



ANN ARBOR FIRE DEPARTMENT

Standard Operating Procedures – 2.09 Live Fire Training



LIVE FIRE TRAINING

Effective: August 20, 2021
Scheduled Review: August 20, 2023
Approved: Fire Chief Mike Kennedy

I. PURPOSE

The purpose of this procedure is to ensure compliance with the intent of National Fire Protection Association (NFPA) Standard 1403: “Standard on Live Fire Training Evolutions.” The ongoing training of firefighters is the cornerstone of good fire protection. However, the benefits derived from live fire training can be negated by the injuries and deaths suffered by fire fighters under unsafe and poorly supervised training conditions. AAFD is committed to providing high quality live fire training that utilizes industry best practices and identifies safety as a top priority.

II. LIVE FIRE PLANNING

- A. All live fire training evolutions require prior approval by the training division and assistant chief of operations or fire chief.
- B. An instructor who has completed the International Society for Fire Service Instructors (ISFSI) - Live Fire Fixed Facility Instructor shall be present for all live fire training. A Michigan Fire Fighters Training Council Instructor I shall be present for all live fire trainings. This may be same person as the ISFSI instructor.
- C. Only clean wood and straw shall be used in the designated portion of the burn trailer. No synthetic materials, OSB, plywood, flammable liquids, flammable gas, or other materials shall be burned. Burning shall only occur on the burn rack. The fuel package used shall be limited to avoid conditions that could cause flashover or backdraft. Fuel materials shall be used only in the amounts necessary to create the desired fire size.
- D. A rated fire pump capable of supplying a minimum of 750-gpm shall be used for all live fire training.
- E. The engine shall be supplied with minimum one 4” or 5” supply line. The engine shall be positioned so the driver / operator has a clear line of site of the burn trailer.
- F. All student and instructor lines may be supplied off of the same engine. It is not necessary to lay a second supply line to a second hydrant. All hoselines shall be minimum 1¾” with nozzles rated for 95-gpm or greater. Booster lines shall not be used for live fire training. There shall be three hoselines:
 - i. Ignition officer line
 - ii. Fire attack (may be stretched off an apparatus as part of the evolution)
 - iii. Back-Up (must be on the ground, charged prior to start of evolution)
- G. No interior line shall be supplied directly off a hydrant.
- H. All lines must be supplied off of separate discharges. No lines shall be supplied off of a wye gate. Three lines = three discharges.
- I. All facets of each evolution to be conducted shall be discussed in the pre-burn briefing, and assignments shall be made for all crews participating in the training session.
- J. The location of simulated victims is not required to be disclosed, providing that the possibility of victims is discussed during the pre-burn briefing. Mannequin “victims” shall not be clothed in bunker gear. At no time shall humans be used as victims.



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- K. Burn evolution sheets shall be completed for each drill and submitted to the training division at training completion.

III. ASSIGNMENTS

These are minimum numbers for evolutions. Complex or extended operations shall require additional personnel at the discretion of the Instructor-In Charge working in concert with the Safety Officer.

Minimum overhead and support personnel needed (5):

- 1 Instructor-In Charge (IIC),
- 1 Safety Officer
- 1 Ignition Officer
- 1 Functional Instructor
- 1 EMS Officer / Pump Operator

Minimum Instructional Staff:

1 Instructor per 5 students. Note: AAFD, as the AHJ, allows company officers to serve as instructors for their crews.

Personnel serving the function of Instructor-In-Charge, Safety Officer, and Functional Instructor need to have completed the internal Safe Live Fire course and approved by the training officer, assistant chief of operations, or fire chief.

- A. Instructor-In-Charge (IIC) has overall responsibility and authority for managing and coordinating the drill. The IIC is responsible for executing the approved attack plan and filling out the Burn Evolution form.
 - i. Radio designator is “Command”
 - ii. A command post shall be established and positioned to afford maximum visibility of the structure and operating companies.
 - iii. Will assign instructors and rotate as necessary.
 - iv. Will ensure that each drill is conducted in accordance with the latest version of NFPA 1403 and that all instructors participating in this drill have been given an opportunity to review this SOP.

- B. Safety Officer is responsible for ensuring that conditions, policies, and practices are conducive to presenting a safe learning environment. The Safety Officer shares the responsibility to ensure that the exercises are conducted in compliance with NFPA 1403 and that department SOPs related to live fire training are adhered to.
 - i. Radio designator is “Safety”.
 - ii. Responsible for the safety of all participants and spectators at the scene of the training session.
 - iii. Has authority to stop all unsafe acts and correct any unsafe conditions.
 - iv. Shall wear full PPE during all evolutions including a SCBA, face mask shall not be donned but must be readily able to be donned.
 - v. Maintain a state of readiness to assist with a MayDay or Evacuation Order



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- C. Ignition Officer is maintaining the integrity of the fire and ventilation control to achieve the desired amount of fire, smoke, and heat.
The materials used in the burn should not exceed the limits listed in this SOP.
Ignition Officer responsible for the ignition of the fire.
- i. Radio designator is “Ignition”
 - ii. The ignition team consists of the Ignition Officer and the Functional Instructor.
 - iii. The ignition team shall have a separate, dedicated hoseline.
- D. Functional Instructor works with the Ignition Officer for maintaining the integrity of the fire and ventilation control to achieve the desired amount of fire, smoke, and heat. The instructor shall advise the IIC when the ignition team is ready for the attack crew.
- i. Radio designator is “Instructor”
 - ii. The ignition team consists of the Ignition Officer and the Functional Instructor.
 - iii. The Functional Instructor shall work with the fire attack on the objectives in the lesson plan and provide instructional direction to the attack team.
 - iv. The ignition team shall have a separate, dedicated hoseline.
- E. Backup Team is staffed with a charged back-up line, in position to assist in fire extinguishment and rescue of interior personnel. This group will be staffed with MFFTC certified firefighter I&II (not student fire fighters) and shall consist of a minimum of two fire fighters.

IV. ORDER OF OPERATIONS

- A. Set-up: According to the site plan unless conditions dictate a change.
- B. Briefing: IIC will conduct a briefing for all instructors and students to ensure that everyone understands the “Rules of Engagement.”
- C. Building Survey: Check the interior for any tools, equipment, animals or persons.
- D. Assignments: Assume assigned positions and flow lines.
- E. Ignition: The Ignition Officer will coordinate lighting fires with the IIC. Ignition Officers shall not ignite for more than one (1) consecutive evolution.

IIC will conduct a final inventory including the following items:

- Walk through drill ground and building ensuring all is ready.
- Ensure enough and appropriate apparatus is available and ready for use.
- Enough equipment.
- Adequate water supply.
- Safety equipment ready for use.

It is the responsibility of all students to follow the guidelines as explained by the instructors.
It is the responsibility of all instructors to adhere to this SOP in its entirety.

V. POST-BURN OPERATIONS

- A. Shutting down: Begin the demobilization process at the discretion of the Instructor-in-Charge. Leave at least one line in operation until the fire is “dead out.”



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- B. Firefighter Rehabilitation: Ensure firefighters are hydrating and using wipes to decontaminant soot from skin.
- C. Post Incident Analysis: IIC will conduct an on-site debriefing for all participants.
- D. Burn Building Clean up: All materials involved in the burn will be thoroughly doused and allowed to cool for 24 hours. After 24 hours, the material should be disposed of in the appropriate receptacles. All mannequins used in the evolution shall be cleaned and checked for integrity. Any damage should be noted and reported to the training division.
- E. All personnel participating in live fire training are encouraged to shower after evolutions and wash turnout gear following scheduled training evolutions. For scheduled multi-day evolutions, gear may be washed after the final training day.

VI. LESSON PLAN - LIVE BURN EVOLUTIONS

Reading and other assignments:

- AHJ-specific handouts that the instructor may provide

Teaching and Learning Aids:

- Fire suppression, ventilation, and support equipment
- Optional chalkboard or easel pad

Time: 1 to 3 hours depending on number of students

Teaching and Learning Domain: Psychomotor

Student Performance Objective (SPO):

The student will be able to select the correct hose and nozzle for a given fire incident within a structure, recognizing potential hazards and likely fire behavior, and initiate an interior fire attack.

Enabling Objectives:

EO 1 Select the correct nozzle and hose for a fire within a structure

EO 2 Describe fire behavior and hazards within a structure

EO 3 Demonstrate advancing a hoseline for interior attack and suppressing a fire

Overview:

- Selecting hose and nozzle
- Fire behavior
- Fire suppression

General

This lesson contains two scenarios: a fire on the first floor and a basement fire. There are not any “curves”; no lost firefighters, multiple fire locations, obstructions and entanglements, or complicated rescues. It is straightforward-select a hoseline, advance the hoseline, suppress the fire, the retreat the line. We are not “testing” the firefighters, seeing how hot we can make the burn or how much fire we can create in the building.



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The keys to these evolutions are safety and reinforcing basic skills. Follow the safety policy established by AAFD without exception. Ensure that all of the students have the opportunity to practice the fundamental skills of fire suppression and hose handling.

Logistics

Simply put, this lesson requires the basic tools, apparatus, and water supply necessary to combat a room and contents fire within a structure. This includes ladders, forcible entry tools, hoselines, SCBA, full turn-out gear, etc. Some specific requirements include:

- SCBA
- Two separate water sources (booster tank counts for one source)
- Extra SCBA bottles or air-supply apparatus or equipment
- Personal accountability system
- Radio communications between IC, safety, and all interior personnel
- Rehabilitation equipment and supplies
- Basic life support vehicle

Scenarios

There are two simple scenarios for this lesson: room and contents fire on the first floor and a room and contents fire in the basement. For each evolution, there will be a crew assigned to fire attack and another as a back-up line. The remaining crews will standby for assignment. After each evolution, the crews will rotate: the attack crew will move to rehab or standby, back-up crew moves to attack, and stand-by crews to back-up. Continue in this manner until at least each crew has had an opportunity to fill each role.

First Floor Room and Contents Fire

This is the most basic evolution in the live burn exercises. A single fire is lit on the main level. The attack crew, led by a student and supervised by a support instructor, will select the appropriate diameter hoseline and nozzle type, describe potential hazards and expected fire spread, and advance on the fire. The crew will then demonstrate typical fire attack tactics (direct, indirect, or combination) the hydraulically ventilate the burn area. After ventilation, the crew will safely back the line out of the building and all crews will switch roles. A critique will follow each evolution.

Basement Room and Contents Fire

Once all crews have rotated through the first scenario, this second scenario will begin. Again, this is a single fire (representing room and contents) but it is lit in the same location. The only difference in the evolutions, then, is the need to advance the hoseline down from on top of the trailer down the stairs. The important point of this scenario is effective hose handling. If the students advance up the stairs, they should extend the line to the landing above the fire floor and route the hose to the outside of the stairwell.

Aside from the above considerations, the remainder of the scenario should mirror the actions of the first floor room and contents fire scenario-select the correct hose and nozzle, advance the line, suppress the fire, ventilate, the retreat. Switch crew roles at the end of each evolution and critique the fire attack.



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Summary:

Lesson 1: Live Burn Evolutions

Student Performance Objective (SPO):

The student will be able to select the correct hose and nozzle for a given fire incident within a structure, recognizing potential hazards and likely fire behavior, and initiate an interior fire attack.

Review:

- Selecting hose and nozzle
- Fire behavior
- Fire suppression



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Live Fire Burn Evolutions

Date: _____ Person Completing Form: _____

Location: Wheeler Training Trailers Assigned Radio Talk Group: InterOp10 (need to call EHP Dispatch to reserve)

Pre Burn Inspection

Area	Damage or Defects
Burn Room – interior burn area	
Exterior of the burn trailer	

- Washtenaw Metro Dispatch must be contacted prior to any burning. (734)994-2911
- All instructors must be knowledgeable on NFPA 1403 provisions.
- ***Copy of NFPA 1403 must be at burn site and accessible to all participants***

All participants briefed on:

Safety Officer Initials

1. Pre-plan of the exercise to be conducted	
2. Accountability system	
3. Assigned radio talk group	
4. Crew and instructor assignments	
5. Safety rules	
6. Hydration	
7. Location of EMS equipment and EMS Officer	
8. Incident commander and his/her location during the training session.	
9. Evacuation signal and procedure (shall be sounded / demonstrated)	
10. ALL MAYDAYS ARE REAL. If a Mayday occurs, the outside safety will open all windows and doors, interior safety officers will deploy to the mayday firefighter/crew. The RIC will stand by, awaiting deployment orders from the IIC.	
11. Emergency procedures to be followed in case of human or mechanical breakdown.	
12. Walk through of burn building	
13. Reporting of injury / illness	
14. Turnout gear check (NFPA 1971 & donning)	
15. SCBA check (90% full & NFPA 1981) and functional PASS (NFPA 1982)	



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Post Burn Inspection

Area	Damage or Defects
Burn Room – interior burn area	
Exterior of the burn trailer	

Post Burn Evaluation

Safety Officer Initials

• instructors & students accounted for	
• training critique conducted	
• unusual conditions or events documented	
• defective or damaged equipment documented	
• injury / illness documented	
• burn building swept clean	
• all equipment returned to proper location	

One instructor may be assigned multiple roles excluding the Safety Officer.



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Burn Evolution #1

Temperature (heat index in Fahrenheit):		
Command (Instructor in Charge):		Safety:
Ignition Officer:	Functional Instructor:	EMS Officer (Pump Operator)
Unit / Students:	Unit / Students:	Unit / Students:
Assignment:	Assignment:	Assignment:
Fire Lit Time:		Fire Out Time:

Burn Evolution #2

Temperature (heat index in Fahrenheit):		
Command (Instructor in Charge):		Safety:
Ignition Officer:	Functional Instructor:	EMS Officer (Pump Operator)
Unit / Students:	Unit / Students:	Unit / Students:
Assignment:	Assignment:	Assignment:
Fire Lit Time:		Fire Out Time:



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Burn Evolution #3

Temperature (heat index in Fahrenheit):		
Command (Instructor in Charge):		Safety:
Ignition Officer:	Functional Instructor:	EMS Officer (Pump Operator)
Unit / Students:	Unit / Students:	Unit / Students:
Assignment:	Assignment:	Assignment:
Fire Lit Time:		Fire Out Time:

Burn Evolution #4

Temperature (heat index in Fahrenheit):		
Command (Instructor in Charge):		Safety:
Ignition Officer:	Functional Instructor:	EMS Officer (Pump Operator)
Unit / Students:	Unit / Students:	Unit / Students:
Assignment:	Assignment:	Assignment:
Fire Lit Time:		Fire Out Time:



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Burn Evolution #5

Temperature (heat index in Fahrenheit):		
Command (Instructor in Charge):		Safety:
Ignition Officer:	Functional Instructor:	EMS Officer (Pump Operator)
Unit / Students:	Unit / Students:	Unit / Students:
Assignment:	Assignment:	Assignment:
Fire Lit Time:		Fire Out Time:

Burn Evolution #6

Temperature (heat index in Fahrenheit):		
Command (Instructor in Charge):		Safety:
Ignition Officer:	Functional Instructor:	EMS Officer (Pump Operator)
Unit / Students:	Unit / Students:	Unit / Students:
Assignment:	Assignment:	Assignment:
Fire Lit Time:		Fire Out Time: