

TRAINING BULLETIN NUMBER 77
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LIVE FIRE TRAINING

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I. INTRODUCTION

Live Fire Training provides valuable experience and is an excellent means of training Firefighters. While this type of training provides high levels of realism, it obviously carries with it most of the hazards of firefighting at an actual incident. Live Fire Training Evolutions must be planned with great care and supervised closely by qualified instructors.

The standard set forth in this bulletin deals with the training of Firefighters under live fire conditions. The focus is on training in coordinated fire suppression, support, and control activities with minimum risk for the participants. Live Fire Training Evolutions conducted in accordance with this standard shall be managed using a documented incident command structure. The line of authority shall be made clear to all participants to ensure that both expected and unforeseen situations will be managed efficiently and safely.

This standard is designed to ensure adequate levels of safety while allowing some flexibility to apply independent judgment based on local situations and the training objectives to be accomplished. This standard does not include aircraft, marine structures, vessels, refineries or wildland fire training.

Live Fire Training Evolutions can be conducted in either a Training Center Burn Structure, such as a reinforced concrete drill tower, steel flashover container or in a vacant structure acquired by the Department, from a property owner, for the purpose of conducting Live Fire Training Evolutions.

Live Fire Training Evolutions are normally conducted as the final phase of basic training or as an ongoing means of maintaining and improving acquired skills. In both instances they are an important means by which the Firefighter can demonstrate and practice acquired skills and further develop an appreciation of the necessary safety aspects of firefighting.

II. **APPROVAL PROCEDURES**

Planning activities shall be coordinated through the In-Service Training Section with approval from the Bureau Commander, Bureau of Emergency Services. For approval of recruit training sessions the approving authority shall be the Assistant Bureau Commander, Bureau of Human Resources. The In-Service Training Section will assist in developing training objectives, instructional staff, and practical application of the National Fire Protection Association's "Standard on Live Fire Training Evolutions," NFPA 1403.

The training site will be inspected, as outlined in Item VI (Training Sites) prior to submittal for approval. Availability of dates must be acquired and verified through the In-Service Training Section, Operations Control Division (OCD), and the Department Safety Officer. To comply with the South Coast Air Quality District (SCAQMD) requirement, the Training Officer must contact SCAQMD the afternoon prior to the Live Fire Training Evolution at 1-800-442-4847 for permission to burn.

III. **TRAINING OFFICER**

The officer in charge of the training activities will be designated as the Training Officer and, as such, is responsible for:

1. Obtaining permission, as outlined in Item II (Approval Procedures), Live Fire Training Evolution.
2. Identifying a Safety Officer or Officers, as needed, to safely conduct the exercise.
3. Designating instructors to assist in developing training objectives, filling preparatory staff and planning positions, and developing needed logistical support for the Live Fire Training Evolutions. All instructors shall be certified by the Department to deliver Live Fire Training.
4. Considering the circumstances of each training session and providing suitable provisions for rest and rehabilitation of participants at the scene. These considerations shall include medical evaluation and treatment, food and fluid replenishment, and relief from climatic conditions, according to the circumstances of the training session.

- The Training Officer shall address the safety of participants and assess conditions that can lead to rapid uncontrolled burning, commonly termed "flash over." These conditions include the heat-release characteristics of the fuels involved, preheating by radiation and convection, combustible wall and ceiling coverings, room size and geometry, construction type, and the ratio of fuel to room size. In addition, the arrangement of the fuels along with the location and size of ventilation openings are important factors to be considered when assessing potential fire growth.
 - Determining the expected avenues of fire spread and rate of fire development provides an extra degree of safety for the participants. Voids can result in unexpected vertical and horizontal spread of the fire, which may cut Firefighters off from available exits and contribute to early structural failure.
5. Determining, prior to each specific evolution, the position of and the number of apparatus, attack lines, back-up lines, and exposure lines that will be necessary. Hand lines shall be capable of delivering a minimum of 100 gpm.
 6. Determining Instructor and Firefighter assignments. Crew or company size shall not exceed five members including the officer. An Instructor and Lead Instructor shall be assigned to each function such as fire attack, back-up, ventilation, etc.
 7. Designating a Primary Instructor as the "Ignition Officer" to control the materials being burned.
 - The "**Ignition Officer**" shall wear full protective clothing, including SCBA, when performing this function. The Safety Officer and a charged hose line shall accompany the Ignition Officer when igniting any fire.
 - The Live Fire Training Evolution shall be immediately stopped if the Training Officer determines, through continuing assessments, that the combustible nature of the environment represents a potential hazard. The evolution shall continue only when the appropriate corrective actions have been taken to reduce the hazard.

IV. SAFETY OFFICER

A Safety Officer or Officers must be appointed for all Live Fire Training and not be assigned other duties that may interfere with safety responsibilities. The Safety Officer has the authority to intervene and control any aspect of the Live Fire Training when a potentially unsafe condition exists.

The Safety Officer reports to the Incident Commander and is responsible for preventing unsafe acts and elimination of unsafe conditions including but not limited to:

1. Ensuring that manual safety devices on the apparatus being utilized are staffed.
2. Ensuring that all members wear their safety equipment, as outlined in the Manual of Operation, prior to their participation.
3. Verifying that sufficient back-up lines to protect members on attack lines and additional safety personnel have been provided should an unplanned situation or condition occur.
4. Ensuring that flammable or combustible liquids are not used on Live Fire Training Evolutions in structures.

To provide for safety of the participants, the Safety Officer will coordinate with the Rescue Ambulance on standby to ensure their readiness in an emergency.

No person shall be placed inside the training building to simulate a victim.

All participants shall follow Department policy as outlined in the Manual of Operation regarding protective clothing and equipment when involved with any Live Fire Training Evolution. Each participant shall be equipped with full protective clothing and self-contained breathing apparatus. All participants shall be inspected by the Safety Officer prior to entry into a Live Fire Training Evolution to ensure that protective clothing and SCBA are serviceable and being properly worn.

All participants involved in any evolution or fire suppression activity shall breathe from a SCBA air supply whenever operating in an atmosphere that is suspected to be or that may become oxygen deficient and/or contaminated by products of combustion.

v. PRE-BURN PROCEDURES

Prior to conducting Live Fire Training, the Training Officer will conduct a pre-burn briefing with all officers involved to ensure they are thoroughly familiar with the training site and any manual safety devices. The Training Officer will:

1. Conduct a pre-burn walk through for all officers.
2. Review all training activities and procedures to be used.
3. Review all safety equipment and procedures to be used.
4. Review the Incident Command Structure and how it will be utilized during the training activities.
5. Review a pre-burn plan document that indicates all the features of the training site along with evacuation routes, should an injury or mishap occur.

VI. TRAINING SITES

A. Preparation of Training Center Burn Structures

Training Center Burn Structures shall be visually inspected for damage prior to Live Fire Training Evolutions. Damage should be documented. The structural integrity of the building should be evaluated and documented at least annually or at more frequent intervals if needed.

To ensure proper operation, all safety devices, doors, windows, window shutters, roof shutters, automatic ventilators, mechanical equipment, lighting, sprinklers, and standpipes, shall be checked and operated, where appropriate, prior to any Live Fire Training.

B. Preparation of Vacant Structures

1. Prior to conducting any Live Fire Training in a vacant structure, the Training Officer shall conduct a structural integrity inspection. The owner must provide the Training Officer conducting the inspection with written permission to use the facility.
2. A copy of an approved demolition permit issued through the Department of Building and Safety shall be provided prior to acceptance of any building by the Department for the purpose of Live Fire Training.
3. Documentation that any asbestos hazard has been properly disposed of shall be required.
4. Verification of notification to utility companies to disconnect service and to remove wires and meters.
5. All documentation shall be submitted to the Bureau Commander, Bureau of Emergency Services for review and final approval.

To provide maximum safety and control, a careful inspection shall be conducted to determine that the following items have been addressed:

1. Roofs, floors, railings, and stairs shall be made safe. Carpets, linoleum, and asphalt floor coverings must be removed.
2. Potential chimney hazards shall be reduced.
3. Closed containers such as water heaters shall be removed or sufficiently vented to eliminate an explosion or over pressure rupture.
4. All walls and ceilings shall be intact or patched.
5. Low density combustible fiber board, celotex, and unconventional interior finishes that could contribute to an unanticipated increase in fire intensity shall be removed.

6. All doors and windows shall be removed. Windows may be covered with plywood sheeting in such a manner that it can be easily removed from the interior or exterior of the structure.
7. Debris contributing to unsafe conditions shall be removed.
8. Utilities shall be disconnected. Service wires and meters shall be removed.

Buildings that cannot be made safe, as required above, shall not be utilized for interior Live Fire Training.

C. Exposure Considerations

Adjacent buildings or property that might become involved shall be properly protected or removed. Utility services adjacent to the burn area shall be removed or protected.

Trees, brush, and surrounding vegetation which creates a hazard to participants shall be removed. Combustible materials, other than those intended for the Live Fire Training Evolution, shall be removed from the structure or safety perimeter, or stored in a protected area to preclude accidental ignition.

Property adjacent to a training site which could be affected by the smoke, such as railroads, airports, schools, hospitals, or other similar facilities, shall be identified, and the person-in-charge of that facility informed of the date and time of the Live Fire Training Evolution.

D. Water Supply

The water supply for any Live Fire Training Evolution shall be carefully assessed taking into consideration the types of evolutions, the extent of the evolutions, the size and construction of any building involved, the fuel load to be involved, attack methods to be used, the protection of exposures and the requirements of all back-up lines used to protect personnel.

Separate sources shall be utilized to supply attack and back-up lines to prevent total water supply loss.

Reliability shall be considered when determining what constitutes separate sources. The intent here is to prevent simultaneous loss of both attack and back-up lines in the event of a pump failure or supply line failure.

E. Staging

Adequate areas for the staging, spotting, and operating of fire apparatus being used in the Live Fire Training Evolution shall be designated and included on the site plan. Apparatus shall be positioned to assure prompt response in case of an emergency.

F. Base

A secure base area shall be designated to park apparatus not involved in the evolution. A "rehab" area shall be provided for participants that are not involved with the current evolution. The location selected shall not interfere with fire ground operations.

G. Spectator Safety

All spectators shall be restricted to an area outside the operational area established by the Safety Officer.

Fire line markings, signs, or barricades, as needed, shall be posted to clearly identify the perimeter of the operational area.

Visitors allowed within the perimeter to observe operations and evolutions shall be escorted, at all times, and will be required to wear appropriate protective clothing.

Streets or freeways in the vicinity of the training site shall be surveyed for potential impact from Live Fire Training Evolutions. Appropriate steps shall be taken to protect motorists. Such steps may include street closures, detours, signs, and traffic controllers. Give consideration to traffic flow and periods of peak usage. If necessary, conduct the Live Fire Training Evolutions during periods of light traffic. Contact the Department of Transportation district office for traffic control, signs, and barriers. Notify the California Highway Patrol if the training site is near a freeway.

Fire lines shall be established for the purpose of keeping pedestrian traffic clear of the operational area of the training site. Contact the Police Department for assistance with fire line control and security, if necessary.

Awareness of current and predicted weather conditions, especially wind direction and velocity shall be maintained. In all cases, immediately before any actual ignition, a final check of the weather conditions shall be made. Live Fire Training Evolutions should be planned for periods of mild weather and good air quality.

All possible sources of ignition, other than those under the direction of the Ignition Officer, shall be removed from the safety perimeter.

H. Fuel Materials

The fuels that are utilized in Live Fire Training Evolutions shall have known burning characteristics of such a nature to be as controllable as possible. Unidentified materials, such as debris found in and around the structure, which may burn in unanticipated ways, react violently, or create environmental or health hazards, shall not be used. Fuels that may be contaminated by toxic or unknown materials shall not be used.

The quantity of fuel used shall be limited to the minimum amount required to create the fire size necessary to meet the training objective of the Live Fire Training Evolution.

It should be understood that it is not necessary to have large fires to teach fire behavior and most basic evolutions and tactics. If, for example, the objective of the training evolution is coordination of multiple attack lines, a larger fire may be required. The key element is to maintain a fire that is controllable.

For interior Live Fire Training Evolutions only Class "A" materials such as pine excelsior, wooden pallets, straw, paper, and other ordinary combustibles shall be used as fuel. Pressure treated wood, rubber, and plastic materials shall not be used. The use of flammable or combustible liquids is prohibited for use in Live Fire Training Evolutions in structures.

I. Fire Growth

The Training Officer shall assess the selected fire room environment for factors that will affect the growth, development, and spread of fire.

VII. **MEDICAL UNIT**

A Medical Unit shall be established using the assigned Rescue Ambulance. It should be easily accessible and included on the site plan. Assigned uniformed personnel shall provide medical treatment, arrange for hospital transport, as needed, and document all reported injuries, no matter how slight.

VIII. **SUPPLY UNIT**

A Supply Unit should be established to provide replacement air bottles, and miscellaneous equipment. Consideration should be given to providing a Food Service for fluid replacement and snacks. The location selected should be accessible for participants and included on the site plan.

X. **DOCUMENTATION UNIT**

The following reports and records shall be maintained on all Live Fire Training Evolutions in accordance with this standard:

1. Site plan, burn plan, and operational plan.
2. A list of instructors present and their assignments.
3. A list of all other participants.
4. Documentation of unusual conditions encountered.
5. Documentation of any injuries incurred and treatment rendered.
6. Documentation of any changes or deterioration of training center, burn buildings, or props.
7. Documentation of physical inspection of all personal safety equipment.

8. Records and approvals pertaining to the buildings used for Live Fire Training Evolutions.
9. Documentation of the training exercise at the beginning and conclusion as to the condition of the premises and adjacent area.

Upon completion of the training session, vacant structures shall be secured as needed or as per written agreement with the property owner or responsible party. The control of the property shall be returned to the property owner before the Fire Department leaves the drill site.

A post-training analysis shall be conducted to evaluate participant and instructor performance and to reinforce the learning experience of all participants.

XI. GLOSSARY OF TERMS

Incident Commander "IC"

The individual responsible for the management of all incident operations at the incident site.

Ignition Officer

The Primary Instructor assigned to control all materials being burned and sources of ignition.

Instructor

A member who, based on training and experience, is certified by the Department to deliver any portion of the course instruction with Lead Instructor supervision.

Lead Instructor

A certified Instructor who, based on training and subject matter expertise, is certified by the Department to be responsible for instruction, supervision, and evaluation of participants in their assigned portion of the course.

Live Fire

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

Participant

Any student, instructor, officer, visitor, or other person who is involved in the Live Fire Training or instruction within the operations area.

Primary Instructor

A Fire Officer, certified Lead Instructor, who based on education, training, experience, and subject matter expertise, is certified by the Department to serve as a Division or Group Supervisor (i.e., Ignition Officer, or Safety Officer) for any Live Fire Training and be responsible for instruction, direction, and evaluation of Lead Instructors.

Safety Perimeter

The area surrounding the Live Fire Training Evolution where all the hazards associated with live fire and firefighting exist. Participants operating in this area must be trained, protected, and have assigned involvement in the evolution.

Safety Officer

The Primary Instructor assigned to maintain a safe working environment during all Live Fire Training Evolutions. The Safety Officer reports directly to the Incident Commander.

Training Officer

The Primary Instructor designated by the Department to be "Instructor-in-Charge" of Live Fire Training. The Training Officer is responsible for planning the training, documentation, direction, and evaluation of instructional staff, and reports to the Incident Commander.

Training Center Burn Structure

A building specifically designed to conduct Live Fire Training Evolutions on a repetitive basis. It shall not include a building or portion thereof that is primarily used for training in the use of breathing apparatus where only smoke conditions are created.

XII. INSTRUCTOR SELECTION CRITERIA AND PROCESS

The inherent danger involved when conducting a Live Fire Training Evolution requires the use of qualified instructors. The Los Angeles City Fire Department has identified four levels of instructional staff:

- Primary Instructor
- Lead Instructor
- Instructor
- Training Officer

Qualifications for each of these levels is based on teaching experience and subject matter experience.

NOTE: This selection criteria is based on the requirements of NFPA 1403 and the specific needs of the Department.

Selection Criteria

Primary Instructor

Responsible for instruction, direction, and evaluation of Instructors and Lead Instructors. Serve as Division or Group Supervisor, Safety Officer, Ignition Officer or any other ICS position in the Live Fire Training Program.

Requirements:

- Certified Lead Instructor
- Any Officer
- Meet any one of the following:
 1. Completed Fire Instructor IA and 1B.
 2. Have a valid Community College teaching credential.
 3. Completed the UC/CSU 60 hours Techniques of Teaching Course.
 4. Completed the NFA's Fire Service Instructional Methodology Course.
- Received two written evaluations from different Primary Instructors who have observed actual teaching, supervision and evaluation techniques.

Lead Instructor

Responsible for instruction, supervision, and evaluation of participants in any portion of the Live Fire Training Program.

Requirements:

- Certified Instructor in the Live Fire Training Program
- Any rank

Meet any one of the following:

1. Completed Fire Instructor IA and 1B.
2. Have a valid Community College teaching credential.
3. Completed the UC/CSU 60 hours Techniques of Teaching Course.
4. Completed the NFA's Fire Service Instructional Methodology Course.

Possess a thorough knowledge of the following:

1. Fire Behavior
2. Fireground Supervision
3. Fireground Safety
4. Firefighting Tactics and Strategy

- Completed at least 40 hours of instruction in the Live Fire Training Program.
- Received two written evaluations from a Primary Instructor who has observed actual teaching technique delivery.

Training Officer

Designated by the Department to be the "Instructor-in-Charge" of the Live Fire Training Evolution. Responsible for planning the evolution, documentation, direction, and evaluation of instructional staff, and assists the Incident Commander in managing the course.

Requirements:

- Certified Primary Instructor

Selection Process

The In-Service Training Section shall handle the certification and tracking of all Live Fire Training Instructors.

Members interested in becoming certified as a Live Fire Training Instructor, Lead Instructor or Primary Instructor shall submit a resume with proof of instructor training attached.

The In-Service Training Section will select Instructors based on the established criteria.

Lead Instructors and Primary Instructors will be selected based on the established selection criteria and the recommendation of the evaluating Primary Instructors.

The Training Officer shall be selected by the Bureau Commander who approves the Live Fire Training Evolution. The In-Service Training Section can provide assistance in the selection of a Training Officer.

The In-Service Training Section shall maintain records on the number of course deliveries for all Live Fire Training Instructors, Lead Instructors, and Primary Instructors.

IX. LIVE FIRE TRAINING ICS

This Organizational Chart represents the minimum command and control required for Live Fire Training, and shall be expanded as needed.

