

Live Fire Training: Structural

Instructor Teaching Objectives for LFT-S:

1. The safety of all participants will be the foremost deciding factor when determining what activities and training evolutions will be carried out.
2. Through the use of the **SFM-TD Standard Operating Procedures for Live Fire Training Manual**, the instructors shall determine what level of protective equipment shall be necessary for each type of activity or evolution and shall then ensure that the **SOP** is followed by all those participating (including instructors and support personnel).
3. Instructors shall describe and demonstrate (when possible) the principles, differences and relationship between fire theory and fire behavior.
4. Instructors shall explain thermal layering.
5. Instructors shall explain the difference between rollover and flashover. **THE ONLY TIME A FLASHOVER COULD BE DEMONSTRATED IS AFTER EVERYONE HAS SAFELY EXITED THE STRUCTURE AND SHOULD BE OBSERVED FROM A WINDOW OR DOORWAY OPENING ON THE OUTSIDE OF THE BUILDING.**
6. Instructors shall explain to and assist the students in understanding the proper methods for attacking and extinguishing a free burning fire in an enclosed environment.

7. Instructors shall explain and demonstrate the benefit of using a narrow to medium fog pattern (instead of a wide or full-fog pattern) to reduce the chances of disturbing the thermal balance in the room.
8. Instructors shall assist the student in proper methods of hydro-ventilation through a hinged, exterior window or door, explaining the benefits of this procedure as it is being done.
9. Instructors shall demonstrate proper nozzle operations including, pattern adjustment, gallonage, and on/off operation, prior to the student being allowed to enter the structure and attack the fire.
10. While inside the structure, Instructors must monitor students for signs of anxiety or fatigue. If a student needs to leave the building or is requested to leave, an Instructor shall escort them out. When that Instructor is finished inside the structure, they should contact that student and see if they can be of any assistance to them and explain the reasons why they were escorted outside. If escorted outside for medical reasons, the Instructor shall ensure that the student is examined by EMS on scene.
11. Instructors shall explain and demonstrate different methods of exposure protection and the proper use of each method.

Student Learning Objectives for LFT-S

UPON COMPLETION THE STUDENT SHOULD:

1. Understand the principles, differences, and relationships between fire theory and fire behavior.

2. Understand and be able to explain thermal layering and the relationship it has with creating and maintaining a thermal balance in the room.
3. Be able to explain the differences between rollover and flashover and the phenomenon that takes place with each.
4. Be able to demonstrate the proper methods for attacking and extinguishing a free burning fire in an enclosed environment.
5. Understand the advantages of using a narrow to medium fog pattern to reduce the possibilities of upsetting the thermal balance of the room.
6. Be able to demonstrate the use of and explain the benefits of hydro-ventilation.
7. Understand the purpose for entering and exiting the fire floor or area on hands and knees.
8. Understand what thermal columns are and how to control the embers that travel with them.
9. Be able to demonstrate the proper method for doing an exterior attack through windows and doors.
10. Understands what exposure protection is, methods of accomplishing it, and the additional strains this operation puts on a water supply.
11. Understand the use of and limitations of natural ventilation.
12. Understand the principles, advantages, and limitations of Positive Pressure Ventilation. (This is optional. If fan availability, structure design and quality, and fire conditions permit)

MINIMUM NUMBER OF SUPPORT PERSONNEL

All Live Fire Training will operate under an Incident Management System with a designated Incident Commander.

A-One (1) State Fire Marshal Training Division Lead Instructor

B-Assistant Instructors as determined by the SFMTD Lead Instructor (Minimum of 1 Instructor for every 5 students)

C-One (1) Lead Safety Officer

D- Two (2) additional Safety Officers, to be located on separate sides of the structure. A/B side, C/D side.

E-Additional Safety Officers as determined by the SFMTD Lead Instructor.

F-One (1) Water Supply Officer

G-One (1) Pump Officer

H-One (1) Air Supply Officer

I-One (1) EMS Unit and Personnel.

J-One (1) Door-way Safety Officer

This is only a minimum number. Where conditions exist, it may be desirable to have more support personnel to assist with safety concerns.

POSITION RESPONSIBILITIES/JOB FUNCTIONS

SFMTD-LEAD INSTRUCTOR:

1. Must inspect building prior to local entity applying for training or permits to ensure soundness of the building for live fire training evolutions.
2. Coordinate with the SFMTD Office as well as local entity as to times and dates of live fire training evolution. **(At least 45 days prior to scheduled training date)**
3. Ensure that a signed copy of the permission-to-burn form from the SFM office, a local burn permit, and a demolition permit from DEQ is applied for and has been received. **(The SFM permission-to-burn and the Local Burn Permit shall be kept on file by the Lead Instructor)**
4. Appoint Instructor Assistants as necessary.
5. Have the authority to terminate the live fire training evolution at any time do to weather, structural stability, health and safety of instructors and students.
6. SFMTD Lead Instructor shall remain in charge of the training evolution until all above-ground portions of the building are on the ground. At which time, responsibility for the structure

and the fire are reverted back to the local authority hosting the LFT.

7. SFMTD Lead Instructor shall introduce all support personnel.
8. Obtain a course enrollment form with names of all support and entry personnel and organizations being represented. **(The course enrollment forms, along with all the required permits are to be returned to the TDO within 5 days)**
9. Discuss all evolutions and make appropriate assignments.
10. Discuss protocol for actual fire call (one truck to be left at burn building).
11. Determine evacuation signal and safe haven (air horn blast or siren blast of 15 seconds)
12. Discuss procedures for low water problems (extinguish the fire until water supply can be re-established)
13. Ensure that Host Department personnel have first opportunity to enter structure.
14. Monitor placement of hose lines for safety purposes.
15. Keep abreast of current and/or changing weather conditions.
16. Ensure the use of minimum 1 ½ inch or 1 ¾ inch hand lines, set on minimum 95 GPM at desired pattern for interior operations. Larger lines may be needed for exterior and exposure protection.

17. Notify Lead Safety Officer and Water Supply Officer when interior evolutions are terminated.

18. Conduct a post-burn de-briefing and participant evaluation.

19. Discuss problems encountered (If any)

20. Immediately notify SFMTD Chief Instructor or Full-Time Instructor for that area, of any injuries to participants or damage to equipment and also the Supervisor of the injured party.

21. Ensure that students participating on interior fire attack training meet the requirements as stated in NFPA 1403, which are the job performance requirements listed in NFPA 1001.

22. Assign Instructor Teams to all 4 sides of structure to monitor exposure protection, ember patrol, and collapse zones.

23. Shall establish a hazard zone area.

INSTRUCTOR ASSISTANTS

1. Assist the SFMTD Lead Instructor with registration of all participants.

2. Assist the SFMTD Lead Instructor on all evolutions.

3. Report to SFMTD Lead Instructor any unsafe conditions or acts.

4. Have the same Safety Responsibilities as the Lead Instructor.

LEAD SAFETY OFFICER:

1. Shall oversee all duties of assigned safety officers.
2. Shall have the authority to correct any problems or immediately terminate the training at any time when in his/her opinion, a situation has become or is becoming unsafe.
3. Will have radio contact with SFMTD Lead Instructor.
4. Shall not be assigned any other duty than that of Lead Safety Officer.

DOORWAY SAFETY OFFICER:

1. Will have radio contact with Lead Instructor and Lead Safety Officer.
2. Shall monitor all safety aspects of the interior evolution and report any unsafe acts to the Lead Safety Officer and/or Lead Instructor.
3. Shall inspect all participants entering the structure to ensure they are wearing PPE meeting NFPA requirements.
4. Shall mark and keep track of attack line and safety line.
5. Intervene and control any aspect of the evolution when in his/her judgment, a potential or real danger, accident, or unsafe condition exists.
6. Maintain a head count and operate the accountability system on participants entering and exiting the structure.
7. Reports to the Lead Safety Officer.

8. Maintains radio communications with Interior Instructors.

9. Not leave the entrance doorway unmanned for any reason while the building is occupied.

10. Not be assigned any other duties that may interfere with their safety responsibilities.

SAFETY OFFICERS:

1. Shall monitor building conditions that may jeopardize the safety of participants and shall report to the Lead Safety Officer and/or Lead Instructor.

2. Shall be assigned to monitor the A/B and C/D sides of the structure to monitor exposure protection, ember patrol, and collapse zones.

3. Shall enforce the hazard zone radius that requires PPE.

WATER SUPPLY OFFICER:

1. Shall establish and maintain an adequate water supply to ensure proper water flow to the nozzles.

2. Shall establish an adequate water supply to ensure proper water flow for the involvement of the structure and protection of exposures.

3. Shall monitor water usage and ensure that a reserve water supply exists if the main water source is interrupted (i.e., booster tanks on pumpers full, tankers on scene and available to hook into pumpers or drop into folding tanks.)

4. Shall notify SFMTD Lead Instructor of low water conditions prior to booster tanks on pumpers being utilized.
5. Have communications with the SFMTD Lead Instructor and Lead Safety Officer.
6. Act as Safety Officer at folding tank or water supply locations.

PUMP OFFICER:

1. Shall ensure that pump panels are continuously monitored and manned.
2. Shall ensure that proper flow and pressure is given to attack and safety lines as well as all exposure lines.
3. Shall monitor fuel levels of apparatus and make arrangements with the host department, to have apparatus fueled if fuel gauges drop below ½ tanks.
4. Shall monitor engine heat levels and oil pressure levels of the apparatus.
5. Shall ensure that pressure relief devices are functioning and set properly.

AIR SUPPLY OFFICER:

1. Shall be responsible for filling empty SCBA bottles.
2. Shall designate a “full bottle, empty bottle” location.

3. Shall check the hydrostatic test date on the cylinders being filled and ensure that they are current. **(No bottles will be filled that don't have a current hydro date on them)**
4. Report to Lead Safety Officer any low air situations.
5. Ensure that any SCBA placed back into service is functioning properly.
6. No bottles will be filled while being worn by any firefighters, or Instructors.

SAFETY REQUIREMENTS:

1. All participants shall utilize proper fitting, protective clothing complying with NFPA standards for Structural Firefighting. This includes coats and pants with Nomex or equivalent equipment with vapor barriers; helmets with earflaps, face shield or eye protection, and chin strap; gloves (No red ball or rubber); boots; Nomex or PBI protective hoods or equivalent. No $\frac{3}{4}$ length day boots will be allowed unless worn under bunker pants. **(NO tank tops, shorts, or spandex will be worn under the bunker clothing)**
2. All jewelry will be removed, watches, rings, nose and earrings along with any piercing type jewelry.
3. **ONLY** positive pressure self-contained breathing apparatus shall be worn.
4. Absolutely no beards or facial hair that interferes with the SCBA mask seal will be allowed. **(Questions regarding the amount of facial hair on an individual will be directed toward the SFMTD Lead Instructor. Their decision is final.)**

5. The main attack and safety lines shall come off of separate apparatus set at a minimum of 95GPM.
6. Additional attack and safety lines will be placed at the entrance for the RIT team and exposure protection.
7. Participants are required to show knowledge of nozzle patterns and settings as well as SCBA emergency procedures to an outside instructor prior to entering the structure. **(No exceptions to this rule!)**
8. No “First Timers” will be allowed to enter the structure as a team.
9. “First Timers” shall notify the Doorway Safety Officer that they have never been inside before and the Doorway Safety Officer will in turn notify the Interior Instructors.
10. At least One (1) Interior Instructor shall have a portable radio that interfaces with the Lead Instructor and Doorway Safety Officer.
11. The ventilation opening will be operated by a firefighter with a portable radio that interfaces with the Interior Instructors.
12. The ventilation openings shall be hinged or sliding to facilitate opening and closing immediately after the attack is made. This will allow the room to be vented of smoke, heat, and steam and insure the safety of all inside.
13. A roof vent shall be cut and hinged to remove excess heat and smoke from the attic area.

14. All above roof portions of chimneys will be knocked down to roof level, all saddle and shelf type chimneys shall be removed. Any excessive weight loading on the roof shall be removed. All TV, Radio, and CB antennas shall be removed.

15. Multi-storied building shall be laddered in at least Two (2) separate locations. The ladders shall be secured to the structure if un-manned.

16. Interior Instructors shall work in pairs. The Lead Interior Instructor shall teach the students the proper methods of attack, hydro-ventilation, and fire behavior. The 2nd Interior Instructor shall man the nozzle on the safety line. **(No Exceptions)**

17. Additional hose lines shall be available for exposures as deemed necessary by the SFMTD Lead Instructor.

18. **No person shall be placed inside the structure to play the role of “Victim”.**

19. **Only One (1) fire at a time shall be permitted within the structure while the interior operations are being conducted.**

20. No helmet-mounted flashlights shall be allowed inside the structure during training evolutions.

21. Students shall enter and exit the fire area on hands and knees following the hose lines.

22. Anyone within the hazard zone established by the SFMTD Lead Instructor shall be in full PPE excluding SCBA.

23. A RIT team of at least 2 instructors shall be established by the SFMTD Lead Instructor. These positions may rotate through the Assistant Instructors but must always be staffed. The RIT

Team shall be immediately available near the doorway entrance for activation.

24. The Host Departments most senior chief officer on scene shall be designated the Incident Commander. They have the authority to stop the training at any time.

25. Everyone participating in the training shall be at least 18 years of age, belong to an emergency service agency, and be covered by Workers Compensation Insurance through their local organization.

26. No alcoholic beverages or drugs shall be allowed on the fire training ground.

27. Anyone that is intoxicated or unable to perform their duties on scene shall be asked to leave the training ground by the SFMTD Lead Instructor and the Incident Commander.

28. Anyone violating these or any other prudent safety rules shall be asked to leave the training ground by the SFMTD Lead Instructor and the Incident Commander.

29. An accountability system will be used on the training ground for **ALL PARTICIPANTS** and shall be monitored by the Doorway Safety Officer.

HOSE LINE ASSIGNMENTS:

1. Two (2) Interior Instructors shall be inside the structure at all times; they may rotate duties.

2. Attack lines:

1 ½ inch or 1 ¾ inch at 95GPM minimum

Nozzle operator

Back-up person on attack line
Interior Instructor at all times with nozzle person

Safety lines:

1 ½ inch or 1 ¾ inch at 95GPM minimum
Back-up person on safety line
Interior Instructor at nozzle position.

3. Participants shall rotate forward to the attack line nozzle position.

STAGING AREA:

1. For additional apparatus and support vehicles.
2. For EMS units on scene.
3. For air supply and support systems.
4. Rest and rehab area for participants.

FUEL TYPES:

1. Fuels utilized shall have known burning characteristics of such nature to be as controllable as possible. Un-identified materials such as debris found in or around the structure, which may burn in unanticipated ways, react violently, or create environmental or health hazards, shall not be utilized.

2. ONLY CLASS “A” material shall be utilized and ONLY in the necessary amount to create the desired fire size.

3. Absolutely NO FLAMMABLE OR COMBUSTIBLE LIQUIDS SHALL BE USED OR EVEN ALLOWED IN THE STRUCTURE. This includes when the structure is no

longer being used for interior evolutions and is to be burnt down.

BUILDING PREPARATIONS:

1. All utilities shall be disconnected.
2. All window glass shall be removed and openings covered.
3. Horizontal hinged or sliding window openings shall be utilized in the rooms to be used for training.
4. Vertical hinged or sliding ventilations openings (that can be operated from ground level) shall be utilized on the roof for attic openings.
5. Hot water heaters, fuel tanks, and all closed vessels shall be removed or vented.
6. All above roof portions of chimneys will be knocked down to roof level, all saddle and shelf type chimneys shall be removed. Any excessive weight loading on the roof shall be removed. All TV, Radio, and CB antennas shall be removed.
7. Holes in walls and ceilings that may aid the spread of fire shall be covered.
8. All hazardous materials shall be removed (i.e., paint and aerosol cans, weed killers, etc.)
9. All rooms shall have doors removed to prevent back draft potential.

10. If suspected asbestos is found inside or outside of the structure, the SFMTD Lead Instructor shall not schedule the training until the asbestos has been removed.

11. All outdoor hazards shall be covered, guarded, or removed to prevent injuries to participants.

12. All building preparations shall be the responsibility of the host department.

EMS:

1. There shall be One (1) EMS transport unit on scene at all times. If the EMS unit leaves, the training evolution shall stop until another unit is on scene. The EMS unit shall be staffed by trained individuals.