qualifications*, 2019 edition.

2.3 Other Publications.

- Current adopted edition of the International Fire Code.
- *Live Fire Training: Principles and Practice to NFPA 1403*, 2nd edition, Burlington, MA: Jones & Bartlett Learning, 2019.

SECTION 3: DEFINITIONS

- 3.1 [The following definitions apply only] to the terms used in this standard. Where terms are not defined in this [section] or within another [section], they [should] be defined using the context in which they are used. *Merriam-Webster's Collegiate Dictionary*, [current] edition, shall be the source for the [generally] accepted meaning (3.1).

- 3.1.1 **Acquired Prop.** A piece of equipment . . . that was not designed for burning but is used for live fire training evolutions (3.3.1).

- 3.1.2 **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 (3.3.27.1).

- 3.1.3 **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 (3.2.1).

- 3.1.4 **Backdraft.** A deflagration resulting from the sudden introduction of air into a confined space containing oxygen-deficient products of incomplete combustion (3.3.2).

- 3.1.5 **British Thermal Units (BTU).** The quantity of heat required to raise the temperature of one pound of water by 1° Fahrenheit (F) at the pressure of 1 atmosphere and temperature of 60° Fahrenheit (F) (Jones & Bartlett, 252).

- 3.1.6 **Burn Sequence Chart.** The data collected and policies specified by the AHJ regarding sequential live fire burn evolutions in a specific live fire training structure (Jones & Bartlett, 252).
- 3.1.7 **Ceiling Jet.** A relatively thin layer of flowing hot gases that develops under a horizontal surface (e.g., ceiling) as a result of plume impingement and the flowing gas being forced to move horizontally (Jones & Bartlett, 252).
- 3.1.8 **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) (NFPA 1403, 3.3.3).
- 3.1.9 **Combustion.** A chemical process of oxidation that occurs at a rate fast enough to produce heat and usually light in the form of either a glow or flame (Jones & Bartlett, 252).
- 3.1.10 **Combustion Products.** The heat, gases, volatilized liquids and solids, particulate matter, and ash generated by combustion (Jones & Bartlett, 252).
- 3.1.11 **Conduction.** Heat transfer to another body or within a body by direct contact (3.3.4).
- 3.1.12 **Construction Classification Numbers.** A series of numbers from 0.5 through 1.5 that are mathematical factors used in a formula to determine the total water supply requirements (Jones & Bartlett, 252).
- 3.1.13 **Convection.** Heat transfer by circulation within a medium such as a gas or a liquid (3.3.5).
- 3.1.14 **Core Temperature.** The body's internal temperature (Jones & Bartlett, 252).
- 3.1.15 **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 (Jones & Bartlett, 252).
- 3.1.16 **Deflagration.** Propagation of a combustion zone at a velocity that is less than the speed of sound in the unreacted medium (3.3.6).
- 3.1.17 **Demonstration.** The act of showing a skill (3.3.7).
- 3.1.18 **Dry Run.** Used during initial training, an attack on a prop with no fire and no water flowing to give students confidence in hose handling techniques. It is

followed by the second evolution flowing water and the third evolution introducing fire (Jones & Bartlett, 252).

- 3.1.19 **Endothermic.** Reactions that absorb heat or require heat to be added (Jones & Bartlett, 252).
- 3.1.20 **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 (NFPA 1403, 3.3.8).
- 3.1.21 **Evolution.** A set of prescribed actions that result in an effective fireground activity (3.3.9).
- 3.1.22 **Exothermic.** Reactions that result in the release of energy in the form of heat (Jones & Bartlett, 252).
- 3.1.23 **Exterior Prop.** A nonstructural, outdoor live fire training prop (Jones & Bartlett, 252).
- 3.1.24 **Fire.** A rapid, persistent chemical reaction resulting in the evolution of light and heat in varying intensities (Jones & Bartlett, 252).
- 3.1.25 **Fire Control Team.** A team consisting of at least two members including the ignition officer. The other firefighter(s) can staff the charged line, observe the ignition, help maintain the fire, and watch for and report adverse conditions (Jones & Bartlett, 252).
- 3.1.26 **Fire Flow Rate.** The amount of water pumped per minute (gallons per minute or liters per minute) for a fire. There are several different formulas that are commonly used to calculate this (Jones & Bartlett, 252).
- 3.1.27 **Fire Point.** The temperature at which a liquid fuel produces sufficient vapors to support combustion once the fuel is ignited (Jones & Bartlett, 252).
- 3.1.28 **Fire Tetrahedron.** A geometric shape used to depict the four components required for a fire to occur: fuel, oxygen, heat, and chemical chain reactions (Jones & Bartlett, 252).
- 3.1.29 **Fire Triangle.** A geometric shape used to depict the three components of which a fire is composed: fuel, oxygen, and heat (Jones & Bartlett, 252).
- 3.1.30 **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 (NFPA 1403, 3.3.10).

- 3.1.31 **Flammable Range.** The range of concentrations between the lower and upper flammable limits (Jones & Bartlett, 252).
- 3.1.32 **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 (3.3.11).
- 3.1.33 **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 (3.3.12).
- 3.1.34 **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 (3.3.13).
- 3.1.35 **Fully Developed Stage.** The stage of fire development where heat release rate has reached its peak within a compartment (Jones & Bartlett, 253).
- 3.1.36 **Gas-fired Live Fire Training Structure.** A permanent live fire training structure where the fires are fueled primarily by propane or liquefied natural gas (Jones & Bartlett, 253).
- 3.1.37 **Go/No Go Sequence.** A verbal confirmation via radio communication that each and every participant is ready for action in the live fire environment (Jones & Bartlett, 253).
- 3.1.38 **Gravity Current.** The path or route taken as air enters the structure or compartment heading toward the fire, and smoke leaves the compartment via the same route back, or by alternative openings that occur, preexist, or are created by fire fighters during the tactical venting actions (Jones & Bartlett, 253).
- 3.1.39 **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) (Jones & Bartlett, 253).
- 3.1.40 **Heat.** A form of energy characterized by vibration of molecules and capable of initiating and supporting chemical changes and changes of state (Jones & Bartlett, 253).

- 3.1.41 **Heat Flux.** The rate of heat transfer per unit area to a surface, typically expressed in kW/m² or Btu/ft²-sec (Jones & Bartlett, 253).
- 3.1.42 **Heat Release Rate.** The amount of heat energy released by a material over time in a fire (Jones & Bartlett, 253).
- 3.1.43 **High-Temperature Environment.** An environment with a temperature above 104°F (40°C) (NFPA 1403, 3.3.14).
- 3.1.44 **Hot Gas Layer.** As the fire progresses through the incipient stage and into growth, additional fuel will become involved and the heat release rate from the fire will increase. The buoyant, heated gases will form a hot layer that will build and extend down from the ceiling (Jones & Bartlett, 253).
- 3.1.45 **Ignition.** The process of initiating self-sustained combustion (Jones & Bartlett, 253).
- 3.1.46 **Ignition Temperature.** Minimum temperature a substance should attain in order to ignite under specific test conditions (Jones & Bartlett, 253).
- 3.1.47 **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, (3.3.15).
- 3.1.48 **Incident Scene Rehabilitation.** A function on the fireground that cares for the well-being of the fire fighters. It includes physical assessment, revitalization, medical evaluation and treatment, and regular monitoring of vital signs (Jones & Bartlett, 253).
- 3.1.49 **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 (Jones & Bartlett, 253).
- 3.1.50 **Instructor.** An individual qualified by the authority having jurisdiction to deliver fire-fighter 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, (3.3.16).
- 3.1.51 **[Lead instructor].** 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 I] in accordance with NFPA 1041, (3.3.17).

- 3.1.52 **Laminar Smoke Flow.** Smooth or streamlined movement of smoke, which indicates that the pressure in the building is not excessively high (Jones & Bartlett, 253).
- 3.1.53 **Live Fire.** Any unconfined open flame or device that can propagate fire to the building, structure, or other combustible materials (NFPA 1403, 3.3.18).
- 3.1.54 **Live Fire Training Structure.** A structure specifically designed for conducting live fire training evolutions on a repetitive basis (3.3.27.2).
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 multi-story, 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 (A.3.3.27.2).
- 3.1.55 **Manufactured Prop.** A type of exterior prop that is built to resemble an actual emergency for the purposes of live fire training (Jones & Bartlett, 253).
- 3.1.56 **Minimum Water Supply.** The quantity of water required for fire control and extinguishment (Jones & Bartlett, 253).
- 3.1.57 **Neutral Plane.** The interface at a vent, such as a doorway or a window opening, between the hot gas flowing out of a fire compartment and the cool air flowing into the compartment where the pressure difference between the interior and exterior is equal (Jones & Bartlett, 253).
- 3.1.58 **Non-Gas-Fired Live Fire Training Structure.** A permanent live fire training structure where the fires are fueled by Class A materials such as excelsior, hay, and pallets (Jones & Bartlett, 253).
- 3.1.59 **Occupancy Hazard Classification Numbers.** A series of numbers from 3 through 7 that are mathematical factors used in a formula to determine total water supply requirements (Jones & Bartlett, 253).
- 3.1.60 **Order of Operations.** The sequence of steps to conduct a procedure. In this context, the steps are in proper sequence to conduct the live fire evolution, but

order of operations could also refer to any emergency scene operation (Jones & Bartlett, 253).

- 3.1.61 **Participant.** Any student, instructor, safety officer, visitor, or other person who is involved in the live fire training evolution within the operations area (NFPA 1403, 3.3.19).
- 3.1.62 **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 (3.3.20).
- 3.1.63 **Personal Protective Clothing.** The full complement of garments fire fighters are normally required to wear while on emergency scene, including turnout coat, protective trousers, fire-fighting boots, fire-fighting gloves, a protective hood, and a helmet with eye protection (3.3.21).
- 3.1.64 **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 (3.3.22).
- 3.1.65 **Plume.** The column of hot gases, flames, and smoke rising above a fire, also called convection column, thermal updraft, or thermal column (Jones & Bartlett, 253).
- 3.1.66 **Postevolution Debriefing.** A review of the training event. It is used as a critique to evaluate the objectives and training evolution to determine positive events as well as those that need improvement (Jones & Bartlett, 253).
- 3.1.67 **Preburn Plan.** A briefing session conducted for all participants of live fire training in which all facets of each evolution to be conducted are discussed and assignments for all crews participating in the training sessions are given (Jones & Bartlett, 253).
- 3.1.68 **Pyrolysate.** Product of decomposition through heat; a product of a chemical change caused by heating (3.3.23).
- 3.1.69 **Pyrolysis.** A process in which material is decomposed, or broken down, into simpler molecular compounds by the effects of heat alone; pyrolysis often precedes combustion (Jones & Bartlett, 253).
- 3.1.70 **Radiation.** Heat transfer by way of electromagnetic energy (3.3.24).
- 3.1.71 **Rapid Fire Growth.** Unusually fast growth in fire, most often found when in a heated, oxygen-deficient atmosphere when oxygen is introduced or when fuel involving petrochemical-based plastics is involved with a much higher heat release rate than ordinary combustibles (Jones & Bartlett, 254).

- 3.1.72 **Safety Officer.** An individual appointed by the authority having jurisdiction as qualified to maintain a safe working environment at all live fire training evolutions (NFPA 1403, 3.3.25).
- 3.1.73 **Sequential Live Fire Burn Evolutions.** The amount of fuel per evolution and the number of sequential evolutions between cool-down periods, per specific room in an agency's live fire training structure on one day, as determined by the AHJ following experimentation, recording temperature, and other data (Jones & Bartlett, 254).
- 3.1.74 **Shall.** Indicates a mandatory requirement (3.2.2).
- 3.1.75 **Should.** Indicates a recommendation or that which is advised but not required (3.2.3).
- 3.1.76 **Smoke Explosion.** A form of fire gas ignition; ignition of accumulated flammable products of combustion and air that are within their flammable range (Jones & Bartlett, 254).
- 3.1.77 **Standard (NFPA).** 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 (3.2.4).
- 3.1.78 **Stratification.** The phenomenon where the upward movement of smoke and gases ceases because of the loss of buoyancy (Jones & Bartlett, 254).
- 3.1.79 **Stroke Volume.** The amount of blood pumped with each contraction of the heart (Jones & Bartlett, 254).
- 3.1.80 **Student.** Any person who is present at the live fire training evolution for the purpose of receiving training (3.3.26).
- 3.1.81 **Surface-to-Mass Ratio.** The ratio of surface area of the fuel to the mass of the fuel (Jones & Bartlett, 254).
- 3.1.82 **Temperature.** The degree of sensible heat of a body as measured by a thermometer or similar instrument (Jones & Bartlett, 254).

- 3.1.83 **Thermal Gradient.** The rate of temperature change with distance (Jones & Bartlett, 254).
- 3.1.84 **Thermal Layering.** The stratification (heat layers) that occurs in a room as a result of a fire (Jones & Bartlett, 254).
- 3.1.85 **Thermal Tolerance.** The body's ability to cope with high heat conditions (Jones & Bartlett, 254).
- 3.1.86 **Thermoregulation.** The process by which the body regulates temperature (Jones & Bartlett, 254).
- 3.1.87 **Training Structure.** See "Acquired Structure" and "Live Fire Training Structure."
- 3.1.88 **Ventilation-Controlled Fire.** A fire in which the heat release rate or growth is controlled by the amount of air available to the fire (NFPA 1403, 3.3.28).
- 3.1.89 **Ventilation-Limited.** A fire that has an adequate supply of fuel available but is not receiving an adequate supply of oxygen (Jones & Bartlett, 254).
- 3.1.90 **Vent Point Ignition.** Smoke is at or above its ignition temperature and is lacking oxygen. The smoke will ignite as it exits the opening and falls within the flammable range (Jones & Bartlett, 254).

SECTION 4: GENERAL

- 4.1 **Application.** All live fire training evolutions shall comply with this [section] and the appropriate [section] for the type of training being performed (4.1).
 - 4.1.1 Strict safety practices shall be applied to all structures selected for live fire training evolutions (4.1.1).
- 4.2 **Mitigation and Documentation for Acquired Structures.**
 - 4.2.1 All required [documentation] to conduct live fire training evolutions shall be obtained (4.2.1).
 - 4.2.3 The runoff from live fire shall comply with the requirements of the AHJ (4.2.3) [in compliance with the Utah Division of Air Quality].

4.3 Student Prerequisites.

4.3.1 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 Fire Fighter I in NFPA 1001 related to the subjects [below] (NFPA 1403, 4.3.1). [All shaded/bolded skills on the training record must be signed before live fire training, in accordance with the Utah Fire Service Certification System Firefighter I training requirements.]

- (1) Health and Safety
- (2) Fire Behavior/Fire Dynamics
- (3) Personal Protective Equipment

4.3.1.1 Required Minimum Training for Acquired Structures.

Prior to being permitted to participate in live fire training evolutions, the student shall have received training to meet the requirement of 4.3.1 and this section:

- (1) Ladders
- (2) Forcible Entry
- (3) Ventilation
- (4) Water Supply
- (5) Rapid Intervention Team/Crew (RIT/RIC)

4.3.1.2 Fire Dynamics. All participants shall have received training for the following:

- (1) The conditions necessary for flashover to occur
- (2) The components of fire and definition of a fire
- (3) The three mechanisms of heat transfer — conduction, convection, and radiation (4.3.2.1).

4.3.1.3 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 capabilities and limitations of their protective clothing and equipment (4.3.2.2).

4.3.1.4 Fundamentals of Fire Behavior. All participants shall be given classroom training for the following skills:

- (1) Describing the basic chemical and physical processes involved in combustion
- (2) Explaining fire phenomena using the fire triangle and tetrahedron as simple models of combustion
- (3) Explaining basic concepts of thermal dynamics, including thermal energy, temperature, and methods of heat transfer
- (4) Describing the combustion process for gaseous, liquid, and solid fuels
- (5) Explaining the concepts of heat of combustion and heat release rate
- (6) Describing the influence of the fuel/oxygen mixture on combustion
- (7) Explaining the concept of chemical chain reaction as it relates to flaming combustion

- (8) Recognizing characteristics of common types of combustion products
- (9) Using terminology related to combustion and fire dynamics (NFPA 1403, 4.3.2.3).

4.3.1.5 **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 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:
 - (a) Type of fuel
 - (b) Availability and locations of additional fuel
 - (c) Volume of the compartment
 - (d) Ceiling height and size, number, and arrangement of ventilation openings
 - (e) Thermal properties of the enclosure (i.e., insulation)
- (8) The hazards presented by fire behavior that impact a singular or multiple compartment(s)
- (9) How the following fire behavior phenomena occur:
 - (a) Flashover
 - (b) Backdraft
 - (c) Smoke explosion
- (10) The influence of changes in ventilation in each of the following burning regimes:
 - (a) Fuel-controlled
 - (b) Ventilation-controlled
- (11) Differences among ventilation, unplanned ventilation, and tactical ventilation
- (12) The significance of fire behavior indicators in each of the following categories:
 - (a) Building
 - (b) Smoke
 - (c) Flow path
 - (d) Heat
 - (e) Flame
 - (f) Impact of wind (4.3.2.4).

4.3.1.6 **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
- (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 (NFPA 1403, 4.3.2.5).

4.3.2 **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 [a signed training record] of having successfully completed the prescribed minimum training to the levels specified in 4.3.1. (4.3.3).

4.3.2.1 **Documentation of Prescribed Minimum Training [for Acquired Structures.]**
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 student participants from outside agencies should be allowed to participate only as official representatives of an established organization. Prior documentation should be required in order to facilitate planning of the training session (A.4.3.3).

4.4 **Participant Health and Safety.**

4.4.1 Instructors and participants [should] be rehabbed in accordance with the provisions of NFPA 1584, Chapter 6 (4.4.1).

4.4.1.1 **Physical Fitness Requirements.** The Utah Fire Service Certification Council (UFSCC) acknowledges the importance of and need for physical fitness requirements as listed in NFPA 1001, *Standard on Fire Fighter Professional Qualifications* (2019). Many agencies and departments have existing policies, regulations, etc. already in place regarding these requirements. The handling of physical fitness requirements is a local matter, outside the authority and jurisdiction of the UFSCC. The Council will not check, test, evaluate, or determine how individual agencies meet these requirements. Some departments have found it necessary to waive any type of physical fitness requirements due to their own special needs. As a local decision, this is permitted. However, due to the amount of physical, mental, and emotional stress inherent in this profession, the Utah Fire Service Certification Council strongly recommends careful evaluation before altering or doing away with any existing physical fitness requirements.

The requirements listed in Chapter 1 of NFPA 1001 (2019) are:

- (1) Meet the minimum educational requirements established by the authority having jurisdiction.

- (2) [The Utah Fire Service Certification Council Policy 11.3 requires that a candidate must be 18 years of age.]
- (3) Meet the medical requirements of NFPA 1582, *Standard on Comprehensive Occupational Medical Program for Fire Departments*, chapter 5, subsection 5.1.1, as determined by the medical authority of the AHJ.
- (4) Physical fitness requirements for entry-level personnel should be developed and validated by the authority having jurisdiction. Physical fitness requirements should be in compliance with applicable Equal Employment Opportunity regulations and other legal requirements.

4.4.1.2 **Occupational Safety and Health Requirements.**

- (1) Meet the Protective Clothing and Protective Equipment requirements in Section 4.9 in this Utah Live Fire Training Standard.
- (2) Meet OSHA 29 CFR 1910.134(g) regarding use of respirators, “Prohibiting conditions that may result in facepiece seal leakage.” This pertains to facial hair that may prevent a good face seal.
- (3) Meet OSHA 1910.134 (g)(1)(i)(A)(B) Occupational health and safety regulatory requirements.

4.4.2 When assessing the length and number of live fire training sessions (evolutions) conducted in a training day, the following shall be taken into account:

- (1) Nature of the work to be performed by the participant,
- (2) Physical stress of the work on the participant,
- (3) Temperature of the work and evolution environment,
- (4) Exposure time in a high temperature environment, and
- (5) Other circumstances (e.g., weather, heat index) (NFPA 1403, 4.4.2)

4.4.3 **All training participants must be of the mindset that they are responsible for their own safety and the safety of others around them.**

4.5 Safety Officer.

4.5.1 A safety officer shall be appointed for all live fire training evolutions (4.5.1). [The safety officer shall be at the level of Firefighter II and Instructor I and should be certified in Live Fire Training. It’s recommended that safety officers also have their NFA Safety Officer certification.]

4.5.2 All live fire training [lead] instructors and safety officers shall be trained on the application of the requirements contained in this [Utah Live Fire Training Standard] (4.5.2).

[The Utah Live Fire Training Standard] must be applied with the understanding that every training structure, whether an acquired structure or a training center burn building, is unique. The following are just some of the factors that would affect how NFPA 1403 is applied to a specific structure:

- (1) Number of stories.
- (2) Construction (concrete, concrete block, metal building).
- (3) Type and quantity of structural protective lining system (SPLS).
- (4) Type of temperature monitoring system (TMS), if any.
- (5) Size of burn rooms.
- (6) Number of burn rooms.
- (7) Type, size, and number of windows/doors.
- (8) Type, size, and number of passive ventilation openings/chop outs.
- (9) Fuel utilized in live fire evolutions (straw, excelsior, pallets, propane gas, natural gas, or a combination).
- (10) Type of interior finish materials on the ceiling, walls, and floors. If combustible, they need to be accounted for in the fuel load evaluation, or they need to be removed. Combustible materials on the ceiling, wall, or floor surfaces can lead to a rapid transition to flashover.
- (11) Type and number of means of egress and means of escape.
- (12) Prevailing winds.
- (13) Altitude (NFPA 1403, A.4.5.2)

4.5.3 The safety officer shall have the authority, regardless of rank, to intervene and control any aspect of the operations when, in his or her judgment, a potential or actual danger, potential for accident, or unsafe condition exists (4.5.3).

4.5.4 The responsibilities of the safety officer shall include, but not be limited to, the following:

- (1) Prevention of unsafe acts
- (2) Elimination of unsafe conditions (4.5.4)

4.5.5 The safety officer shall provide for the safety of all persons on the scene, including students, instructors, visitors, [media], and spectators (4.5.5).

4.5.6 The safety officer shall not be assigned other duties that interfere with safety responsibilities (4.5.6).

4.5.7 The safety officer shall be knowledgeable in the operation and location of safety features available for the live fire training structure or prop, such as emergency shutoff switches, gas shutoff valves, and evacuation alarms (4.5.7).

4.5.8 Additional safety personnel, as deemed necessary by the safety officer, shall be located to react to any unsafe or threatening situation or condition (4.5.8).

The additional safety personnel can be necessary to watch for signs of fire in voids, concealed spaces, and exit paths, or combinations thereof, at acquired structures. Where fire is discovered in any of these areas, the operation should cease as a training exercise and should be treated as a working structure fire (A.4.5.8).

- 4.6 Extreme Weather.** The training session shall be curtailed, postponed, or canceled, as necessary, to reduce the risk of injury or illness caused by extreme weather conditions (4.6).

Severe weather could require the participants to respond to other incidents, or could expose trainees to danger if training takes place during severe weather. Wind velocity can contribute to spreading the fire within the training structure or throughout a neighborhood, or wind direction could cause smoke problems in the neighborhood. Severe weather presents the potential for health and safety hazards to all persons attending and participating in an exercise. Extreme heat can cause heat exhaustion or heat stroke, and extreme cold can cause frostbite, hypothermia, or slippery surfaces. An impending severe storm can bring lightning or high winds. Such situations warrant the careful consideration of limiting activity, waiting for a storm to pass, or postponing the exercise (NFPA 1403, A.4.6).

4.7 Lead Instructor and Assistant Instructors.

- 4.7.1 The instructor shall meet the minimum job performance requirements for Fire Instructor I in NFPA 1041 (4.7.1).
- 4.7.2 The [lead instructor] shall be responsible for full compliance with this standard (4.7.3).
- 4.7.3 It shall be the responsibility of the [lead instructor] to coordinate overall fireground activities to ensure correct levels of safety (4.7.4).
- 4.7.4 The [lead instructor] shall assign the following personnel:
(1) One instructor to each functional crew, each of which shall not exceed five students [1:5]
(2) One additional instructor for each additional functional assignment (4.7.5)
- 4.7.5 The lead instructor shall assign the following personnel (in addition to those listed in 4.7.4) for acquired structures:
(1) One instructor to each backup line
(2) A Rapid Intervention Team/Crew (RIT/RIC)
- 4.7.6 The [lead instructor should] 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 (4.7.6).
- 4.7.6.1 Instructors [should] be rotated through the duty assignments (4.7.6.1). Instructors should be provided rest and rehabilitation as required in 4.7.6.1. Instructors should remove their personal protective clothing to reduce thermal saturation of the PPE (A.4.7.6.1).

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- 4.7.6.2 Assignment rotation, rest, and rehabilitation [should] be provided for instructors (4.7.6.2).
- 4.7.7 [Assistant instructors] shall be qualified by the AHJ to deliver live fire training (NFPA 1403, 4.7.7).
- 4.7.8 Additional instructors shall be designated when factors such as extreme temperatures or large groups are present, and classes of long duration are planned (4.7.8).
- 4.7.9 Prior to the ignition of any fire, instructors shall ensure that all protective clothing and equipment specified in this [section] are being worn according to manufacturer's instructions (4.7.9).
- 4.7.10 Instructors shall take a personal accountability report (PAR) when entering and exiting [an acquired] structure or prop during an actual attack evolution conducted in accordance with this standard (4.7.10).
- 4.7.10.1 Acquired structures shall have a formalized accountability system in place (i.e., PAR) for the Authority Having Jurisdiction. The lead instructor will coordinate, understand, and integrate the instructors with the AHJ's accountability system.
- 4.7.11 Instructors shall monitor and supervise all assigned students during the live fire training evolution (4.7.11).
- 4.7.12 Awareness of weather conditions, wind velocity, and wind direction shall be maintained, including a final check for possible changes in weather conditions immediately before actual ignition (4.7.12). Monitoring the wind and weather conditions is important for determining the impact of the wind on your live fire evolution. Placing students and instructors downwind of the fire, either inside or outside of the structure, could result in exposure to thermal or chemical hazards that exceed those normally associated with the planned evolution, which could result in injury or death (A.4.7.12).
- 4.7.13 *Training Instructors on How to Use Specialty Props.*
- 4.7.13.1 The instructors and the safety officer responsible for conducting live fire training evolutions with a gas-fueled training system or with other specialty props (such as flashover [and backdraft] simulator) shall be trained in the complete operation of the system and the props (4.7.13.1).
- 4.7.13.2 The training of instructors and the safety officer shall be performed by an individual authorized by the gas-fueled training system and specialty prop manufacturer or by others qualified to perform this type of training (4.7.13.2).

4.7.14 *Training Instructors on How to Develop a Ventilation-Controlled Evolution.* The instructors and safety officers responsible for conducting live fire training evolutions with flow path and ventilation-controlled conditions shall be trained in means to develop the evolutions as specified in 4.13.7 (4.7.14).

4.8 Fire Control Team.

4.8.1 A fire control team shall consist of a minimum of two personnel (NFPA 1403, 4.8.1).

4.8.1.1 One person who is not a student or safety officer shall be designated as the “ignition officer” to ignite, maintain, and control the materials being burned (4.8.1.1).

4.8.1.1.1 The ignition officer shall be a member of the fire control team (4.8.1.1.1).

4.8.1.2 One member of the fire control team 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 (4.8.1.2). The purpose and principal function is to observe the ignition officer while igniting or maintaining the fire. Members of the fire control team should rotate duties to prevent overheating and thermal saturation (A.4.8.1.2).

4.8.2 The decision to ignite the training fire shall be made by the [lead instructor] in coordination with the safety officer (4.8.2).

4.8.3 The fire shall be ignited by the ignition officer (4.8.3).

4.8.4 The fire control team shall wear full personal protective clothing, including SCBA, when performing this control function (4.8.4).

4.8.5 A charged hose line shall be available when the fire control team is igniting or tending to any fire (4.8.5).

4.8.5.1 In all acquired structures, a charged hose line shall be available to the ignition officer in the fire compartment.

4.8.6 Fires shall not be ignited without an instructor visually confirming that the flame area is clear of personnel being trained (4.8.6).

4.9 Personal Protective Equipment (PPE).

4.9.1 All students, instructors, safety personnel, and other personnel shall wear all protective clothing and equipment specified in this [section] according to manufacturer’s instructions whenever they are involved in any evolution or fire suppression operation during the live fire training evolution (4.9.1).

- 4.9.2 The safety officer shall ensure that all participants' PPE has been inspected by the AHJ as outlined in the checklist (Utah Live Fire Training Standard, Appendix A, Figure 1). Including, but not limited to the following:
- Turnout coat, pants, and hood: outer shell, lining, hardware
 - Helmet: shell, liner, hardware, straps, earflaps
 - Gloves: outer shell, liner
 - SCBA: cylinder, harness, hardware, regulator, hoses, PASS device, fit tested facepiece, straps
 - Boots: liner, hardware
 - Look for: contamination, heat discoloration, burns, charring, tears, cracks, holes, fraying, thermal damage, moisture-barrier delaminating, or weakening of materials. Ensure that snaps, zippers, Velcro, and all other closures are functioning correctly with appropriate fit and with proper seal.
- 4.9.3 Protective coats, trousers, hoods, footwear, helmets, and gloves shall have been manufactured to meet the requirements of NFPA 1971 (NFPA 1403, 4.9.3).
- 4.9.4 SCBA shall have been manufactured to meet the requirements of NFPA 1981 (4.9.4).
- 4.9.5 Clothing worn under personal protective clothing can degrade and cause injury to the wearer, even without damaging the protective clothing. All wearers of personal protective clothing should be aware of the dangers of clothing made from certain all-synthetic materials that can melt and then adhere to and burn the wearer even if protective clothing that meets NFPA standards is worn. Any clothing, such as shirts, pants, underwear, and sweatshirts, worn under personal protective clothing should meet the requirements of NFPA 1975 whenever possible, or clothing should be selected, at a minimum, for the fabric's ability to resist ignition (A.4.9.5). Choose clothing made from "thermally stable textiles that will not rapidly deteriorate, melt, shrink, or adhere to the wearer's skin, causing greater, more severe burn injuries" (NFPA 1975, 1.2.1.1). Fire-retardant fabrics and all-natural fibers should be considered (A.4.9.5).
- 4.9.6 Personal alarm devices shall have been manufactured to meet the requirements of NFPA 1982 (4.9.6).
- 4.9.7 The fire department shall provide and require all students, instructors, safety personnel, and other personnel participating in any evolution or operation of fire suppression during the live fire training evolution to use SCBA when engaged in any operation where they could encounter atmospheres that are IDLH or potentially IDLH or where the atmosphere is unknown (4.9.7).

4.10 Communication.

- 4.10.1 A method of fireground communications shall be established to enable coordination among the incident commander, the interior and exterior sectors, the safety officer, and external requests for assistance (NFPA 1403, 4.10.1).
- 4.10.2 A building evacuation plan shall be established, including an evacuation signal to be demonstrated to all participants in an interior live fire training evolution (4.10.2). Participants involved in the live fire training evolutions should be instructed to report to a predetermined location for a [PAR check] if evacuation of the acquired structure is signaled. Instructors should immediately report any personnel not accounted for to the [lead instructor]. Examples of an evacuation signal that could be used include a whistle, apparatus air horn, or high-low electronic siren (A.4.10.2).

4.11 Emergency Medical Services (EMS).

- 4.11.1 Basic life support (BLS) emergency medical services[, according to the AHJ,] shall be available on site to handle injuries [at acquired structures and should be available for props] (4.11.1). If available, advanced life support (ALS) should be provided on site (A.4.11.1).
 - 4.11.1.1 For acquired structures, BLS emergency medical services with transport capabilities shall be available on site to handle injuries (4.11.1.1).
 - 4.11.2 A parking area for an ambulance or an emergency medical services vehicle shall be designated and located where it will facilitate a prompt response in the event of personal injury to participants in the evolution (4.11.2).
 - 4.11.3 Written reports shall be completed and submitted on all injuries and on all medical aid rendered, [according to the AHJ] (4.11.3).

4.12 Water Supply.

A minimum flow rate of 95 gpm is necessary in order to provide adequate quantities of water to cover the planned evolution, plus a reserve for unanticipated emergencies. The appropriate quantity and exact flow rates that are 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, type of fire stream to be utilized, and principles of fire attack and deployment aid in determining the exact flow rates that are necessary (A.4.12).

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- 4.12.1 The [lead instructor] and the safety officer shall determine the rate and duration of waterflow necessary for each individual live fire training evolution, including the water necessary for control and extinguishment of the training fire, the water supply necessary for backup line(s) to protect personnel, and any water needed to protect exposed property (NFPA 1403, 4.12.1).
- 4.12.2 Each hose line and backup line(s) shall be capable of delivering a minimum of 95 gpm (4.12.2).
- 4.12.3 Backup line(s) shall be provided to ensure protection for personnel on training attack lines (4.12.3).
- 4.12.3.1 All attack and backup lines shall be a minimum of 1½" in diameter.
- 4.12.4 Two water supply sources:
(1) A booster tank with a minimum of 500 gallons *or*
(2) Uninterrupted source(s) with either a minimum 1,500-gallon tender or an adequate fire hydrant
- 4.12.4.1 Water supply requirements for acquired structures:
(1) Meet the Fire Flow Formula: Length x Width/3 or (L x W)/3 (one exposure is 25%).
(2) Have a water supply available "to handle exposure protection or unforeseen situations" (4.12.4).
- 4.12.5 [Acquired Structures]. Separate water sources [should] be utilized for the supply of attack lines and backup lines in order to preclude the loss of both water supply sources at the same time (4.12.5) [, except under the following conditions.] A single water source shall be sufficient at a training center facility where the water system has been engineered to provide adequate volume for the evolutions conducted and a backup power source or backup pumps, or both, are in place to ensure an uninterrupted supply in the event of a power failure or malfunction (4.12.5.1).
- Reliability should be considered when determining what constitutes valid separate sources. The intent of this paragraph is to prevent the simultaneous loss of both attack lines and backup lines in the event of a pump or water supply failure. Where a public water supply system is used, two pumpers on two different hydrants [or water sources] should be used. Two pumpers drafting from the same pond or river also are appropriate, provided the source contains sufficient usable water. Where tankers or folding tanks, or both, are used, two separate pumpers should be used to supply the attack and backup lines (A.4.12.5).
- 4.12.6 There shall be room provided around all props so that there is space for all attack line(s) as well as backup line(s) to operate freely (4.12.6).

4.13 Fuel Materials.

- 4.13.1 The fuels that are utilized in live fire training evolutions shall only be [Class A natural fiber materials] (NFPA 1403, 4.13.1). Acceptable fuels include pine excelsior, wooden pallets, straw, hay, and other wood-based products (A.4.13.1).
- 4.13.1.1 Fuel-fired buildings and props are permitted to use the appropriate fuels for the design of the building or prop (4.13.1.1).
- 4.13.2 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 (4.13.2).
- 4.13.3 Flammable or combustible liquids, as defined in NFPA 30, shall not be used in live fire training evolutions (4.13.3).
- 4.13.4 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 (4.13.4).
- 4.13.5 [Propane/butane lighters and torches] and similar devices are permitted to be used to ignite training fires if the device is removed immediately after ignition of the training fire (4.13.5).
- 4.13.5.1 Fusees (safety flares) and matches are permitted for use when igniting in live fire training evolutions.
- 4.13.6 Fuel materials shall be used only in the amounts necessary to create the desired fire size (4.13.6).
- 4.13.6.1 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 fire fighters 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 (A4.13.6).
- 4.13.7 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 (4.13.7).

- 4.13.7.1 An operational plan for accomplishing training objectives with a ventilation-controlled fire/flow path training, utilizing a fuel load that could generate a controlled flashover, should include the following:
- (1) This material outlines considerations for an operation plan, based on this standard, for evolutions during which a ventilation-controlled fire with a fuel load designed to be capable of generating a controlled flashover in the ignition room is being used for training purposes.
 - (2) The lead instructor should identify the fire growth observation area prior to ignition of any live fires. The observation area should be out of the exhaust portion of the flow path. Students and instructors should have a charged hose line in the observation area that has a fire stream capable of reaching the ignition room and suppressing the fire. Students and instructors should be in the observation area prior to ignition of fire.
 - (3) Charged hose lines should be placed in position prior to ignition of fire. The hose line should be used to control temperature and fire growth from the observation area.
 - (4) Observation areas should be on the same level as or below the level of the fire with direct unimpeded access to an exit.
 - (5) No students or instructors should be in the fire room after ignition.
 - (6) The identification of the potential flow path should be communicated to all students and instructors prior to ignition. The lead instructor should designate the flow path.
 - (7) No unidirectional flow paths that exhaust over fire fighters should be created. If weather or the fire creates a potentially hazardous change to the flow path, the interior instructor should be notified immediately, and personnel should exit the structure or take other action to maintain the safety of the instructors and personnel.
 - (8) The interior instructor should coordinate ventilation with exterior personnel to complete the ventilation to achieve the desired fire effect. After charged hose lines are placed, and instructors and students are located in the observation area, ventilation should be coordinated (NFPA 1403, A.4.13.7).

It is NOT RECOMMENDED that flashover training be implemented with students or instructors inside acquired structures.

4.13.8 The [lead instructor] and the safety officer shall assess the selected fire room environment for factors that can affect the growth, development, and spread of fire (4.13.8).

4.13.8.1 The [lead instructor] is concerned with the safety of participants and the assessment of conditions that can lead to rapid, uncontrolled burning, commonly

referred to as *flashover*. Flashover can trap, injure, and kill fire fighters. Conditions known to be variables affecting the attainment of flashover are as follows:

- (1) The heat release characteristics of materials used as primary fuels
- (2) The preheating of combustibles
- (3) The combustibility of wall and ceiling materials
- (4) The room geometry (e.g., ceiling height, openings to rooms)

In addition, the arrangement of the initial materials to 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 (NFPA 1403, A.4.13.8).

- 4.13.9 [Acquired Structures]. The [lead instructor] 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 (4.13.9)
- 4.13.9.1 [Acquired Structures]. Plotting the expected avenues of firespread and the time factors for expected buildup 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 hazard, the [lead instructor] should prescribe primary and secondary exit paths for participants in the exercises (A.4.13.9).
- 4.13.10 The training exercise shall be stopped immediately when the [lead instructor] or the safety officer determines through ongoing assessment that the combustible nature of the environment represents a potential hazard (4.13.10).
- 4.13.10.1 An exercise stopped as a result of an assessed hazard according to 4.13.10 shall continue only when actions have been taken to reduce the hazard (4.13.10.1).
- 4.13.10.1.1 [Acquired Structures]. Incidents of injuries and deaths during live fire training exercises indicate 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. It might be necessary to remove combustible wall and ceiling materials, reduce the amount of furnishings, or take other similar measures to reduce rapid fire growth. Careful consideration should be given to the presence of combustible void spaces, and steps should be taken to ensure that the fire is not able to gain unexpected growth in such areas (A.4.13.10).
- 4.13.11 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 (4.13.11).

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- 4.13.11.1 Propane and liquefied natural gas remain in the liquid state only when they are stored and distributed under pressure. When either of these gases is released, the difference in the storage and atmospheric pressures can cause the liquid to convert quickly to a gas. During this conversion, liquid propane, for example, can expand to 270 times its volume. With such a high expansion rate, a leaking liquid propane pipe has the potential to cause the space to reach an explosive level (NFPA 1403, A.4.13.11).
- 4.13.11.2 Liquefied versions of the gases specified in 4.13.11 shall not be permitted inside the live fire training structure (4.13.11.1).
- 4.13.11.3 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 (4.13.11.2).
- 4.13.11.3.1 The safety person at the remote shutoff should have the authority to shut off the fuel supply to the prop when, in the safety person's judgment, the prop has malfunctioned, the fire has gone dangerously out of control, or the extinguishment team is in jeopardy (A.4.13.11.2).
- 4.13.11.4 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 (4.13.11.3).
- 4.13.11.5 Liquefied petroleum gas props shall be equipped with all safety features as described in NFPA 58 and NFPA 59 (4.13.11.4).
- 4.13.11.6 Where the evolution involves the failure of a safety feature, the failed part shall be located downstream from the correctly functioning safety feature (4.13.11.5).
- 4.13.11.7 Where flammable or combustible liquids are used, measures shall be taken to prevent runoff from contaminating the surrounding area (4.13.11.6).
- 4.13.11.7.1 There shall be oil separators for cleaning the runoff water (4.13.11.6.1).
- 4.13.11.8 Vehicles used as props for live fire training [should follow all AHJ policies and procedures. It is recommended that] all fluid reservoirs, tanks, shock absorbers, drive shafts, and other gas-filled closed containers [shall be] removed, vented, or drained prior to any ignition (4.13.11.7).
- 4.13.11.9 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 (4.13.11.8).

- 4.13.11.10 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 (4.13.11.9).

4.14 Parking/Staging.

- 4.14.1 Areas for the staging, operating, and parking of fire apparatus that are used in the live fire training evolution [should] be designated (NFPA 1403, 4.14.1).
- 4.14.2 An area for parking fire apparatus and vehicles that are not a part of the evolution [should] be designated so as not to interfere with fireground operations (4.14.2).
- 4.14.3 If any of the apparatus described in 4.14.2 is in service to respond to an emergency, it [should] be located in an area that will facilitate a prompt response (4.14.3).
- 4.14.4 Where required or necessary, parking areas for police vehicles or for the [media should] be designated (4.14.4).
- 4.14.5 Ingress and egress routes [should] be designated, identified, and monitored during the training evolutions to ensure their availability in the event of an emergency (4.14.5).

4.15 Visitors and Spectators.

- 4.15.1 All spectators shall be restricted to an area outside the operations area perimeter established by the safety officer (4.15.1).
- 4.15.2 Control measures [should] be posted to indicate the perimeter of the operations area (4.15.2).
- 4.15.3 Visitors who are allowed within the operations area perimeter [should] be escorted at all times (4.15.3).
- 4.15.4 Visitors who are allowed within the operations area perimeter [should] be equipped with and shall wear appropriate protective clothing (4.15.4).
- 4.15.5 Control measures [should] be established to keep pedestrian traffic in the vicinity of the training site clear of the operations area of the live burn (4.15.5).

4.16 Preburn Plan/Briefing.

- 4.16.1 A preburn plan shall be prepared and shall be utilized during the preburn briefing sessions (4.16.1). See Utah Live Fire training Standard, Appendix C, Figure 9.

UTAH LIVE FIRE TRAINING STANDARD

- 4.16.1.1 All features of the training areas shall be indicated on the preburn plan (4.16.1.1).
- 4.16.2 Prior to conducting actual live fire training evolutions, a preburn briefing session shall be conducted by the [lead instructor or assigned personnel] with the safety officer for all participants (4.16.2).
- 4.16.3 Written learning objectives [should] be required for all live fire training evolutions (NFPA 1403, 4.16.3).
- 4.16.4 All facets of each evolution to be conducted shall be discussed (4.16.4).
- 4.16.5 Assignments shall be made for all crews participating in the training session (4.16.5).
- 4.16.6 The location of the manikin shall not be required to be disclosed, provided that the possibility of victims is discussed in the preburn briefing (4.16.6).
- 4.16.7 Prior to conducting any live fire training, all participants shall have a knowledge of and familiarity with the prop or props being used for the evolution (4.16.7).
- 4.16.8 Prior to conducting any live fire training, all participants shall be required to conduct a walk-through of the acquired structure, burn building, or prop in order to have a knowledge of and familiarity with the layout of the acquired structure, building, or prop and to facilitate any necessary evacuation (4.16.8).
- 4.16.9 Property adjacent to the training site that could be affected by the smoke from the live fire training evolution, such as railroads, airports or heliports, and nursing homes, hospitals, or other similar facilities, shall be identified (4.16.9).
- 4.16.9.1 The persons in charge of the properties described in 4.16.9 shall be informed of the date and time of the evolution (4.16.9.1).
- 4.16.9.2 Local fire dispatch (PSAP) shall be notified prior to burning and at the end of training.
- 4.16.10 Streets or highways in the vicinity of the training site shall be surveyed for potential effects from live fire training evolutions (4.16.10).
- 4.16.10.1 Safeguards shall be taken to eliminate possible hazards to motorists (4.16.10.1). Such safeguards can include street closings, traffic rerouting, signs, and police traffic control (A.4.16.10.1).

4.17 Victim(s).

- 4.17.1 No person(s) shall play the role of a victim inside any live fire training structure or acquired structure (4.17.1).

- 4.17.2 Rescue manikins [shall not wear an SCBA. Rescue manikins should not be dressed in fire-fighting personal protective clothing unless the PPE is] uniquely colored or specially marked (4.17.2). [Manikins shall be identified to all personnel during the preburn briefing.]

SECTION 5: ACQUIRED STRUCTURES

5.1 Structures and Facilities.

- 5.1.1 Any acquired structure that is considered for a structural fire training exercise shall be prepared for the live fire training evolution (5.1.1). Where live fire training structures are available, they should be used instead of acquired structures (NFPA 1403, A.5.1.1).
- 5.1.1.1 Buildings that cannot be made safe as required by this [section] shall not be utilized for interior live fire training evolutions (5.1.1.1).
- 5.1.2 Adjacent buildings or property that might become involved shall be protected or removed (5.1.2).
- 5.1.3 Preparation shall include application for and receipt of required permits and permissions (5.1.3). [Permits may be required according to AHJ policies and procedures.]
- 5.1.4 Ownership of the acquired structure shall be determined prior to its acceptance by the AHJ (5.1.4). Information pertaining to building ownership should be reviewed by the legal counsel of the AHJ prior to acceptance of the structure (A.5.1.4).
- 5.1.5 Evidence of clear title shall be required for all structures acquired for live fire training evolutions (5.1.5).
- 5.1.6 Written permission shall be secured from the owner of the structure in order for the fire department to conduct live fire training evolutions within the acquired structure (5.1.6).
- 5.1.7 A clear description of the anticipated condition of the acquired structure at the completion of the evolution(s) and the method of returning the property to the owner shall be put in writing and shall be acknowledged by the owner of the structure (5.1.7).
- 5.1.8 Proof of insurance cancellation or a signed statement of nonexistence of insurance shall be provided by the owner of the structure prior to acceptance for use of the acquired structure by the AHJ (5.1.8) [and reviewed by legal counsel] (A.5.1.8).

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5.1.9 A [thorough] search of the acquired structure shall be conducted to ensure that no unauthorized persons, animals, or objects are in the acquired structure immediately prior to ignition [i.e., in the attic, crawl space, etc.] (5.1.10).

5.1.10 No person(s) shall play the role of a victim inside the acquired structure (5.1.11).

5.1.11 Only one fire at a time shall be permitted within an acquired structure (5.1.12).

5.2 Hazards.

5.2.1 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 [i.e., wood rot, swamp coolers, etc.] (NFPA 1403, 5.2.1).

5.2.2 All hazardous storage conditions shall be removed from the structure or neutralized in such a manner as to not present a safety problem during use of the structure for live fire training evolutions (5.2.2).

Care should be exercised in the neutralization of hazards posed by closed tanks and vessels. The vessel or its contents can pose a hazard that should be eliminated. Appropriate references should be consulted, or assistance should be obtained 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.5.2.2).

5.2.3 Closed containers and highly combustible materials shall be removed from the structure (5.2.3).

5.2.3.1 Oil tanks and similar closed vessels that cannot be removed shall be vented to prevent an explosion or overpressure rupture (5.2.3.1).

5.2.3.2 Any hazardous or combustible atmosphere within the tank or vessel shall be rendered inert (5.2.3.2).

5.2.4 All hazardous structural conditions shall be removed or repaired so as to not present a safety problem during use of the structure for live fire training evolutions (5.2.4).

5.2.4.1 Floor openings shall be covered to be made structurally sound (5.2.4.1).

5.2.4.2 Fires shall not be ignited under exposed structural members (5.2.4.2).

5.2.4.3 Missing stair treads and rails shall be repaired or replaced (5.2.4.3).

5.2.4.4 Dangerous portions of any chimney shall be removed (5.2.4.4).

- 5.2.4.5 Holes in walls and ceilings shall be patched (5.2.4.5).
- 5.2.4.6 Roof ventilation openings that are normally closed but can be opened in the event of an emergency shall be permitted to be utilized (5.2.4.6).
- 5.2.4.7 Low-density combustible fiberboard and other highly combustible interior finishes shall be removed (NFPA 1403, 5.2.4.7).

Low-density combustible fiberboard has been implicated as a major factor in the following rapidly spreading fires that resulted in fatalities:

- (1) Our Lady of the Angels School (Chicago, IL, 1958)
- (2) Hartford Hospital (Hartford, CT, 1961)
- (3) Opemiska Social Club (Chapais, Quebec, 1980)
- (4) Boulder Fire Department training fire (Boulder, CO, 1982)

Unconventional interior finishes include burlap, carpeting, and artificial turf (A.5.2.4.7).

- 5.2.4.8 Extraordinary weight above the training area shall be removed (5.2.4.8).
- 5.2.5 All hazardous environmental conditions shall be removed before live fire training evolutions are conducted in the structure (5.2.5). [Appendix B, Figure 3] provides a sample form for the inspection of acquired structure and to identify hazards (A5.2.5).
- 5.2.5.1 All forms of asbestos deemed hazardous shall be removed by an approved manner and documentation provided to the AHJ (5.2.5.1).
- 5.2.6 Debris creating or contributing to unsafe conditions shall be removed (5.2.6).
- 5.2.7 Any toxic weeds, insect hives, or vermin that could present a potential hazard shall be removed (5.2.7).
- 5.2.8 Trees, brush, and surrounding vegetation that create a hazard to participants shall be removed (5.2.8).
- 5.2.9 Combustible materials, other than those intended for the live fire training evolution, shall be removed or stored in a protected area to preclude accidental ignition (5.2.9).

5.3 Utilities.

- 5.3.1 [All] utilities shall be disconnected [i.e., gas, power, water, cable, phone, etc.] (5.3.1).
- 5.3.2 Utility services adjacent to the live burn site shall be removed or protected (5.3.2).

5.4 Exits.

- 5.4.1 Exits from the acquired structure shall be identified and evaluated prior to each training burn (5.4.1).
- 5.4.2 Participants of the live fire training shall be made aware of exits from the acquired structure prior to each training burn (NFPA 1403, 5.4.2).
- 5.4.3 Fires shall not be located in any designated exit paths (5.4.3).
- 5.4.4 Secondary emergency egress on all floors shall be established prior to live fire training.
- 5.4.5 Extra caution shall be taken when entering a potentially hazardous flow path. (i.e., ascending or descending stairways).

SECTION 6: GAS-FIRED LIVE FIRE TRAINING STRUCTURES AND MOBILE ENCLOSED LIVE FIRE TRAINING PROPS

6.1 Structures and Facilities.

- 6.1.1 This section pertains to all interior spaces where gas-fired live fire training exercises occur (6.1.1).
- 6.1.2 Live fire training structures shall be left in a safe condition upon completion of live fire training evolutions (6.1.2).
- 6.1.3 Debris hindering the access or egress of fire fighters shall be removed prior to the beginning of the training exercises (6.1.3).
- 6.1.4 Flammable gas fires shall not be ignited manually (6.1.4).

6.2 Inspection and Testing.

- 6.2.1 Live fire training structures shall be inspected visually for damage prior to live fire training evolutions (6.2.1). There should be ongoing concern for the progressive damage to live fire training structures associated with fire intensity during live fire training evolutions. Excessive fire intensity can result in accelerated destruction of the live fire training structure and can increase the risk to personnel to an unacceptable level. Examples of common damage to check for include [but are not limited to] the following:
 - (1) Visible structural defects such as cracks, spalls, or warps in structural floors, columns, beams, and walls.
 - (2) Thermal linings. Thermal linings are intended to protect the structural components. Exposure to live fire training can cause the thermal linings

to wear out over time. Portions of it can loosen and fall out, anchoring devices can loosen, and reinforcing and supporting pieces can corrode, creating a safety concern for occupants. In addition, cracks, holes, openings, gaps, or penetrations in the thermal lining can lead to damage to the structure behind the lining.

- (3) Doors. Doors in live fire training structures at times do not operate properly, sticking shut during training and creating safety problems relating to emergency egress.
- (4) Hinges. A rusted hinge at a second-floor window shutter could cause the shutter to fall to the ground below.
- (5) Loose, rusted, or damaged handrails and guardrails.
- (6) Loose or missing stair nosings, or damage to stair treads. (NFPA 1403, A6.2.1)

- 6.2.1.1 Damage shall be documented and the building owner or AHJ shall be notified (6.2.1.1). [See Utah Live Fire Training Standard, Appendix B, Figure 4], Live Structural Fire Training Facility Inspection form (6.2.1.1). The exact form should be approved by local officials.
- 6.2.2 Where the live fire training structure damage is severe enough to affect the safety of the participants, training shall not be permitted (6.2.2).
- 6.2.3 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 (6.2.3).
- 6.2.4 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 (6.2.4).
- 6.2.5 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 (6.2.5).
- 6.2.6 The structural integrity of the live fire training structure shall be evaluated and documented annually by the building owner or AHJ (6.2.6).
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 (NFPA 1403, A.6.2.6).

- 6.2.6.1 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 or other competent professional with live fire training structure experience and expertise, or by another competent professional as determined by the building owner or AHJ (6.2.6.1).
- 6.2.7 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 (6.2.7). Routine maintenance is important to providing a safe, durable live fire training structure for live fire training (A.6.2.7).
- 6.2.8 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 (6.2.8).
- 6.2.8.1 The structural inspection shall include removal of concrete core samples from the structure to check for delaminations within the concrete (6.2.8.1).
- 6.2.9 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 (6.2.9).

SECTION 7: NON-GAS-FIRED LIVE FIRE TRAINING STRUCTURES AND MOBILE ENCLOSED LIVE FIRE TRAINING PROPS

7.1 Structures and Facilities.

- 7.1.1 This section pertains to all interior spaces where non-gas-fired live fire training exercises occur (7.1.1).
- 7.1.2 Live fire training structures shall be left in a safe condition upon completion of live fire training evolutions (NFPA 1403, 7.1.2).
- 7.1.3 Debris hindering the access or egress of fire fighters shall be removed prior to the beginning of the training exercises (7.1.3).

7.2 Inspection and Testing.

- 7.2.1 Live fire training structures shall be inspected visually for damage prior to live fire training evolutions (7.2.1). See section 6.2.1.
 - 7.2.1.1 Damage shall be documented, and the building owner or AHJ shall be notified (7.2.1.1). See Utah Live Fire Training Standard, Appendix B, Figure 4, Live Structural Fire Training Facility Inspection form. The exact form should be approved by local officials.
- 7.2.2 Where the live fire training structure damage is severe enough to affect the safety of the participants, training shall not be permitted (7.2.2).
- 7.2.3 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 (7.2.3).
- 7.2.4 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 (7.2.4).
- 7.2.5 The structural integrity of the live fire training structure shall be evaluated and documented annually by the building owner or AHJ (7.2.5). See section 6.2.6.
 - 7.2.5.1 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 (7.2.5.1).
- 7.2.6 The structural integrity of the live fire training structure [should] 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 (7.2.6). See section 6.2.7.

7.2.7 All structures constructed with calcium aluminate refractory structural concrete [should] be inspected by a structural engineer with expertise in live fire training structures every 3 years (7.2.7). 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 (NFPA 1403, A.6.2.8).

7.2.7.1 The structural inspection [should] include removal of concrete core samples from the structure to check for delaminations within the concrete (7.2.7.1).

7.2.8 Part of the live fire training structure evaluation [should] 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 (7.2.8). 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 (A.6.2.9).

7.3 Sequential Live Fire Burn Evolutions.

7.3.1 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 (7.3.1).

7.3.2 A burn [Incident Action Plan (IAP) should] be developed for the burn rooms in a live fire training structure (7.3.2).

7.3.2.1 The burn [Incident Action Plan (IAP) should] 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 (7.3.2.1).

7.3.3 The burn sequence for each room [should] define the maximum fuel load that can be used for the first burn and each successive burn (7.3.3). Reducing fuel loads for successive evolutions to maintain a safe environment should be considered (A.7.3.3).

7.3.4 The burn [Incident Action Plan (IAP) should] also specify the maximum number of evolutions that can be safely conducted during a given training period before the room is allowed to cool (7.3.4).

- 7.3.4.1 The following facts will affect conditions encountered in a burn room during a live fire evolution:
- (1) Larger burn rooms and rooms with higher ceilings will have more cubic feet of air than smaller burn rooms.
 - (2) Generally, with a given quantity of fuel, the lower the cubic footage in a room, the higher the temperatures and more rigorous the environment will be.
 - (3) As the number of openings in a burn room increase, the available ventilation area increases, resulting in typically lower temperatures and less severe environments.
 - (4) The construction of the burn room will affect how much energy the room will retain with each successive evolution. All burn rooms will retain a level of heat with each burn. The temperature and radiant heat in the burn room will increase with each additional evolution. At some point, every room will become too hot to safely conduct further training. Outside environmental conditions might also affect this (NFPA 1403, A.7.3.4).
- 7.3.5 The fuel loads per evolution and the maximum number of sequential evolutions in each burn room shall not be exceeded under any circumstances (7.3.5).

SECTION 8: EXTERIOR LIVE FIRE TRAINING PROPS

8.1 Props, Structures, and Facilities.

- 8.1.1 This section pertains to all exterior props where live fire training exercises occur (8.1.1).
- 8.1.2 Props used for outside live fire training shall be designed specifically for the evolution to be performed (8.1.2).
- 8.1.3 Exterior props shall be left in a safe condition upon completion of live fire training evolutions (8.1.3).
- 8.1.4 For outside training, care shall be taken to select areas that limit the hazards to both personal safety and the environment (8.1.4).
- 8.1.5 The training site shall be without obstructions that can interfere with fire-fighting operations (8.1.5).
- 8.1.6 Where live training fires are used outside, the ground cover shall be such that it does not contribute to the fire (8.1.6).
- 8.1.7 Debris hindering the access of fire fighters shall be removed prior to the beginning of the training exercise (8.1.7).

8.2 Inspection and Maintenance.

8.2.1 Exterior props shall be inspected visually for damage prior to live fire training evolutions (8.2.1).

8.2.1.1 Damage to exterior props shall be documented and the owner or AHJ shall be notified (NFPA 1403, 8.2.1.1).

8.2.2 All safety devices and emergency shutdown switches, plus doors, shutters, vents, and other operable devices, shall be checked prior to any live fire training evolutions to ensure they operate correctly (8.2.2).

8.2.3 The structural integrity of the props shall be evaluated and documented annually (8.2.3).

SECTION 9: REPORTS AND RECORDS

9.1 General.

9.1.1 The following records and reports shall be maintained on all live fire training evolutions in accordance with the requirements of [the Utah Live Fire Training Standard]:

- (1) An accounting of the activities conducted
- (2) A listing of instructors present and their assignments
- (3) A listing of all other participants
- (4) Documentation of unusual conditions encountered
- (5) Any injuries incurred and treatment rendered
- (6) Any changes or deterioration of the structure
- (7) Documentation of the condition of the premises and adjacent area at the conclusion of the training exercise (9.1.1)

9.1.2 For acquired structures, records pertaining to the structure shall be completed (9.1.2). [See Utah Live Fire Training Standard, Appendix B, Figure 5, which] shows a standard notice of cancellation or nonrenewal of insurance. [See also Appendix B, Figure 6, which shows an example of a] release form that can be used with acquired structures. The exact form should be approved by local officials (A.9.1.2).

9.1.3 Upon completion of the training session, an acquired structure shall be formally turned over to the control of the property owner (9.1.3).

9.1.3.1 The turnover process [should] include the completion of a standard form indicating the transfer of authority for the acquired structure (9.1.3.1).

9.1.4 A post-training critique session, complete with documentation, shall be conducted to evaluate student performance and to reinforce the training that was covered (9.1.4).

APPENDIX A

Personal Protective Equipment

Documents approved by the Authority Having Jurisdiction (AHJ) have priority.
The following example is a sample of what should be used as needed.

APPENDIX B

Form Examples

Documents approved by the Authority Having Jurisdiction (AHJ) have priority.
The following examples are samples of what should be used as needed.

FIRE DEPARTMENT

FIRE TRAINING ANNOUNCEMENT

The _____ Fire Department will be conducting **LIVE FIRE TRAINING** in your area on _____ (month) _____ (day), 20____ (year).

This training will be conducted using live fire and smoke located at _____ (address). As always, _____ Fire Department is committed to the community by proactively conducting “real” training in order to provide the highest quality of service to you in the event of an emergency. We hope that our training will not interfere with your normal activities.

We thank you for your patience and support. If you have any questions, please feel free to contact us at _____ or _____.

Thank you,

(Name)
Title

_____ Fire Department

Figure 3

Site Inspection Worksheet – Residential Properties			
Instructor's names:		Date:	
		Construction date:	
Site address:		Parcel #/PIN:	
Comments:			
Category	Items	Description/Location/Notes	Quantity
Universal wastes	Fluorescent/HID fixtures		
	Batteries		
	Mercury devices		
Building materials	Exterior siding		
	Roofing		
	Paint condition		
	Mold condition		
	Septic system		
	Wells		
	Treated wood		
Refrigerants	Air conditioner		
	Refrigerator/ice box		
	Other		
Household wastes	Waste oil		
	Fuel		
	Paints/solvents		
	Household cleaners		
	Yard care products		
	Other		
Building structures	Basement/crawl space		
	Garage		
	Shed		
	Other		

Other potential issues:

Figure 4

Live Structural Fire Training Facility Inspection	
Region: _____	
Facility: _____	
Date: _____	
Inspected by: _____	
Legend: ✓ = Ok N = Noteworthy D = Requires attention	
GENERAL	
(1) _____	Floors, walls, stairs, and other structural components appear capable of withstanding the weight of the contents, participants, and accumulated water.
EXTERIOR	
(2) _____	Perimeter lighting
(3) _____	General appearance
(4) _____	Exterior of structure
(5) _____	Windows
(6) _____	Doors
(7) _____	Railings
(8) _____	Stairs
INTERIOR	
(9) _____	Housekeeping (swept clean, no fuel storage on fire floor)
(10) _____	Windows/shutters
(11) _____	Functional doors
(12) _____	Lined ceilings/walls (crazing, cracking, delamination, metal mesh visible)
(13) _____	High temperature linings (loose/damaged tile, exposed bolts)
(14) _____	Burn racks
(15) _____	Fuel inventory/storage
OTHER	
(16) _____	
(17) _____	
Documentation of Issues:	
Item #	Description
<p><i>Note:</i> If damage is present in approved burn rooms, use the form on the reverse side to specify the details of the damage.</p>	
<p>NFPA 1403, Figure A.6.2.1.1 Page 1 of 2</p>	

(continued)

Live Structural Fire Training Facility Inspection (continued)

Describe damage in detail below and attach photos.

Floor:

Room:

Wall or ceiling:

Area involved (ft² or in.²):

Damage description:

Distance in Feet of the Entire Burn Room																				
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Distance in Feet of the Entire Burn Room	1																			
	2																			
	3																			
	4																			
	5																			
	6																			
	7																			
	8																			
	9																			
	10																			
	11																			
	12																			
	13																			
	14																			
	15																			
	16																			
	17																			
	18																			
	19																			
	20																			

Indicate the entire size of the burn room and the exact area that is damaged.

Figure 5

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 OF ADDRESS OF INSURED:

(Applicable item is 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.

NONRENEWAL

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.

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

Figure 6

Release Form

_____ Fire Department

Address _____

City/County _____ State _____

Date _____

Having agreed with the Building Official, City/County 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/County of _____

To demolish, by burning or other means, the said structure. I further release the City/County of _____

From any claim for loss resulting from such demolition.

Owner/Agent

Owner/Agent

Witness

NFPA 1403, Figure A.9.1.2(b), Sample Release Form

APPENDIX C

Personnel Responsibilities

Documents approved by the Authority Having Jurisdiction (AHJ) have priority.
The following examples are samples of what should be used as needed.

Figure 7

LIVE FIRE	
Responsibilities of Personnel Checklist	
<p>Lead Instructor</p> <p>_____ 1. Plan and coordinate all training activities</p> <p>_____ 2. Monitor activities to ensure safe practices</p> <p>_____ 3. Inspect training structure integrity prior to each fire</p> <p>_____ 4. Assign instructors:</p> <p style="padding-left: 20px;"><input type="checkbox"/> Attack hose lines</p> <p style="padding-left: 20px;"><input type="checkbox"/> Backup hose lines</p> <p style="padding-left: 20px;"><input type="checkbox"/> Functional assignments</p> <p style="padding-left: 20px;"><input type="checkbox"/> Teaching assignments</p> <p>_____ 5. Brief instructors on responsibilities:</p> <p style="padding-left: 20px;"><input type="checkbox"/> Accounting for assigned students</p> <p style="padding-left: 20px;"><input type="checkbox"/> Assessing student performance</p> <p style="padding-left: 20px;"><input type="checkbox"/> Clothing and equipment inspection</p> <p style="padding-left: 20px;"><input type="checkbox"/> Monitoring safety</p> <p style="padding-left: 20px;"><input type="checkbox"/> Achieving tactical and training objectives</p> <p>_____ 6. Assign coordinating personnel, as needed:</p> <p style="padding-left: 20px;"><input type="checkbox"/> Emergency Medical Services</p> <p style="padding-left: 20px;"><input type="checkbox"/> Communications</p> <p style="padding-left: 20px;"><input type="checkbox"/> Water supply</p> <p style="padding-left: 20px;"><input type="checkbox"/> Apparatus staging</p> <p style="padding-left: 20px;"><input type="checkbox"/> Equipment staging</p> <p style="padding-left: 20px;"><input type="checkbox"/> Breathing apparatus</p> <p style="padding-left: 20px;"><input type="checkbox"/> Personnel welfare</p> <p style="padding-left: 20px;"><input type="checkbox"/> Public relations</p> <p>_____ 7. Ensure adherence to the Utah Live Fire Training Standard by all persons within the training area</p>	<p>Safety Officer</p> <p>_____ 1. Prevent unsafe acts</p> <p>_____ 2. Eliminate unsafe conditions</p> <p>_____ 3. Intervene and terminate unsafe acts</p> <p>_____ 4. Supervise additional safety personnel, as needed</p> <p>_____ 5. Coordinate lighting of fires with the lead instructor</p> <p>_____ 6. Ensure compliance of participants' personal equipment with applicable standards:</p> <p style="padding-left: 20px;"><input type="checkbox"/> Protective clothing</p> <p style="padding-left: 20px;"><input type="checkbox"/> Self-contained breathing apparatus (SCBA)</p> <p style="padding-left: 20px;"><input type="checkbox"/> Personal alarm devices, where used</p> <p>_____ 7. Ensure that all participants are accounted for, both before and after each evolution</p> <p>Ignition Officer/Team</p> <p>_____ 1. Ignite, maintain, and control the materials being burned</p> <p>_____ 2. Recognize, report, and respond to any adverse conditions</p> <p>_____ 3. Staff dedicated charged line (Acquired structures)</p> <p>_____ 4. Team should rotate duties to prevent overheating and thermal saturation</p> <p>_____ 5. Coordinate ignition with lead instructor</p> <p>Student</p> <p>_____ 1. Acquire prerequisite training</p> <p>_____ 2. Become familiar with building layout</p> <p>_____ 3. Wear approved full protective clothing</p> <p>_____ 4. Wear approved SCBA</p> <p>_____ 5. Obey all instructions and safety rules</p> <p>_____ 6. Provide documentation of prerequisite training, if from an outside agency</p>
<p>Assistant Instructor</p> <p>_____ 1. Monitor and supervise assigned students (no more than 5 per instructor)</p> <p>_____ 2. Inspect student's protective clothing and equipment</p> <p>_____ 3. Account for assigned students, both before and after evolutions</p>	

NFPA 1403, Figure C.1, Checklist for Responsibilities of Personnel

Figure 8

LIVE FIRE EVOLUTION CHECKLIST

* To be used in conjunction with Preburn and Postburn Checklists

PERMITS, DOCUMENTS, NOTIFICATIONS, INSURANCE

- ___ 1. Written documentation received from owner:
 - Permission to burn structure
 - Proof of clear title
 - Certificate of insurance cancellation
 - Acknowledgment of postburn property
- ___ 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
- ___ 9. * Environmental hazards: i.e., asbestos, mercury, batteries, etc.

PREBURN PLANNING

- ___ 1. Preburn plans made, showing the following:
 - Site plan drawing, including all exposures
 - 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 acquired structure/live fire training structure/burn prop 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 hose lines
- ___ 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

TRAINING STRUCTURE PREPARATION

- ___ 1. Training structure inspected to determine structural integrity
- ___ 2. All utilities disconnected (acquired structures 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. Training structure 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:
 - Training structure layout
 - Crew and instructor assignments
 - Safety rules
 - Training structure evacuation procedure
 - Evacuation signal (demonstrate)
- ___ 2. All hose lines 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

LIVE FIRE EVOLUTION CHECKLIST

* To be used in conjunction with Preburn and Postburn Checklists

PREBURN PROCEDURES (continued)

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

POSTBURN PROCEDURES

- ___ 1. All personnel accounted for
- ___ 2. Remaining fires overhauled, as needed
- ___ 3. Training structure inspected for stability and hazards where more training is to follow
- ___ 4. Training after action conducted
- ___ 5. Records and reports prepared, as required:
- Account of activities conducted
 - List of instructors and assignments

- Documentation of unusual conditions or events
- Documentation of injuries incurred and treatment rendered
- Documentation of changes or deterioration of live fire training structure
- Acquired structure release
- Student Training Records
- Certificates of completion

- ___ 6. Building and property released to owner, release document signed
- ___ 7. * Conduct a competent third-person inspection of overhaul for training that included live fire. This is necessary to confirm complete fire extinguishment.
- ___ 8. * Cover or secure all openings on premises if demo is not to be completed within the next 24 hours.

RELEASE FORM

Having agreed with the Building Official, City/County of _____, that a structure owned by me and located at _____, City/County of _____, *State _____, 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/County of _____ to demolish, by burning or other means, the said structure.

I further release the City/County of _____ from any claim for loss resulting from such demolition.

Fire Department _____

Address _____

City/County _____ *State _____

Date _____

Owner/Agent _____

Owner/Agent _____

Witness _____

Figure 9

LIVE FIRE PREBURN CHECKLIST

Department Name: _____

Date of Class: _____ **Time of Class:** _____

Class Location/Address: _____

Print name for the following:

Lead Instructor: _____

Additional Instructors: _____

Safety Officer: _____

Ignition Officer/Team: _____

Assistant Instructor: _____

Other: _____

Instructions: Place a check mark in the box next to each item as you complete it. Place an “R” or circle around the check box if the item requires additional documentation.

Meeting with Instructors

- Students/Instructors signed in
- Instructor assignments made
- Ignition Officer assigned
- Rapid Intervention Team (RIT) identified
- Apparatus used and assignment made
- PASS checked
- Incident Commander
- Student Instructor
- Review student performance objectives
- Water supply
- Safety Officer
- Backup line

Weather/Training Site Inspection

- Identify Operations Area
- Check for obstructions both overhead and around the area
- Safe area identified for PIO/Media/VIP
- Training postponed, canceled, or rescheduled due to weather
- Spectators restricted to outside Hot Zone (minimum 100’ in all directions)
- Check for safe training area (ice, good drainage, exposures, or obstructions)

Prop Inspection

- Inspect the prop for any damage and document if necessary
- Search structure (ensure no persons are inside prior to ignition)
- Inspect doors, windows, scuttles to verify proper function
- Remove any debris hindering access or egress of firefighters

Health and Safety

- Accountability of students, instructors, and testers
- RIT – Outfit the RIT with proper equipment
- Rehab needs are met
- Decision to ignite by Lead Instructor in coordination with the Safety Officer (SO)
- Medical Plan in place (call 911 or have local assets in place)
- Ensure that students are monitored (health condition and vitals)
- Fires are not set in any exit paths
- Fire started by Ignition Officer
- Rehab area: out of smoke and extreme weather

Preburn Briefing

- Pre-evolution briefing: assignments made
- SCBA malfunction procedures discussed
- Establish evacuation plan and alarm
- No person to play the role of a victim inside during the live fire training
- Establish accountability meeting place
- Conduct a walk-through with all students pointing out exits; and demonstrate how doors and windows function

(In continuation of Figure 9)

Water Supply

- All lines capable of at least 95 GPM
- All attack and backup lines are a minimum of 1½” in diameter
- In accordance with the Utah Live Fire Training Standard, determine the number of attack and backup lines needed
- Two water supply sources: 1. a booster tank with a minimum of 500 gallons or 2. uninterrupted source(s) with either a minimum 1,500 gallon-tender or an adequate fire hydrant

Personal Protective Equipment

- Safety Officer or Lead Instructor to inspect all PPE prior to use and entry into the burn structure
- PASS devices inspected and used
- Complete PPE to be worn: helmet, gloves, hood, turnout pants, turnout coat, boots, SCBA
- All PPE to be worn and used in accordance with manufacturer’s requirements

Complete the Site Plan

- Location of pumper listed
- Water source and supply line locations documented
- Address any obstructions or exposures and document in the “Additional detail or suggestions” box below
- Location of attack and backup lines documented

Signatures for class start:

Lead Instructor
(Print Name): _____
Lead Instructor
(Signature): _____

Date: _____

Agency dispatch notified of Live Fire Training:

Signature of Agency Rep: _____

Notification Date
and Time: _____

Position: _____

Verification of dispatch notification – Lead Instructor:

*Signature of Lead
Instructor:* _____

Notification Date
and Time: _____

Additional detail or suggestions:

Figure 10

LIVE FIRE POSTBURN CHECKLIST

Department Name: _____

Date of Class: _____ **Time of Class:** _____

Class Location/Address: _____

Print name for the following:

Lead Instructor: _____

Additional Instructors: _____

Safety Officer: _____

Ignition Officer/Team: _____

Assistant Instructor: _____

Other: _____

Instructions: Place a check mark in the box next to each item as you complete it. Place an "R" or circle around the check box if the item requires additional documentation.

Equipment Inventoried

- Expendable supplies (excelsior, and amount remaining)
- Document any item broken or missing

- Operational equipment (hose, nozzles, SCBAs, etc.) all inventoried, items tagged, and shortages Noted

Postburn Briefing

- Inspection of PPE by the Safety Officer or Lead Instructor for instructor and students
- Training objectives met
- Student evolution debriefing completed

- Gross decon of student PPE. Advise on NFPA standard for PPE cleaning and follow AHJ policy
- Inspect SCBAs

Prop Inspection and Cleanup

- All burnt materials placed in metal dumpster
- Floors swept
- Doors, windows, and scuttles properly secured for transport

- All materials completely extinguished
- Shovels, brooms properly stored
- All particle board, sheetrock, and other stock materials placed in proper storage areas

Document any item regarding prop inspection and cleanup

Course Materials

- Student books
- Instructor materials, injury reports

- Agency equipment damage noted
- Other

LIVE FIRE POSTBURN CHECKLIST (continued)

Signatures for class completion:

Lead Instructor
(Print Name): _____

Lead Instructor
(Signature): _____

Date: _____

**Agency dispatch notified that live
fire training has concluded:**

Notification Date
and Time: _____

Signature of Agency Rep: _____

Position: _____

**Verification that agency dispatch has been
notified that training has concluded:**

*Signature of Lead
Instructor:* _____

Notification Date
and Time: _____

Name of dispatcher (POC): _____

Additional information:

Insert Header

MEDIA ANNOUNCEMENT

Subject: _____
Release Date: _____

On _____ (month) _____ (day), 20____ (year) at _____ (time) AM/PM the
_____ Fire Department will be conducting **LIVE**
FIRE TRAINING located at (address):

_____ City _____
County _____, Utah.

This fire training will be conducted with live fire and possibly heavy smoke. The following safety measures will take place:

- _____ street/road will be closed to through traffic from _____ AM/PM to _____ AM/PM.
- Detours will be provided to route traffic around the road closure (as needed).
- Other: _____
- We ask bystanders to please refrain from entering the training ground and surrounding area.

As always, _____ Fire Department is committed to the community by proactively conducting “real” live fire training in order to provide the highest quality of service in the event of an emergency.

For more information, please contact:

- (Name)
- (Job Title)
- (Phone)
- (Email)

APPENDIX D

Medical Form and Information

Documents approved by the Authority Having Jurisdiction (AHJ) have priority.
The following examples are samples of what should be used as needed.

Figure 12 - Example of an Employee Injury/Accident Form

First Report of Employee Injury/Accident Form		
Employee Information		
I am reporting a work-related: <input type="checkbox"/> Injury <input type="checkbox"/> Illness <input type="checkbox"/> Near Miss		
Employee Name: (Last, First, Middle): _____ , _____		
Best Contact Number: _____	Work Number: _____	
Address: _____		City/County: _____
State: _____	ZIP: _____	
Department: _____	Job Title: _____	
Supervisor: _____	Job Title: _____	
Work Status: <input type="checkbox"/> Full-Time <input type="checkbox"/> Part-Time <input type="checkbox"/> Volunteer		
Shift Hours: <input type="checkbox"/> A Shift <input type="checkbox"/> B Shift <input type="checkbox"/> C Shift	Weekly Total Hours: _____	
Injury Information		
This form must be submitted within 24 hours of the injury		
Injury Date: _____	Injury Time: _____ (AM/PM)	Time employee began work: _____ (AM/PM)
Location where the injury occurred (be Specific): _____		
Describe the injury (be Specific): _____		
What parts of your body were injured? _____		
Has this part of your body been injured before? <input type="checkbox"/> Yes <input type="checkbox"/> No		
Did you see a doctor for your injury? <input type="checkbox"/> Yes <input type="checkbox"/> No If yes, date seen? _____		
Name and address of Physician/Health care provider, if seen: _____		
Treatment Type: <input type="checkbox"/> No Medical Treatment <input type="checkbox"/> First Aid Only <input type="checkbox"/> Work-Med <input type="checkbox"/> Emergency Room <input type="checkbox"/> Hospitalized Overnight <input type="checkbox"/> Other		
List all equipment, materials, or chemicals that were being used: _____		
Were safeguards or safety equipment provided? <input type="checkbox"/> Yes <input type="checkbox"/> No		Were they used? <input type="checkbox"/> Yes <input type="checkbox"/> No
List Safeguards: _____		
Was Supervisor notified? <input type="checkbox"/> Yes <input type="checkbox"/> No		Date: _____
Witnesses (Name and Number): _____		
Employee Signature: _____		Date: _____
Human Resource Use		
Date submitted form: _____	Fatality? <input type="checkbox"/> Yes <input type="checkbox"/> No	Date: _____
Claim Number: _____		
HR Representative Signature: _____		Date: _____

Heat Exhaustion and Heat Stroke in Training

(NFPA 1403, Annex D)

This [section] is not a part of the requirements of this [standard] but is included for informational purposes only.

Heat-Related Illnesses.

The two most serious heat-related illnesses are heat exhaustion and heat stroke. The following material is excerpted from the NIOSH document *Occupational Exposure to Hot Environments, Revised Criteria*.

Symptoms of heat exhaustion include fatigue, nausea, headache, dizziness, pallor, weakness, and thirst. Factors that predispose a person to heat exhaustion include sustained exertion in the heat, failure to replace the water lost in sweat, and lack of acclimatization. Heat exhaustion responds readily to prompt treatments such as moving to a cooler environment, resting in a recumbent position, and taking fluids by mouth.

Heat stroke is the more serious of the heat-related illnesses and is considered a medical emergency. Symptoms of heat stroke include hot, red, dry skin, a rectal temperature of 104°F (40°C) or above, confusion, possible convulsions or loss of consciousness, or any combination of these symptoms. Factors that predispose a person to heat stroke include sustained exertion in the heat by unacclimatized workers, lack of physical fitness, obesity, recent alcohol intake, dehydration, individual susceptibility, and chronic cardiovascular disease. Heat stroke should be treated immediately. Treatments to reduce body temperature rapidly include immersing in chilled water, rinsing with alcohol, wrapping in a wet sheet, or fanning with cool, dry air, or any combination of these treatments. A physician's care is necessary to treat possible secondary disorders such as shock or kidney failure. While heat exhaustion cases greatly outnumber heat stroke cases, every case of heat exhaustion should be treated as having the potential to develop into heat stroke.

Acclimatization is a physiological adaptation to heat stress that occurs over a short period of time. After acclimatization has occurred, the body sweats more while losing less salt and can maintain a lower core temperature and lower cardiovascular demands. A person becomes acclimatized to a certain work intensity and temperature with repeated exposures to that work load and temperature. Formal acclimatization procedures might not be necessary for all fire fighters; however, training drills should be held outdoors regularly so that seasonal acclimatization can occur. For additional protection against heat stress, fire fighters might want to perform their regular aerobic training activities outdoors, especially during the spring and summer.

The metabolic demands of firefighting range from 60 percent to 100 percent of maximum aerobic capacity. Tasks such as stair climbing, roof venting, and rescue operations, when performed in full gear, have an energy cost of 85 percent to 100 percent of maximum capacity and lead to near maximum heart rates.

It is clear from these estimates that a high level of cardiovascular fitness is an advantage in performing fire-fighting tasks. The higher level of fitness allows a longer work period and

UTAH LIVE FIRE TRAINING STANDARD

provides a greater reserve in case of an unexpected increase in work demands or in extreme environmental conditions.

There are fire incidents during which even the fittest, most acclimatized fire fighter is exposed to significant heat stress. For this reason, many fire departments have adopted formal procedures for on-scene rehabilitation and have incorporated them into their manuals for standard operating procedures. The general goals of rehabilitation are as follows:

- (1) To provide physical and mental rest, allowing the fire fighter to recuperate from demands of emergency operations and adverse environmental conditions
- (2) To revitalize fire fighters by providing fluid replacement and food as needed
- (3) To provide medical monitoring, including treatment of injuries, to determine if and when fire fighters are able to return to action

APPENDIX E

Sample IAP

Not all inclusive.

Documents approved by the Authority Having Jurisdiction (AHJ) have priority.
The following examples are samples of what should be used as needed.

INCIDENT OBJECTIVES (ICS 202)

Incident Name: Acquired Structure IAP

Operational Period:

Incident Number: _____

Date: _____ To: _____

Objective(s):

Time: _____ To: _____

- Event Priorities:
1. Safety – Instructors and students
 2. Event Control – Provide structured, formal training to a set group of students
 3. Facilities – Verify that acquired structure documents are complete and filed

Management

- Objectives:
1. Complete training evolutions as per plan and schedule
 2. Gain additional skills by applying practical applications as directed
 3. Maintain accountability of all students, instructors and staff via use of ICS 204’s instructor assignment lists and student rosters.

Control

- Objectives:
1. Establish ICP
 2. Provide IAP
 3. Provide technical and logistical support
 4. Create mapping and acquired structure directions, parking and staging as per IAP.
 5. Provide situational awareness and updates
 6. Conduct a course evaluation at the end of the training session

Operational Period Command Emphasis: _____

General Situational Awareness: _____

Site Safety Plan Required? Yes No

Approved Site Safety Plan(s) location: _____

Incident Action Plan Items Included:

- ICS 201 ICS 202 ICS 203 ICS 204 ICS 205 ICS 205A ICS 206
 ICS 207 ICS 208 ICS 215A Map/Chart Weather Forecast, Currents, etc.
Other: Class Schedules Off Site Maps with Logs diagrams
 Schedule of Events Division Assignment Org

Incident Commander Name and Signature:

Date: _____

Prepared by: _____ Title: _____

Date: _____

INCIDENT BRIEFING (ICS 201)

Incident Name: Acquired Structure IAP **Operational Period:**

Incident Number: _____ **Date:** _____ **To:** _____

Map/Sketch: _____ **Time:** _____ **To:** _____

Include sketch, describing the total area of operations, the incident site/area, impacted and threatened areas, overflight results, trajectories, impacted shorelines, or other graphics depicting situational status and resource assignment.

Situation Summary (for briefings and transfer of command):

Current and Planned Objectives:

Current and Planned Actions, Strategies, and Tactics

Time:	Actions:
_____	_____
_____	_____
_____	_____
_____	_____

Attach Current Organization Chart

Attach Resource Summary which includes the following:

Resource(s) Identifier Date Ordered ETA Notes Arrived Yes No

Prepared by: _____ **Title:** _____

Date: _____

ORGANIZATION ASSIGNMENT LIST (ICS 203)

Incident Name: Acquired Structure IAP **Operational Period:**

Incident Number: _____ Date: _____ To: _____

_____ Time: _____ To: _____

Incident Commander(s) and Staff:

IC/UC's: _____

Deputy: _____

Lead Instructor: _____

Safety Officer(s): _____

Ignition Officer/Team: _____

Assistant Instructor(s): _____

Other: _____

Planning: _____

Logistics: _____

Operations: _____

Support: _____

Service: _____

ASSIGNMENT LIST (ICS 204)

Resources Assigned:

Resource Identifier	Leader	# of Persons	Contact Info	Reporting Location, equipment, notes:

Attached additional assignments: Yes No

Work Assignments:

Special Instructions: Yes No **Details:**

Prepared by: _____ **Title:** _____

Date: _____

MEDICAL PLAN (ICS 206)

Incident Name: Acquired Structure IAP **Operational Period:**
Incident Number: _____ **Date:** _____ **To:** _____
Time: _____ **To:** _____

Medical Aid Stations:

Name (Last, First)	Location	Contact Number()	Paramedics on Site?
			<input type="checkbox"/> Yes <input type="checkbox"/> No
			<input type="checkbox"/> Yes <input type="checkbox"/> No
			<input type="checkbox"/> Yes <input type="checkbox"/> No
			<input type="checkbox"/> Yes <input type="checkbox"/> No

Transportation (indicate air or ground):

Ambulance Service	Location	Contact Number(s)	Level of Service
			<input type="checkbox"/> ALS <input type="checkbox"/> BLS
			<input type="checkbox"/> ALS <input type="checkbox"/> BLS
			<input type="checkbox"/> ALS <input type="checkbox"/> BLS

Hospitals:

Hospital Name:	Address:	Contact Number/ Frequency	Travel Time		Trauma Center	Burn Center	Helipad
			Air	Ground			
					<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
					<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
					<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No

Special Medical Emergency Procedures:

Check box if aviation assets are utilized for rescue. If assets are used, coordinate with Air Operations.

Prepared by: _____ **Title:** _____
Date: _____

SAFETY MESSAGE/PLAN (ICS 208)

Incident Name: Acquired Structure IAP **Operational Period:**
Incident Number: _____ **Date:** _____ **To:** _____
Prepared: **Date:** _____ **Time:** _____ **Time:** _____ **To:** _____
Prepared by: _____ **Title:** _____

Safety Message:

Safety Plan:

Additional Safety Information:

Incident Action Plan Safety Analysis (ICS 215A)

Incident Area	Hazards/Risks	Mitigations

Prepared: **Date:** _____ **Time:** _____
Prepared by: _____ **Title:** _____