



# Fire Fighter Survival (2023)

## Course Plan

### Course Details

- Description:** This hands-on course provides the knowledge and skills needed to minimize errors on the fire ground and reduce fire fighter injuries and fatalities including calling Mayday; SCBA and air management; and navigation, disentanglement, wall breach, anchoring, window hang, ladder escape, and above and below grade survival techniques.
- Designed For:** All fire service suppression and rescue personnel
- Prerequisites:** Fire Ground Survival Awareness (IAFF – online / Must be completed within 90 days of SFT course start date.)
- Standard:** Attend and participate in all course sections  
Successful completion of all skills identified on the Training Record
- Hours:** 16 hours  
(5.25 lecture / 10.75 application)
- Max Class Size:** 50
- Instructor Level:** SFT Registered Fire Fighter Survival Instructor
- Instructor/Student Ratio:** 1:50 (lecture)  
1:10 (application/skills proficiency)
- Restrictions:** This course requires a site with adequate space, materials, equipment, and training props to deliver the training according to the course outline. See Facilities, Equipment, and Personnel under Required Resources.  
All instructors counted toward student ratios, including application components, must be SFT Registered Fire Fighter Survival Instructors.
- SFT Designation:** FSTEP

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## Required Resources

### Instructor Resources

To teach this course, instructors need:

- PPE – complete structural ensemble
- SCBA – complete ensemble with an additional cylinder
- General knowledge of Project Mayday ([www.projectmayday.net](http://www.projectmayday.net))
- *Fire Ground Survival* student manual
  - IAFF, current edition
  - <https://www.iaff.org/fire-ground-survival/>
  - Available after course registration
- A site-specific training action plan

### Online Instructor Resources

The following instructor resources are available online at

<https://osfm.fire.ca.gov/divisions/state-fire-training/fstep-curriculum/>:

- Topic 2-2: [Effects of Hormonal or Fear Induced Heart Rate Increase](#)
- Topic 2-3: Mayday Case Studies
- Topic 3-3: Physiological Effects of Smoke Inhalation
- Topic 4-1: [U.S. Firefighter Disorientation Study \(2003 – Mora\)](#)
- Activity 2-3: Calling Mayday
- Activity 3-1a: Inspecting, Donning, and Using SCBA
- Activity 3-1b: Troubleshooting SCBA Problems
- Activity 3-1c: Buddy Breathing
- Activity 8-1: Mayday Case Studies
- Drill Ground Activity 1: Call Mayday
- Drill Ground Activity 2: Troubleshoot SCBA Problems
- Drill Ground Activity 3: Partially Remove SCBA
- Drill Ground Activity 4: Fully Remove SCBA
- Drill Ground Activity 5: Convert SCBA for Rescue
- Drill Ground Activity 6: Air Management
- Drill Ground Activity 7: Use SBCA in a Rescue Environment
- Drill Ground Activity 8: Navigation
- Drill Ground Activity 9: Disentanglement
- Drill Ground Activity 10: Wall Breach – Backwards Swim
- Drill Ground Activity 11: Wall Breach – Head First
- Drill Ground Activity 12: Anchor and Bail Out
- Drill Ground Activity 13: Window Hang
- Drill Ground Activity 14: Ladder Escape – Hook Two / Slide to Four

- Drill Ground Activity 15: Ladder Escape – Head First

## Student Resources

To participate in this course, students need:

- PPE – complete structural ensemble
- SCBA – complete ensemble with an additional cylinder
  - Academy host provides for academy students
  - Non-academy students provide their own

## Facilities, Equipment, and Personnel

### Facilities

The following facilities are required to deliver this course:

- Standard learning environment or facility, which may include:
  - Enough tables and chairs to seat participants and instructors
  - Writing board or paper easel chart
  - Markers, erasers
  - Amplification devices
  - Projector and screen
  - Laptop or tablet with presentation or other viewing software
  - Electrical cords
  - Internet access with appropriate broadband capabilities (recommended)
- A training site with the facilities, structures, work areas, materials, props, tools, and equipment of adequate size, type, and quantity to fully and safely support the cognitive and psychomotor training required to deliver the curriculum

### Equipment

Student safety is of paramount importance when conducting the type of hands-on training associated with this course.

- The equipment listed below is the minimum for the delivery of this course.
- The student is responsible for providing all PPE and ensuring that all PPE meets AHJ and site requirements.
- For all tools and equipment, ensure that you have the power source, operating supplies (blades, fuel, etc.), cleaning supplies, and appropriate PPE.

The following equipment is required to deliver this course:

Equipment
<b>Training Equipment</b>
600 feet of initial attack 1 ¾" or 1 ½" hoseline
SCBA cylinder refill capabilities
Decontamination supplies for SCBA low pressure regulators and mask/facepiece

Radios with at least two channels/frequencies that can be used dedicated for training exercises
24-foot extension ladders
Rope to secure ladders in position for upper floor egress skills
NFPA 2500 approved belay equipment for upper floor egress skills
Flashlights
Hand tools
Extension cords
Any other items listed in the Drill Ground Activity pages
<b>Personal Protective Clothing and Equipment</b>
Structural firefighting ensemble <ul style="list-style-type: none"> <li>• Must meet the requirements contained in NFPA 1500, Standard on Fire Department Occupational Safety, Health and Wellness Program and include: helmet, coat, trousers, boots, hood, and gloves.</li> </ul>
Personal equipment normally carried by jurisdiction’s fire fighters (i.e., flashlight, wire cutters, axe, etc.)
<b>Medical and Logistical Facilities and Equipment</b>
Area out of direct sunlight that can be used for rehabilitation, with cooling and warming capability.
Medical kit <ul style="list-style-type: none"> <li>• As a minimum, kit must contain essentials needed to provide basic life support care including airways, dressings, and a variety of first aid equipment</li> </ul>
Radios for instructors with two dedicated frequencies/channels <ul style="list-style-type: none"> <li>• One frequency/channel used by students in performing radio communications skills required during simulated MAYDAYs</li> <li>• One frequency/channel used by instructors to communicate with medical personnel if a fire fighter is injured</li> </ul>
Hydration stations with water and ice in sanitary conditions
Restrooms

**Training Props**

The following training props are required to deliver this course:

- Training structure (building, tower, or equivalent props capable of supporting learning objectives)
  - Three or more floors with windows on each floor where ladders can be positioned.
  - Three or more rooms no less than 10 feet x 10 feet
    - Rooms should have movable furnishings to relocate from room to room.
    - Rooms should be able to be darkened.
  - Anchoring points must be available on each floor for securing belay systems.
  - Two or more entrances /exits to structure.

- Electrical sources must be available.
- 
- Training ground
  - Flat surface around training structure to accommodate ground ladder placement.
  - Large area where multiple skills can occur without interfering with each other.
    - An area of 100 feet x 100 feet or more is recommended.
    - Three smaller areas of less than 100 feet x 100 feet are allowable.
  - At least one working hydrant.

The course provider or agency assumes all responsibility, liability, and maintenance for the engineering design, strength, stability, and adequacy of all props, including anchor points and tie offs. The provider or agency further assumes all responsibility, liability, and maintenance for all tools, equipment, and supplies used at the site for the delivery of a Fire Fighter Survival class. This includes, but is not limited to, ladders, ropes, hardware, and software.

### **Personnel**

The following personnel are required to deliver this course:

- Any instructor counted toward student ratios, including application components, must be an SFT Registered Fire Fighter Survival Instructor.
- SFT strongly recommends the use of Skills Coaches as supplemental support to assist with application and skills proficiency practice.
- The use of Skills Coaches as supplemental support does not fulfill the 1:10 instructor/student ratio requirement.

## Time Table

Segment	Lecture	Application	Unit Total
<b>Unit 1: Introduction</b>			
Topic 1-1: Orientation and Administration	0.25	0.0	
Topic 1-2: Course Safety Requirements	0.25	0.0	
<b>Unit 1 Totals</b>	<b>0.50</b>	<b>0.0</b>	<b>0.50</b>
<b>Unit 2: Mayday Mindset</b>			
Topic 2-1: Identifying Common Causes of Mayday Situations	0.25	0.0	
Topic 2-2: Understanding Physiological Responses to Stress	0.25	0.0	
Topic 2-3: Calling Mayday	0.25	0.25	
<b>Unit 2 Totals</b>	<b>0.75</b>	<b>0.25</b>	<b>1.0</b>
<b>Unit 3: SCBA and Air Management</b>			
Topic 3-1: Mitigating SCBA Problems	0.5	1.0	
Topic 3-2: Changing SCBA Profiles	0.25	1.5	
Topic 3-3: Air Management Techniques	0.25	1.5	
<b>Unit 3 Totals</b>	<b>1.0</b>	<b>4.0</b>	<b>5.0</b>
<b>Unit 4: Navigation and Disentanglement</b>			
Topic 4-1: Navigation Techniques	0.25	1.0	
Topic 4-2: Disentanglement Techniques	0.25	1.0	
<b>Unit 4 Totals</b>	<b>0.5</b>	<b>2.0</b>	<b>2.5</b>
<b>Unit 5: Wall Breach and Anchoring</b>			
Topic 5-1: Wall Breach Techniques	0.5	1.0	
Topic 5-2: Anchoring and Bailout Techniques	0.25	0.5	
<b>Unit 5 Totals</b>	<b>0.75</b>	<b>1.5</b>	<b>2.25</b>
<b>Unit 6: Window Hang and Ladder Escape</b>			
Topic 6-1: Window Hang Techniques	0.25	0.5	
Topic 6-2: Hook Two/Slide to Four Ladder Escape Technique	0.25	0.5	
Topic 6-3: Head-First Ladder Escape Technique	0.25	0.5	
<b>Unit 6 Totals</b>	<b>0.75</b>	<b>1.5</b>	<b>2.25</b>
<b>Unit 7: Above and Below Grade Survival</b>			
Topic 7-1: Above and Below Grade Survival Techniques	0.5	0.0	
<b>Unit 7 Totals</b>	<b>0.5</b>	<b>0.0</b>	<b>0.5</b>
<b>Unit 8: Mayday Case Studies</b>			
Topic 8-1: Mayday Case Studies	0.5	1.0	
<b>Unit 8 Totals</b>	<b>0.5</b>	<b>1.5</b>	<b>2.0</b>
<b>Formative Assessments</b>			
Determined by AHJ or educational institution	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>

Segment	Lecture	Application	Unit Total
<b>Summative Assessment</b>			
Determined by AHJ or educational institution	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>
<b>Course Totals</b>	<b>5.25</b>	<b>10.75</b>	<b>16.0</b>

### Time Table Key

1. The Time Table documents the amount of time required to deliver the content included in the course plan.
2. Time is documented using the quarter system: 15 min. = .25 / 30 min. = .50 / 45 min. = .75 / 60 min. = 1.0.
3. The Course Totals do not reflect time for lunch (1 hour) or breaks (10 minutes per each 50 minutes of instruction or assessment). It is the instructor’s responsibility to add this time based on the course delivery schedule.
4. Application (activities, skills exercises, and formative testing) time will vary depending on the number of students enrolled. The Application time documented is based on the maximum class size identified in the Course Details section.
5. Summative Assessments are determined and scheduled by the authority having jurisdiction. These are not the written or psychomotor State Fire Training certification exams. These are in-class assessments to evaluate student progress and calculate course grades.



## Recommended Teaching Plan

Day 1	Time
Topic 1-1: Orientation and Administration Topic 1-2: Course Safety Requirements	0.5
Topic 2-1: Identifying Common Causes of Mayday Situations (0.25) Topic 2-2: Understanding Physiological Responses to Stress (0.25) Topic 2-3: Calling Mayday (0.25) <ul style="list-style-type: none"> <li>• Micro Group (0.25) <ul style="list-style-type: none"> <li>○ Activity 2-3: Calling Mayday</li> </ul> </li> </ul>	1.0
Topic 3-1: Mitigating SCBA Problems (0.5) <ul style="list-style-type: none"> <li>• Micro Group (0.5) <ul style="list-style-type: none"> <li>○ Activity 3-1a: Inspecting, Donning, and Using SCBA</li> <li>○ Activity 3-1b: Troubleshooting SCBA Problems</li> <li>○ Activity 3-1c: Buddy Breathing</li> </ul> </li> </ul>	1.0
Complete 1 of 4 Skill Stations <ul style="list-style-type: none"> <li>• Changing SCBA Profiles (Topic 3-2) <ul style="list-style-type: none"> <li>○ Drill Ground Activity 2: Troubleshoot SCBA Problems</li> <li>○ Drill Ground Activity 3: Partially Remove SCBA</li> <li>○ Drill Ground Activity 4: Fully Remove SCBA</li> <li>○ Drill Ground Activity 5: Convert SCBA for Rescue</li> </ul> </li> <li>• Air Management Techniques (Topic 3-3) <ul style="list-style-type: none"> <li>○ Drill Ground Activity 6: Air Management</li> </ul> </li> <li>• Navigation Techniques (Topic 4-1) <ul style="list-style-type: none"> <li>○ Drill Ground Activity 8: Navigation</li> </ul> </li> <li>• Disentanglement Techniques (Topic 4-2) <ul style="list-style-type: none"> <li>○ Drill Ground Activity 9: Disentanglement</li> </ul> </li> </ul>	1.25
Lunch Break	TBD
Complete 1 of 4 Skill Stations (see above)	1.25
Complete 1 of 4 Skill Stations (see above)	1.25
Complete 1 of 4 Skill Stations (see above)	1.25
Wrap Up <ul style="list-style-type: none"> <li>• Clean up and debrief</li> <li>• Q&amp;A</li> <li>• Assign case study assignment <ul style="list-style-type: none"> <li>○ Activity 8-1: Mayday Case Studies</li> </ul> </li> </ul>	0.5

<b>Day 2</b>	<b>Time</b>
<b>Introduction</b> <ul style="list-style-type: none"> <li>• Review/assess Day 1 (10 minutes)</li> <li>• Q&amp;A (5 minutes)</li> <li>• Injury report (5 minutes)</li> <li>• Topic 8-1 presentations (10 min/group)</li> </ul>	1.0
<b>Complete 1 of 4 Skill Stations</b> <ul style="list-style-type: none"> <li>• Wall Breach (Topic 5-1)                             <ul style="list-style-type: none"> <li>○ Drill Ground Activity 10: Wall Breach – Backwards Swim</li> <li>○ Drill Ground Activity 11: Wall Breach – Head First</li> </ul> </li> <li>• Window Hang / Anchor and Bail Out (Topic 5-2) (Topic 6-1)                             <ul style="list-style-type: none"> <li>○ Drill Ground Activity 13: Window Hang</li> <li>○ Drill Ground Activity 12: Anchor and Bail Out</li> </ul> </li> <li>• Ladder Escape (Topic 6-2) (Topic 6-3)                             <ul style="list-style-type: none"> <li>○ Drill Ground Activity 14: Ladder Escape – Hook Two/Slide to Four</li> <li>○ Drill Ground Activity 15: Ladder Escape – Head First</li> </ul> </li> <li>• SCBA in a Rescue Environment                             <ul style="list-style-type: none"> <li>○ Drill Ground Activity 1: Call Mayday</li> <li>○ Drill Ground Activity 7: Use SCBA in a Rescue Environment</li> </ul> </li> </ul>	1.5
Complete 1 of 4 Skill Stations (see above)	1.5
Lunch Break	TBD
Complete 1 of 4 Skill Stations (see above)	1.5
Complete 1 of 4 Skill Stations (see above)	1.5
Topic 7-1: Above and Below Grade Survival	0.5
<b>Wrap Up</b> <ul style="list-style-type: none"> <li>• Clean up and debrief</li> <li>• Q&amp;A</li> </ul>	0.5

## Unit 1: Introduction

### Topic 1-1: Orientation and Administration

#### Terminal Learning Objective

At the end of this topic, a student will be able to identify facility and classroom requirements and identify course objectives, events, requirements, assignments, activities, skills exercises, resources, evaluation methods, and participation requirements in the course syllabus.

#### Enabling Learning Objectives

1. Identify facility requirements
  - Restroom locations
  - Food locations
  - Smoking locations
  - Emergency procedures
2. Identify classroom requirements
  - Start and end times
  - Breaks
  - Electronic device policies
  - Special needs and accommodations
  - Other requirements as applicable
3. Review course syllabus
  - Course objectives
  - Calendar of events
  - Course requirements
  - Student evaluation process
  - Assignments
  - Activities
  - Required student resources
  - Class participation requirements

#### Discussion Questions

1. Determined by instructor

#### Application

1. Have students complete all required registration forms.

## **Topic 1-2: Course Safety Requirements**

### **Terminal Learning Objective**

At the end of this topic a student, given course safety requirements, AHJ policies and procedures, and NFPA standards, will be able to participate in the OSFM Fire Fighter Survival course so that all skills and training evolutions are carried out in accordance with AHJ policies and procedures.

### **Enabling Learning Objectives**

1. Identify risks and hazards associated with fire fighter survival training
2. Identify AHJ training safety policies and procedures
3. Identify appropriate PPE and SCBA for participation
4. Identify preventative measures to mitigate hazards and injuries
  - Arrive well rested
  - Inform instructor(s) of pre-existing injuries or conditions
  - Maintain situational awareness
  - Stay hydrated
5. Identify process for reporting injury or illness

### **Discussion Questions**

1. Determined by instructor

### **Application**

1. Determined by instructor

### **Instructor Notes**

1. Familiarize yourself with the agency, academy, or training site safety plan. If there isn't one, develop a safety plan applicable to the skills presented in the course.

## Unit 2: Mayday Mindset

### Topic 2-1: Identifying Common Causes of Mayday Situations

#### Terminal Learning Objective

At the end of this topic a student, given Mayday case studies, will be able to identify common causes of Mayday situations so that Mayday situations, injuries, and line of duty deaths are reduced in accordance with AHJ policies and procedures and best practices.

#### Enabling Learning Objectives

1. Define the term “Mayday”
  - Any life-threatening situation that cannot be resolved within 30 seconds
2. Identify common Mayday situations
3. Identify most common causes of Mayday situations
  - Complacency
  - Communication
  - Crew continuity
4. Identify most common causes of fire fighter fatalities
  - Improper risk assessment
  - Lack of Incident Command
  - Lack of accountability
  - Inadequate communications
  - Lack of SOPs or failure to follow

#### Discussion Questions

1. What are some common causes of fire fighter emergencies and deaths?
2. Why do you think these emergencies and deaths continue to happen?

#### Application

1. Determined by instructor

#### Instructor Notes

1. Use this topic to set the tone for the day.
2. Address any general questions related to the prerequisite IAFF Fireground Survival course.
3. ELO 2: Reference [www.projectmayday.net](http://www.projectmayday.net) for Mayday case studies.
4. ELO 4: Based on the NIOSH 5 Lessons Learned from LODD.

## Topic 2-2: Understanding Physiological Responses to Stress

### Terminal Learning Objective

At the end of this topic a student, given techniques and guidelines to operate in a hostile or emergency environment, will be able to effectively respond to stress so that Mayday situations, injuries, and line of duty deaths are reduced in accordance with AHJ policies and procedures and best practices.

### Enabling Learning Objectives

1. Describe the nervous system's sympathetic (fight or flight) response to stress
  - Elevated blood pressure
  - Elevated heart rate
  - Increased respiratory rate
  - GI tract dump
  - Blood shunting (acidosis)
  - Loss of dexterity
  - Audible exclusion
  - Tunnel vision
2. Describe how the brain responds to stress
  - Shutdown of prefrontal cortex and critical thought process
  - Revert to mid-brain, primal survival thinking
  - Must rely on repetitive training and muscle memory
3. Describe environmental pathology
  - VUCA-T2
    - Volatile
    - Uncertain
    - Complex
    - Ambiguous
    - Threat-containing
    - Time-constraining
  - No control over environment, must function within it
  - Must rely on training to survive within current environment
    - Checklists might fail
    - Linear thinking might fail
  - Learn to exploit environment and use it for survival
4. Describe how to operate within a hostile or emergency environment
  - Muscle memory
    - Need 60-100 reps of non-stressful repetitive movements to fully engrain for cognitive recall
    - Develop an initial response mechanism (mental checklist) to start survival process through repetitive motion
  - GRAB-LIVES
    - Gauge – check air gauge
    - Radio – call for assistance

- Air – activate pass
  - Breathing – conserve air
  - Low – stay low to avoid toxic air and heat
  - Illuminate – shine flashlight
  - Volume – make noise
  - Exit – find an exit
  - Shield airway – protect airway
  - Tactical (BOA) breathing
    - Breathe
      - Slow, deliberate, under control
    - Organize
      - What is the environment?
      - What is the problem?
      - What tools and resources are available?
    - Act
      - Take action
      - May need to act without all needed information based on:
        - Changing conditions
        - Environmental conditions
        - Instinct
5. Describe the components of a PACE survival plan
- Primary plan
  - Alternative plan
  - Contingency plan
  - Emergency plan

**Discussion Questions**

1. Have you been in a situation where you experienced a fight or flight response?
2. How did you work through that response?
3. When might you need to act, even if you don't have all needed information?

**Application**

1. Given a sample fire fighter survival event, have students develop of a quick PACE plan.

**Instructor Notes**

1. Impress on students that there isn't enough time in the course to master this material. These skills need to be practiced and refreshed throughout their career.
2. ELO 2: Use the "Effects of Hormonal or Fear Induced Heart Rate Increase" documents as a reference.
3. ELO 4: The point is not to remember acronyms; the point is to run routines so often they become muscle memory and habit.

## Topic 2-3: Calling Mayday

### Terminal Learning Objective

At the end of this topic a student, given AHJ policies and procedures, equipment, and best practices, will know when and how to declare a Mayday in accordance with AHJ policies and procedures and best practices.

### Enabling Learning Objectives

1. Identify Mayday situations
  - Separated from hoseline
  - Low air
  - Trapped/entangled
  - Injured
  - Unknown exit location
  - Rapidly changing fire conditions
  - Loss of communications
  - Loss of water
  - Falling through roof or floor
  - Missing crew member
2. Identify factors that can delay calling Mayday
  - Pride
  - Denial
  - Loss of situational awareness
  - Fear of ridicule
  - Lack of procedural knowledge (how to)
3. Identify when to call an immediate Mayday
  - Imminent danger
  - When the situation cannot be resolved within 30 seconds
  - Situational – based on environment, location, tools, air, etc.
4. Identify when to call Mayday
  - Self-rescue (rapid assessment)
    - BOA (breathe, organize, act)
    - Can you resolve the issue on your own within 30 seconds?
  - Crew assistance
    - Can someone help resolve the issue within 30 seconds?
    - Request help from those near by
    - Attempt correction action if possible
    - Calling a Mayday for those who may not be able to
  - Call Mayday
5. Describe how to use radio equipment to call Mayday
  - Radio placement
    - Where to place
    - Why placement matters



- Radio use
    - PTT – push to talk
    - EAB – emergency activation button
    - Volume selection
    - Channel selection
  - Terminology
    - Mayday traffic
    - Emergency traffic
    - Priority traffic
    - FIRESCOPE definitions vs. agency practice
  - Procedure
    - Locate radio
    - Depress buttons
    - Call Mayday
      - Repeat three times “MAYDAY! MAYDAY! MAYDAY!”
      - Relay information
      - If not acknowledged, repeat
      - If not acknowledged again, change channels
6. Describe information to relay during a Mayday call
- Who, What, Where, Air
  - LUNAR – location, unit, name, assignment, resources needed
  - NUCAN – name, unit, conditions, actions, needs
7. Describe survival actions to take after calling Mayday
- Perform self-survival skills
    - GRAB-LIVES
  - Stay calm
  - Never give up
8. Identify external actions triggered by a Mayday call
- Radio control and discipline initiated
  - Fireground operations and incident priorities continue
  - Crews working in proximity notified
  - Resources reassigned to that location
  - Rapid Intervention Crew (RIC) activated
  - Additional units activated
  - Rescue or removal
  - Incident strategy and priorities re-evaluated
9. Demonstrate calling Mayday

**Discussion Questions**

1. What are some Mayday situations?
2. What factors contribute to an “immediate” Mayday call?
3. What information do you need to relay during a Mayday call?
4. What are some different ways to describe your location?
5. What should you do after you call Mayday?

**Application**

1. Activity 2-3: Calling Mayday
  - Divide students into groups (10 max) to practice during lecture portion
2. Drill Ground Activity 1: Call Mayday
  - Complete during skill station rotations
  - Can be included in any skill station rotation

**Instructor Notes**

1. Use the “Mayday Case Studies” document or [www.projectmayday.net](http://www.projectmayday.net) as a reference.
2. ELO 5: Use Berkeley Way case study (linked in “Mayday Case Studies”) pages 93-97 as example.

## Unit 3: SCBAs and Air Management

### Topic 3-1: Mitigating SCBA Problems

#### Terminal Learning Objective

At the end of this topic a student, given an SCBA, manufacturer specifications, AHJ policies and procedures, and best practices, will be able to mitigate SCBA problems so that SCBA is donned and worn correctly, controlled breathing techniques are used, emergency procedures are enacted if SCBA fails, all low air warnings are recognized, and respiratory protection is not intentionally compromised, and SCBA problems are identified and resolved in accordance with manufacturer specifications, AHJ policies and procedures, and best practices.

#### Enabling Learning Objectives

1. Identify the importance of SCBA checks
  - Verifies operability
  - Increases personal safety
  - Reinforces crew continuity
  - Decreases likelihood of SCBA emergencies
  - Increases survivability profile
2. Identify common SCBA problems that occur on the fireground
  - Cracked, broken, or damaged mask
  - Air from regulator discharging uncontrollably
  - Ripped or severed hose
  - Decreased air flow / air supply interruption
  - Audible leak from hose connection at cylinder connection
  - Low-pressure alarm activation
  - Out of air
  - Broken or damaged harness
3. Describe how to identify the source of an SCBA problem
  - Check cylinder
    - Turn on or gate down?
    - Properly connected?
  - Check mask
    - MMR attached?
    - Bypass valve open or closed?
    - Properly sealed?
    - Cracks or bubbles?
  - Check hoses and connections
    - Damaged?
    - Disconnected?
  - Check remote gauge
    - Air volume?

- Check harness
  - Loose?
  - Broken?
  - Donned correctly?
- 4. Describe what to do when an SCBA problem cannot be resolved
  - Remain calm
  - Buddy breathe (if needed)
  - Exit environment (if possible)
  - Call Mayday
  - Initiate self-survival procedures
- 5. Demonstrate SCBA proficiency
  - Daily check
  - Donning
  - Use
- 6. Demonstrate troubleshooting SCBA problems
- 7. Demonstrate buddy-breathing techniques

**Discussion Questions**

1. What does SCBA stand for?
2. What are you looking for during a “morning check”?
3. What types of SCBA problems can occur on the fireground?
4. What are some basic SCBA troubleshooting procedures?

**Application**

1. Activity 3-1a: Inspecting, Donning, and Using SCBA
  - Divide students into groups (10 max) to practice during lecture portion
2. Activity 3-1b: Troubleshooting SCBA Problems
  - Divide students into groups (10 max) to practice during lecture portion
3. Activity 3-1c: Buddy Breathing
  - Divide students into groups (10 max) to practice during lecture portion
4. Drill Ground Activity 2: Troubleshoot SCBA Problems
  - Complete during skill station rotations

**Instructor Notes**

1. None

## Topic 3-2: Changing SCBA Profiles

### Terminal Learning Objective

At the end of this topic a student, given a scenario, an SCBA, AHJ policies and procedures, and best practices, will be able to change their SCBA profile to escape an untenable atmosphere so that SCBA is doffed (as applicable), adjusted or relocated, and re-donned in a manner that does not compromise respiratory protection in accordance with manufacturer specifications, AHJ policies and procedures, and best practices.

### Enabling Learning Objectives

1. Identify when to change an SCBA profile
  - When current profile is too large to fit through space available
    - Wall breaches
    - Entanglements
    - Collapse
    - Obstacles (furniture, doors, etc.)
2. Describe how to change from a standard profile to a low or reduced profile (partial removal)
  - Always keep mask on
  - Undo chest strap (if applicable)
  - Loosen and remove shoulder strap opposite regulator
  - Loosen waist strap (if needed)
  - Grip shoulder strap and regulator hose to protect regulator and mask
  - Raise regulator arm to elevated elbow (chicken wing) position
  - Shift harness assembly so cylinder is almost parallel with body (touching arm)
  - Proceed through space or obstacle
  - Re-orient SCBA to normal position
  - Adjust and don
  - Tighten shoulder, chest, and waist straps
3. Describe how to change from a standard profile to zero or no profile (full removal)
  - Always keep mask on
  - Undo chest strap (if applicable)
  - Loosen both shoulder straps
  - Loosen waist strap (if needed)
  - Grip shoulder strap and regulator hose to protect regulator and mask
  - Unbuckle waist strap
  - Remove non-regulator shoulder strap
  - Rotate cylinder to front and remove regulator shoulder strap
  - Never release regulator strap grip
  - Push SCBA ahead of body through space or obstacle
  - Re-orient SCBA to normal position (regulator strap first)
  - Adjust and don
  - Tighten shoulder, chest, and waist straps

4. Describe how to convert SCBA for rescue
  - Always keep mask on
  - Undo chest strap (if applicable)
  - Loosen shoulder straps
  - Loosen waist strap
  - Unbuckle waist strap
  - Re-buckle waist strap between legs
  - Tighten shoulder straps
  - Tighten waist strap
5. Identify risks and hazards associated with changing SCBA profiles
  - Dislodging mask
  - Wrapping low-pressure regulator around arm
  - Dropping SCBA
  - Loss of contact with SCBA
6. Demonstrate the low or reduced profile (partial removal) technique
7. Demonstrate the zero or no profile (full removal) technique

**Discussion Questions**

1. Under what circumstances will you change your SCBA profile?
2. What risks are associated with changing your SCBA profile?

**Application**

1. Drill Ground Activity 3: Partially Remove SCBA
  - Complete during skill station rotations
2. Drill Ground Activity 4: Fully Remove SCBA
  - Complete during skill station rotations
3. Drill Ground Activity 5: Convert SCBA for Rescue
  - Complete during skill station rotations

**Instructor Notes**

1. Practice changing SCBA profiles outside of the training props to develop muscle memory before having students complete the steps during an evolution.

## Topic 3-3: Air Management Techniques

### Terminal Learning Objective

At the end of this topic a student, given a scenario, an SCBA, and AHJ policies and procedures, and best practices, will be able to manage air consumption on the fireground in accordance with manufacturer specifications, AHJ policies and procedures, and best practices.

### Enabling Learning Objectives

1. Describe the importance of air management
  - It saves lives
  - It is vital to functioning efficiently on the fireground
  - Air is a finite resource that determines capacity and operation time
2. Identify the key components of NFPA 1404 (current edition) as they relate to fire fighter survival
  - Training requirements
  - Fit testing requirements
  - Rule of Air Management
    - Know how much air is in SCBA and manage that air to leave the IDLH environment BEFORE low air warning alarm sounds
      - Exit the IDLH atmosphere before consumption of reserve air begins
      - Low-air alarm is notification that individual is consuming reserve air
      - Activation of the reserve-air alarm is an immediate action item for the individual and the team
3. Describe components of smoke
  - Hydrogen cyanide (asphyxiant)
  - Carbon monoxide (asphyxiant)
4. Describe physiological impact of breathing smoke
5. Describe physiological impact of wearing SCBA
  - Compresses the diaphragm
  - Increases accessory muscle use for breathing
  - Limits oxygen exchange increasing carbon dioxide retention
  - Increases heart rate due to increased effort to breath
6. Identify air consumption rates
  - 45-minute cylinder = 1,800 liters of air
  - Average fire fighter respiratory rate = 100 liters per minute
7. Identify air conservation strategies
  - AHJ best practices in accordance with NFPA 1404
  - Rule of thirds
    - 1/3 for entry and operations
    - 1/3 for exit
    - 1/3 for emergency egress

- “Breathing” component of GRABLIVES
  - Conserve air
  - Control breathing
- 8. Identify factors that impact air consumption rates
  - Physical fitness
  - Stress/emotional stability
  - Sleep deprivation
  - Respiratory rate
  - Workload
  - Body position
  - Environment
  - Travel distance
  - Time in IDLH
- 9. Demonstrate air management techniques

**Discussion Questions**

1. What are the benefits of good air management?
2. What factors impact air consumption rates?
3. What strategies can you employ to control your air consumption rate?

**Application**

1. Drill Ground Activity 6: Air Management
  - Complete during skill station rotations
2. Drill Ground Activity 7: Use SCBA in a Rescue Environment
  - Complete during skill station rotations

**Instructor Notes**

1. ELO 2: Use NFPA 1404 (current edition) as a reference.
2. ELO 4: See “Physiological Effects of Smoke Inhalation” document.
3. ELO 7: The Rule of Thirds is just one example. Teach to AHJ guidelines and equipment.
4. Recommend referencing the Seattle, WA (2000 – [Sunset Hotel Incident](#) – Yob) near miss incident.
5. Recommend using [Air Management for the Fire Service](#) (Gagliano, Phillips, Jose, & Bernocco – Fire Engineering® Books & Videos) as a supplementary reference.
6. The Air Management and Navigation stations are good candidates for combining depending on space, time, and resources.
7. See Skill Station 3-3: Air Management for recommended skill station set up.



## Unit 4: Navigation and Disentanglement

### Topic 4-1: Navigation Techniques

#### Terminal Learning Objective

At the end of this topic a student, given a scenario, PPE, a radio, hoseline, tools, AHJ policies and procedures, and best practices, will be able to navigate through an interior environment so that orientation is re-established using hoseline, tools, or other methods in accordance with AHJ policies and procedures, and best practices.

#### Enabling Learning Objectives

1. Describe the importance of situational awareness
  - Assist with processing necessary information for recognition-primed decision making and early identification of problems
  - Identify resource needs (where, what, when, resource deployment, and current fireground operations)
  - Increase fire fighter and crew safety
  - Prevent/reduce Mayday situations
2. Identify factors that lead to disorientation on the fire ground
  - Lack of situational awareness
  - Lack on continual size up
  - Lack of visibility
  - Lack of orientation/interior mapping
  - Lack of communication
  - Task saturation
    - Overwhelm
    - Tunnel vision
  - Building construction
  - Building contents
  - Changing fire conditions
  - Flow path
  - Inexperience
  - Fatigue/stress
  - Physical fitness
3. Identify key components of exterior size up (360)
  - Building footprint (window size, doors, access and egress)
  - Building construction
  - Building contents
  - Building occupancy type
  - Smoke conditions (volume, velocity, density, color)
  - Fire location and impact on the building
  - Resources already in operation (hoselines, ladders, size, location, radio traffic)

4. Identify key components of interior size up
  - Interior footprint and layout
  - Contents (floor type and fire load)
  - Location of fire
  - Smoke conditions
  - Access and egress
5. Identify when and how to call Mayday when disoriented
  - Recognize disorientation
  - BOA (breathe, organize, act)
  - Call Mayday
  - Perform self-survival skills
    - GRAB-LIVES
  - Initiate navigation procedures
6. Describe how to communicate location
  - By hose
    - Diameter
    - Color
    - Location
  - By landmark
    - Windows
    - Doors
    - Elevation
    - Side of structure (Alpha, Bravo, Charlie, Delta)
  - By environment
    - What can you see?
    - What can you hear?
    - What can you feel?
7. Describe proactive steps fire fighters can take to reduce disorientation
  - Know PPE components, features, and limitations
  - Carry tools and equipment in same locations every time
  - Always maintain situational awareness
  - Practice skills regularly (muscle memory)
  - Combat complacency
  - Maintain physical and mental fitness
8. Describe body positioning and movement techniques for reorientation
  - Body positioning
    - Benefits of sliding position vs. crawling
    - Upright sliding position
      - Sit back on rear leg
      - Front leg with foot flat on floor and knee bent
      - Torso upright with center of gravity on rear leg
      - One hand on ground to stabilize body
      - One hand sweeping high on wall to locate windows and doors

- Movement
  - Move front foot forward while rear leg slides behind
  - Maintain chest in upright position
  - Drop leading shoulder and scan below neutral plane to maintain situational awareness
  - Every slide should cover approximately three feet
  - Sweep hand high on wall while sliding
- 9. Describe how to use hoseline for reorientation
  - Locate hoseline
    - Feel with both hands while facing hose
  - Search hoseline until locating coupling
    - Feel for coupling with outstretched arms
    - Lift hose and slam on floor to listen for coupling contact
    - Travel toward sound maintaining contact with hose
  - Find male coupling (lugs are larger and run entire length)
    - “Smooth, Bump, Bump, to the Pump”
    - “Long Lugs Lead Out”
  - Follow hoseline to exit structure
    - Hook one foot to the hose (to maintain contact)
    - Extend body and arm to locate a wall
    - Utilize sweep technique to identify egress points
- 10. Describe how to use tools for reorientation
  - Base tool selection on exterior size up
  - Single-level structures
    - Halligan
      - Triangle technique
      - Motorcycle grip
  - Basement or raised foundation
    - Halligan
      - Upright (Adz towards floor)
      - Sounding technique
      - Motorcycle grip
  - Elevated operations
    - Combination of triangle and sounding technique

### Discussion Questions

1. What factors can lead to disorientation on the fireground?
2. How does body positioning improve situational awareness?
3. What are some ways to communicate location?
4. How can continual size up help minimize disorientation?

### Application

1. Drill Ground Activity 8: Navigation

### Instructor Notes

1. ELO 3 and 4: Recommend using the following supplementary materials for reference:

- [\*The Art of Reading Smoke\*](#) (Dodson – Fire Engineering® Books & Videos)
  - [\*The Art of Reading Buildings\*](#) (Mittendorph & Dodson – Fire Engineering® Books & Videos)
2. Recommend using the following case studies (in “Mayday Case Studies” document) and reports for this topic:
- Indianapolis, IN, (1992 – Athletic Club Fire)
  - Ashville, NC (2011 – Medical Building – Bowen)
  - Bryan, TX (2013 – Assembly Hall – Pickard and Wallace)
  - San Antonio, TX (2017 – Strip Mall – Deem)
  - Topic 4-1: [“U.S. Fire Fighter Disorientation Study”](#) (2003 – Mora)

## Topic 4-2: Disentanglement Techniques

### Terminal Learning Objective

At the end of this topic a student, given a scenario, PPE, radio, cutting tools, hand tools, a hoseline, AHJ policies and procedures, and best practices, will be able to transition through an entanglement so that respiratory protection is not intentionally compromised, and entanglement is transitioned in accordance with AHJ policies and procedures, and best practices.

### Enabling Learning Objectives

1. Describe the importance of disentanglement
  - It saves lives
2. Identify types of entanglements
  - HVAC ducting
  - Wires
    - Telecommunications
    - Electrical
  - Drop ceiling grid
3. Identify entanglement points on SCBA, PPE, and equipment
  - SCBA
    - Cylinder
    - Cylinder strap
    - First stage regulator
  - PPE
    - Helmet
    - Mask
    - Coat
  - Equipment
    - Radio
    - Equipment
    - Hand tools
4. Identify tools used for disentanglement
  - Wire cutters
  - Spring-loaded cutters
  - “Lineman” cutters
5. Identify tool placement for access during entanglement
6. Identify when and how to call Mayday in entanglement situations
  - BOA (breathe, organize, act)
  - Can you disentangle in about 30 seconds?
  - Call Mayday
  - Perform self-survival skills
    - GRAB-LIVES
  - Initiate disentanglement procedures

7. Describe disentanglement options

- Defensible space sweep
  - Sweep outstretched arm to create largest possible opening
  - Move safely through opening
- Swim
  - Get as low to the ground as possible
  - Roll SCBA cylinder toward ground away from hazard (puts you on your side)
  - Sweep outstretched arm to create largest possible opening
  - Place gloved hand over helmet “eagle” (if possible)
  - Lead with head and arms
  - Avoid temptation to raise onto elbows (increases your profile)
  - Propel body forward until hand resting on helmet encounters obstacles then repeat sweep
  - Free body and equipment from snags
    - Recognize resistance
    - Stop forward progress to release tension
    - Reach for entanglement
    - Adjust to work equipment free from snag
    - Continue through entanglement
- Use a hand tool
  - Tool functions as extension of hand or arm during sweep and swim techniques
  - Advantages and disadvantages in different environments
- Use a hose line
  - Likely already in place prior to entanglement
  - Position hoseline above and follow underneath to exit or safety
- SCBA removal (full removal while laying down)
  - Undo chest strap (if applicable) and waist strap
  - Remove shoulder strap opposite regulator
  - Grip shoulder strap and regulator hose to protect regulator and mask
  - Turn body toward regulator shoulder strap and face SCBA while removing arm from shoulder strap
  - Always maintain grip on shoulder strap with regulator hose
  - Holding harness and cylinder to chest, sweep with free hand to create largest possible opening
  - Propel body forward through opening
  - Re-orient SCBA to normal position (air supply strap first)
  - Adjust and don
  - Tighten shoulder, chest (if applicable), and waist straps
- Cutting
  - Locate, isolate, cut
  - Cutting in front vs. cutting behind
  - Ensure protection on of SCBA and communications equipment

8. Demonstrate disentanglement techniques

- Sweep
- Swim
- SCBA removal
- Cut

**Discussion Questions**

1. What components on the fireground can cause entanglement?
2. What components on a fire fighter can cause entanglement?

**Application**

1. Drill Ground Activity 9: Disentanglement
  - Complete during skill station rotations

**Instructor Notes**

1. Recommend using the following case studies (in “Mayday Case Studies” document) and reports for this topic: Memphis, TN (1994 – Regis Towers LODD)
2. ELO 3: Have an associate dress in full PPE and talk through from head to toe, pointing out areas that often get stuck.

## Unit 5: Wall Breach and Anchoring

### Topic 5-1: Wall Breach Techniques

#### Terminal Learning Objective

At the end of this topic a student, given a scenario, PPE, radio, hand tools, AHJ policies and procedures, and best practices, will be able to breach a wall so that respiratory protection is not compromised, and wall is breached in accordance with AHJ policies and procedures and best practices.

#### Enabling Learning Objectives

1. Describe the importance of wall breaching
2. Identify wall construction materials
  - Shiplap
  - Drywall
  - Tongue and groove
  - Brick
  - Lathe and plaster
  - Sheer walls
3. Identify potential obstacles or hazards contained in walls
  - Electrical (wires and outlets)
  - Plumbing
  - Insulation
  - Studs
4. Identify when and how to call Mayday
  - BOA (breathe, organize, act)
  - Call Mayday
  - Perform self-survival skills
    - GRAB-LIVES
  - Initiate wall breach procedures
5. Describe how to breach a wall
  - Locate the area to breach
  - Close door (if possible) to buy additional time
  - Identify material to breach
  - Send a tool through material first
    - Check for obstacles
    - Evaluate area and environment
  - Make the breach (opening)
    - Ensure opening is large enough to exit quickly
    - May need to knock stud at sole plate for wider opening
  - Sound floor on opposite side of opening
    - Leave tool on opposite side to pick up after traveling through



- Travel through opening
  - Reduce SCBA profile if necessary
  - May need to clear obstacles (furniture, etc.)
    - Use legs to conserve energy and air
- 6. Describe how to travel through a breach using the backwards swim technique
  - Sound floor on opposite side of opening
  - Sit with back and SCBA in the opening
  - Position feet in front
  - Lift buttocks off ground (clear baseboard if needed)
  - Shift cylinder to right side of opening
  - Rotate left arm over left shoulder and through opening
  - Lean back as arm passes through
  - Rotate hips and body
  - Repeat action with right arm to “swim” through opening
- 7. Describe how to travel through a breach using the head-first technique
  - Sound floor on opposite side of opening
  - Kneel centered facing opening
  - Place shoulders on either side of breach
  - Rotate onto one hand and forearm, raising opposite arm to reduce SCBA profile
  - Reach raised arm through opening
  - Crawl forward, rotating body to follow through
- 8. Demonstrate traveling through a breach using the backwards swim technique
- 9. Demonstrate traveling through a breach using the head-first technique

**Discussion Questions**

1. When might you need to breach a wall?
2. How does wall material impact breaching operations?
3. What types of obstacles or hazards are contained within walls?

**Application**

1. Drill Ground Activity 10: Wall Breach – Backwards Swim
  - Complete during skill station rotations
2. Drill Ground Activity 11: Wall Breach – Head First
  - Complete during skills station rotations

**Instructor Notes**

1. None

## Topic 5-2: Anchoring and Bailout Techniques

### Terminal Learning Objective

At the end of this topic a student, given a scenario, PPE, tools, objects used to anchor and descend, AHJ policies and procedures, and best practices, will be able to anchor and descend from an elevated exit in an IDLH environment so that respiratory protection is not compromised, a secure anchor is established, and descent occurs in a controlled and safe manner in accordance with AHJ policies and procedures and best practices.

### Enabling Learning Objectives

1. Describe the importance of descending from an elevated exit
  - Increase chance of survival
  - Escape when you can't go back the way you came
2. Identify when and how to call Mayday
  - BOA (breathe, organize, act)
  - Call Mayday
  - Perform self-survival skills
    - GRAB-LIVES
  - Initiate anchoring and bailout procedures
3. Identify equipment needed to descend from an elevated exit
  - Rope
    - Aramid/Kevlar – should be in all bailout kits
    - Nylon – not ideal
      - Low melting point
      - Easily cut
      - Always have edge protection
  - Aluminum carabiners
    - Locking HMS carabiners are best
      - Wide, pear shape for knot passing
      - Easy to manipulate in gloves
      - Increase friction for slower descent speeds
  - Webbing
    - All fire fighters should carry at least 22' of 1" webbing for fireground operations
      - Should be open (not looped)
      - Can use for bailouts when tied together
      - Can use for Class III harness packaging
4. Describe how anchors work
  - Bends in rope substantially reduce weight on anchor
    - Single 90-degree bend takes 70% of weight off anchor
    - A 200-lb firefighter using their legs to push out from a building creates a fulcrum and can put 400 lbs. on the anchor
  - Keep low to promote bends in rope or webbing

5. Describe how to use commercial or pre-rigged anchors
  - Come with proprietary hook/anchor
  - End user must train on specifics
  - Follow manufacturer specifications
  - Follow AHJ policies and procedures
6. Describe how to use fire fighter tools as anchors
  - Types of tools
    - Hooks, bars, axes
    - End user must know how to attach or secure each
      - Clove hitch
      - Girth hitch
  - Tool across window
    - Attach rope or webbing to tool so it is balanced when weighted
    - Brace tool in a corner so that each end of tool is braced against window frame
    - If tool has a pick style end, bury in wall to add stability
    - Use body to weight system and climb out exit point (soft start)
    - Ensure that tool never moves and is fully weighted before committing full body weight to rope or webbing
  - Tool in drywall next to window
    - Breach wall next to window frame creating hole large enough to fit main body of tool vertically
    - Attach rope to tool head and ensure it is secure
    - Slide tool body into breach hole
    - Bury tool into wall as much as possible keeping head and rope anchor visible
    - Use body to weight system and climb out exit point (soft start)
    - Ensure tool never moves and is fully weighted before committing full body weight to rope or webbing
  - Tool in header above window
    - Use tool to sound structural members above window frame
    - Breach wall and sink tool head so it rests on top of structural member
    - Attach rope or webbing to tool
    - Use body to weight system and climb out exit point (soft start)
    - Ensure tool never moves and is fully weighted before committing full body weight to rope or webbing
  - Stud wrap
    - Breach wall
    - Wrap rope or webbing around studs to create an anchor point
    - Use body to weight system and climb out exit point (soft start)
    - Ensure tool never moves and is fully weighted before committing full body weight to rope or webbing

7. Describe how to use improvised anchors
  - Use what is available in the environment
    - Objects in room
    - Furniture
    - Wall breach to access structural member
    - Door frame
    - People
  - Furniture
    - Attach with hitch or carabiner
  - Wall breach to access structural member
    - Window frame
      - Above
      - Beside
    - Wall
      - Find structural members
  - Door frame
    - Brace knot or carabiner in hinge gap between frame and door
    - Keep low by bottom hinge
    - Close door
  - People (human anchor)
    - Using a body to perform as anchor
    - Position fire fighter below window on back with legs bracing wall and sill
    - Clip carabiner to anchor fire fighter
8. Identify knots used in descending from an elevated exit
  - Overhand knot – used for webbing bailouts
    - Ensure webbing is not looped
    - Take two ends of webbing (if extending the bailout) and hold them together
    - Take an arm's length (at least) of slack
    - Tie an overhand knot with both ends of webbing
  - Munter hitch – lots of ways to tie
    - Clove hitch technique
    - Carabiner clip-in technique
    - Direct tie in techniques (various)
  - Carabiner spine wrap – used for webbing bailouts
    - Facing anchored webbing, use dominant hand to open carabiner gate
    - Clip onto webbing and roll wrist three times to wrap webbing around carabiner
      - With each roll, ensure carabiner is clipping on to webbing
      - Roll + clip, roll + clip, roll + clip
    - Massage webbing on spine to ensure down range side is slack
    - Anchor side should be at top of carabiner and will tighten when weighted

9. Describe how to bail out using webbing
  - Use at least two pieces of webbing tied together with an overhand knot
  - Anchor one end (to literally anything)
  - Perform carabiner wrap in portion of webbing closest to exit
  - Clip wrapped carabiner to harness
  - Always keep hand on brake (downhill/loose side of webbing)
  - Resolve knots as needed
    - Brake hand should feel a knot coming
    - Don't stop
    - Slow down and let knot reach carabiner
    - Let knot pass through carabiner
  - Transitioning to second piece of webbing (connect to first via overhand knot)
    - Keep brake hand engaged
    - Use non-brake hand to feed tails of overhand knot through carabiner
    - Reach around to backside of carabiner and give tails a solid tug to pull knot through carabiner
    - Resume descent
10. Describe how to bail out using rope
  - Anchor one end of rope
  - Move to exit portal
  - Using an HMS carabiner, reach out of portal and grab some rope slack
  - Clip carabiner to rope using Munter hitch
11. Describe how to bail out using a personal escape system
  - Follow manufacturer specifications
  - Follow AHJ policies and procedures
12. Describe how to exit and descend
  - Soft start when loading system ("sniff the sill")
    - Keep hand on rope as it passes over sill too keep fingers from getting pinched underneath
    - Put head out of window near side
    - Stay low and roll out of exit on stomach
    - Use brake hand to reach out along exterior to help clear legs and SCBA
    - Keep body against building using knees to navigate obstacles
  - Do not "L out" and become a fulcrum on the anchor
  - Do not kick out or jump on the way down
  - Exit in a slow and controlled manner (live to fight another day!)
  - Do not straighten the rope or webbing – substantially increases weight on anchor
13. Demonstrate overhand knot
14. Demonstrate Munter hitch
15. Demonstrate carabiner spine wrap
16. Demonstrate anchoring (based on prop)
17. Demonstrate bail out (one of the three options)

**Discussion Questions**

1. Why is it important to not “L” out while descending on a rope?
2. Why is aramid rope preferred over nylon?
3. If you use webbing for a bailout procedure, what is the preferred method of descent?

**Application**

1. Drill Ground Activity 12: Anchor and Bail Out
  - Complete during skill station rotations

**Instructor Notes**

1. ELO 7: There are lots of ways to tie a Munter hitch. Teach several techniques and let students use one most comfortable for them.
2. ELO 12-14: Have students demonstrate for an instructor outside of a training evolution.

## Unit 6: Window Hang and Ladder Escape

### Topic 6-1: Window Hang Techniques

#### Terminal Learning Objective

At the end of this topic a student, given a scenario, PPE, tools, AHJ policies and procedures, and best practices, will be able to seek refuge by hanging out a window so that respiratory protection is not compromised until help arrives in accordance with AHJ policies and procedures and best practices.

#### Enabling Learning Objectives

1. Describe the importance of a window hang maneuver
  - A means of seeking refuge when no other options (egress, ladder escape, etc.) exist
2. Identify when and how to call Mayday
  - BOA (breathe, organize, act)
  - Call Mayday
  - Perform self-survival skills
    - GRAB-LIVES
  - Locate window
  - Initiate window hang procedures
3. Describe how to execute an individual window hang
  - Locate and travel to window
    - Close door to room to buy additional time if possible
    - Stay low to avoid heat and smoke
  - Clear window frame of glass, sash, screen, curtains, blinds
    - Start at top and force out
      - Allows maximum removal of fire gasses and heat
      - Minimizes falling glass
    - Remove any glass or debris on sill to reduce injury
  - Get on hands and knees
  - Position one shoulder against the wall below the window
  - Lift body only enough to exit window
    - Lead with arm, then head, then leg
    - Roll body over the sill, keeping as low as possible
    - Use interior arm and leg to grip sill for support
    - Final hang position is achieved when inside arm and leg are used to hook windowsill to keep most of body outside window and away from heat
  - Radio an update of your situation
  - Remain in window until rescued or conditions become untenable
4. Identify where to position ladder to rescue a fire fighter hanging in a window
  - Position top of ladder to fire fighter's center mass (core)
5. Identify how to transition from a window hang to a ladder
  - Grip ladder with exterior arm
  - Lock elbow (to create pivot arm)

- Rotate into ladder slide position leading with exterior leg
  - Slide down ladder
6. Describe how to execute a two-person (side by side) window hang
    - One person calls Mayday while the other person clears window
    - Follow individual procedure
    - Final hang position is achieved when individuals are situated cylinder to cylinder, facing away from each other
    - Radio an update of your situation
    - Remain in window until rescued or conditions become untenable
  7. Identify considerations associated with a two-person (stacked) window hang
    - Window size
    - Fire fighter sizes
    - Remaining air
    - Injuries
    - SCBA removal
      - Partial removal – mask on (rest on floor in room, hang from arm)
      - Full removal – regulator off (breathing exterior air)
  8. Describe how to drop from a window if conditions become untenable
    - Ensure interior arm is still locked inside window
    - Raise exterior arm and grip windowsill
    - Rotate interior leg over sill and let it hang
    - Slide interior arm out of window and grip windowsill
    - Maintain upright hanging position until help arrives, or conditions become untenable
    - Drop to the ground while keeping knees bent
    - Roll upon impact if possible

**Discussion Questions**

1. When would you use a window hang escape?
2. How many people can hang from one window?
3. How would you divide duties during a two-person window hang escape?
4. What is the best way to clear a window?
5. Where do you position a ladder to rescue someone hanging from a window?

**Application**

1. Drill Ground Activity 13: Window Hang
  - Complete during skill station rotations

**Instructor Notes**

1. Students are required to do a one-person window hang to complete the course. Add a two-person hang if time, resources, and safety requirements permit.



## Topic 6-2: Hook Two / Slide to Four Ladder Escape Technique

### Terminal Learning Objective

At the end of this topic a student, given a scenario, PPE, a ladder, AHJ policies and procedures, and best practices, will be able to escape from an elevated area using a ladder and the hook two / slide to four technique to exit a structure without compromising air protection in accordance with AHJ policies and procedures and best practices.

### Enabling Learning Objectives

1. Identify when to use a ladder escape
  - Above ground level
  - Cut off from primary means of egress
  - Base ladder escape technique on size of window and fire fighter
2. Identify when and how to call Mayday
  - BOA (breathe, organize, act)
  - Call Mayday
  - Perform self-survival skills
    - GRAB-LIVES
  - Locate window
  - Initiate ladder escape procedures
3. Describe how to execute a hook two / slide to four ladder escape
  - Locate window
  - Close door to room (if possible) to buy additional time
  - Travel to window
    - Stay low to avoid heat and smoke
  - Clear window frame of glass, sash, screen, curtains, blinds
    - Starting at the top and force out
      - Allows maximum removal of fire gasses and heat
      - Minimizes falling glass
    - Remove any glass or debris on sill to reduce injury
  - Locate ladder
    - Lean over windowsill
    - Stay as low as possible
    - Feel for ladder with gloved hand
  - Place both hands on beams
  - Make a fist with one hand
  - Place back of fist over rung 1 and hook under rung 2
  - Secure inside of elbow around rung 2 (maintain fist)
  - Slide opposite arm down beam to rung 4
  - Slide hang across rung 4 to opposite beam and grasp rung 4
  - Prepare to transition weight from rung 2 to rung 4
    - Bend knees
    - Tuck feet

- Using elbow (rung 2) and gripped hand (rung 4) as pivot points, rotate body over windowsill
  - Descend ladder quickly
  - Clear bottom of ladder quickly to allow additional fire fighters to escape
4. Identify risks and hazards associated with hook two / slide to four ladder escapes
    - Improper hand/arm placement or grip
      - Significant injury
      - Falls
    - Too much momentum
      - Overshoot ladder
      - Move ladder
  5. Demonstrate a hook two / slide to four ladder escape

### **Discussion Questions**

1. When should you use a hook two / slide to four ladder escape?
2. What risks are associated with ladder escapes?
3. How many points of contact are needed for hook two / slide to four ladder escapes?

### **Application**

1. Drill Ground Activity 14: Ladder Escape – Hook Two / Slide to Four
  - Complete during skill station rotations

### **Instructor Notes**

1. None

## Topic 6-3: Head-First Ladder Escape Technique

### Terminal Learning Objective

At the end of this topic a student, given a scenario, PPE, a ladder, AHJ policies and procedures, and best practices, will be able to escape from an elevated area using a ladder and the head-first technique to exit a structure without compromising air protection in accordance with AHJ policies and procedures and best practices.

### Enabling Learning Objectives

1. Identify when to use a ladder escape
  - Above ground level
  - Cut off from primary means of egress
  - Base ladder escape technique on size of window and fire fighter
2. Identify when and how to call Mayday
  - BOA (breathe, organize, act)
  - Call Mayday
  - Perform self-survival skills
    - GRAB-LIVES
  - Initiate ladder escape procedures
3. Describe how execute a head-first ladder escape
  - Locate window
  - Close door to room (if possible) to buy additional time
  - Travel to window
    - Stay low to avoid heat and smoke
  - Clear window frame of glass, sash, screen, curtains, blinds
    - Starting at the top and force out
      - Allows maximum removal of fire gasses and heat
      - Minimizes falling glass
    - Remove any glass or debris on sill to reduce injury
  - Locate ladder
    - Lean over windowsill
    - Stay as low as possible
    - Feel for ladder with gloved hand
  - Grab ladder rungs with both hands
    - Do not wrap thumbs around rungs
  - Pull body head first over windowsill
    - Maintain low profile
    - Pivot out of window on midsection
    - Avoid snagging tools and equipment
  - Use hands to reach out and grab next rung
  - Descend using hand-over-hand technique
  - As feet exit window, hook toes onto windowsill to control transition onto ladder
  - Use toes of boots to control speed by hooking feet on each rung while descending

- At the bottom, roll off ladder by extending one arm underneath last rung to position body on side
- Clear bottom of ladder quickly to allow additional fire fighters to escape
- 4. Identify risks and hazards associated with head-first ladder escapes
  - Improper grip or hand/foot placement
    - Significant injury
    - Falls
  - Too much momentum
    - Overshoot ladder
    - Move ladder
- 5. Demonstrate a head-first ladder escape

### **Discussion Questions**

1. When should you use a head-first ladder escape?
2. What risks are associated with ladder escapes?
3. How many points of contact are needed for a head-first escape?
4. Why should you not use your thumbs during a head-first escape?

### **Application**

1. Drill Ground Activity 15: Ladder Escape – Head First
  - Complete during skill station rotations

### **Instructor Notes**

1. None

## Unit 7: Above and Below Grade Survival

### Topic 7-1: Above and Below Grade Survival Techniques

#### Terminal Learning Objective

At the end of this topic a student, given a scenario, PPE, tools, AHJ policies and procedures, and best practices, will be able to assess above and below grade Mayday situations and determine best case survival techniques in accordance with AHJ policies and procedures and best practices.

#### Enabling Learning Objectives

1. Identify above and below grade Mayday situations
  - Falling into basements (20%)
  - Falling through roof (15%)
2. Identify how avoid falls through floors
  - Proper size up (360)
    - Is there a basement?
    - Is the fire in the basement?
  - Proper sounding
  - Situational awareness
  - Reading smoke
  - Burn time
3. Identify buildings with potential basements or lower levels
  - Homes
  - Commercial buildings with below-grade storage
  - Apartment buildings
4. Describe survival techniques for below-grade falls
  - Call Mayday
  - BOA (breathe, organize, act)
    - Look for walls, stairs, windows
    - Find safe refuge
    - Never give up
5. Identify how avoid falls through roofs
  - Proper size up (360)
  - Know roof
    - Materials
    - Construction
    - Inspection cut locations
  - Proper sounding
  - Situational awareness
  - Reading smoke
  - Burn time
  - Prior burn history

6. Identify how roof materials impact operations and rescue
  - Metal
  - Shingle
  - Asphalt
  - Tile
  - Concrete
  - Solar
7. Identify how roof construction impacts operations and rescue
  - Conventional vs. light weight
  - Residential vs. commercial
8. Describe survival techniques for roof falls
  - Call Mayday
    - Usually by someone who witnesses, not downed fire fighter
  - BOA (breathe, organize, act)
    - Crew
    - Downed fire fighter
  - Weight displacement
    - Tools
    - Equipment
    - Ladders

**Discussion Questions**

1. Why is a 360 size up so important to potential fire fighter survivability?
2. When performing a roof assessment, what are some considerations regarding different roof types and construction?
3. If a fire fighter falls through a roof or basement, what are some immediate considerations for self-survival?

**Application**

1. Determined by instructor

**Instructor Notes**

1. ELO 1: Statistics are from 2022. Use most current data during course delivery.
2. There are no drill ground activities associated with this topic. Talk through it, but students are not required to demonstrate.

## Unit 8: Mayday Case Studies

### Topic 8-1: Mayday Case Studies

#### Terminal Learning Objective

At the end of this topic a student, given a fire fighter survival topic and NIOSH Fire Fighter Fatality Report or Near Miss Report, will be able to identify factors that contribute to specific Mayday situations and recommend solutions or mitigations to avoid similar events in accordance with AHJ policies and procedures and best practices.

#### Enabling Learning Objectives

1. Identify factors that contribute to injuries, Mayday situations, and line of duty deaths
2. Identify solutions or mitigations to avoid injuries, Mayday situations, and life of duty deaths

#### Discussion Questions

1. Determined by instructor

#### Application

1. Activity 8-1: Mayday Case Studies
  - Divide students into groups (10 max) to evaluate and research (homework) and present their findings (8-10 minutes) to the class.

#### Instructor Notes

1. Introduce case study assignment on Day 1. Provide each student with access (print or digital) to their assigned case study. Student groups will present their findings on Day 2.

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## How to Read a Course Plan

A course plan identifies the details, logistics, resources, and training and education content for an individual course. Whenever possible, course content is directly tied to a national or state standard. SFT uses the course plan as the training and education standard for an individual course. Individuals at fire agencies, academies, and community colleges use course plans to obtain their institution's consent to offer course and provide credit for their completion. Instructors use course plans to develop syllabi and lesson plans for course delivery.

### Course Details

The Course Details segment identifies the logistical information required for planning, scheduling, and delivering a course.

### Required Resources

The Required Resources segment identifies the resources, equipment, facilities, and personnel required to deliver the course.

### Unit

Each Unit represents a collection of aligned topics. Unit 1 is the same for all SFT courses. An instructor is not required to repeat Unit 1 when teaching multiple courses within a single instructional period or academy.

### Topics

Each Topic documents a single Terminal Learning Objective and the instructional activities that support it.

### Terminal Learning Objective

A Terminal Learning Objective (TLO) states the instructor's expectations of student performance at the end of a specific lesson or unit. Each TLO includes a task (what the student must be able to do), a condition (the setting and supplies needed), and a standard (how well or to whose specifications the task must be performed). TLOs target the performance required when students are evaluated, not what they will do as part of the course.

### Enabling Learning Objectives

The Enabling Learning Objectives (ELO) specify a detailed sequence of student activities that make up the instructional content of a lesson plan. ELOs cover the cognitive, affective, and psychomotor skills students must master to complete the TLO.

### Discussion Questions

The Discussion Questions are designed to guide students into a topic or to enhance their understanding of a topic. Instructors may add to or adjust the questions to suit their students.

**Application**

The Application segment documents experiences that enable students to apply lecture content through cognitive and psychomotor activities, skills exercises, and formative testing. Application experiences included in the course plan are required. Instructors may add additional application experiences to suit their student population if time permits.

**Instructor Notes**

The Instructor Notes segment documents suggestions and resources to enhance an instructor's ability to teach a specific topic.

**CTS Guide Reference**

The CTS Guide Reference segment documents the standard(s) from the corresponding Certification Training Standard Guide upon which each topic within the course is based. This segment is eliminated if the course is not based on a standard.