



Chapter 5: Safety and Health Program

5.00.090 Live Fire

A. Purpose

1. The purpose of this procedure is to define the guidelines for conducting live-fire events at the Fire Training Academy (FTA).
2. It is incumbent upon the FTA to:
 - a. Promote safety for those who use or work at the FTA.
 - b. Ensure the safety of all participants and the longevity of structure and props.
 - c. Maintain a safe and effective learning environment during all training conducted at or by the FTA.

B. Desired Outcome

1. The desired outcome is to reduce or eliminate potentially hazardous situations while creating a realistic learning environment for participants. It is also intended to promote a high level of safety, culture, awareness and practices among staff, contractors, stakeholders and students that utilize the FTA. Washington Administrative Code (WAC) 296-305 and National Fire Protection Association (NFPA) Standard 1403 are the established guides, which will be utilized to conduct live-fire events.

C. Definitions

1. Lead Instructor - Referred to as the Instructor-In-Charge (IIC) in NFPA 1403. An individual qualified as an instructor and designated by the Authority Having Jurisdiction (AHJ) to be in charge of a live-fire training event.
2. Safety Officer - An individual, full-time employee, or contract fire service instructor appointed by the AHJ as qualified to maintain a safe working environment at all live-fire training events.
3. Assistant Safety Officer - Individual(s), full-time employee(s), contract fire service instructor(s), or a qualified cooperative instructor(s) assigned as an assistant to the Safety Officer. This person is an extension of the Safety Officer under the direction of the Safety Officer.
4. Instructor - An individual qualified by the AHJ to deliver firefighter training and has the training and experience to supervise students during live-fire events.
5. Cooperative Instructor - An instructor associated with a cooperative group deemed qualified by their agency and the AHJ to deliver firefighter training.
6. Ignition Officer - A member of the Fire Control Team designated to ignite, maintain, and control the materials being burned.
7. Ignition Safety - A member of the Fire Control Team assigned to observe the Ignition Officer ignite and maintain the fire, and to recognize, report, and respond to any adverse conditions. This position may be assigned to instructors or students participating in the event. This position is the only position that may be assigned to a student.
8. Fire Control Team - This team is responsible for ignition of live training or demonstration fires. The Fire Control Team shall consist of a minimum of two personnel. The Ignition Officer and Ignition Safety are members of the Fire Control Team.



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9. Student - A person that is present at the live-fire event for the purpose of receiving training.
10. Participant - Any student, instructor, safety officer, visitor, or other person who is involved in the live-fire event and within the operations area.
11. Live-Fire - Any unconfined, open flame or device that can propagate fire to the building, structure, or other combustible materials.
12. Live-Fire Event – Any live-fire scenario including, but not limited to, live-fire training evolutions, live-fire training labs, and live-fire demonstrations.
 - a. Live-Fire Training Evolution - A set of prescribed actions that result in an effective fire ground activity. An exercise carried out in accordance with a set procedures or an action plan; the act of bringing into play or realizing in action; a drill carried out for training and discipline. Used for the evaluation of minimum acceptable performance during training for initial fire suppression and rescue activities.
 - b. Live-Fire Training Lab – A place or scenario designed and equipped for the study of fire science to include testing and analysis; providing opportunity for experimentation, observation, or practice in fire behavior and fire control. This is an academic period set aside for observing fire development, behavior and the effect of water application under specified conditions.
 - c. Live-Fire Demonstration - A set of prescribed conditions and actions to achieve an effective visual display of fire ground activity for participants.
13. Personal Protective Equipment (PPE) - Protective clothing, helmets, eye protection, respiratory protection or other garments/equipment designed to protect the wearer's body from injury.
14. Live-Fire Action Plan (LFAP) - A Live-Fire Action Plan (LFAP) documents training goals, objectives and strategy defined by the curriculum or objectives. It contains general tactics to achieve goals and objectives within the overall strategy, while providing information on the live-fire event parameters. The LFAP facilitates dissemination of critical information about the live-fire event to participants.

D. Responsibilities

1. Training and demonstration activities can result in hazards that are equal to, if not greater than, those encountered on an emergency scene. Prior to the live-fire event, the instructors must make known to all participants what is expected of the student and what the drill objectives are, per the lesson plan (LP) or LFAP. Likewise, it is the responsibility of the student or other participants to make the instructor aware of any condition or situation that may keep the student from safely completing assigned tasks.
2. Firefighter safety and survival are directly related to training. Positive examples from peers/officers and correct training can provide the most influence over behavior as it relates to safe practices.
3. Prior planning is the key. It is well documented that habits formed under controlled situations will be what firefighters revert to in periods when they are required to perform under stressful conditions. Therefore, habits and traits they acquire early on must be correct and frequently reviewed.



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4. Safety shall be the primary consideration in all live-fire events. All live-fire events shall be conducted with attentiveness to the participant needs and shall ensure that adequate steps are taken to protect safety and health during live-fire events.
5. Guidelines contained within this policy shall cover physical, mental and heat related stress during live-fire events and provide for the rehabilitation of participants at the FTA.
6. Only qualified instructors and/or safety personnel approved by the Fire Training Academy AHJ shall supervise live-fire events.

E. Tasks

1. The Lead Instructor shall be responsible for full compliance with this policy. Responsibilities include, but are not limited to the following:
 - a. Coordinate overall fire ground activities to ensure the highest levels of safety.
 - b. Prior to each specific evolution, lab or demonstration, refer to the LP and/or LFAP. Determine the correct number of attack lines and backup lines and ensure they are in place.
 - c. Assign the following personnel:
 - (1) One qualified instructor to each functional crew which shall not exceed five participants.
 - (2) One instructor to each backup line.
 - (3) One additional qualified instructor for each additional functional assignment.
 - d. Ensure all FTA provided equipment and the burn rooms are inspected visually prior to live-fire events.
 - (1) Structural damage shall be documented and all damaged equipment shall be tagged and reported on a Maintenance/Repair Request form.
 - (2) Verify that the temperature monitoring equipment is operating.
 - e. Ensure fire ground communications are operating to enable coordination with FTA Staff, the Lead Instructor, the Safety Officer, the Assistant Safety Officer(s), the Cooperative Instructor(s), Students and other classes for any requests for assistance.
 - f. Provide a designated area 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.
 - g. Instructors shall be rotated through duty assignments.
 - h. Prior to the live-fire event, review the student expectations and drill objectives per the LP or LFAP with participants.
 - i. Conduct a complete prop familiarization and safety walk through with participants who will be entering the live-fire area.
2. A Safety Officer shall be designated for each live-fire event. Responsibilities shall include, but are not limited to, the following:
 - a. Support the responsibilities of the FTA Health & Safety Officer.
 - b. Have authority, regardless of rank, to intervene, suspend, or control any aspect of a live-fire event when, in their judgment a potential or actual danger, accident, unsafe condition exists, or if safety procedures contained in the LP or LFAP are not followed.



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- c. Shall not be assigned other duties that interfere with their safety responsibilities.
 - d. Ensure full set-up of the Burn Building or prop and fire ground is accomplished in accordance with the LP.
 - e. Ensure availability of first aid equipment and hydration/rehabilitation stations.
 - f. Ensure that personnel are properly dressed in appropriate protective clothing and that safety equipment is functioning properly prior to and throughout each live-fire event.
 - g. Ensure that personnel are familiar with the use of the individual accountability system as identified in the LFAP.
 - h. Assign Assistant Safety Officers, as deemed necessary, to fulfill objectives.
 - i. Provide for the safety of persons on the scene including students, instructors, visitors, and spectators.
 - j. Ensure that spectators are restricted to a safe area outside the operations area perimeter.
 - (1) Spectators who are allowed to observe within the operations area perimeter must be escorted at all times and meet the following requirements:
 - (2) Spectators shall meet or exceed training requirements for the area.
 - (3) Spectators shall meet or exceed PPE requirements of the area.
 - k. Recognize and address/prevent unsafe acts or conditions.
 - l. Ensure all instructors demonstrate and practice prescribed safety precautions.
 - m. Ensure that live-fire events are conducted safely per WAC 296-305 and NFPA 1403.
 - n. Ensure that a safety brief is delivered and that it addresses specific hazards and evacuation procedures for the specific live-fire event being conducted.
 - o. Ensure that water dispensers, drinking cups, and waste receptacles are provided at each rehabilitation station as necessary. The water dispensers are in addition to personal hydration bottles.
3. Additional Assistant Safety Officer(s), as deemed necessary by the Safety Officer, shall be assigned. Responsibilities of the Assistant Safety Officer(s) shall include, but are not limited to, the following:
- a. Support the responsibilities of the Safety Officer.
 - b. Assist the Safety Officer as assigned and directed.
 - c. Shall not be assigned other duties that interfere with their safety responsibilities.
 - d. Be located strategically within, or adjacent to, the structure in order to react to any unplanned or threatening situation or condition.
 - e. Ensure that Instructors follow prescribed live-fire safety precautions and ignition procedures.
4. The igniting of live training or demonstration fires shall only be accomplished by a Fire Control Team.
- a. A charged hose line shall be available when the Fire Control Team is igniting or tending to any fire.
 - b. The decision to ignite a training or demonstration fire shall be made by the Lead Instructor in coordination with the Safety Officer.



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- c. The Ignition Safety shall be in the area to observe the Ignition Officer ignite and/or maintain the fire, and to recognize, report, and respond to any adverse conditions.
 - d. The fire shall be ignited by the Ignition Officer.
 - e. No student shall be in close proximity to any burn prop during light-off procedures except during a fire behavior or similar lab or when assigned as the Ignition Safety. Fires shall not be ignited without an instructor visually confirming that the flame area is clear of participants.
 - f. Each instructor shall be responsible to control the materials being burned in accordance with the LP.
 - g. Unnecessary combustible fuel loads creating sources of ignition shall be removed from the operations area.
 - h. No students shall ignite or stoke any fire or burn pad at the FTA.
 - a. Fires shall not be located in any designated exit paths.
 - j. The Ignition Officer and Ignition Safety may assume an instructor role upon safe ignition of the fire.
5. Instructor responsibilities shall include, but are not limited to, the following:
- a. Establishing a personnel accountability system and/or process for each live-fire event.
 - b. Taking a Personal Accountability Report (PAR) when participants are entering and exiting the structure or at any time an emergency or evacuation occurs.
 - c. Ensuring no participant(s) enter live-fire events without being tracked or accounted for.
 - d. Oversee no more than five participants during live-fire events.
 - e. Ensure that all PPE are being worn according to manufacturer's instructions prior to entering or participating in a live-fire event.
 - f. Monitor and supervise all assigned participants during live-fire events.
 - g. Conduct and record additional PPE checks of assigned participants during periods of rehabilitation.
 - h. Be aware of weather conditions, wind velocity, and wind direction, including a final check for possible changes in weather conditions, immediately before actual ignition.
6. Student prerequisites to live-fire exposure include, but are not limited to, the following:
- a. Prior to being permitted to participate in live-fire training evolutions, the student shall have received training meeting the minimum job performance requirements for Fire Fighter I; NFPA 1001, *Standard for Fire Fighter Professional Qualifications*, related to the following subjects:
 - (1) Safety
 - (2) Fire behavior
 - (3) Portable extinguishers
 - (4) PPE
 - (5) Face piece crazing
 - (6) Ladders
 - (7) Fire hose, appliances, and streams



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- (8) Overhaul
 - (9) Water supply
 - (10) Ventilation
 - (11) Forcible entry
 - (12) Building construction
- b. Prior to being permitted to participate in live-fire training labs, the student shall have received training meeting the minimum job performance requirements for Fire Fighter I; NFPA 1001, *Standard for Fire Fighter Professional Qualifications*, related to the following subjects:
- (1) Safety
 - (2) PPE
 - (3) Capabilities and limitations
 - (4) Face piece crazing
 - (5) Fire behavior
 - (6) Building construction
 - (7) Fire hose, appliances, and streams
 - (8) Water supply
- c. Students participating in a live-fire training evolution or live-fire training lab who have received the required minimum training from other than the FTA shall not be permitted to participate in any live-fire training event without first presenting written evidence of having successfully completed the prescribed minimum training levels specified above.
- d. Maritime and Industrial Fire Brigade students are exempt from NFPA 1001 prerequisites.
7. The pre-burn plan contained in the LFAP shall be utilized during the pre-burn briefing sessions.
- a. All features of the live-fire areas shall be indicated on the pre-burn plan.
 - b. Prior to conducting a live-fire event, a pre-burn briefing session shall be conducted cooperatively by both the Lead Instructor and the Safety Officer for all participants.
 - c. Each facet of the live-fire event shall be discussed.
 - d. Assignments shall be made for all crews participating in the event.
 - e. The location of the hose dummies is not required to be disclosed, provided that the possibility of victims is discussed in the pre-burn briefing.
 - f. Prior to conducting any live-fire event, all participants shall have knowledge of, and familiarity with, the prop or props being used for the live-fire event.
 - g. Prior to conducting any live-fire event, all participants who will operate within the live-fire area shall be required to participate in a walk-through of the Burn Building or prop in order to have knowledge of, and familiarity with, the layout of the building or prop to facilitate easy egress or evacuation.
 - (1) Additional walk-through(s) of the Burn Building or prop shall be required following any changes to the configuration or conditions prior to continuing any live-fire event.



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8. A method of fire ground communications shall be established to enable coordination among the Lead Instructor, the interior and exterior sectors, the Safety Officer, and others who may make requests for assistance.
9. A building or prop evacuation plan shall be established. The evacuation plan shall be discussed with all participants including a demonstration of the evacuation signal. A PAR shall be taken following any evacuation or exit from the Burn Building or prop.
10. The Lead Instructor and the Safety Officer shall determine the rate and duration of water flow necessary for each individual live-fire event, including the water necessary for control and extinguishment of the fire and the water supply necessary for backup line(s) to protect participants and egress routes.
 - a. Each hose line and backup line(s) shall be capable of delivering a minimum of 95 gallons per minute.
 - b. Backup line(s) shall be provided to ensure protection for participants assigned to attack lines.
 - c. There shall be room provided around all props so that there is space for all attack line(s) and backup line(s) to operate freely.
 - d. The training water system is engineered to provide adequate volume for live-fire events.
11. Backup pumps shall be in place and available if needed.
12. A backup power source (generator) shall be in place and available if needed.
 - a. The generator will automatically engage with the loss of shore power.
 - b. The pressure and volume of the water system may be impacted during the change of power sources. This is dependent on the amount of water flowing at the time of the outage.
 - c. Flammable Liquid/Liquid Propane Gas (LPG) fires shall provide for backup lines supplied from a separate water source (i.e. charged from a fire engine booster tank monitored by an assigned pump operator).
 - d. In the event of a power failure an evacuation alarm will sound. The live-fire event shall end, and all participants shall immediately evacuate to a safe area outside the live-fire event.
 - e. The live-fire event may continue after a complete PAR, rehabilitation, and reset.
 - f. Be aware that if/when shore power returns, there will be another brief impact to the pressure and volume of water delivered.
13. Fire (fuel) loading shall follow these procedures:
 - a. Class A fuels that are utilized in live-fire training evolutions and labs shall only be of wood products.
 - (1) Oriented Strand Board (OSB) shall be used on a limited basis as prescribed in the LP.
 - (2) OSB may be utilized in the presentation of fire behavior/thermal balance, flash over, backdraft, nozzle training, water application, and ventilation labs.
 - (3) OSB shall not be used to build or line walls, ceilings, or floors during live-fire events.



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- b. Fuel shall be limited to the minimum amount necessary to create the desired fire size to meet the LP objectives.
 - c. Pallets may be added to the fire during the live-fire event to maintain or sustain a full fire load required for instruction. Prior to adding the pallets the fire must be cooled and the radiant energy decreased to prevent PPE damage (including face piece crazing).
 - d. Pallets shall be stacked no more than four feet high for storage in the Burn Building.
 - e. Fuel loading depends upon the nature and condition of the fuel based on four dry, solid, and complete softwood pallets. If the fuel available is broken, incomplete, moist, etc. additional pallet material may be added to make up a fire that has the approximate size, volume, and fuel content of the desired four-pallet model. A fire load shall not be increased beyond the prescribed load without permission and consensus of the Lead Instructor, Safety Officer, and FTA Chief of Instruction, FTA Safety Officer or FTA Program Coordinator (Deputy State Fire Marshal).
 - (1) The wood pallets that are utilized in live-fire events shall have known burning characteristics that are as controllable as possible.
 - (2) Unidentified materials that could burn in unanticipated ways or create additional environmental or health hazards shall not be used.
 - (3) Pressure-treated wood, rubber, plastic, polyurethane foam, upholstered furniture; straw, or hay treated with pesticides or harmful chemicals shall not be used unless approved by the FTA for a specific demonstration.
 - f. The fuel load shall be limited to avoid conditions that could cause an uncontrolled fire event.
 - g. 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.
 - h. The Lead Instructor and the Safety Officer shall document fuel loading, including all of the following:
 - (1) Type of fuel material
 - (2) Quantity and Quality of the fuel material
 - (3) Temporary wall placement
 - (4) Dimensions of the room
 - (5) Ventilation profile
 - i. No material, other than pallets and OSB, shall be burned without the permission and consensus of the Lead Instructor, Safety Officer, and FTA Chief of Instruction, FTA Chief of Safety or FTA Program Coordinator (Deputy State Fire Marshal).
14. All participants are encouraged to monitor the Burn Building temperature monitoring system. The Lead Instructor and the Safety Officer shall monitor the temperature monitoring system to evaluate real time conditions and adjust live-fire activities accordingly.
- a. The temperature monitoring system display screen shall be visible to all participants in the Self Contained Breathing Apparatus (SCBA) building adjacent to the Burn Building.
 - b. Temperature parameters will guide adjustments to the live-fire event.



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- c. A temperature monitoring report shall be printed and reviewed at the end of each live-fire day.
 - d. The FTA Program Coordinator shall ensure a copy of the temperature monitoring report is included with the class packet.
15. Any live-fire event 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. An event stopped as a result of an assessed hazard shall continue only when actions have been taken to reduce or eliminate the hazard and with permission and consensus of the Lead Instructor, Safety Officer, and FTA Chief of Instruction, FTA Chief of Safety or FTA Program Coordinator (Deputy State Fire Marshal).. The stoppage and remediation efforts shall be documented.
 16. Whenever practical, the exterior windows and doors of the Burn Building shall be opened to allow burn rooms to cool. Stairwell accesses shall be kept closed to help reduce the amount of combustion product in the stairwell.
 17. Window sills shall be wet down periodically during each live-fire event to prevent them from burning.
 18. The live-fire event shall be curtailed, postponed, or canceled to reduce the risk of injury or illness caused by extreme weather conditions.
 19. No one shall play the role of a rescue victim during live-fire training events.
 20. No rescue dummies shall be dressed to resemble a firefighter.
 21. Areas for the staging, operating, and parking of fire apparatus that are used in live-fire events shall be designated by the FTA, identified in the LFAP and prominently marked on the fire ground.
 - a. An area for parking fire apparatus and vehicles that are not a part of the event shall be designated so as not to interfere with fire ground operations.
 - b. Ingress and egress routes shall be designated, identified, and monitored during the live-fire events to ensure their availability in the event of an emergency.
 22. The “two air bottle rule” or 45 minutes of work time is the maximum work duration at the FTA prior to mandatory rehabilitation. A rehabilitation site shall be established and shall provide suitable protection from the prevailing environmental conditions.
 - a. It shall enable students to be free from fumes or smoke.
 - b. It shall include a provision for medical assessments or treatment.
 - c. Supplies at the site shall include fluids, water, activity beverages, and blood pressure cuffs.
 - d. Participants shall be encouraged to drink water and activity beverages throughout the day but especially during periods of rehabilitation.
 - e. Instructors shall record the participants’ resting pulse rate prior to, during, and following live-fire exposure and will visually monitor the participants’ physical condition during live-fire exposure.
 - (1) After ten minutes of rest, a pulse shall be measured for 30 seconds. If the pulse rate is more than 110 beats per minute, live-fire exposure and other activity shall



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- be discontinued for that participant until further assessment of the participant is completed and there is an adequate drop in pulse rate.
- f. Participants shall be directed to advise instructors immediately if they believe their level of fatigue or exposure to heat is affecting them or if they are becoming ill from the effects.
 - g. Rehabilitation shall not be less than ten minutes.
 - h. The SCBA shall be removed.
 - i. Protective clothing shall be loosened or removed.
 - j. PPE shall be checked for proper fit and operation, as well as for damage, prior to returning to live-fire exposure.
23. An Injury/Exposure report and a written statement shall be completed and submitted on all injury or near-miss incidents.
- a. A supervisor/instructor written statement of the facts regarding any incident during any live-fire event shall be filed.
 - b. All reports shall be filed within 24 hours.
 - c. The Chief of Instruction and Chief of Safety shall be notified and they shall escalate the notification through the chain of command as needed.
24. Each participant with live-fire exposure shall be equipped with full protective clothing and SCBA. All participants shall be inspected by the Safety Officer prior to entry into a live-fire event to ensure that the protective clothing and SCBA are being worn properly and are in serviceable condition. Full protective clothing shall be worn during live-fire events.
- a. Students, instructors, safety personnel, and other personnel shall properly wear all protective clothing and equipment whenever they are involved in any live-fire event.
 - b. Students, instructors, safety personnel, and other personnel participating in any live-fire event shall breathe from a SCBA equipped with a PASS device, whenever they are operating under one or more of the following conditions:
 - (1) In an atmosphere that is oxygen deficient or contaminated by products of combustion, or both.
 - (2) In an atmosphere that is suspected of being oxygen deficient, contaminated by products of combustion, or both.
 - (3) In an atmosphere that can become oxygen deficient, contaminated, or both.
 - (4) Below ground level.
 - c. PPE shall meet the requirements of WAC and NFPA standards.
 - d. Safety functions of PPE shall not be disabled for any reason. Malfunctioning or out of service PPE shall not be used.
 - e. PPE inspections and function check shall be conducted by all participants following rehabilitation and prior to returning to live-fire exposure.
 - (1) PPE found damaged or defective shall be taken out of service, reported, and documented immediately; live-fire events will be stopped accordingly.
 - (2) Conditions contributing to the damage shall be evaluated and mitigated by the Lead Instructor and Safety Officer prior to resuming the live-fire event.



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- (3) Crazing of a SCBA face piece is a “near miss incident” and shall be reported and documented as such.
 - (4) Damage to turnout gear, helmets, or other PPE by heat exposure is a “near miss incident” and shall be reported and documented as such.
 - (5) A temperature monitoring report shall be printed off and used to evaluate the conditions; include a copy of the report with the near miss report.
25. Horseplay, pranks, practical jokes, and senseless playful acts disregarding safety are not permitted at any time or during any activity at the FTA. It is the policy of the FTA that in no case shall any act or activity be permitted, regardless of purpose, that has not been reviewed and approved by the Safety Officer and supervised by an approved instructor.

Approved: _____

Commander Washington State Patrol Fire Training Academy

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Supersedes:
Applies to: All FTA Personnel

Effective Date: TBD
See Also:
CALEA:
