

**VIRGINIA DEPARTMENT OF FIRE PROGRAMS
POLICY AND PROCEDURE**



SUBJECT: Live Fire Training Procedures

P&P 03.01.02

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CATEGORY: Safety and Risk Management

SUBCATEGORY: Safety Procedures

APPROVED BY:

EFFECTIVE DATE: 07/01/2020

REVISION DATE:


Executive Director Michael Reilly
DEPARTMENT OF FIRE PROGRAMS

FORMS REQUIRED: Several discussed within the policy

1. PURPOSE

The purpose of this document is to establish policies for conducting safe and effective live fire training evolutions, in compliance with NFPA 1403, Standard on Live Fire Training.

In the event of conflicting information in this document, the current NFPA 1403 standard shall take precedence until the conflict can be resolved.

If any interpretations of these policies cause a conflict that affects the safety and well-being of the participants in any live fire training activity in the facility The Instructor in Charge shall cease all live fire training activities until said conflict is resolved.

2. SCOPE

Conducting safe and effective live fire training evolutions is one of the most important activities associated with the use of VDFP supported live fire training structures. This policy will apply to all live fire training, along with specifically cited OSHA and NFPA standards, as well as VDFP's Live Fire Training Structure Grant Policy.

The owner of the live fire training structure, in conjunction with the Virginia Department of Fire Programs, is responsible for ensuring that the conditions, policies and practices at all live fire training facilities are conducive to presenting a safe learning environment and is responsible for the coordination of training activities and maintenance of the facility.

The Virginia Department of Fire Programs funds live fire training structures and their maintenance, fully and partially funded fire training programs, and adjunct instructor staff as needed. Failure to comply with this policy and other identified policies can cause The Virginia Department of Fire Programs to withhold allocations of funding for any of the aforementioned.

Instructors at the facility are responsible for ensuring that these policies are followed and for conducting themselves according to instructional practices as outlined under *NFPA 1041, Standards for Fire Service Instructor Professional Qualifications* and the Virginia Department

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of Fire Programs Policies at all times. They are also responsible for supervising the general conduct of their personnel and for their compliance with these policies.

Students using these facilities shall follow instructions given by those providing supervision and must abide by those policies/directives to ensure the safe and effective use of the facility outlined within this procedure.

A failure to comply with this policy and procedure could result in a suspension of VDFP sanctioned training.

3. Referenced Publications (NFPA 1403 (2018) Chapter 2.1)

A. Live Burn Forms

1. Incident Action Plan (IAP)
2. Accident Report (hard copy, to capture data until completed online)
3. Live Fire Evolution Checklist (two pages)
4. Live Burn Evaluation Form (1403 Compliance)
5. Propane Emergencies Checklist (for LPG live fire props)
6. Personal Protective Equipment and Training Accountability Form
 - a. Students and instructors must fill these forms out and they must be on file with the instructor - in - charge or the EMS officer. If the form is not completed the individual will not be allowed to participate in the evolution.
7. Live Burn Accountability (Medical Form) two pages
 - a. Before the day's training begins each student and instructor must fill out a "Live Burn Accountability Medical Form" and return it to the Instructor - in - Charge. This form is essential. In the event that a student or instructor gets hurt or becomes unconscious, this form will have all of the emergency information about the individual. It will assist the EMS providers and hospital with updated information, who to call, any present conditions, and any medications, etc.
8. Logistics Checklist
 - a. checklist designed to assist the Instructor in Charge in preparing all materials that are needed for a successful training evolution

The forms listed will be submitted with the course paperwork for verification of the final certification burn. The lone exception is The "**Live Burn Accountability Medical Form**" which should not be submitted and should be maintained by the AHJ.

4. DEFINITIONS (NFPA 1403 (2018) Chapter 3.1)

Compliance Officer - A VDFP approved instructor for NFPA 1403: Live Fire Training Evolutions.

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Decontamination – Commonly refers to actions taken at the fire scene to remove as much soil and contamination as possible without actually taking the clothing apart and cleaning it in a machine.

5. **GENERAL PRACTICES FOR CONDUCTING LIVE FIRE TRAINING (NFPA 1403 (2018) Chapter 4)**

A. Role of the Compliance Officer

A minimum of one VDFP approved Compliance Officer will be on site for the final certification burn for all funded, non-funded, partially funded, or reimbursable courses. The designated Compliance Officer is responsible to ensure all final certification burns are in compliance with standards and policy. The Compliance Officer is not to act as the primary safety officer for the final certification burn unless specifically requested by the locality in advance of the approved final certification burn date. Compliance Officers are required as parts of their assignment to document that instructors are following the VDFP Live Burn Compliance Evaluation Form.

B. Pre-arrival Phase

The assigned Compliance Officer shall coordinate with the Instructor in Charge and Safety Officer at least five days prior to the live fire training date to discuss details, arrival time and answer any questions. Further information or documentation may be obtained from The Division Chief if needed. The Compliance Officer should obtain a copy of the IAP from the Instructor in Charge for review.

- Ensure that you have copies of the proper forms:
- Ensure that your turnout gear is clean and serviceable
- For Adjunct Instructor - ensure that you have all of the proper paperwork from the Division Chief.

C. Pre-burn Phase

Meet with the Instructor in Charge and use the “Live Fire Evolution Checklist” to ensure that all necessary paperwork is in place and pre burn planning has been done. Obtain and review a copy of the local live fire training policy if available

- Attend the instructor meeting.
- Ensure you know the locations and duties of the instructors.
- Ensure that there are enough instructors to ensure 5 to 1 student – instructor ratio.
- Participate in the building walkthrough.
- Ensure that the building is safe and clear of debris.
- Ensure that all windows and doors are unlocked and operating
- Review the Site Safety Plan.
- Ensure that Command, Accountability, and RIT plans are in place.

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- Ensure that the overall site is safe and clear of debris and that any unsafe areas are clearly marked and isolated.
- Ensure that adequate medical staffing is on site and properly equipped.
- Ensure that all instructors have their baseline medical checks.
- Ensure that Training Objectives have been made clear to all participants.

Monitor the student meeting.

- Ensure that all students are checked for safe personal clothing
- Monitor turnout gear check including hoods and gloves by instructors.
- Monitor inspection of SCBA to include properly operating PASS devices.
- Live Burn Accountability system and Live Burn Medical Forms are filled out on each student and held in a secure location.
- Ensure that all safety procedures are covered to include: Site Safety Plan, Accountability System, building walk through, emergency evacuation signal, PAR checks, etc.

Review site set up.

- Review: attack line and backup line placement, unblocked exits, fire set ups (3 pallets and 1 to 1 ½ bales of straw maximum).
- Review: Rehab/EMS location, proper number and location of apparatus, water supply, operation of temperature monitoring system.

D. Burn Phase

Monitor the burn size.

Ensure instructors are checking student PPE and SCBA for proper use prior to entry.

Monitor for safety hazards.

- Proper ladder use
- Proper tool use
- Proper hose movement and use
- Proper lifting techniques
- Horse play and freelancing are prohibited
- Injuries or health problems are promptly reported

Monitor student behavior

- Watch for unusual student behavior.
- Watch for signs of heat or cold related emergencies.
- Ensure proper breaks are provided.
- Ensure post entry medical checks are done and recorded.

Ensure accountability system is being used.

Ensure only manikins are used as victims

Ensure ignition officer is igniting burns properly with full PPE and SCBA and with proper safety backup.

If applicable, check temperature monitoring system to ensure that maximum temperatures are not exceeded.

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Ensure that injuries are checked out immediately, proper medical care provided, and the proper VDFP Injury Reports are completed.

Important: The Compliance Officer has the authority from VDFP to stop any unsafe act and/or shut down a burn if conditions warrant. If a burn is shut down by the Compliance Officer, that burn must be rescheduled in its entirety in order for the students to receive credit for certification. If the Compliance Officer must shut down a burn, the appropriate VDFP Division Chief shall be notified as soon as possible. All actions taken and deficiencies noted shall be included on the “Live Burn Evaluation Form” to be sent in to the appropriate Division Chief.

E. Post-burn Phase

Ensure that the post burn debriefing is held and attend.

Ensure that appropriate site cleanup is done.

Check the building for damage and unsafe conditions.

Decontamination - Ensure that PPE and SCBA are cleaned and the students are advised on what to do when they return to their departments.

Meet with the Lead Instructor in Charge and ensure that the proper paperwork is completed and sent in to VDFP. This would include the “Live Burn Accountability Form” (included in the school paperwork) and any “Accident Report Form” (s) that may be necessary.

Complete the “Live Burn Evaluation Form” and all other appropriate paperwork and send them to the appropriate Division Chief within 5 working days.

F. Temperature Monitoring Systems (TMS) (NFPA 1403 (2018) Chapter 4.5.2)

The system (if present) shall be activated and tested for the area(s) of training. It shall be immediately accessible to the Instructor in Charge and Safety Officer to signal unsafe temperature levels. If the system is unavailable or inoperable, the Instructor in Charge shall take steps to assure that the fuel loading procedures are carefully monitored to protect both the structure and the students. Instructor in Charge shall report the problem to the VDFP Division Chief. A record of temperature readings must be maintained on every burn that takes place in the facility. This file may be either electronic or hard copy.

Any of the following conditions indicate that the fire has reached a maximum safe level:

- Ceiling temperature of
 - 800 degrees Fahrenheit for rooms with no protective thermal linings
 - 1000 degrees Fahrenheit for rooms with Padgenite, Westemp, or Marinite refractory boards on the ceiling
 - 1200 degrees Fahrenheit for rooms with “High Temperature Lining” systems 203 on the ceiling.
 - Or other parameters as set by the burn building design (posted).

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Should any of these parameters be exceeded prior to student entry, the fire is to be cooled to acceptable interior condition. Alternate Methods of monitoring such as thermal imaging cameras or infrared thermometers shall be utilized and temperatures recorded in the event the TMS is not working or can be utilized as an additional means of monitoring.

G. Extreme Weather (NFPA 1403 (2018) Chapter 4.6)

Monitor environmental hazards (be familiar with VDFP Extreme Weather Policy).

H. Rehabilitation (Rehab) (NFPA 1403 (2018) Chapter 4.7.6)

Rehab should be conducted according to *NFPA 1584 Standard on the Rehabilitation Process for Members during Emergency Operations and Training Exercises (current edition)*. The rehab area provides the student and instructors an area free from smoke and contaminants to rest, replenish fluids, and to have their vitals taken when they arrive in this sector. Rehab shall be established away from the structure in a safe accessible area, out of direct sunlight. Listed below are guidelines for recommended items to have in the Rehab area:

- 2 Coolers (1 w/ice water, 1 w/ice and drink that replaces electrolytes)
- Cups
- Blood Pressure Cuffs and Stethoscopes
- Pad and Pen to record vitals

No PPE shall be permitted in the rehab area. Participants should remain in the rehab for no less than 20 minutes. Generally, rehab is needed when participants have consumed 2 30 minute or 45-minute air cylinders, one 60-minute air cylinder or 40 minutes of firefighting activity when they have not utilized SCBA. Participants may be released from rehab only after rehab officer has approved them for release. Vital signs must fall within parameters as indicated on the Live Burn Medical Form in order to be released from rehab. Even if vital signs are within these parameters and the EMS providers feel the participant should not be released, the experience and judgment of EMS providers shall be relied upon. Particular attention should be paid to heat illnesses that might occur as a result of participation in live fire training.

I. Accountability (NFPA 1403 (2018) Chapter 4.7.10)

An Accountability System **must** be used, this system can be the one in place for the AHJ conducting live fire training but all participants must be included and be accounted for at all times.

J. Personal Protective Clothing (PPE) (NFPA 1403 (2018) Chapter 4.9)

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Clothing worn under PPE should meet the requirements of NFPA 1975: Standard on Emergency Services Work Apparel, but is left to the AHJ.

K. Self-Contained Breathing Apparatus (OSHA/NFPA)

Additionally VDFP requires all participants to be clean-shaven if they are participating in courses which require the use of SCBA. Policies of the AHJ may supersede but they will be required to produce evidence of a fit test meeting OSHA requirements. Because Adjunct Instructors are VDFP employees, VDFP is required to adhere to the OSHA requirements. To ensure the safety of students in courses conducted under the auspices of VDFP, all students enrolled in schools which require the use of SCBA will adhere to this policy.

This can be further affirmed as a violation of The OSHA Respiratory Protection Standard (CFR 1910.134). There are generally two types of challenges that have been either asked of OSHA or adjudicated through the courts. These are usually based on the claim of pseudofolliculitis barbae (razor bumps/irritation caused by shaving close) or for religious reasons. OSHA clearly indicates in opinion letters that these are not valid reasons for non-compliance with the standard. OSHA regulations are enforceable within the Commonwealth. OSHA also clearly states that even though an employee passed a fit test with a beard, they are clearly violating the Respiratory Protection Standard.

The current edition of NFPA 1500, *The Standard on Fire Department Occupational Safety and Health Programs (current edition)* states in 7.14.3* Members who have a beard or facial hair at any point where the face piece is designed to seal with the face or whose hair could interfere with the operation of the unit shall not be permitted to use respiratory protection at emergency incidents or in hazardous or potentially hazardous atmospheres. Use of SCBA wouldn't be allowed under several other sections of Chapter 7.13, *Using Respiratory Protection*, of NFPA 1500.

L. Decontamination

Decontamination is discussed in Chapter 14 of NFPA 1500-18, *Standard on Fire Department Occupational Safety and Health*, and Chapter 7.2.1 of NFPA 1851-20, *Standard on Selection, Care, and Maintenance of Protective Ensembles for Structural Fire Fighting and Proximity Fire Fighting*.

The *International Agency for Research on Cancer* recognizes soot as a Group 1 carcinogen, meaning that it is categorized as one of the worst carcinogens that firefighters can be exposed to, particularly during interior structural firefighting or during fire training.

Decontamination is required on all live fire training exercises that occur and include:

- All live fire training burns occurring during any VDFP sanctioned school (Class A or B)

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- Any live burn occurring in VDFP funded burn buildings (or props)
- All instructors and students are required to decontaminate

Decontamination between burn evolutions shall consist of dry brush decontamination and/or the use of wipes for facial, arm, hand and neck areas. Dry brush decontamination shall also occur when changing SCBA cylinders and the face piece, helmet and hood are to remain in place.

Decontamination can be accomplished with minimal equipment. Recommendations to include some of the following items with some explanation on some (other items may be included as deemed by the AHJ):

- Garden Hose (Approximately 25') recommended as saturating the PPE can better be avoided using the lower flow hose/nozzle.
- 5 gallon bucket w/lid to contain components
- Garden hose nozzle
- Soft bristle brushes for washing
- 2 ½ inch to garden hose reducer (AHJ dependent)
- Mild detergent (dish soap, baby soap, avoid phosphate containing)
- Heavier duty brushes for dry decontamination
- Decontamination Wipes
- Large **clear** trash bags for storage of PPE
- Duct Tape

Decontamination at the conclusion of the burn evolutions shall consist of wet soap and water decontamination of each participant in the evolutions (students and instructors). Students will again utilize decontamination wipes then bag all contaminated PPE and seal with duct tape. The bagged PPE should not be transported in passenger carrying areas of vehicles and should be washed as soon as possible before being utilized again. If shower facilities are available at the training site, it is recommended to shower prior to departure from the facility and to change into a clean set of dry clothing. We suggest washing personal clothing at the training facility or fire station if equipped. Taking home and washing contaminated clothing or uniforms is discouraged. Documentation of exposure to carcinogens for individuals shall be left up to AHJ, but is highly recommended. VDFP personnel or staff shall document their exposures occurring during training fires.

M. Communication (NFPA 1403 (2018) Chapter 4.10)

The Instructor in Charge shall ensure radios are available for the live fire training. Radios shall be used for at least the following positions, to ensure communications and safety of all:

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- Instructor in Charge
- Compliance Officer
- Safety Officer
- Additional Safety Officers (one each floor that is used for live burns)
- Squad/Crew instructors
 - Instructor Note: If it is a problem for the jurisdiction to outfit all squad/crew instructors with radios, then each Squad/Crew in the IDLH must have a radio and trade off as you rotate squads through their evolutions.
- EMS
- Rehabilitation

N. Emergency Medical Services (NFPA 1403 (2018) Chapter 4.11.3)

Any participant who is identified as injured or ill during the exercise shall immediately be reported to the Instructor in Charge. The Instructor in Charge shall ensure that a Virginia Department of Fire Programs “Accident Report” is completed and procedures are followed regarding injury/illness.

Actions in Case of Serious Injury or Death during Training (life or career threatening injury) related to the training event the following steps must be taken:

- Patient Care
- Ensure that patient care begins at once and an EMS transport unit is called if not on site.
- Document and secure all items removed from the victim.
- Ensure that all medical paperwork (PPCR) is started at once.
- Ensure or work with law enforcement to ensure that family members are notified as soon as possible.
- Ensure that a member of the teaching team goes to the hospital to follow up with the patient.
- Scene Security
- Notify appropriate law enforcement to respond.
- Establish a perimeter.
- No one should be allowed inside perimeter without a specific purpose.
- Document all those who enter and leave the security area and any evidence that is touched.
- Do not move anything until everything is documented unless it is to treat the victim or control the situation. Equipment that may have been a contributing factor may be confiscated and held as evidence.
- If possible, photograph or video everything.
- Identify all witnesses.
- Obtain or be sure law enforcement obtains statements from all involved.

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Notify the appropriate Division Chief immediately. If they cannot be reached, notify the Duty Officer 804-612-7273, if no answer, contact The State EOC at 800-468-8892 and request that the on duty VDFP representative contact you as soon as possible. The Division Chief or Duty Chief shall notify the Chief of Training & Operations and the Chief Safety Officer

O. Fuel Materials (NFPA 1403 (2018) Chapter 4.13)

Current research indicates that exposures to carcinogens, and other hazardous byproducts, such as PAHs (Polycyclic Aromatic Hydrocarbons) and benzene can occur with the use of certain manufactured wood products. Some products burned in live fire training release significant levels of these products compared to other fuels. Among these is OSB (Oriented Strand Board) which contains the adhesive PMDI (poly-methylene diphenyl diisocyanate) . One of our missions is to reduce unnecessary exposure to these potentially cancer causing materials to firefighters. With that in mind, VDFP prohibits the use of OSB (Oriented Strand Board) manufactured with PMDI (poly-methylene diphenyl diisocyanate) during live fire training in funded schools or live fire training structures, to include flashover simulators. Recent research indicates that there is a significant amount of exposure to hazardous byproducts that could increase the risk of cancer to firefighters. VDFP would encourage training entities to ban the use of this product across The Commonwealth of Virginia in live fire training as a best practice in firefighter safety. Alternative fuel materials exist that will provide a high degree of fidelity in the training environment.

P. Fire Training Procedures

No more than two fires shall be burning at the same time (typically one per floor). This does not include ovens or “smoke pots” whose sole purpose is to generate additional heat or smoke. When utilizing acquired structures for live fire training, no more than one fire shall be burning at any time. Also please note that acquired structures are not authorized to be utilized for VDFP training schools.

Artificial smoke generating machines and fluids may be used in accordance with smoke machine and fluid manufacturers’ recommendations, guidelines, or instructions.

Q. Evacuation Signal

The emergency evacuation process and signal shall be explained and demonstrated to all during the pre-burn brief. (NFPA 1403 (2018) A 4.10.2)

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5. RECORDS AND REPORTS (NFPA 1403 (2018) Chapter 9.1.4)

All students and instructors will gather and discuss the overall activities and make preparation for overhaul/clean-up operations. Prior to releasing the students, the Instructor - in - Charge shall ensure the welfare of any participants involved in the training activity.

The building and exterior will be thoroughly inspected for any remaining fire and for physical damage. All unusable burned materials will be extinguished and properly discarded in a dumpster or area provided at the facility.