Water Rescue Awareness and Operations (2021)

Course Plan

Course Details

Description: Topics include dynamic hydrology; recognizing and isolating hazards to rescuers and victims; managing a water rescue incident; incident size up and communication; working with air assets and watercraft; selecting and using PPE and rescue equipment; searching for and managing victims; constructing and using technical rope rescue systems and skills; dynamic swimming; performing non-entry rescues from the shore; and terminating an incident. This course incorporates awareness and operations training based on NFPA 1006 (2021).

Designed For: Public safety members with river and flood rescue responsibilities.

Prerequisites: IS-100, IS-200, IS-700, and IS-800 (FEMA)

Standard: Attend and participate in all course sections

Successful completion of all skills identified on the Training Record

Hours: 8 hours

(6.5 lecture / 1.5 application)

Max Class Size: 50

Instructor Level: SFT Registered Water Rescue Awareness and Operations Instructor

Instructor/Student Ratio: 1:50 (lecture)

1:25 (skills/teaching demonstrations)

Restrictions: All instructors counted toward student ratios, including application components, must be SFT Registered Water Rescue Awareness and Operations Instructors

SFT Designation: FSTEP

Table of Contents

Required Resources

Instructor Resources

To teach this course, instructors need:
- NFPA 1006: Standard for Technical Rescue Personnel Professional Qualifications (2021)
- NFPA 2500: Standard for Operations and Training for Technical Search and Rescue Incidents and Life Safety Rope and Equipment for Emergency Services (2021)
- FIRECOPE ICS 162 Technical Search and Rescue Incident Operational System Description
- ICS 420-1 – Field Operations Guide (FEMA, current edition)
- Emergency Response Guidebook (DOT, current edition)
- Full personal protective equipment per AHJ requirements (including Type 5 PFD, helmet, gloves, close-toed footwear, whistle (pealess), knife, head lamp, strobe light)

Recommended resources:
- *Water Rescue: Principles and Practice to NFPA 1006 and 1670: Surface, Swiftwater, Dive, Ice, Surf, and Flood* (Treinish, Steve; Jones & Bartlett; 3rd edition, 2021)
- *Swiftwater Rescue* (Slim Ray; CFS Press; expanded edition, 2013)
- *River Rescue: A Manual for Whitewater Safety* (Bechdel, Ray, & AtLee; CFS Press, 4th edition, 2009)

Online Instructor Resources

The following instructor resources are available online at
https://osfm.fire.ca.gov/divisions/state-fire-training/fstep-curriculum/
- None

Student Resources

To participate in this course, students need:
- Any textbook required by the instructor
- Full personal protective equipment per AHJ requirements (including Type 5 PFD, helmet, gloves, close-toed footwear, whistle (pealess), knife, head lamp, strobe light)

Facilities, Equipment, and Personnel

Facilities

The following facilities are required to deliver this course:
- Standard learning environment or facility, which may include:
  - Writing board or paper easel chart
  - Markers, erasers
  - Amplification devices
  - Projector and screen
  - Laptop or tablet with presentation or other viewing software
  - Internet access with appropriate broadband capabilities

- A Water Rescue Awareness and Operations training site with the NFPA 1006 required 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 high-risk training associated with this Water Rescue Awareness and Operations course.

- The equipment listed below is the minimum for the delivery of this course.
- The student is responsible for providing their 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:

Quantity Per 8-person Squad	Equipment
Determined by scenario	Rope, water rescue throw bags
Determined by scenario	Personal floatation device with blow out ring (Type V, good working condition)
Determined by scenario	Whistle, pealess
Determined by scenario	Cutting tool, knife with protective sheath attached to PPE
Determined by scenario	Light, strobe attached to PPE
1	Hose Inflation kit 2½" fire hose (length determined by AHJ) 2½" plug 2½" cap with inflation
Per Course	**Optional**
1	Boat, self-bailing raft, or Inflatable Rescue Boat (AHJ) or prop With supplies for rigging (e.g., soft and hardware)
1	Boat inflation device

The provider or agency assumes all responsibility, liability, and maintenance for the engineering design, strength, stability, and adequacy of all props. 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 Water Rescue Awareness and Operations class.

Personnel

The following personnel are required to deliver this course:

- Any instructor counted toward student ratios must be an SFT Registered Water Rescue Awareness and Operations (2021) Instructor.

Time Table

Segment	Lecture	Application	Unit Total
Unit 1: Introduction			
Topic 1-1: Orientation and Administration	0.25	0.0	
Unit 1 Totals	**0.25**	**0.0**	**0.25**
Unit 2: Water Rescue Concepts and Skills			
Topic 2-1: Managing a Water Rescue Incident	0.25	0.0	
Topic 2-2: Describing Dynamic Hydrology	0.50	0.0	
Topic 2-3: Recognizing Hazards and Initiating Isolation Procedures	0.25	0.0	
Topic 2-4: Assessing Hazards to Rescuers and Victims	0.50	0.0	
Topic 2-5: Developing a Site Survey for an Existing Water Hazard	0.25	0.0	
Topic 2-6: Sizing Up a Water Rescue Incident	0.25	0.0	
Topic 2-7: Communicating in a Dynamic Water Environment	0.25	0.25	
Topic 2-8: Developing and Implementing an Incident Action Plan to Use Watercraft	0.25	0.0	
Topic 2-9: Implementing an Incident Action Plan to Use Air Assets	0.25	0.0	
Topic 2-10: Selecting and Using Personal Protective Equipment	0.25	0.25	
Topic 2-11: Operating Water Rescue Equipment	0.50	0.0	
Topic 2-12: Describing Flood Hazards and Evacuation Procedures	0.25	0.0	
Topic 2-13: Limiting Exposure to Potentially Contaminated Floodwater	0.25	0.0	
Topic 2-14: Supporting an Operations- or Technician-level Incident	0.25	0.0	
Topic 2-15: Performing a Victim Search	0.25	0.0	
Topic 2-16: Managing a Victim	0.25	0.0	
Topic 2-17: Demonstrating Boat Rigging	0.25	0.50	
Topic 2-18: Performing a Non-Entry Rescue from Shore	0.25	0.25	
Topic 2-19: Constructing and Using Technical Rope Rescue Systems and Skills	0.25	0.25	
Topic 2-20: Swimming in Dynamic Water	0.25	0.0	
Topic 2-21: Directing a Rescue Team During Operations	0.25	0.0	
Topic 2-22: Terminating an Incident	0.25	0.0	
Unit 2 Totals	**6.25**	**1.5**	**7.75**

Segment	Lecture	Application	Unit Total
Formative Assessments			
Determined by AHJ or educational institution	0.0	0.0	0.0
Summative Assessment			
Determined by AHJ or educational institution	0.0	0.0	0.0
Course Totals	**6.5**	**1.5**	**8.0**

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.

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.

Unit 2: Water Rescue Concepts and Skills

Topic 2-1: Managing a Water Rescue Incident

Terminal Learning Objective

At the end of this topic a student, given water rescue scenarios and AHJ policies, procedures, and standards, will be able to manage a water rescue incident in accordance with local, state, and federal standards, policies, and procedures.

Enabling Learning Objectives

1. Describe water rescue scope of practice and standards
   - NFPA 1006 (current edition)
     - Surface water
     - Swiftwater
     - Floodwater
   - NFPA 2500 (current edition)
   - FIRESCOPE 162, Chapter 12 (current edition)
   - AHJ policies, procedures, and standards
2. Describe policies/procedures for rescue team activation
   - Local
   - State
   - Federal
3. Describe legal considerations and practices
   - Training and certification requirements
   - Negligence
   - Abandonment
4. Describe the discipline-specific components of the Incident Command System
   - Upstream spotter
   - Downstream safety
   - Rigging team (if needed)
   - Rescue team lead
   - Rescuer/rescue team
   - Receiving team
5. Describe rescue priorities
   - Low risk to high risk
     - Talk
     - Reach
     - Throw
     - Boat (row)
     - Swim (go)
     - Tethered swimmer (tow)
     - Helicopter (helo)
   - Rescue vs. recovery
   - Incident within an incident

- Safety priorities
  - Rescuer (self)
  - Rescue team
  - Victim(s)
6. Describe how to recognize the need for technical rescue resources
- Identify the need
- Identify available resources
  - AHJ resources
  - Local/regional resources
  - State resources
    - FIRESCOPE/Cal OES
  - Federal resources
    - FEMA USAR
- Initiate the response system
  - Apply operational protocols
  - Select and use planning forms
  - Request support operations and resources
- Secure and render scene safe until additional resources arrive
  - Implement safety measures
- Incorporate awareness-level personnel into the operational plan

Discussion Question
1. What type of waterways are present in your AHJ?
2. What type of water rescue incidents are common to your AHJ?
3. What are your legal responsibilities regarding water rescue?
4. What are some key water rescue ICS positions?

Application
1. Determined by instructor

Instructor Notes
1. None

CTS Guide Reference: CTS 1-3, CTS 4-3, CTS 7-3

Topic 2-2: Describing Dynamic Hydrology

Terminal Learning Objective

At the end of this topic a student, given a dynamic water environment, will be able to describe dynamic hydrology as it relates to rivers, channels, and floods so that hydrology impacts are avoided or mitigated during water rescue operations.

Enabling Learning Objectives

1. Describe the forces of dynamic water
2. Describe how to calculate current speed
3. Describe how to calculate water volume (cubic feet of water per second) in a river/channel
4. Describe river orientation and where to place personnel
   - Upstream
   - Downstream
   - River right
   - River left
5. Describe features created by moving water and how they impact water rescue operations
   - Laminar flow
   - Helical flow
   - Eddies
   - Eddy lines
   - Strainers/sieves
     - Natural
     - Manmade
   - Pillows
   - Hole/hydraulic
     - Smiling (closed)
     - Frowning (open)
   - Standing waves (haystacks)
   - Aerated water
   - Current vectors
   - Manmade features
     - Low-head dams
     - Drainage culverts
       - Trapezoid
       - Rectangle
     - Hydroelectric facilities
6. Describe the effects of hydrodynamic forces on rescuers and victims
7. Describe criteria for selecting victim retrieval locations based on water environment and conditions
8. Identify river classifications
   - Class 1 through 6

- Change based on conditions

Discussion Questions

1. How does cubic feet per second (cfs) impact water hydrology?
2. How do water speed and volume impact rescue operations?
3. What additional considerations are associated with operations involving manmade features?

Application

1. Determined by instructor

Instructor Notes

1. For any topic taught in a classroom, supplement with images and videos as visual aids.

CTS Guide Reference: None

Topic 2-3: Recognizing Hazards and Initiating Isolation Procedures

Terminal Learning Objective

At the end of this topic a student, given scene control barriers, personal protective equipment (PPE), requisite equipment, and available specialized resources, will be able to recognize incident hazards associated with water rescue and initiate isolation procedures so that all hazards are identified; resource application fits the operational requirements; hazard isolation is considered; risks to rescuers, bystanders, and victims are minimized; and rescue time constraints are taken into account.

Enabling Learning Objectives

1. Describe hazards created by or associated with surface or dynamic water
2. Describe types and natures of water rescue incident hazards
   - Surface water
   - Swiftwater
   - River/Floodwater
3. Describe types of mitigation and isolation equipment and their use
4. Describe resource capabilities and limitations
5. Describe operational requirement concerns
6. Describe common types of rescuer and victim risks
7. Describe methods for controlling access to the scene
8. Initiate mitigation and isolation procedures
   - Identify incident hazards
   - Identify resource capabilities and limitations
   - Assess potential hazards to rescuers and bystanders
   - Place scene control barriers
   - Operate control and mitigation equipment

Discussion Questions

1. When assessing a waterway, what are the most dangerous hazards?

Application

1. Conduct an incident hazard assessment and isolate hazards

Instructor Notes

1. None

CTS Guide Reference: CTS 1-2, CTS 4-2, CTS 7-2

Topic 2-4: Assessing Hazards to Rescuers and Victims

Terminal Learning Objective

At the end of this topic a student, given an incident scenario and a tool cache, will be able to assess dynamic water conditions, characteristics, and features in terms of hazards to the rescuer and victims so that the flow and conditions are estimated accurately, mechanisms of entrapment are considered, hazards are assessed, the depth and surrounding terrain are evaluated, and findings are documented.

Enabling Learning Objectives

1. Describe how to interpret information sources and identify their impact on operational decision making
   - Flow
   - Maps and charts
   - Local terrain data
   - Weather forecasts
   - Local water hazards and conditions
   - Common event characteristics
     - Surface water
     - Swiftwater
     - Floodwater
   - Entrapment mechanisms
   - Human physiology and survival factors
     - Mechanical effect of water on human body
     - Heat transfer properties
     - Trauma
     - Injuries
2. Identify current vectors for safe navigation
3. Identify areas and features that are safe zones in dynamic water environments
4. Determine flow and environmental factors and their effects on victims and rescuers
5. Acquire and interpret weather forecasts and local terrain data and evaluate their impact on victims and rescuers
6. Interpret maps or charts

Discussion Question

1. Where are safe zones typically located?
2. What is the leading cause of illness and injury around water?

Application

1. Assess hazards to rescuers and victim(s)

Instructor Notes

1. None

CTS Guide Reference: CTS 5-3, CTS 8-2

Topic 2-5: Developing a Site Survey for an Existing Water Hazard

Terminal Learning Objective

At the end of this topic a student, given historical data, specific PPE for conducting site inspections, flow insurance rate maps, tide tables, and meteorological projections, will be able to develop a site survey for an existing water hazard so that life safety hazards are anticipated, risk/benefit analysis is included, site inspections are completed, water conditions are projected, site-specific hazards are identified, routes of access and egress are identified, boat ramps (put-in and take-out points) are identified, the method of entrapment is considered, and areas with a high probability for victim location are determined.

Enabling Learning Objectives

1. Describe requisite contents of a site survey
2. Describe types, sources, and information provided by reference materials
3. Describe hydrology and the influence of hydrology on rescues
4. Describe types of hazards associated with water rescue practices scenarios, inspections practices, and considerations techniques
5. Describe risk/benefit analysis
6. Describe identification of hazard-specific PPE
7. Describe factors influencing access and egress routes
8. Describe behavioral patterns of victims
9. Describe environmental conditions that influence victim location
10. Interpret reference materials
11. Perform a scene assessment
12. Evaluate site conditions
13. Complete risk/benefit analysis
14. Select and use necessary PPE

Discussion Questions

1. What are the key components of a site survey?
2. Does your AHJ have any unique environmental conditions that impact your water rescue environment?

Application

1. Determined by instructor

Instructor Notes

1. None

CTS Guide Reference: CTS 2-1

Topic 2-6: Sizing Up a Water Rescue Incident

Terminal Learning Objective

At the end of this topic a student, given a water incident, background information and applicable reference materials, will be able to size up a water rescue incident so that the scope of the rescue is determined; the operational mode is defined; resource availability, response times, and types of rescues are determined; the number of victims is identified; the last reported location of all the victims is established; witnesses and reporting parties are identified and interviewed; resource needs are assessed; primary search parameters are identified; and information required to develop an initial incident action plan is obtained.

Enabling Learning Objectives

1. Describe how to conduct a size up
   - Determine scope of the rescue
   - Define operational mode
   - Determine resource availability, capability, and response times
   - Determine types of rescues
   - Identify number of victims
   - Establish place last seen (PLS) and time last seen (TLS) of all the victims
   - Evaluate environmental conditions that influence victim location
   - Identify and interview witnesses and reporting parties
   - Assess resource needs
   - Identify primary search parameters
   - Identify factors influencing access and egress routes
   - Obtain information required to develop an initial incident action plan
2. Describe types of reference materials and their uses
3. Describe how to conduct a risk/benefit assessment
4. Describe information-gathering techniques and how that information is used in the size-up process
5. Describe elements of an incident action plan and related information
6. Describe how size up relates to the incident management system
7. Read technical rescue reference materials
8. Evaluate site conditions
9. Relay information
10. Manage witnesses
11. Use information-gathering sources

Discussion Questions

1. Determined by instructor

Application

1. Size up a water rescue incident

Instructor Notes

1. None

CTS Guide Reference: CTS 1-1, CTS 2-4, CTS 4-1, CTS 7-1

Topic 2-7: Communicating in a Water Environment

Terminal Learning Objective

At the end of this topic a student, given a water incident, whistles, and hand signals, will be able communicate with other rescuers during an operation so that commands are shared, and rescue objectives are met.

Enabling Learning Objectives

1. Describe communication challenges in a water rescue environment
2. Describe ways to communicate in a water rescue environment
   - Verbal
   - Hand signals
   - Whistle blasts
   - Radio
3. Demonstrate forms of communication

Discussion Questions

1. What do the various hand signals mean?
2. What do the various whistle blasts mean?
3. What barriers are involved with each type of communication?

Application

1. Communicate using verbal commands
2. Communicate using hand signals
3. Communicate using whistle blasts
4. Communicate using radios

Instructor Notes

1. None

CTS Guide: None

Topic 2-8: Developing and Implementing an Incident Action Plan to Use Watercraft

Terminal Learning Objective

At the end of this topic a student, given an incident action plan (IAP), a watercraft, defined resources, and AHJ policies and procedures, will be able to develop and implement an IAP, as a member of a team, for the use of watercraft to support water search and rescue operations, so that hazards are addressed; watercraft pre-deployment checks are completed; watercraft launch or recovery is achieved; rescuers are deployed and recovered; both onboard and rescue operations conform with watercraft operational protocols and capabilities; communications are clear and concise; the candidate is familiar with watercraft nomenclature, operational protocols, design limitations, and launch/recovery site issues; and operational objectives are achieved.

Enabling Learning Objectives

1. Describe the components of an IAP
   - Communications Plan
   - Safety Plan
   - Operations Plan
     - PACE (primary, alternate, contingency, emergency)
   - Medical Plan
2. Describe how to combine multiple actions and information sources into a cohesive plan
   - Formal vs. informal
   - AHJ tactical worksheet
3. Use a tactical worksheet

Discussion Question

1. What are key components of an IAP?
2. What are the advantages of using a tactical worksheet?
3. Who is responsible for developing the IAP?
4. How does an IAP support Leader's Intent?

Application

1. Determined by instructor

Instructor Notes

1. Use the course delivery IAP as an example. Walk the students through it.

CTS Guide Reference: CTS 2-7, CTS 8-4, CTS 9-2

Topic 2-9: Implementing an Incident Action Plan to Use Air Assets

Terminal Learning Objective

At the end of this topic a student, given an incident action plan (IAP), access to air assets, and AHJ policies and procedures, will be able to implement an action plan for the use of air assets to support water search and rescue operations so that air-to-ground communication is established and maintained; applications are within the capabilities and skill levels of the helicopter service; hazards are addressed; rescuers are deployed and recovered as required; victim is extracted from water hazards consistent with existing or anticipated bodies of water in the AHJ; onboard and rescue operations conform with aircraft operational protocols and capabilities; air crew and ground personnel safety are not compromised; communications are clear and concise; all personnel are familiar with aircraft nomenclature, operational protocols, and design limitations; landing zones are designated and secured; and fire suppression resources are available at the landing zone.

Enabling Learning Objectives

1. Describe means of contacting and accessing agencies with air assets
2. Describe the role of aircraft in the support of water events
3. Describe the limitations of the available aircraft in the conditions associated with the rescue environment
4. Describe the role of the rescuer as part of an aviation team
5. Describe basic safety considerations for working around aircraft
   - Aircraft personnel who provide instruction/authority
   - Proper way to approach and leave the area
   - Proper way to enter and exit aircraft
   - Working near/under rotor wash
   - Landing zone requirements
   - Crash survival principals
   - Ancillary aircraft rescue equipment
6. Describe how to establish and control landing zones
7. Describe how to rig aircraft for anticipated rescue procedures
8. Implement a notification plan to request air assets
9. Develop a list of tactical objectives to be achieved by the aircraft
10. Communicate mission priorities with the aircrew or operator of the aircraft

Discussion Question

1. Who gives the authority to approach or enter an aircraft?
2. What are the safety concerns when working around aircraft?

Application

1. Determined by instructor

Instructor Notes

1. None

CTS Guide Reference: CTS 2-8, CTS 8-5

Topic 2-10: Selecting and Using Personal Protective Equipment

Terminal Learning Objective

At the end of this topic a student, given a water rescue assignment, personal protective and life support equipment (PPE) and United States Coast Guard (USCG) standards for personal flotation devices (PFD), will be able to identify, select, don, doff, and maintain PPE for water rescue operations so that rescuer is protected from temperature extremes and environmental hazards, PPE is appropriate to incident response needs and donned and worn correctly, swimming ability is maximized, and AHJ protocols are followed.

Enabling Learning Objectives

1. Describe the types and uses of and selection criteria for PPE
   - Personal flotation device (PFD)
     - Type III (USCG)
     - Type V (USCG)
   - Dry suit/wetsuit
   - Thermal protection
   - Helmet
   - Gloves
   - Close-toed footwear
   - Whistle (pealess)
   - Knife
   - Headlamp
   - Strobe light
2. Identify manufacturer's recommendations for PPE
3. Describe how to don and doff PPE
   - AHJ protocols for equipment positioning
4. Describe personal escape techniques
   - Applications
   - Capabilities
   - Equipment and procedures for signaling distress
5. Describe how to care for and maintain PPE
6. Inspect PPE
7. Use pre-operation checklists
8. Select personal flotation devices, water rescue helmets, and personal protective clothing and equipment
9. Don and doff PPE
10. Communicate distress signals
11. Use emergency escape procedures

Discussion Questions

1. What types of PPE are appropriate for different types of water environments?
2. How do you care for and maintain PPE?
3. What is the most important piece of PPE?

Application

1. Inspect PPE

2. Don, doff, and use PPE

Instructor Notes

1. Have students practice donning and doffing in the classroom.

CTS Guide: CTS 2-2

Topic 2-11: Operating Water Rescue Equipment

Terminal Learning Objective

At the end of this topic a student, given rescue equipment, a victim, and a water environment, will be able to identify and operate basic equipment used for water rescue operations so that equipment is used in accordance with manufacturer specifications and AHJ policies and procedures.

Enabling Learning Objectives

1. Describe the use, limitations, and safety considerations of water rescue equipment
   - Throw bag
     - Throws and recoils
     - Timeframe
     - Distance
     - Accuracy
   - Line capture
   - Line throwing devices
   - Rope rescue equipment
     - Hardware and software determined by AHJ
   - Hose inflation kit (site dependent)
   - PFD blowout ring
2. Describe how to maintain and store water rescue equipment
3. Operate equipment
4. Maintain and store equipment

Discussion Questions

1. What types of equipment are used in dynamic vs. static water conditions?
2. What types of equipment do your AHJ resources carry?
3. How does the rope in a throw bag differ from other types of rescue rope?

Application

1. Use water rescue equipment
2. Operate a PFD quick release buckle system (if available)

Instructor Notes

1. Demonstrate and let students practice using equipment.
2. Rigging and operating watercraft is covered in Topic 2-17.

CTS Guide: None

Topic 2-12: Describing Flood Hazards and Evacuation Procedures

Terminal Learning Objective

At the end of this topic a student, given floodwater scenarios, the ICS 420-1 Field Operations Guide, and the DOT Emergency Response Guidebook (ERG), will be able to describe types and causes of floods, hazards, and evacuation procedures associated with flood rescue operations so that floodwater operations are conducted in accordance with AHJ standards, policies, and procedures.

Enabling Learning Objectives

1. Describe types of floods
   - Tidal floods (tsunamis, storm surges, king tides, etc.)
   - Water overflowing typical boundaries (rivers, lakes, tides, etc.)
   - Structure failure (dam break, levee failure, terrorism, etc.)
   - Flash floods
   - Mud or debris flow
2. Describe the evolution of a flood
   - Rise
   - Stasis
   - Drain
3. Describe flood environment hazards
   - Utilities
   - Contaminants
   - Hazardous materials
   - Insects and animals
   - Submerged objects (fences, structures, signs, vehicles, etc.)
   - Differential pressure/drains
   - Individuals with harmful intent
4. Describe how to manage and navigate terrain and environment hazards covered with floodwater or subject to differential pressures
   - Survey rescue environment for hazard indicators
   - Avoid, isolate, or control identified hazards
   - Floodwater can eradicate, displace, or cover buildings, roads, and signs typically used to provide orientation and document search progress
     - Use GPS and alternate mapping techniques
     - Establish geographic baselines
     - Coordinate rescuer positions and resource locations
     - Avoid submerged hazards and geographic features
     - Document search progress
5. Describe hazardous material exposure, protection, and decontamination
6. Describe basic flood search, rescue, and evacuation procedures
7. Describe considerations for pets and livestock

Discussion Questions

1. What types of floods are common in your jurisdiction?

2. What are common hazards associated with floods?
3. What is your AHJ's plan for dealing with household pets and service animals?
4. How does your AHJ navigate areas covered by floodwater?

Application

1. Determined by instructor

Instructor Notes

1. ELO 5: Keep this at the initial/basic awareness/operations level. The intent is to introduce these concepts.

CTS Guide: CTS 8-8, CTS 8-9

Topic 2-13: Limiting Exposure to Potentially Contaminated Floodwater

Terminal Learning Objective

At the end of this topic a student, given a floodwater event, a tool cache, AHJ protocols and practices, and access to the required engineering controls and decontamination tools, will be able to limit exposure of victims and rescuers to potentially contaminated floodwater so that the sources of potential contamination are identified and their effects and those of cross-contamination are minimized.

Enabling Learning Objectives

1. Identify contamination sources
2. Identify routes of exposure
3. Identify indicators of the presence of contaminants
4. Describe methods to limit exposure to contaminated water
5. Describe decontamination methods for specific contaminants
6. Use engineering controls and personal protective equipment (PPE)
7. Use practices that limit exposure to contaminants
8. Remove of potential contaminants or render them inert

Discussion Question

1. What types of contaminants can occur in floodwater?
2. How can contaminants enter your body?
3. How can your PPE help protect you from routes of exposure?

Application

1. Determined by instructor

Instructor Notes

1. None

CTS Guide Reference: CTS 8-6

Topic 2-14: Supporting an Operations- or Technician-level Incident

Terminal Learning Objective

At the end of this topic a student, given a water incident, a designated mission, an incident action plan, safety equipment, and resources from the tool cache, will be able to support water rescue operations, so that the assignment is carried out, skills are demonstrated in a controlled environment, performance parameters are achieved, hazards are continually assessed, environmental concerns are managed, progress is reported to command, personnel accountability is maintained, personnel rehabilitation is facilitated, the incident action plan is supported, and emergency procedures are demonstrated.

Enabling Learning Objectives

1. Describe AHJ operational protocols
2. Describe scene support requirements
3. Describe support procedures
   - Search patterns
   - Equipment setup
   - Communications
   - Upstream or downstream safety spotter
   - Personnel accountability
   - Tend to an in-water rescuer
   - Scene control and access
   - Liaison with victim, family, bystanders, agency, etc.
4. Identify how to avoid becoming a hazard or victim
5. Execute basic support skills

Discussion Question

1. How can you support an operations- or technician-level incident?
2. In what ways can a rescuer become a hazard or victim?'

Application

1. Support an operations- or technician-level incident

Instructor Notes

1. None

CTS Guide Reference: CTS 1-4, CTS 2-12, CTS 4-4, CTS 5-2, CTS 7-4, CTS 8-1

Topic 2-15: Performing a Victim Search

Terminal Learning Objective

At the end of this topic a student, given a water rescue scenario, topographical maps of a search area, descriptions of all missing persons and incident history, hydrological data including speed and direction of currents or tides, and a tool cache, will be able to perform a victim search so that all accessible areas of the incident are surveyed and victim locations are marked, areas with high probability of detection are differentiated from other areas, witnesses are interviewed, critical interview information is recorded, passive and active search tactics are implemented, personnel resources are considered and used, and search parameters are communicated.

Enabling Learning Objectives

1. Describe search fundamentals
   - LAST (locate, access, stabilize, transport)
   - PLS (point last seen)
   - TLS (time last seen)
   - POD (probability of detection)
2. Describe how to manage witnesses
   - Critical interview questions and practices
3. Identify different tools used for searches
4. Describe reconnaissance, hasty (rapid), primary, and secondary (low and high) search types
   - Conduct search
   - Mark victim locations
   - Share findings
5. Identify high-probability victim locations
   - Consider human instinct or behavior during incident
   - Consider both land- and water-based locations
   - Swiftwater
     - PLS
     - High POD points
     - Anywhere that allows water but not objects to pass through
       - Strainers
       - Eddies
       - Obstructions
     - Shoreline
   - Floodwater
     - Entrapment or refuge areas
     - Highest points (roofs, attics, etc.)
     - Vehicles (may be submerged or floating)
     - Under or on highway overpasses, trees, towers, power poles
6. Describe how to mark victim locations
7. Describe how to communicate victim locations
8. Describe how to incorporate spotters

- Purpose
- Selecting positions

9. Define search parameters
   -

Discussion Questions

1. What are the differences between the types of searches?
2. What considerations factor into a successful search plan?

Application

1. Determined by instructor

Instructor Notes

1. ELO 4: The types of searches are delineated in FIRESCOPE ICS-162.

CTS Guide: CTS 2-3, CTS 8-7

Topic 2-16: Managing a Victim

Terminal Learning Objective

At the end of this topic a student, given a water incident and rescue equipment, will be able to manage a victim so that so that incidents are managed and risks to rescuers and the victim are minimized.

Enabling Learning Objectives

1. Describe typical victim behaviors
   - Cooperative vs. combative
   - Fear responses
   - Panic
   - Counter-panic/disassociation
2. Describe how to manage family and bystanders
   - Panic
   - Counter-panic
   - Fear
   - Grief
3. Describe victim medical considerations
   - Incident-related Injuries
   - Pre-existing conditions (diabetes, asthma, etc.)
   - Working with special needs populations
4. Describe how to approach a victim
5. Describe c-spine application techniques in a water environment

Discussion Questions

1. When does a victim become a patient?
2. What are some methods for handling a combative victim?
3. What are the options for, and risks involved with, immobilizing a patient?

Application

1. Determined by instructor

Instructor Notes

1. None

CTS Guide: None

Topic 2-17: Demonstrating Boat Rigging

Terminal Learning Objective

At the end of this topic a student, given a rescue watercraft and equipment, will be able to rig a rescue watercraft so that objectives are met and watercraft is rigged in accordance with manufacturer specifications and AHJ policies and procedures.

Enabling Learning Objectives

1. Describe common types of rescue watercraft
   - Rafts
     - Design
     - Construction materials
     - Capability
     - Inflation
     - Rigging
     - Components (D-rings, valves, handles, thwarts, etc.)
     - Attachments (oar frame, flip lines, painter/bow line, drift sock, etc.)
     - Maintenance and repair
     - Operational safety
   - IRBs (inflatable rescue boat)
     - Design
     - Construction materials
     - Capability
     - Inflation
     - Rigging
     - Components (D-rings, valves, handles, drain plug, scuppers, etc.)
     - Attachments (flip lines, painter/bow line, drift sock, motor, prop guards, tow bridles, etc.)
     - Maintenance and repair
     - Operational safety
   - Jon boats
     - Design
     - Construction materials
     - Capability
     - Rigging
     - Components (D-rings, handles, pump, etc.)
     - Attachments (painter/bow line, motor, prop guards, tow bridles, etc.)
     - Maintenance and repair
     - Operational safety
   - Personal watercraft
     - Design
     - Construction materials
     - Capability
     - Rigging
     - Components (D-rings, handles, pump, motor, etc.)

- o Attachments (tow bridles, etc.)
- o Maintenance and repair
- o Operational safety
2. Describe watercraft terminology
3. Rig a watercraft

Discussion Questions
1. What are the pros and cons of each type of rescue boat?
2. What type of boats and equipment does your AHJ have?

Application
1. Rig a watercraft

Instructor Notes
1. None

CTS Guide: None

Topic 2-18: Performing a Non-Entry Rescue from Shore

Terminal Learning Objective

At the end of this topic a student, given a water rescue scenario, PPE, and a tool cache, will be able to perform a non-entry rescue in the water environment so that the deployed equipment reaches the victim(s), the rescue equipment does not slip through the rescuer's hands, the victim is moved to the rescuer's shoreline, the victim is not pulled beneath the surface by rescuer efforts, the rescuer is not pulled into the water by the victim, neither the rescuer nor the victim is tied to or entangled in a rescue device, and the rescue is accomplished in accordance with policies and safety procedures.

Enabling Learning Objectives

1. Identify potential non-entry rescue scenarios
   - Can reach the victim from shore using tools
   - Setting up downstream safety for a technical rescue
2. Identify scenarios when non-entry rescue may not be appropriate
   - People (victim and rescuer) conditions (short term/long term)
   - Environmental conditions (short term/long term)
   - Tools available (short term/long term)
3. Identify considerations for non-entry rescue
   - Hydrology and water characteristics
   - Victim behavior
   - Environmental conditions
   - Environmental hazards
   - Incident-specific hazards
   - Time restrictions
4. Identify PPE and tools used for non-entry rescue
   - Types and capabilities
   - Water rescue reach device
   - Water rescue rope
5. Describe hazards and limitations of shore-based rescue
6. Select and use task-specific PPE
7. Identify water hazards (i.e., upstream or downstream, current or tide)
8. Identify hazards directly related to the specific rescue
9. Demonstrate appropriate shore-based victim removal techniques

Discussion Question

1. What tools does your AHJ have/use for non-entry water rescue?
2. What are some potential non-entry rescue scenarios?
3. What are some scenarios where non-entry rescue may not be appropriate?

Application

1. Determined by instructor

Instructor Notes

1. None

CTS Guide Reference: CTS 2-5, CTS 2-6, CTS 5-4, CTS 8-3

Topic 2-19: Constructing and Using Technical Rope Rescue Systems and Skills

Terminal Learning Objective

At the end of this topic a student, given a scenario, PPE, a victim or load, and rescue equipment, will be able to construct and use rope systems and skills to meet water rescue needs of the AHJ so that the movement is controlled, the victim or load is held in place when needed, and operating methods do not stress the system.

Enabling Learning Objectives

1. Describe how to work with ropes, knots, and anchors
2. Describe the capabilities, limitations, and uses for rope systems specific to the water rescue environment
3. Describe how to build and use ropes systems for water rescue
   - Mechanical advantage system
   - Raising and lowering system
   - Horizontal transport system
     - Tension diagonal
4. Describe how to use line throwing and crossing equipment and techniques
5. Describe methods to increase the efficiency of load movement
6. Describe interference concerns and obstacle negation when using rope systems
7. Describe system safety check protocols
8. Describe how to evaluate system components for compromised integrity
9. Describe common personnel assignments and duties
10. Describe common and critical operational commands
11. Determine incident needs
12. Complete a system safety check
13. Evaluate system components for compromised integrity
14. Select personnel
15. Communicate with personnel
16. Evaluate for potential problems

Discussion Questions

1. What is the optimal angle for a tension diagonal
2. How do rope systems increase risk or hazard to rescue operations?

Application

1. Determined by instructor

Instructor Notes

1. None

CTS Guide: CTS 2-11, CTS 5-1

Topic 2-20: Swimming in Dynamic Water

Terminal Learning Objective

At the end of this topic a student, given a course that is representative of the bodies of water existing or anticipated within the AHJ's geographic confines, water rescue PPE, will be able to describe how to use survival swimming and self-rescue skills to negotiate a designated water scenario so that the risk of injury is minimized, flotation is maintained, the specified objective is reached, all performance parameters are achieved, movement is controlled, hazards are continually assessed, distress signals are demonstrated, and rapid intervention for the rescuer has been considered for deployment.

Enabling Learning Objectives

1. Describe the difference between offensive and safety (defensive) swimming postures
2. Describe dynamic water swimming techniques
   - Basic swim
   - Ferry angle
   - Eddy hopping
   - Surfing
3. Describe how to avoid hydrology and hazards specific to swimmers
   - Shoreline
   - In-water
     - Strainers
     - Holes
     - Foot entrapments
     - Suspended loads
   - Climatic
4. Describe how to select water rescue PPE based on water conditions and hazards
5. Describe personnel accountability methods

Discussion Question

1. How are offensive and defensive swimming different?
2. What swimming technique would you use to avoid a strainer?
3. How would the current vector impact your ferry angle?

Application

1. Determined by instructor

Instructor Notes

1. None

CTS Guide Reference: CTS 2-10, CTS 3-1, CTS 6-2

Topic 2-21: Directing a Rescue Team During Non-Entry Rescue Operations

Terminal Learning Objective

At the end of this topic a student, given incident checklists, maps, topographic surveys, and charts, will be able to direct a rescue team during non-entry operations so that teams are managed, personnel are supervised, hazards are assessed and identified, team health and safety is ensured, qualifications/abilities of rescuers are verified, briefing is conducted, and debriefing is performed.

Enabling Learning Objectives

1. Describe supervisory practices
2. Describe emergency procedures
3. Describe communications procedures
4. Describe local protocols
5. Describe safety checks
6. Describe personnel accountability techniques
7. Implement
   - Emergency procedures
   - Communications procedures
   - Incident management
   - Personnel accountability
   - Resource management

Discussion Questions

1. Determined by instructor

Application

1. Determined by instructor

Instructor Notes

1. None

CTS Guide: CTS 3-5

Topic 2-22: Terminating an Incident

Terminal Learning Objective

At the end of this topic a student, given PPE specific to the incident, isolation barriers, and a tool cache, will be able to terminate an incident so that rescuers and bystanders are protected and accounted for during termination operations; the party responsible is notified of any modifications or damage created during the operational period; documentation of loss or material use is accounted for; scene documentation is performed; scene control is transferred to a responsible party; potential or existing hazards are communicated to that responsible party; debriefing, post-incident analysis, and critique are conducted; and command is terminated.

Enabling Learning Objectives

1. Describe PPE characteristics
   - PPE requirements change in IDLH vs non-IDLH
   - Decontamination requirements
2. Identify hazard and risk identification
   - Reevaluate mitigated and ongoing hazards
   - Resources in transition
   - Complacency
   - Normalized deviance
   - Fatigue
3. Describe equipment/vessel removal procedures
   - When to leave in place
   - Systematic breakdown and removal
4. Describe isolation techniques
5. Identify statutory requirements
   - Determined by AHJ
6. Identify responsible parties
7. Describe accountability system use
   - PAR – personnel accountability report
8. Describe documentation and reporting methods
   - Determined by AHJ
9. Describe post-incident analysis techniques
   - Determined by AHJ
   - Critical incident stress debriefing
10. Select and use hazard-specific PPE
11. Decontaminate PPE
12. Use barrier protection techniques
13. Implement data collection and record-keeping/reporting protocols
14. Conduct post-incident analysis activities

Discussion Question

1. What hazards and risks can arise during incident termination?
2. Who are some examples of responsible parties that may assume responsibility for the scene when the incident terminates?

3. What critical incident stress management resources are available to you?

Application

1. Terminate an incident

Instructor Notes

1. None

CTS Guide Reference: CTS 2-13, 5-5, 8-10

Drill Ground Activities and Evolutions

Activities and Evolutions

The following components must be covered in the drill ground activities and/or evolutions but can be combined and completed in the order that best suits the props available and AHJ policies and procedures.

Because this class does not include water access or entry, the activities can be done using photos and/or videos to simulate the water rescue incidents.

Drill ground activities must incorporate the following learning objectives:
- Conduct an incident hazards assessment and isolate hazards
- Assess hazards to rescuers and victim(s)
- Size up a water rescue incident
- Communicate using verbal commands
- Communicate using hand signals
- Communicate using whistle blasts
- Communicate using radios
- Inspect PPE
- Don, doff, and use PPE
- Use water rescue equipment
- Support an operations- or technician-level incident
- Terminate an incident

Drill ground activities must address the following operations:
- Rig a watercraft
- Operate a PFD quick release buckle system (if available)

Safety Notes

If this course is taught near water, use the following guidelines for student safety and site selection.

Student Safety
Before conducting any in-water training you, as the instructor, are responsible for ensuring the safety of everyone involved in the training exercise.

Never put students in a position where they must act as the sole rescuer of other students. Their presence in the class implies that their knowledge and skill levels are not sufficient to operate without direct supervision.

Always be in a position from which you can rescue students. Drills, simulations, or training areas where students cannot be rapidly rescued are not suitable and must be avoided.

Site Selection

The body of water used for training should be no more complex than a Class III and should provide a means for safe and effective rescue of both students and instructors.

An ideal training area offers a variety of water features that provide opportunities to have students complete all skills.

Water depth and consistency should be suitable to perform all required tasks.

The bank of the body of water should provide a safe means of ingress and egress.

Be cautious when training in small waterways and creeks. These bodies of water don't usually carry heavy water flows and are often strainer choked and full of debris. Do a complete and comprehensive survey before training in these bodies of water.

Scrutinize irrigation canals and manmade dams. These structures often have debris such as rebar and rip rap in them that are hazardous to swimmers. They can also have rapidly changing water levels.

Low head dams are extremely hazardous and should never be used for training purposes. They offer no way out, and rescue is difficult at best. Training in and around them is inviting disaster.

Site Assessment and Safety

Be thoroughly familiar with the training area to identify and mitigate all hazards.
- Arrive early at the training site to assess conditions.
- Scout the training area for strainers, sweepers, exposed rebar, or other debris that could snag a student.
- Assess the area for foot and body entrapment hazards such as underwater ledges and submerged debris and logs.
- Anticipate projected water levels and know if the waterway is influenced by dam release or prone to sudden changes due to hydroelectric activities or precipitation.
- The area may have a rapid current with wave trains.
- Avoid areas with large holes or other dangerous currents.
- Monitor the weather for potential impact on water flows.
- Pre-plan the "no go" zone location.

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 courses 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.

Skill Sheet
The Skill Sheet segment documents the skill sheet that tests the content contained within the topic. This segment is eliminated if the course does not have skill sheets.