



WESTCHESTER COUNTY DEPARTMENT OF EMERGENCY SERVICES

LIVE BURN GUIDELINES - REV. 5.31.07

Purpose:

To establish operating guidelines to assure the safe operation of “live fire” training at the Westchester County Emergency (DES) Training facility.

1.0 Basis:

These guidelines are promulgated based on National Fire Protection Association (NFPA) 1403, and New York State Office of Fire Prevention and Control (NYS-OFPC) live fire guidelines.

These guidelines shall be adhered to by all instructors and students when conducting “Class A” burn evolutions at the DES Training Center. All evolutions must follow the guidelines of NFPA 1403, NFPA 1500 and NFPA 1001.

All instructors identified in this Document must have achieved a minimum training of National Certified Fire Instructor I (NFPA 1001) and be “Live Fire Certified” (NYS-OFPC). Copies of instructor certifications shall be on file with the Westchester County Department of Emergency Services, Fire Division prior to the instructors participation in live burn evolutions.

These guidelines shall supersede any individual agency/department live burn policies when that agency/department utilizes the DES training facility. Any deviation from this live burn procedure shall require prior, written approval from the County Fire Coordinator.

This document shall apply only to Class A fire training props and is not applicable to propane fueled props.

Any training evolution utilizing smoke from a “live fire” in the building shall be considered a live fire evolution and shall be conducted in accordance with this document.

2.0 Class “A” Burn Evolutions Safety Requirements:

2.1 The safety of instructors, students and visitors shall be the primary concern during any activities conducted at the DES facility.

2.2 A designated “live burn” checklist shall be completed by the lead instructor prior to starting any training evolution involving live fire.

2.3 Evolutions shall not be conducted if winds or gusts are expected to exceed 40 mph. Any other weather conditions that may affect the safe operation of live fire must be taken into consideration prior to initiating an evolution.

2.4 Reliable, readily available, methods of emergency communications to request EMS or other resources shall be in place and tested prior to initiating an evolution.

2.5 Rehabilitation capability shall be established prior to initiating an evolution. (may include cooling/ misting fans, water or other methods of hydration).

3.0 Class “A” Burn Evolutions Safety Requirements-Staffing

3.1 Each Class “A” evolution shall require a Firefighter Assist and Safety Team. There shall be a minimum of 4 firefighters, trained as interior firefighters with firefighter Safety and Survival and FAST team training available and dedicated to the FAST team. (FAST Teams members cannot be involved in the training exercise or act as instructors). (Appendix II)

3.2 The primary function of all assigned instructors is firefighter safety. Each Class “A” evolution shall require a minimum of 4 County Fire Instructors (CFI)(Appendix I) in full Personal Protective Equipment (PPE includes full turnout gear and SCBA). Two instructors shall be assigned to monitor the interior operations to insure safety of the firefighters and effectiveness / continuity of the curriculum. One instructor shall be assigned to the exterior operations to insure firefighting safety and the effectiveness / continuity of the curriculum. An instructor shall act as the Safety Officer (SO). He/she shall be responsible to insure the building is unoccupied before any “live fire” is initiated. (Additional safety personnel may be assigned under the direction of the scene safety officer)

3.3 Each Class “A” evolution shall require a minimum of one 1¾” attack line and one backup line of equal or larger diameter. The backup line shall be connected to a separate water source than the attack line and remain charged at all times during the evolution. The Safety Officer may require additional safety lines be placed into service.

3.4 The SO shall be responsible to control all phases of the “live fire” training evolution to assure a safe operation. The SO shall be responsible for the safety of all persons on the scene, including students, instructors, visitors, or spectators. The SO may stop any evolution if it is discovered to be un-safe at any time.

3.5 Participating Fire Departments shall be responsible to verify that all department participants in live burn evolutions are physically qualified; have current mask fit testing; and have achieved a minimum certification of Firefighter I training (FF1)(Appendix II).

3.6 All personnel entering any area of the burn building during active fire situations shall be donned in full PPE (including SCBA).

3.7 The Lead Instructor (Appendix I)(Appendix III) shall assign an Accountability Officer (AO) whom shall be responsible to monitor accountability for all firefighters entering and exiting the building during an attack evolution. An accountability system shall be established for all evolutions.

3.8 There shall be a certified Emergency Medical Technician (EMT) assigned to each live burn evolution. BLS Emergency medical equipment (provided by DES) shall be readily available for the EMT's use. (Equipment shall include a trauma bag; O2 tank w/regulator and appropriate masks/airway management equipment; burn sheet and burn treatment supplies and a portable radio capable of contacting the ECC-60- Control).

4.0 Class "A" Burn Evolutions Safety Requirements-Briefing

4.1 A "pre-burn" briefing shall be conducted by the lead instructor for all instructors and participants prior to commencing the burn. All evolutions shall be explained and described; instructor roles assigned; crews assigned at this time. Emergency evacuation procedures shall be discussed at the briefing. All participants shall be made aware of the evacuation signal. The briefing shall identify the means of communications and radio channel shall be assigned.

5.0 Evolution Procedures

5.1 Fire attack crews shall be under the direct supervision of a instructor (Appendix III). Attack crews shall be limited to a maximum of 4 firefighters.

5.2 The lead instructor shall be the ignition officer for all fires. He will ignite all fires while accompanied by the SO. Both the LI and the SO shall be donned in full turnout gear (including SCBA). At no time shall any fire be ignited by a single individual. Charged lines shall be in place before ignition takes place. (Ref 3.3). Upon ignition, the LI and the SO shall leave the building prior to commencing the evolution.

5.3 At no time shall any personnel be positioned in the building to act as a "victim". Only training manikins shall be used as victims. (not in close proximity to fire to eliminate the possibly of damaging or igniting the manikins).

5.4. Only "Class A" combustibles shall be used during evolutions. A maximum of 140 pounds of combustible material shall be used per burn. Example: 1 bale of hay and 2 wood pallets. Under no circumstances shall additional fuel be added once a fire has been ignited.

5.5 The following materials are prohibited from use during live burns:

- Flammable liquids
- Tires
- Pressure treated lumber
- Furniture, mattresses, etc.

5.6 Live fires shall be extinguished in a timely fashion, i.e., without excessive pre-burn. Live fires shall be extinguished as soon as the training objectives have been achieved.

Approved , 2007
Deputy Commissioner/Fire Coordinator
John E. Jackson

Attached Appendices:

Appendix I- NFPA 1403, Live Fire Guidelines

Appendix II- NFPA 1001, Professional Qualifications

Appendix III- NFPA 1403, Annex C, Instructors Duties and assignments.

Live Burn Checklist

Complete all information below prior to commencing live burn evolution.

Course Name: _____ (or Department Name if applicable)

*Lead Instructor: _____

*Safety Officer: _____

*Additional Instructors: _____

**indicates positions that must be staffed or live burns cannot occur*

Pre Burn Planning: (Please all items)

- Command Post Established
- Rehab Sector Established
- EMT on location with assigned equipment
- Hose line positions established (backup from a separate source)
- Hose lines flowed to insure proper operation
- All radio equipment checked and operating

Participants Briefed on the Following:

- Building layout and walkthrough
- Crew and instructor assignments
- Safety rules and accountability procedures
- Safety briefing about burn
- Building evacuation procedures
- Demonstrate Evacuation Procedure

Additional Checks:

- All personnel in proper gear (PPE & SCBA)
- Fire load is not excessive
- Building is completely empty before fires are ignited
- F.A.S.T. team is in place and briefed

Appendix I
NFPA 1403
Live Burn Guidelines

Chapter 6 Non-Gas-Fired Training Center Buildings

6.1 Student Prerequisites.

6.1.1* Prior to being permitted to participate in live fire training evolutions, the student shall have received training to meet the job performance requirements for Fire Fighter I in NFPA 1001, Standard for Fire Fighter Professional Qualifications, related to the following subjects:

- (1) Safety
- (2) Fire behavior
- (3) Portable extinguishers
- (4) Personal protective equipment
- (5) Ladders
- (6) Fire hose, appliances, and streams
- (7) Overhaul
- (8) Water supply
- (9) Ventilation
- (10) Forcible entry

6.1.2* Students participating in a live fire training evolution who have received the required minimum basic training from other than the authority having jurisdiction shall not be permitted to participate in any live fire training evolution without presenting prior written evidence of having successfully completed the prescribed minimum training to the levels specified in 6.1.1.

6.2 Structures and Facilities.

6.2.1* Strict safety practices shall be applied to all structures selected for live fire training evolutions.

6.2.2* Training center burn buildings shall be inspected visually for damage prior to live fire training evolutions.

6.2.2.1 Damage shall be documented.

6.2.2.2* The structural integrity of the building shall be evaluated and documented annually by a licensed professional engineer with burn building experience and expertise.

6.2.2.3* Part of the burn building evaluation shall include, once every five years, the removal and reinstallation of a representative area of thermal linings (if any) to inspect the hidden conditions behind the linings.

6.2.2.4 The engineer shall core solid structural concrete slabs and walls that have been exposed to temperatures in excess of 149°C (300°F) to check for hidden delaminations and to test compressive strength once every 10 years for conventional (Portland) concrete and every three years for refractory (calcium aluminate) concrete.

6.2.2.5 Where the burn building damage is severe enough to affect the safety of the students, training shall not be permitted.

6.2.3 All doors, windows and window shutters, roof scuttles and automatic ventilators, mechanical equipment, lighting, manual or automatic sprinklers, and standpipes necessary for the live fire training evolution shall be checked and operated prior to any live fire training evolution to ensure they operate correctly.

6.2.4* All safety devices, such as thermometers, oxygen and toxic and combustible gas monitors, evacuation alarms, and emergency shutdown switches, shall be checked prior to any live fire training evolutions to ensure they operate correctly.

- 6.2.5 Training center burn buildings shall be left in a safe condition upon completion of live fire training evolutions.
- 6.2.6 Debris hindering the access or egress of fire fighters shall be removed prior to the beginning of the next training exercises.
- 6.2.7 In preparation for live fire training, an inspection of the structure shall be made to determine that the floors, walls, stairs, and other structural components are capable of withstanding the weight of contents, participants, and accumulated water.
- 6.2.8 Property adjacent to the training site that could be affected by the smoke from the live fire training evolution, such as railroads, airports or heliports, and nursing homes, hospitals, or other similar facilities, shall be identified.
- 6.2.9 The persons in charge of the properties described in 6.2.8 shall be informed of the date and time of the evolution.
- 6.2.10* Streets or highways in the vicinity of the training site shall be surveyed for potential effects from live fire training evolutions, and safeguards shall be taken to eliminate any possible hazard to motorists.
- 6.2.11 Pedestrian traffic in the vicinity of the training site shall be kept clear of the operations area of the live burn by the use of fire lines.
- 6.2.12 Awareness of weather conditions, wind velocity, and wind direction shall be maintained, including a final check for possible changes in weather conditions immediately before actual ignition.
- 6.2.13 The water supply for any individual live fire training evolution shall be assessed based on the extent of the evolutions to be performed.
- 6.2.13.1 Consideration shall be given to the control and extinguishment of the fire and the provision of necessary backup lines to protect personnel.
- 6.2.13.2 The minimum water supply and delivery for live fire training evolutions shall meet the criteria identified in NFPA 1142, Standard on Water Supplies for Suburban and Rural Fire Fighting.
- 6.2.13.3 A minimum reserve of additional water in the amount of 50 percent of the fire flow demand determined in accordance with 6.2.13.2 shall be available to handle exposure protection or unforeseen situations.
- 6.2.13.4* Separate sources shall be utilized for the supply of attack lines and backup lines in order to preclude the loss of both water supply sources at the same time.
Exception: A single source shall be sufficient at a training center facility where the water system has been engineered to provide adequate volume for the evolutions conducted and a backup power source or backup pumps, or both, are in place to ensure an uninterrupted supply in the event of a power failure or malfunction.
- 6.2.14 Areas for the staging, operating, and parking of fire apparatus that are used in the live fire training evolution shall be designated.
- 6.2.14.1 An area for parking fire apparatus and vehicles that are not a part of the evolution shall be designated so as not to interfere with fireground operations.
- 6.2.14.2 Consideration shall be given to locating this area in order to facilitate prompt response of apparatus in the event of an emergency.
- 6.2.14.3 Where required or necessary, parking areas for police vehicles or for the press shall be designated.
- 6.2.14.4 A parking area for an ambulance or an emergency medical services vehicle shall be designated.
- 6.2.14.5 Consideration shall be given to locating this area to facilitate prompt response in the event of a personal injury to participants in the evolution.
- 6.2.14.6 Consideration shall be given to the designation and layout of ingress/egress routes in order to ensure their availability in the event of an emergency.
- 6.2.15 Prior to conducting actual live fire training evolutions, a preburn briefing session shall be conducted for all participants.

- 6.2.15.1 All facets of each evolution to be conducted shall be discussed in the preburn briefing, and assignments shall be made for all crews participating in the training session.
- 6.2.15.2 The location of simulated victims shall not be required to be disclosed, provided that the possibility of victims is discussed during the preburn briefing.
- 6.2.15.3 A preburn plan shall be prepared and shall be utilized during the preburn briefing sessions.
- 6.2.15.4 All features of the training areas and structure shall be indicated on the preburn plan.
- 6.2.16 Prior to conducting any live fire training, all participants shall be required to conduct a walk-through of the structure in order to have a knowledge of and familiarity with the layout of the building and to facilitate any necessary evacuation of the building.
- 6.2.17 All spectators shall be restricted to an area outside the operations area perimeter established by the safety officer.
- 6.2.17.1 Control measures such as ropes, signs, and fire line markings shall be posted to indicate the perimeter of the operations area.
- 6.2.17.2 Visitors who are allowed within the operations area perimeter to observe operations shall be escorted at all times.
- 6.2.17.3 Visitors who are allowed within the operations area perimeter shall be equipped with and shall wear complete protective clothing according to manufacturer's instructions and in accordance with 6.4.17.1 through 6.4.17.7.
- 6.2.18 All possible sources of ignition, other than those that are under the direct supervision of the person responsible for the start of the training fire, shall be removed from the operations area.
- 6.3 Fuel Materials.
- 6.3.1 The fuels that are utilized in live fire training evolutions shall have known burning characteristics that are as controllable as possible.
- 6.3.2 Unidentified materials, such as debris found in or around the structure that could burn in unanticipated ways, react violently, or create environmental or health hazards, shall not be permitted to be used.
- 6.3.3 Fuel materials shall be used only in the amounts necessary to create the desired fire size.
- 6.3.4* Pressure-treated wood, rubber, and plastic, and straw or hay treated with pesticides or harmful chemicals shall not be permitted to be used.
- 6.3.5 The fuel load shall be limited to avoid conditions that could cause an uncontrolled flashover or backdraft.
- 6.3.6* The use of flammable or combustible liquids, as defined in NFPA 30, Flammable and Combustible Liquids Code, shall not be permitted to be used in live fire training evolutions in structures. Exception: Limited quantities of combustible liquid with a flash point above 38°C (100°F) shall be permitted to be used in a training center burn building that has been specifically engineered to accommodate this fuel.
- 6.3.7* The instructor-in-charge shall assess the selected fire room environment for factors that can affect the growth, development, and spread of the fire.
- 6.3.8* The instructor-in-charge shall document fuel loading including all of the following:
- (1) Furnishings
 - (2) Wall and floor coverings and ceiling materials
 - (3) Type of construction of the structure, including type of roof and combustible void spaces
 - (4) Dimensions of room
- 6.3.9* The training exercise shall be stopped immediately when the instructor-in-charge determines through ongoing assessment that the combustible nature of the environment represents a potential hazard.
- 6.3.10 The exercise shall continue only when the actions have been taken to reduce the hazard.
- 6.4 Safety.
- 6.4.1 A safety officer shall be appointed for all live fire training evolutions.

6.4.2* The safety officer shall have the authority, regardless of rank, to intervene and control any aspect of the operations when, in his or her judgment, a potential or actual danger, accident, or unsafe condition exists.

6.4.3 The responsibilities of the safety officer shall include, but shall not be limited to, the following:

- (1) Prevention of unsafe acts
- (2) Elimination of unsafe conditions

6.4.4 The safety officer shall provide for the safety of all persons on the scene including students, instructors, visitors, and spectators.

6.4.5 The safety officer shall not be assigned other duties that interfere with safety responsibilities.

6.4.6 The safety officer shall be knowledgeable in the operation and location of safety features available within the burn building, such as emergency shutoff switches, gas shutoff valves, and evacuation alarms.

6.4.7* The instructor-in-charge of the live fire training evolutions shall determine, prior to each specific evolution, the number of training attack lines and backup lines that are necessary.

6.4.7.1 Backup lines shall be provided to ensure protection for personnel on training attack lines.

6.4.7.2 Each hoseline shall be capable of delivering a minimum of 360 L/min (95 gpm).

6.4.7.3 The instructor-in-charge shall assign the following personnel:

- (1) One instructor to each functional crew, which shall not exceed five students
- (2) One instructor to each backup line
- (3) Additional personnel to backup lines to provide mobility
- (4) One additional instructor for each additional functional assignment

6.4.8* Additional safety personnel, as deemed necessary by the safety officer, shall be located strategically within the structure to react to any unplanned or threatening situation or condition.

6.4.9 A method of fire ground communications shall be established to enable coordination among the incident commander, the interior and exterior sectors, the safety officer, and external requests for assistance.

6.4.10* A building evacuation plan shall be established, including an evacuation signal to be demonstrated to all participants in an interior live fire training evolution.

6.4.11 Emergency medical services shall be available on site to handle injuries.

6.4.12 Written reports shall be filled out and submitted on all injuries and on all medical aid rendered.

6.4.13 A search of the structure shall be conducted to ensure that no unauthorized persons, animals, or objects are in the building immediately prior to ignition.

6.4.14 No person(s) shall play the role of a victim inside the building.

6.4.15 Fires shall not be located in any designated exit paths.

6.4.16 The training session shall be curtailed, postponed, or canceled, as necessary, to reduce the risk of injury or illness caused by extreme weather conditions.

6.4.17 Each participant shall be equipped with full protective clothing and self-contained breathing apparatus (SCBA).

6.4.17.1 All participants shall be inspected by the safety officer prior to entry into a live fire training evolution to ensure that the protective clothing and SCBA are being worn according to manufacturer's instruction and are in serviceable condition.

6.4.17.2 Protective coats, trousers, hoods, footwear, helmets, and gloves shall have been manufactured to meet the requirements of NFPA 1971, Standard on Protective Ensemble for Structural Fire Fighting.

6.4.17.3 Self-contained breathing apparatus (SCBA) shall have been manufactured to meet the requirements of NFPA 1981, Standard on Open-Circuit Self-Contained Breathing Apparatus for the Fire Service.

6.4.17.4* Where station or work uniforms are worn by any participant, the station or work uniform shall have been manufactured to meet the requirements of NFPA 1975, Standard on Station/Work Uniforms for Fire and Emergency Services.

6.4.17.5 Personal alarm devices shall have been manufactured to meet the requirements of NFPA 1982, Standard on Personal Alert Safety Systems (PASS).

6.4.17.6 All students, instructors, safety personnel, and other personnel shall wear all protective clothing and equipment specified in this chapter according to manufacturer's instructions whenever they are involved in any evolution or fire suppression operation during the live fire training evolution.

6.4.17.7* All students, instructors, safety personnel, and other personnel participating in any evolution or operation of fire suppression during the live fire training evolution shall breathe from an SCBA air supply whenever 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 or contaminated by products of combustion, or both
- (3) In any atmosphere that can become oxygen deficient or contaminated, or both
- (4) Below ground level

6.4.18 One person who is not a student shall be designated as the "ignition officer" to control the materials being burned.

6.4.18.1 The ignition officer shall wear full protective clothing, including self-contained breathing apparatus (SCBA), as required in 6.4.17.1 through 6.4.17.7, when performing this control function.

6.4.18.2 A charged hose line shall accompany the ignition officer when he or she is igniting any fire.

6.4.18.3* The decision to ignite the training fire shall be made by the instructor-in-charge in coordination with the safety officer.

6.4.18.4 The fire shall be ignited by the ignition officer in the presence of and under the direct supervision of the safety officer.

6.5 Instructors.

6.5.1 All instructors shall be qualified to deliver fire fighter training according to the authority having jurisdiction.

6.5.2* The participating student-to-instructor ratio shall not be greater than 5 to 1.

6.5.3 Additional instructors shall be designated when factors such as extreme temperatures or large groups are present, and classes of long duration are planned.

6.5.4 The instructor-in-charge shall be responsible for full compliance with this standard.

6.5.5 Prior to the ignition of any fire, instructors shall ensure that all protective clothing and equipment specified in this chapter are being worn according to manufacturer's instructions.

6.5.6 Instructors shall take a head count when entering and exiting the building during an actual attack evolution conducted in accordance with this standard.

6.5.7 Instructors shall monitor and supervise all assigned students closely during the live fire training evolution.

6.5.8 The instructor-in-charge shall consider the circumstances of each training session and make provisions for the rest and rehabilitation of members operating at the scene, including medical evaluation and treatment, food and fluid replenishment, and relief from climate conditions, in accordance with the circumstances of the training session. (See Annex D.)

6.5.9 Where concurrent, multiple, live fire training evolutions are being conducted in a specifically designed burn building, the identity of the instructor-in-charge shall be clear to all participants.

6.5.10 It shall be the instructor-in-charge's responsibility to coordinate overall burn building fireground activities to ensure proper levels of safety.

Appendix II

NFPA 1001 Professional Qualifications

Chapter 5 Fire Fighter I

5.1 General.

5.1.1 For certification at Level I, the fire fighter candidate shall meet the general knowledge requirements in 5.1.1.1, the general skill requirements in 5.1.1.2, and the job performance requirements defined in Sections 5.2 through 5.5 of this standard and the requirements defined in Chapter 4, Competencies for the First Responder at the Awareness Level, of NFPA 472, Standard for Professional Competence of Responders to Hazardous Materials Incidents.

5.1.1.1 General Knowledge Requirements. The organization of the fire department; the role of the Fire Fighter I in the organization; the mission of fire service; the fire department's standard operating procedures and rules and regulations as they apply to the Fire Fighter I; the role of other agencies as they relate to the fire department; aspects of the fire department's member assistance program; the critical aspects of NFPA 1500, Standard on Fire Department Occupational Safety and Health Program, as they apply to the Fire Fighter I; knot types and usage; the difference between life safety and utility rope; reasons for placing rope out of service; the types of knots to use for given tools, ropes, or situations; hoisting methods for tools and equipment; and using rope to support response activities.

5.1.1.2 General Skill Requirements. The ability to don personal protective clothing within one minute; doff personal protective clothing and prepare for reuse; hoist tools and equipment using ropes and the correct knot; tie a bowline, clove hitch, figure eight on a bight, half hitch, becket or sheet bend, and safety knots; and locate information in departmental documents and standard or code materials.

5.2 Fire Department Communications.

This duty involves initiating responses, receiving telephone calls, and using fire department communications equipment to correctly relay verbal or written information, according to the following job performance requirements.

5.2.1* Initiate the response to a reported emergency, given the report of an emergency, fire department standard operating procedures, and communications equipment, so that all necessary information is obtained, communications equipment is operated correctly, and the information is promptly and accurately relayed to the dispatch center.

(A) Requisite Knowledge: Procedures for reporting an emergency, departmental standard operating procedures for taking and receiving alarms, radio codes or procedures, and information needs of dispatch center.

(B) Requisite Skills: The ability to operate fire department communications equipment, relay information, and record information.

5.2.2 Receive a business or personal telephone call, given a fire department business phone, so that procedures for answering the phone are used and the caller's information is relayed.

(A) Requisite Knowledge: Fire department procedures for answering nonemergency telephone calls.

(B) Requisite Skills: The ability to operate fire station telephone and intercom equipment.

5.2.3 Transmit and receive messages via the fire department radio, given a fire department radio and operating procedures, so that the information is accurate, complete, clear, and relayed within the time established by the AHJ.

(A) Requisite Knowledge: Departmental radio procedures and etiquette for routine traffic, emergency traffic, and emergency evacuation signals.

(B) Requisite Skills: The ability to operate radio equipment and discriminate between routine and emergency traffic.

5.3 Fire ground Operations.

This duty involves performing activities necessary to ensure life safety, fire control, and property conservation, according to the following job performance requirements.

5.3.1* Use SCBA during emergency operations, given SCBA and other personal protective equipment, so that the SCBA is correctly donned and activated within one minute, the SCBA is correctly worn, controlled breathing techniques are used, emergency procedures are enacted if the SCBA fails, all low-air warnings are recognized, respiratory protection is not intentionally compromised, and hazardous areas are exited prior to air depletion.

(A) Requisite Knowledge: Conditions that require respiratory protection, uses and limitations of SCBA, components of SCBA, donning procedures, breathing techniques, indications for and emergency procedures used with SCBA, and physical requirements of the SCBA wearer.

(B) Requisite Skills: The ability to control breathing, replace SCBA air cylinders, use SCBA to exit through restricted passages, initiate and complete emergency procedures in the event of SCBA failure or air depletion, and complete donning procedures.

5.3.2* Respond on apparatus to an emergency scene, given personal protective clothing and other necessary personal protective equipment, so that the apparatus is correctly mounted and dismounted, seat belts are used while the vehicle is in motion, and other personal protective equipment is correctly used.

(A) Requisite Knowledge: Mounting and dismounting procedures for riding fire apparatus; hazards and ways to avoid hazards associated with riding apparatus; prohibited practices; types of department personal protective equipment and the means for usage.

(B) Requisite Skills: The ability to use each piece of provided safety equipment.

5.3.3* Operate in established work areas at emergency scenes, given protective equipment, traffic and scene control devices, structure fire and roadway emergency scenes, traffic hazards and downed electrical wires, so that procedures are followed, protective equipment is worn, protected work areas are established as directed using traffic and scene control devices, and the fire fighter performs assigned tasks only in established, protected work areas.

(A) Requisite Knowledge: Potential hazards involved in operating on emergency scenes including vehicle traffic, utilities, and environmental conditions; proper procedures for dismounting apparatus in traffic; procedures for safe operation at emergency scenes; and the protective equipment available for members' safety on emergency scenes and work zone designations.

(B) Requisite Skills: The ability to use PPC, the deployment of traffic and scene control devices, dismount apparatus and operate in the protected work areas as directed.

5.3.4* Force entry into a structure, given personal protective equipment, tools, and an assignment, so that the tools are used as designed, the barrier is removed, and the opening is in a safe condition and ready for entry.

(A) Requisite Knowledge: Basic construction of typical doors, windows, and walls within the department's community or service area; operation of doors, windows, and locks; and the dangers associated with forcing entry through doors, windows, and walls.

(B) Requisite Skills: The ability to transport and operate hand and power tools and to force entry through doors, windows, and walls using assorted methods and tools.

5.3.5* Exit a hazardous area as a team, given vision-obscured conditions, so that a safe haven is found before exhausting the air supply, others are not endangered, and the team integrity is maintained.

(A) Requisite Knowledge: Personnel accountability systems, communication procedures, emergency evacuation methods, what constitutes a safe haven, elements that create or indicate a hazard, and emergency procedures for loss of air supply.

(B) Requisite Skills: The ability to operate as a team member in vision-obscured conditions, locate and follow a guideline, conserve air supply, and evaluate areas for hazards and identify a safe haven.

5.3.6* Set up ground ladders, given single and extension ladders, an assignment, and team members if needed, so that hazards are assessed, the ladder is stable, the angle is correct for climbing, extension ladders are extended to the necessary height with the fly locked, the top is placed against a reliable structural component, and the assignment is accomplished.

(A) Requisite Knowledge: Parts of a ladder, hazards associated with setting up ladders, what constitutes a stable foundation for ladder placement, different angles for various tasks, safety limits to the degree of angulation, and what constitutes a reliable structural component for top placement.

(B) Requisite Skills: The ability to carry ladders, raise ladders, extend ladders and lock flies, determine that a wall and roof will support the ladder, judge extension ladder height requirements, and place the ladder to avoid obvious hazards.

5.3.7* Attack a passenger vehicle fire operating as a member of a team, given personal protective equipment, attack line, and hand tools, so that hazards are avoided, leaking flammable liquids are identified and controlled, protection from flash fires is maintained, all vehicle compartments are overhauled, and the fire is extinguished.

(A) Requisite Knowledge: Principles of fire streams as they relate to fighting automobile fires; precautions to be followed when advancing hose lines toward an automobile; observable results that a fire stream has been properly applied; identifying alternative fuels and the hazards associated with them; dangerous conditions created during an automobile fire; common types of accidents or injuries related to fighting automobile fires and how to avoid them; how to access locked passenger, trunk, and engine compartments; and methods for overhauling an automobile.

(B) Requisite Skills: The ability to identify automobile fuel type; assess and control fuel leaks; open, close, and adjust the flow and pattern on nozzles; apply water for maximum effectiveness while maintaining flash fire protection; advance 1½-in. (38-mm) or larger diameter attack lines; and expose hidden fires by opening all automobile compartments.

5.3.8* Extinguish fires in exterior Class A materials, given fires in stacked or piled and small unattached structures or storage containers that can be fought from the exterior, attack lines, hand tools and master stream devices, and an assignment, so that exposures are protected, the spread of fire is stopped, collapse hazards are avoided, water application is effective, the fire is extinguished, and signs of the origin area(s) and arson are preserved.

(A) Requisite Knowledge: Types of attack lines and water streams appropriate for attacking stacked, piled materials and outdoor fires; dangers — such as collapse — associated with stacked and piled materials; various extinguishing agents and their effect on different material configurations; tools and methods to use in breaking up various types of materials; the difficulties related to complete extinguishment of stacked and piled materials; water application methods for exposure protection and fire extinguishment; dangers such as exposure to toxic or hazardous materials associated with storage building and container fires; obvious signs of origin and cause; and techniques for the preservation of fire cause evidence.

(B) Requisite Skills: The ability to recognize inherent hazards related to the material's configuration, operate handlines or master streams, break up material using hand tools and water streams, evaluate for complete extinguishment, operate hose lines and other water application devices, evaluate and modify water application for maximum penetration, search for and expose hidden fires, assess patterns for origin determination, and evaluate for complete extinguishment.

5.3.9 Conduct a search and rescue in a structure operating as a member of a team, given an assignment, obscured vision conditions, personal protective equipment, a flashlight, forcible entry tools, hose lines, and ladders when necessary, so that ladders are correctly placed when used, all assigned areas are searched, all victims are located and removed, team integrity is maintained, and team members' safety — including respiratory protection — is not compromised.

(A) Requisite Knowledge: Use of forcible entry tools during rescue operations, ladder operations for rescue, psychological effects of operating in obscured conditions and ways to manage them, methods to determine if an area is tenable, primary and secondary search techniques, team members' roles and goals, methods to use and indicators of finding victims, victim removal methods (including various carries), and considerations related to respiratory protection.

(B) Requisite Skills: The ability to use SCBA to exit through restricted passages, set up and use different types of ladders for various types of rescue operations, rescue a fire fighter with functioning respiratory protection, rescue a fire fighter whose respiratory protection is not functioning, rescue a person who has no respiratory protection, and assess areas to determine tenability.

5.3.10* Attack an interior structure fire operating as a member of a team, given an attack line, ladders when needed, personal protective equipment, tools, and an assignment, so that team integrity is maintained, the attack line is deployed for advancement, ladders are correctly placed when used, access is gained into the fire area, effective water application practices are used, the fire is approached correctly, attack techniques facilitate suppression given the level of the fire, hidden fires are located and controlled, the correct body posture is maintained, hazards are recognized and managed, and the fire is brought under control.

(A) Requisite Knowledge: Principles of fire streams; types, design, operation, nozzle pressure effects, and flow capabilities of nozzles; precautions to be followed when advancing hose lines to a fire; observable results that a fire stream has been properly applied; dangerous building conditions created by fire; principles of exposure protection; potential long-term consequences of exposure to products of combustion; physical states of matter in which fuels are found; common types of accidents or injuries and their causes; and the application of each size and type of attack line, the role of the backup team in fire attack situations, attack and control techniques for grade level and above and below grade levels, and exposing hidden fires.

(B) Requisite Skills: The ability to prevent water hammers when shutting down nozzles; open, close, and adjust nozzle flow and patterns; apply water using direct, indirect, and combination attacks; advance charged and uncharged 1½-in. (38-mm) diameter or larger hose lines up ladders and up and down interior and exterior stairways; extend hose lines; replace burst hose sections; operate charged hose lines of 1½-in. (38-mm) diameter or larger while secured to a ground ladder; couple and uncouple various handline connections; carry hose; attack fires at grade level and above and below grade levels; and locate and suppress interior wall and subfloor fires.

5.3.11 Perform horizontal ventilation on a structure operating as part of a team, given an assignment, personal protective equipment, ventilation tools, equipment, and ladders, so that the ventilation openings are free of obstructions, tools are used as designed, ladders are correctly placed, ventilation devices are correctly placed, and the structure is cleared of smoke.

(A) Requisite Knowledge: The principles, advantages, limitations, and effects of horizontal, mechanical, and hydraulic ventilation; safety considerations when venting a structure; fire behavior in a structure; the products of combustion found in a structure fire; the signs, causes, effects, and prevention of backdrafts; and the relationship of oxygen concentration to life safety and fire growth.

(B) Requisite Skills: The ability to transport and operate ventilation tools and equipment and ladders and to use safe procedures for breaking window and door glass and removing obstructions.

5.3.12 Perform vertical ventilation on a structure as part of a team, given an assignment, personal protective equipment, ground and roof ladders, and tools, so that ladders are positioned for ventilation, a specified opening is created, all ventilation barriers are removed, structural integrity is not compromised, products of combustion are released from the structure, and the team retreats from the area when ventilation is accomplished.

(A) Requisite Knowledge: The methods of heat transfer; the principles of thermal layering within a structure on fire; the techniques and safety precautions for venting flat roofs, pitched roofs, and basements; basic indicators of potential collapse or roof failure; the effects of construction type and elapsed time under fire conditions on structural integrity; and the advantages and disadvantages of vertical and trench/strip ventilation.

(B) Requisite Skills: The ability to transport and operate ventilation tools and equipment; hoist ventilation tools to a roof; cut roofing and flooring materials to vent flat roofs, pitched roofs, and basements; sound a roof for integrity; clear an opening with hand tools; select, carry, deploy, and secure ground ladders for ventilation activities; deploy roof ladders on pitched roofs while secured to a ground ladder; and carry ventilation-related tools and equipment while ascending and descending ladders.

5.3.13 Overhaul a fire scene, given personal protective equipment, attack line, hand tools, a flashlight, and an assignment, so that structural integrity is not compromised, all hidden fires are discovered, fire cause evidence is preserved, and the fire is extinguished.

(A) Requisite Knowledge: Types of fire attack lines and water application devices most effective for overhaul, water application methods for extinguishment that limit water damage, types of tools and methods used to expose hidden fire, dangers associated with overhaul, obvious signs of area of origin or signs of arson, and reasons for protection of fire scene.

(B) Requisite Skills: The ability to deploy and operate an attack line; remove flooring, ceiling, and wall components to expose void spaces without compromising structural integrity; apply water for maximum effectiveness; expose and extinguish hidden fires in walls, ceilings, and subfloor spaces; recognize and preserve obvious signs of area of origin and arson; and evaluate for complete extinguishment.

5.3.14 Conserve property as a member of a team, given salvage tools and equipment and an assignment, so that the building and its contents are protected from further damage.

(A) Requisite Knowledge: The purpose of property conservation and its value to the public, methods used to protect property, types of and uses for salvage covers, operations at properties protected with automatic sprinklers, how to stop the flow of water from an automatic sprinkler head, identification of the main control valve on an automatic sprinkler system, and forcible entry issues related to salvage.

(B) Requisite Skills: The ability to cluster furniture; deploy covering materials; roll and fold salvage covers for reuse; construct water chutes and catch-alls; remove water; cover building openings, including doors, windows, floor openings, and roof openings; separate, remove, and relocate charred material to a safe location while protecting the area of origin for cause determination; stop the flow of water from a sprinkler with sprinkler wedges or stoppers; and operate a main control valve on an automatic sprinkler system.

5.3.15* Connect a fire department pumper to a water supply as a member of a team, given supply or intake hose, hose tools, and a fire hydrant or static water source, so that connections are tight and water flow is unobstructed.

(A) Requisite Knowledge: Loading and off-loading procedures for mobile water supply apparatus; fire hydrant operation; and suitable static water supply sources, procedures, and protocol for connecting to various water sources.

(B) Requisite Skills: The ability to hand lay a supply hose, connect and place hard suction hose for drafting operations, deploy portable water tanks as well as the equipment necessary to transfer water between and draft from them, make hydrant-to-pumper hose connections for forward and reverse lays, connect supply hose to a hydrant, and fully open and close the hydrant.

5.3.16* Extinguish incipient Class A, Class B, and Class C fires, given a selection of portable fire extinguishers, so that the correct extinguisher is chosen, the fire is completely extinguished, and correct extinguisher-handling techniques are followed.

(A) Requisite Knowledge: The classifications of fire; the types of, rating systems for, and risks associated with each class of fire; and the operating methods of, and limitations of portable extinguishers.

(B) Requisite Skills: The ability to operate portable fire extinguishers, approach fire with portable fire extinguishers, select an appropriate extinguisher based on the size and type of fire, and safely carry portable fire extinguishers.

5.3.17 Illuminate the emergency scene, given fire service electrical equipment and an assignment, so that designated areas are illuminated and all equipment is operated within the manufacturer's listed safety precautions.

(A) Requisite Knowledge: Safety principles and practices, power supply capacity and limitations, and light deployment methods.

(B) Requisite Skills: The ability to operate department power supply and lighting equipment, deploy cords and connectors, reset ground-fault interrupter (GFI) devices, and locate lights for best effect.

5.3.18 Turn off building utilities, given tools and an assignment, so that the assignment is safely completed.

(A) Requisite Knowledge: Properties, principles, and safety concerns for electricity, gas, and water systems; utility disconnect methods and associated dangers; and use of required safety equipment.

(B) Requisite Skills: The ability to identify utility control devices, operate control valves or switches, and assess for related hazards.

5.3.19* Combat a ground cover fire operating as a member of a team, given protective clothing, SCBA if needed, hose lines, extinguishers or hand tools, and an assignment, so that threats to property are reported, threats to personal safety are recognized, retreat is quickly accomplished when warranted, and the assignment is completed.

(A) Requisite Knowledge: Types of ground cover fires, parts of ground cover fires, methods to contain or suppress, and safety principles and practices.

(B) Requisite Skills: The ability to determine exposure threats based on fire spread potential, protect exposures, construct a fire line or extinguish with hand tools, maintain integrity of established fire lines, and suppress ground cover fires using water.

5.4 Rescue Operations.

This duty involves no requirements for Fire Fighter I.

5.5 Prevention, Preparedness, and Maintenance.

This duty involves performing activities that reduce the loss of life and property due to fire through hazard identification, inspection, education, and response readiness, according to the following job performance requirements.

5.5.1 Perform a fire safety survey in a private dwelling, given survey forms and procedures, so that fire and life-safety hazards are identified, recommendations for their correction are made to the occupant, and unresolved issues are referred to the proper authority.

(A) Requisite Knowledge: Organizational policy and procedures, common causes of fire and their prevention, the importance of a fire safety survey and public fire education programs to fire department public relations and the community, and referral procedures.

(B) Requisite Skills: The ability to complete forms, recognize hazards, match findings to preapproved recommendations, and effectively communicate findings to occupants or referrals.

5.5.2* Present fire safety information to station visitors or small groups, given prepared materials, so that all information is presented, the information is accurate, and questions are answered or referred.

(A) Requisite Knowledge: Parts of informational materials and how to use them, basic presentation skills, and departmental standard operating procedures for giving fire station tours.

(B) Requisite Skills: The ability to document presentations and to use prepared materials.

5.5.3 Clean and check ladders, ventilation equipment, self-contained breathing apparatus (SCBA), ropes, salvage equipment, and hand tools, given cleaning tools, cleaning supplies, and an assignment, so that equipment is clean and maintained according to manufacturer's or departmental guidelines, maintenance is recorded, and equipment is placed in a ready state or reported otherwise.

(A) Requisite Knowledge: Types of cleaning methods for various tools and equipment, correct use of cleaning solvents, and manufacturer's or departmental guidelines for cleaning equipment and tools.

(B) Requisite Skills: The ability to select correct tools for various parts and pieces of equipment, follow guidelines, and complete recording and reporting procedures.

5.5.4 Clean, inspect, and return fire hose to service, given washing equipment, water, detergent, tools, and replacement gaskets, so that damage is noted and corrected, the hose is clean, and the equipment is placed in a ready state for service.

(A) Requisite Knowledge: Departmental procedures for noting a defective hose and removing it from service, cleaning methods, and hose rolls and loads.

(B) Requisite Skills: The ability to clean different types of hose; operate hose washing and drying equipment; mark defective hose; and replace coupling gaskets, roll hose, and reload hose.

Appendix III
NFPA 1403 Annex C
Responsibilities of Personnel

Annex C: Responsibilities of Personnel

C.1 Instructor-in-Charge.

1. Plan and coordinate all training activities
2. Monitor activities to ensure safe practices
3. Inspect building integrity prior to each fire
4. Assign instructors:
 - Attack hoselines
 - Backup hoselines
 - Functional assignments
 - Teaching assignments
5. Brief instructors on responsibilities:
 - Accounting for assigned students
 - Assessing student performance
 - Clothing and equipment inspection
 - Monitoring safety
 - Achieving tactical and training objectives
6. Assign coordinating personnel, as needed:
 - Emergency medical services
 - Communications
 - Water supply
 - Apparatus staging
 - Equipment staging
 - Breathing apparatus
 - Personnel welfare
 - Public relations
7. Ensure adherence to this standard by all persons within the training area

C.2 Safety Officer.

1. Prevent unsafe acts
2. Eliminate unsafe conditions
3. Intervene and terminate unsafe acts
4. Supervise additional safety personnel, as needed
5. Coordinate lighting of fires with instructor-in-charge
6. Ensure compliance of participants' personal equipment with applicable standards:
Protective clothing
SCBA
Personal alarm devices, where used
7. Ensure that all participants are accounted for, both before and after each evolution

C.3 Instructor.

1. Monitor and supervise assigned students (no more than five per instructor)
2. Inspect students' protective clothing and equipment
3. Account for assigned students, both before and after evolutions

C.4 Student.

1. Acquire prerequisite training
2. Become familiar with building layout
3. Wear approved full protective clothing
4. Wear approved self-contained breathing apparatus
5. Obey all instructions and safety rules
6. Provide documentation of prerequisite training, where from an outside agency