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## Attachment 12

**Date:** July 12th, 2019

**To:** Statewide Training and Education Advisory Committee

**From:** Joe Bunn and Kevin Conant, Fire Service Training Specialist III

**SUBJECT/AGENDA ACTION ITEM:**  
FSTEP – River/Flood Rescue Boat Technician

**Recommended Actions:**  
Information/Discussion – River/Flood Rescue Boat Technician (FSTEP)

**Background Information:**

This curriculum is being presented for the first time to STEAC. During this presentation we are looking for feedback on this curriculum. This course maybe new to some STEAC members, however this curriculum has been utilized for training in the throughout the State of California since 2015. This course originally was developed and facilitated under a firefighter grant through OES (Office of Emergency Services). This project is a joint effort between the California Office of the State Fire Marshal, State Fire Training, the Office of Emergency Services, Fire and Rescue Branch and CAL FIRE, Training Center (Ione). This curriculum was put into the developmental format that all FSTEP and Certification Trainings Standards utilize for State Fire Training. The goal is to make this course available to the Fire Service as soon as possible keeping in mind respect for the process and wanting buy in for all the stakeholders throughout the State of California.

The concept of developing new FSTEP course curriculum is with the purpose of continuing education and professional development, which was approved by STEAC on April 18, 2014. Accordingly, stakeholders identified the need for the creation of numerous courses. The River/Flood Boat Rescue Technician Course is just one of several courses that have and are going through this process.

Therefore, a cadre of experienced subject matter experts with extensive technical expertise in the area of River/Flood Rescue as it relates to operations were selected from various agencies and backgrounds with the mission to create the content for this FSTEP course.

**Cadre Leadership:**

Joe Bunn, Fire Service Training Specialist III, Deputy Chief (ret) US&R CA-TF8, Kevin Conant, Fire Service Training Specialist III, Battalion Chief (ret), US&R CA-TF3, Laura Garwood Meehan, Cadre Editor, Sacramento State.

**Cadre Membership:**

Billy Milligan, Firefighter, Riverside City Fire Department, Aide Barbat, Battalion Chief, San Diego Fire Rescue, Patrick Costamagna, Captain, Sacramento Fire Department, John Brenner, Captain (retired), Sacramento Fire Department, James Colston, Battalion Chief, San Marcos Fire Department, Robb Eichelberger, Lifeguard Sergeant, San Diego Fire Rescue, Zachary Boyd, Engineer, Kern County Fire Department, Paulo Brito, Engineer, San Jose Fire Department

Several of the cadre members are State Fire Training Registered Instructors and all have extensive operational experience with special operations incidents as it relates to search, rescue and boat operations in the River/Flood environment. The development of the material required one multi-day session for this curriculum with additional work by the editor, cadre members and cadre leads to add the finishing editing of the course plans. Because this is an FSTEP Course, the development of a Certification Training Standards (CTS) was not required. However, Terminal Learning Objectives (TLO) were established from the authority from the below standards that typically would be in the CTS. The majority of the TLO's and the supporting Enabling Learning Objectives (ELO) were developed from the authority of standards NFPA 1670 Standard on Operations and Training for Technical Search and Rescue Incidents (2017), and NFPA 1006 Standard for Technical Rescue Personnel Professional Qualifications (2017.) Additionally, NFPA Standards were considered such as 1500, 1521, 1561 with observance to ICS 420-1, Field Operations Guide, ICS-SF-SAR-020-, Swiftwater/Flood Search and Rescue and Boat Operations Recommended for Training, Skills and Equipment List (current edition) and several others references aided as supporting documents when creating the Course Plans.

**River/Flood Rescue Technician**

Activity Type	Time (Hours :Minutes)
Didactic	10:00
Activities and Testing	30:00
Course Hour Totals	40:00

**Analysis/Summary of Issue:**

Following is an analysis of this new FSTEP courses.

1. Neither the old legacy SFT Fire Officer or Chief Officer courses, nor the NFPA Fire Officer I-IV standards addressed the specific hazards and risks faced by an initial incident commander at the scene of any technical search and rescue incident nor any River/Flood or water rescue operations. The only curriculum developed in regards to command and control of special operations is the SFT course, Incident Management of Special Operations, which was created to provide awareness level training for incident commanders in recognizing and managing the initial actions of the technical search and rescue incident safely. This course is highly recommended for any new to special operators that may have the responsibility of command and control of a River/Flood incident. Any career or volunteer fire service

officer will benefit greatly from the design and content of that course as it relates to search and rescue in the River/Flood environment.

2. Planning and Logistics are a huge piece to this course. The number of instructors to students with activities and the dynamic environment to support the River/Flood search and rescue operations and using rescue boats with all the safety elements involved. The site location is the key to success in this course. It is imperative that dynamic water is present to be able to demonstrate, facilitate and test all participants in the skills necessary to meet the standards set forth in the course plan.
3. In addition, this course suggests like any water rescue course that all students have completed OSFM Open Water Rescuer – Basic or equivalent prior to taking this course. The other options are the AHJ (Authority Having Jurisdiction) has a standard swim test that meets or exceeds the International Association of Dive Rescue Specialists (IADRS) Annual Watermanship Test. This prerequisite is should not be an option in any water course this one included.
4. The instructors for this course need an extensive background in water rescue as it relates to the River/Flood environment. Strong experience in search and rescue techniques in this environment using and operating rescue boats with all the associated equipment and PPE necessary to be in this environment is critical. These are high risk low frequency operations, so Safety is paramount and having qualified instructor's limits exposure to incidents in any water environment.
5. The core content utilizes the authority NFPA 1006, 1670 standards, as well as 1500, 1521,1561 and the above documents mentioned as supporting documents for the development of this course.



# River and Flood Rescue Boat Technician

## Course Plan

### Course Details

- Description:** This course prepares participants to demonstrate motorized boat competency in dynamic water rescue. It will familiarize participants with the dynamic water environment, give them hands-on experience, and prepare them to safely execute simple to complex rescue techniques.
- Designed For:** Public safety members with river and flood rescue responsibilities
- Authority:** Office of the State Fire Marshal  
NFPA 1006 Standard for Technical Rescue Personnel Professional Qualifications (2017)  
NFPA 1670 Standard for Operations and Training for Technical Search and Rescue Incidents (2017)
- Prerequisites:** State Fire Training River and Flood Water Rescue Technician  
ICS 200 or 200b Initial Attack Incident Commander (online or in-person)  
Low-Angle Rope Rescue  
It is recommended that students have completed the OSFM Open Water Rescuer - Basic (or equivalent) course prior to taking this course. If students have not taken Open Water Rescuer - Basic, it is recommended that they pass the authority having jurisdiction's (AHJ's) swim test that meets or exceeds the International Association of Dive Rescue Specialists (IADRS) Annual Watermanship Test.
- Corequisites:** None
- Standard:** Complete all activities
- Hours:** Lecture: 12:30

## River and Flood Rescue Boat Technician

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Activities: 27:30

**Hours (Total):** 40:00

**Maximum Class Size:** 24

**Instructor Level:** Primary

**Instructor/Student Ratio:** 1:8 activities, 1:24 lecture

**Restrictions:** Students must possess the physical ability to conduct self-rescue on a rescue boat.

**SFT Designation:** FSTEP

### Required Resources

#### Instructor Resources

To teach this course, instructors need:

- NFPA 1006 Standard for Technical Rescue Personnel Professional Qualifications (2017)
- NFPA 1670 Standard for Operations and Training for Technical Search and Rescue Incidents (2017)
- Water Rescue, Principles and Practice to NFPA 1006 and 1670: Surface, Swiftwater, Dive, Ice, Surf, and Flood (2019) Jones & Bartlett Learning, ISBN: 978128404205
- ICS-SF-SAR-020-1, Swiftwater/Flood Search and Rescue Recommended Training, Skills, and Equipment List (current edition) <http://firescope.caloes.ca.gov/ics-usar/ICS-SF-SAR-020-1.pdf>
- ICS-US&R 120-2, Swiftwater/Flood Search and Rescue Operational Systems Description and Law Enforcement Mutual Aid Plan (current edition)
- ICS-US&R 120-1, Urban Search & Rescue Operation System Description (current edition)
- ICS 420-1, Field Operations Guide (current edition)
- DOT-ERG Emergency Response Guidebook (current edition)
- CAL-OES Water Rescue River Flood Technician (current edition)
- FEMA, NIMS 508: Swiftwater/Flood Search and Rescue Team
- FEMA, NIMS 509: Swiftwater/Flood Rescue Technician

#### Online Instructor Resources

The following instructor resources are available online at

<http://osfm.fire.ca.gov/training/instructorresources.php>:

- The Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act): [Stafford Act Link](#)

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- ICS-SF-SAR-020-1, Swiftwater/Flood Search and Rescue Recommended Training, Skills, and Equipment List (current edition): <http://firescope.caloes.ca.gov/ics-usar/ICS-SF-SAR-020-1.pdf>
- ICS-US&R 120-2, Swiftwater/Flood Search and Rescue Operational Systems Descriin and Law Enforcement Mutual Aid Plan (current edition): <http://firescope.caloes.ca.gov/ics-usar/ICS-USAR-120-2.pdf>
- ICS-US&R 120-1, Urban Search & Rescue Operation System Description (current edition): <http://firescope.caloes.ca.gov/ics-usar/ICS-USR-120-1.pdf>
- ICS 420-1, Field Operations Guide (current edition): [https://www.usfa.fema.gov/downloads/pdf/publications/field\\_operations\\_guide.pdf](https://www.usfa.fema.gov/downloads/pdf/publications/field_operations_guide.pdf)
- Department of Transportation Emergency Response Guidebook (ERG) (current edition) [DOT ERG Manual](#)
- State Fire Training River and Flood Water Rescue Technician (current edition)
- FEMA, NIMS 508: Swiftwater/Flood Search and Rescue Team
- FEMA, NIMS 509: Swiftwater/Flood Rescue Technician

### Student Resources

To participate in this course, instructor may require students to use:

- Water Rescue, Principles and Practice to NFPA 1006 and 1670: Surface, Swiftwater, Dive, Ice, Surf, and Flood (2019) Jones & Bartlett Learning, ISBN: 978128404205

To participate in this course, students need:

- CAL-OES River and Flood Motorized Boat Technician (current edition)
- Personal protective equipment mandated by instructor
- Completed a National Association of State Boating Law Administrators (NASBLA) State-approved boater safety education examination approved by California State Parks Division of Boating and Waterways: [California Boater Card](#)

### Facilities, Equipment, and Personnel

The following facilities, equipment, or personnel are required to deliver this course:

#### Facilities

- Classroom of adequate size and capability (audio/visual aids) to support classroom training
- Wash areas
- Bathrooms
- Rehabilitation area
- Safe and adequate parking
- Boat ramp and dock
- Dynamic water environment

### Site Requirements

- The requesting 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 requesting agency further assumes all responsibility, liability, and maintenance for all tools, equipment, and supplies used at the site for the delivery of River Flood Rescue Boat Technician classes. This includes, but is not limited to, props, ropes, rescue hardware and software.
- Before conducting any training in the water, you as the instructor are responsible for ensuring the safety of everyone involved in the training exercise.
- Students should never be put into a position where they must act as the sole rescuers of other students. The very fact that they are taking your class, implies that their level of knowledge is not sufficient to operate without direct supervision.
- You should arrive early at the training site to conduct an assessment of conditions. The should consist of a moving body of water suitable for safe water rescue training. It should consist of a moving body of water suitable for safe rescue training of a minimum of class I or II. The body of water should be no more complex than a class III and should provide a means for safe and effective rescue of both students and instructors. There should be suitable water depth and consistency to perform all required tasks. The bank of the body of water should provide a safe means of ingress and egress. The area of training must be thoroughly familiar to the instructors and all hazards identified and mitigated. You need to scout the training area for hazards such as strainers, sweepers, exposed rebar or other debris that could snag a student. You should assess the area for foot and body entrapment hazards such as underwater ledges and submerged debris and logs. The training area should be preplanned for where the “no go” zone is located. You should have an idea of what the projected water levels should be, and if the waterway is influenced by dam release or prone to sudden changes due to hydroelectric activities or precipitation. Ideally the training area should offer a variety of water features, so you may take the students through all the skills. The area may have a rapid current and with wave trains. Areas with large holes or other dangerous currents should be avoided. You must always be in a position to rescue your students. Drill, simulations or training areas where students cannot be rapidly rescued are not suitable and must be avoided.
- There are several websites that will assist with monitoring water flows. The weather needs to be monitored for potential impact on water flows.
- Be cautious when training in small waterways and creeks. These bodies of water do not usually carry heavy flows of water and often are strainer choked and full of debris. Do a complete and comprehensive survey before training in these bodies of water.
- Irrigation canals and any man-made dams must also be carefully scrutinized. 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.

## River and Flood Rescue Boat Technician

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- 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.

### Equipment

- 1 first aid kit (AHJ) BLS minimum
- Inflatable rescue boats (IRBs), maximum 1:4 resource/student ratio (It is recommended that spares are available in case of damage during class.)
- Outboard motors with prop guards for IRBs, minimum one for each boat, minimum 25hp, maximum 40hp with fuel cells and fuel lines (It is recommended that spares are available in case of damage during class.)
- Minimum one jon boat
- Outboard motor for jon boat 15hp minimum to 25 hp maximum
- 24 paddles
- 6 towing bridles
- 6 compasses
- Minimum of 2 GPS units (It is recommended to have 1 per boat.)
- 12 righting lines (flip lines)
- 6 throw bags minimum
- 6 waterproof hand lights
- 2 VHF portable marine radios minimum (It is recommended to have 1 per boat.)
- 6 rescue tubes / cans
- Red, green, white snap lights or battery-powered lights for night operations / navigation lights
- Recommended water-rescue mannequins for use in water activities
- 8 buoys minimum, with adequate line and anchors for the depth of water
- Adequate straps for securing equipment to boats
- Adequate equipment bags to secure equipment in boats during operation



### 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, 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. To be determined by the instructor

##### Activities

1. To be determined by the instructor

### Unit 2: River and Flood Rescue Review

#### Topic 2-1: Describing Hydrology and Identifying Travel Paths in Dynamic Water

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### Terminal Learning Objective

At the end of this topic, given a variety of water environments, a student will be able to describe dynamic hydrology as it relates to rivers, channels, and floods and identify travel paths and hazards.

### Enabling Learning Objectives

1. Describe the forces of dynamic water
2. Describe how to determine current speed
3. Describe how to determine cubic feet of water per second in a given river or channel
4. Describe river orientation
5. Identify river or channel features created by moving water
6. Describe the classification of rivers
7. Define the following terms:
  - Upstream
  - Downstream
  - River right
  - River left
  - Volume (cubic feet per second)
  - Laminar flow
  - Helical flow
  - Eddies
  - Eddy line
  - Strainers
    - Sieves
  - Pillows
  - Upstream and downstream
  - Low-head dam
  - Hole
    - Smiling/closed
    - Frowning/open
  - Hydraulic
  - Standing waves (haystacks)
  - Aerated water
  - Current vector
8. Describe techniques used to navigate dynamic water and identify travel paths and hazards

### Discussion Questions

1. How does cubic feet per second (cfs) impact water hydrology?

### Activities

1. The instructor must create an activity directing students to identify hydrologic features and identify travel paths and hazards.

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### Instructor Notes

1. If the topic is taught in a classroom, it is recommended that the instructor use videos among the visual aids.

### Topic 2-2: Describing the Components of Managing a River-Flood Rescue Incident

#### Terminal Learning Objective

At the end of this topic, given a variety of river-flood rescue scenarios, the standards, and the policies and procedures of the AHJ, a student will be able to manage a river-flood rescue incident.

#### Enabling Learning Objectives

1. Describe the scope and practice and standards
2. Describe rescue priorities
  - Low to high risk
  - Rescue versus recovery
3. Describe legal considerations and practices
4. Describe the relevant components of the Incident Command System
5. Describe FIRESCOPE ICS-US&R 120-1 and 120-2 Operational System Description
6. Describe the actions taken to terminate and demobilize an incident
7. Demonstrate the practical application of the incident management system, including demobilization and termination of the incident

#### Discussion Questions

1. When is it appropriate to control or modify the control zones?
2. What are some key ICS positions?

#### Activities

1. The instructor must create an activity directing students to review an incident action plan (IAP).
2. The instructor must create an activity directing students to organize and manage a rescue incident, including demobilization and termination.

#### Instructor Notes

1. The incidents may be simulated.
2. The instructor will continually refer students to the IAP throughout the course.
3. Refer to ICS-SF-SAR-020-1, Swiftwater/Flood Search and Rescue Recommended Training, Skills, and Equipment List (current edition).

### Topic 2-3: Evaluating Hazards, Identifying Current Vectors, and Locating Safety Zones

#### Terminal Learning Objective

At the end of this topic, given a variety of water environments, a student will be able to evaluate hazards in moving water, identify current vectors for navigation, and locate safety zones.

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### Enabling Learning Objectives

1. Identify and describe hazards associated with river and flood rescue
2. Identify current vectors for navigation
3. Identify areas and features that are safe zones in dynamic water environments

### Discussion Questions

1. Where are safe zones typically located?
2. When assessing a waterway, what are the most dangerous hazards?

### Activities

1. The instructor must create an activity directing students to provide a safety briefing describing the hazards present.

### Instructor Notes

1. If the topic is taught in a classroom, it is recommended that the instructor use videos among the visual aids.

## Topic 2-4: Swimming and Navigating Dynamic Water

### Terminal Learning Objective

At the end of this topic, given a variety of water environments, a student will be able to swim and navigate dynamic water.

### Enabling Learning Objectives

1. Assess the hydrology and hazards of the environment prior to entering the water
2. Identify travel paths and hazards
3. Demonstrate swim techniques used to navigate dynamic water

### Discussion Questions

1. What safety concerns must be identified prior to getting in the water?
2. How can currents help or hinder the swimmer's efforts?

### Activities

1. The instructor must create an activity directing students to swim and navigate dynamic water.

### Instructor Notes

1. The instructor must familiarize themselves with the environment and its hazards before this activity.

## Topic 2-5: Identifying Rules and Regulations Governing Vessel Operation

### Terminal Learning Objective

At the end of this topic, given a simulated surface-water rescue environment, the student will identify the navigation rules and regulations that govern operation of a vessel in navigable waters and how they apply to the rescue boat operator in the AHJ.

### Enabling Learning Objectives

1. Describe the navigation rules and regulations that govern operation of a vessel in navigable waters

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- Overview
  - Applicable regions and waterways
  - Governing bodies or enforcement agencies
2. Determine right of way for various types of vessels based on the navigation rules and regulations that govern operation of a vessel in navigable waters
  3. Describe the requirements for a variety of directional aids to navigation:
    - Locations
    - Shapes, numbers, and colors
    - Meanings
    - Hazards
  4. Describe how directional aids assist in navigation and determine right of way

### Discussion Questions

1. How is right of way determined on navigable waterways in the United States?
2. How do you determine right of way for various types of vessels?
3. Which rules and regulations apply to your operational area?

### Activities

2. To be determined by instructor.

### Instructor Notes

1. At the end of this topic, the student will know how to determine the right of way for vessels and be able to apply the required procedures to address various situations they may encounter, enabling them to prevent collisions and organize a system to protect the lives and safety of passengers and crew.
2. In California, there are two governing bodies, USCG and The California Harbors and Navigation Code.
3. The instructor should reinforce these learning objectives on an ongoing basis throughout the field activities.

## Unit 3: Communications and Navigation

### Topic 3-1: Communicating with Other First Responders and USCG

#### Terminal Learning Objective

At the end of this topic, given a variety of marine communication devices, the student will communicate with other first responders and USCG.

#### Enabling Learning Objectives

1. Identify various means of marine communication
  - Hand signals
  - Flares
  - Emergency position-indicating radio beacon (EPIRB)
  - Personnel-locating beacon (PLB)
  - Marine band radio

## River and Flood Rescue Boat Technician

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- Radio specific to the AHJ
2. Describe the applicable marine radio options
    - Describe common marine frequencies and their uses
    - VHF versus UHF and fire department radios
    - International Hail and Distress Channel (VHF Marine 16)
  3. Describe communication procedures specific to USCG
    - Pan-pan
    - Sécurité
    - Mayday
  4. Demonstrate marine communication methods

### Discussion Questions

1. What are the differences between pan-pan, sécurité, and mayday?

### Activities

1. The instructor must create an activity directing students to demonstrate various marine communication methods.

### Instructor Notes

1. Instructor should teach radio etiquette, terminology, and procedures.

## Topic 3-2: Describing Navigational Aids and Devices

### Terminal Learning Objective

At the end of this topic, given a rescue boat, the student will describe and use a variety of navigational aids and devices.

### Enabling Learning Objectives

1. Describe various navigation devices
  - Compass
  - Electronic devices (can include chart plotters and GPS devices)
2. Describe aids to navigation
  - Locations, types, and meanings of navigational aids
  - Use of navigational aids to maneuver into and out of protected channels
  - Hazard identification
3. Demonstrate the use of navigational aids and devices

### Discussion Questions

1. What is dead reckoning in navigation?
2. What is red, right, returning in reference to navigational aids?

### Activities

1. The instructor must create an activity for students to describe and use a variety of navigational aids and devices.

### Instructor Notes

1. If using a GPS, ensure all students are using the same data.
2. The instructor may choose to set up a course using buoys for students to perform the activity on.

## Unit 4: Boat Trailering

### Topic 4-1: Describing Critical Trailering Elements

#### Terminal Learning Objective

At the end of the topic, given a motorized river and flood rescue boat, tow vehicle, and trailer, the student will describe critical elements of trailering boats.

#### Enabling Learning Objectives

1. Describe safety factors associated with trailering operations
  - Pretrip inspection
    - Trailer connections and lights
    - Rescue boat secured
    - Rescue boat equipment secured
  - Use of backers
  - Road travel considerations
  - Speed
2. Describe safe backing fundamentals of a trailered boat
  - Ensure a pretravel inspection is completed
  - Describe road travel
  - Describe backing
3. Describe trailer positioning for launch and recovery
  - Boat ramp etiquette
4. Describe unimproved launches
5. Identify components of a trailer, such as:
  - Hitch types and sizes
  - Trailer electrical connection
  - Bearings
  - Winch
  - Bunks and rollers
  - Tie downs

#### Discussion Questions

1. What are your agency's trailering policies?
2. What risks are involved in trailering and launching a boat?

#### Activities

1. To be determined by the instructor or AHJ.

#### Instructor Notes

1. The instructor should consider using boat-ramp etiquette case studies.

## Unit 5: Boat Components and Terminology

### Topic 5-1: Describing and Assembling Rescue Boat Components

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### Terminal Learning Objective

At the end of this topic, given a variety of boats or visual aids, the student will describe the components of a small rescue boat and demonstrate how to assemble the components of a rescue boat.

### Enabling Learning Objectives

1. Identify types and construction of rescue boats, such as:
  - Aluminum
  - Inflatable
  - Other
2. Identify hull design and components of a rescue boat, such as:
  - Bow, stern, port, and starboard
  - Gunwale tubes and valves, as applicable
  - Transom
  - Drain plugs or scuppers
  - Hydrodynamics
3. Identify components of a rescue boat, such as:
  - Rigging
  - Lifelines
4. Identify propulsion (motor) components, such as:
  - Kill switch with lanyard
  - Transom saver and motor latches
  - Fuel lines
  - Fuel tanks
5. Demonstrate how to assemble the components of a rescue boat

### Discussion Questions

1. What are the differences between motorized inflatable rescue boats and jon boats?

### Activities

1. The instructor must create an activity directing students to build boats, reinforcing the proper boat terminology throughout.

### Instructor Notes

1. None

## Topic 5-2: Describing Equipment and Demonstrating Equipping the Boat

### Terminal Learning Objective

At the end of this topic, given a small rescue boat and a variety of equipment, the student will identify the boat and rescue equipment needed, describe the equipment's purpose, and demonstrate equipping the boat.

### Enabling Learning Objectives

1. Identify and describe the rescue boat equipment of the AHJ, including but not limited to:
  - Paddles
  - Towing bridle
  - Compass



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- Righting line
  - Bow or painter line
  - Handheld lights
  - Anchor
  - Patch kit
2. Identify and describe the rescue equipment of the AHJ, including but not limited to:
    - Throw bag
    - Rescue tube or can
    - Portable radio
    - GPS
    - Spare personal flotation devices (PFDs) for victims
    - Knife
    - First Aid/EMS
      - Waterproof container
      - Space blanket
    - Helmets
    - Wheel Kits

### Discussion Questions

1. What are the differences between boat equipment and rescue equipment?
2. What rescue equipment do boats in your AHJ carry?
3. What steps do you take to keep your equipment dry?

### Activities

1. The instructor must create an activity directing students to equip boats with boat and rescue equipment.

### Instructor Notes

1. The instructor may choose to teach this topic in the classroom or in the field.
2. Refer to ICS-SF-SAR-020-1, Swiftwater/Flood Search and Rescue Recommended Training, Skills, and Equipment List (current edition).

## Topic 5-3: Describing Safety Considerations and Rescuing a Crew Member

### Terminal Learning Objective

At the end of this topic, given a simulated emergency, the student will describe basic safety considerations associated with motorized river and flood rescue-boat operations and demonstrate rescuing a crew member overboard.

### Enabling Learning Objectives

1. Identify the different types of U.S. Coast Guard (USCG)-approved PFDs and their applications
  - Types 1 through 5
  - Other
2. Describe self-survival considerations
  - Crew overboard
  - Crew and passenger accountability

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- Dewatering emergency
  - Individual day and night emergency signaling requirements
3. Describe agency-specific PPE
    - Uniform and clothing selection for exposure considerations
  4. Demonstrate self-survival considerations
    - Crew overboard
    - Crew and passenger accountability
    - Dewatering emergency
    - Individual day and night emergency signaling requirements
  5. Demonstrate techniques for rescuing a crew member overboard

### Discussion Questions

1. Describe AHJ-specific PPE considerations and guidelines for water-rescue incidents.
2. What immediate notifications should be made and what actions performed in the event of a crew-overboard emergency?
3. What are the benefits of seat assignments and preassigning roles and responsibilities for basic emergency procedures?
4. What PPE should be used for a water-based rescue to minimize exposure?
5. What land-based PPE is not appropriate for water-based rescue?

### Activities

1. The instructor must create an activity simulating a crew member overboard who must self-rescue.
2. The instructor must create an activity simulating a crew member overboard who must be rescued by boat operator.

### Instructor Notes

1. The activities require each student to play each role.
2. The instructor should create simulated emergencies in the field throughout the course.
3. The instructor should consider using motorized river and flood rescue boat near-miss or close-call case studies.

## Topic 5-4: Demonstrating Pre- and Postoperational Checks

### Terminal Learning Objective

At the end of this topic, given a variety of motorized river and flood rescue boats, the student will demonstrate pre- and postoperational checks.

### Enabling Learning Objectives

1. Demonstrate trailer inspection
2. Demonstrate boat inspection
3. Demonstrate how to inspect transom bolts and bracket
4. Demonstrate how to inspect a motor:
  - Inspect fuel line and connectors
  - Check oil level
  - Inspect propeller
  - Inspect propeller guard, as applicable

## River and Flood Rescue Boat Technician

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- Use impeller intake flush device
  - Use bypass flush connection
  - Use various fuel additives and nonethanol fuel
  - Use diagnostic equipment
5. Discuss engine warning systems

### Discussion Questions

1. What are your agency's preventative maintenance service schedules?

### Activities

1. The instructor must create an activity where students demonstrate a pre- and posttrip operational check.

### Instructor Notes

1. The activity needs to be relevant to the type of IRB, the AHJ, the students' abilities, and the operating environment.
2. The students must perform a pre- and postoperational check each day.

## Topic 4-5: Performing Motor Maintenance

### Terminal Learning Objective

At the end of this topic, given a motorized river and flood rescue boat, the student will perform motor maintenance for operational readiness.

### Enabling Learning Objectives

1. Identify equipment needed to perform motor maintenance
  - Tools
  - Reference materials
  - Fluids and replacement parts
  - Diagnostics equipment
2. Describe maintenance requirements for general use
  - After routine use
  - Monthly
  - Annually
3. Demonstrate how to service a motor
  - Inspect fuel line and connectors
  - Check oil level check
  - Spark plug inspection and indexing
  - Inspect propeller inspection
  - Inspect propeller guard, as applicable
  - Use impeller intake flush device
  - Use bypass flush connection
  - Use fuel additives and nonethanol fuel diagnostics equipment

### Discussion Questions

1. What are your AHJ's requirements for motor maintenance?
2. What are the manufacturer's requirements for motor maintenance?

## River and Flood Rescue Boat Technician

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### Activities

1. The instructor must create an activity directing students to perform motor maintenance.

### Instructor Notes

1. The instructor should discuss the effects of different water conditions (e.g., salt, pH level, turbidity, or containing harmful organisms) on the motor.

## Unit 6: Basic Boat Handling

### Topic 6-1: Demonstrating Launching and Recovering

#### Terminal Learning Objective

At the end of this topic, given a motorized river and flood rescue boat and a tow vehicle with trailer, the student will demonstrate launching and recovering a rescue boat.

#### Enabling Learning Objectives

1. Demonstrate launching a boat from a trailer
  - Launch preparations
  - Crew position during backing and launch
  - Motor manipulation
2. Demonstrate recovery of a boat to a trailer
  - Recovery preparations
  - Motor manipulation
  - Crew position during recovery
3. Demonstrate anchoring in a dynamic water environment

#### Discussion Questions

1. How do environmental conditions influence launching and recovering a boat?
2. What factors need to be considered when anchoring in a dynamic water environment?

#### Activities

1. The instructor must create an activity directing students to launch and recover a rescue boat.

#### Instructor Notes

1. None

### Topic 6-2: Operating a Rescue Boat and Demonstrating Crew Positions

#### Terminal Learning Objective

At the end of this topic, given a motorized river and flood rescue boat, the student will operate a rescue boat and demonstrate crew positions.

#### Enabling Learning Objectives

1. Demonstrate crew positions
  - Operator
  - Bowman
  - Rescue swimmer

## River and Flood Rescue Boat Technician

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2. Describe safety issues associated with operating a boat
3. Demonstrate righting a flipped boat
4. Demonstrate paddling skills
5. Demonstrate motor-up operations
6. Demonstrate motor manipulation
  - Use of gears
  - Use of throttle
  - Use of tiller
  - Use of motor trim
  - Weight distribution
7. Demonstrate approaching a stationary object
8. Demonstrate beaching operations
9. Demonstrate techniques for starting motors
10. Demonstrate the use of dewatering equipment if applicable

### Discussion Questions

1. What environmental factors influence the drift rates of a boat?
2. What forces affect boat handling? What about positive or negative attitude?

### Activities

1. The instructor must create an activity directing students to perform basic boat handling using paddles only.
2. The instructor must create an activity directing students to flip overturned boats.
3. The instructor must create an activity directing students to perform basic boat handling techniques under motorized power to include wide turns, ferry slalom, turns around objects, and hovering.

### Instructor Notes

1. None

## Topic 6-3: Maneuvering and Docking

### Terminal Learning Objective

At the end of this topic, given a motorized river and flood rescue boat and a dock, the student will maneuver and dock the boat.

### Enabling Learning Objectives

1. Identify safety considerations when docking a boat
2. Demonstrate motor manipulation while docking
3. Demonstrate docking
  - Preparation of docking lines
  - Allowance for wind and current
  - Tying off

### Discussion Questions

1. What are safety considerations for a crewmember or passenger?
2. What are pinch points?

## River and Flood Rescue Boat Technician

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### Activities

1. The instructor must create an activity directing students to maneuver the boat and dock to the port and starboard sides.

### Instructor Notes

1. Boating etiquette is paramount and must be discussed and reinforced prior to this topic.
2. Prior to starting this topic, the instructor must determine and confirm the dock location. Coordinate with the marina or harbor staff prior to beginning activities per AHJ policies.

## Unit 7: Advanced Boat Handling

### Topic 7-1: Operating in Dynamic Water

#### Terminal Learning Objective

At the end of this topic, given a motorized river and flood rescue boat, the student will operate a rescue boat in dynamic water, demonstrating advanced boat handling and rescue techniques and rescue equipment use.

#### Enabling Learning Objectives

1. Describe and demonstrate peel turns
2. Describe and demonstrate J turns
3. Describe and demonstrate a controlled ferry between two objects
4. Describe and demonstrate a slalom at a controlled planning
5. Describe and demonstrate contact rescue
  - Maintain boat in a positive attitude
  - Medical considerations
  - Conscious victim
  - Unconscious victim
6. Describe and demonstrate deploying “go rescuer”
7. Describe and demonstrate transferring members between rescue boats while underway
8. Describe and demonstrate pinning a boat on a fixed object
9. Describe and demonstrate hovering drills
10. Describe and demonstrate throw-bag deployments from a boat
11. Describe and demonstrate how to perform a subject pickup
12. Demonstrate navigating to a predetermined stationary object in open water
13. Demonstrate station keeping in dynamic water

#### Discussion Questions

1. What are the hazards of operating around people in the water?
2. What are some methods for avoiding contact with the watercraft’s propulsion elements?
3. What are considerations for shallow-water operations?
4. What are considerations when in close proximity to other vessels, docks, piers, and bridges while avoiding associated hazards?
5. What would be an operational situation requiring the transfer of members or victims?

## River and Flood Rescue Boat Technician

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### Activities

1. The instructor must create an activity directing students to demonstrate all the ELOs in dynamic water conditions.

### Instructor Notes

1. Perform contact rescues with mannequins or simulating objects.
2. The demonstration of transfer of members may be limited by AHJ policies and procedures.

## Topic 7-2: Towing a Rescue Boat

### Terminal Learning Objective

At the end of this topic the student, given two boats, will demonstrate towing a disabled boat with a rescue boat.

### Enabling Learning Objectives

1. Describe safety considerations for towing boats
  - Environmental conditions
  - Size of towing boat versus size of boat to be towed
  - Towing equipment available
  - Connection points
2. Demonstrate conducting a stern tow
3. Demonstrate conducting an alongside tow

### Discussion Questions

1. What are the safety considerations for towing a boat?
2. What are the differences between emergency and nonemergency towing?
3. What are the differences between rescue versus salvage?
4. What does a towing bridle consist of?
5. What is shock loading, and how do you prevent it?

### Activities

1. The instructor must create an activity directing students to tow a disabled boat.

### Instructor Notes

1. Use situational awareness during a towing operation, which is high-risk.

## Topic 7-3: Managing and Performing a Search

### Terminal Learning Objective

At the end of this topic, given a variety of dynamic water emergencies, a student will be able to manage and perform a victim search in different environments.

### Enabling Learning Objectives

1. Identify the required resources for performing a search
2. Describe how GPS units and various map applications can assist with victim searches
3. Describe search fundamentals

## River and Flood Rescue Boat Technician

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- Time Last Seen (TLS)
  - Place Last Seen (PLS)
  - Probability of Detection (POD)
4. Describe witness management
  5. Identify different tools used for searches
  6. Describe the three general categories of water search operations
    - Aquatic Wide Area Search
    - River Search
    - Flood Basin
  7. Describe reconnaissance, hasty (rapid), primary, and secondary searches
  8. Perform reconnaissance, hasty (rapid), primary, and secondary searches
  9. Demonstrate coordination of multivessel rescue activities
  10. Demonstrate communicating actions to a shore-based incident commander
  11. Demonstrate mitigating the simulated scenario
  12. Describe the transfer of victims to shore-based responders

### Discussion Questions

1. What are the differences between the types of searches?
2. What are the elements required for an effective preplan?
3. What are specific safety considerations during incidents with multiple responding vessels?
4. What are specific safety considerations during night searches?
5. What are the most effective methods of communication between vessels?

### Activities

1. The instructor must create an activity directing students to manage and perform a variety of searches.
2. The instructor must create an activity directing students to perform a night search.

### Instructor Notes

1. The types of searches are delineated in FIREScope ICS-USAR 120-1.
2. The different types of searches may be land based or water based.
3. One night search is highly recommended.
4. The instructor should encourage the use of GPS or map applications during search drills.
5. The instructor may have the students evaluate the IAP from earlier in the course as well as maps or other documents.



## River and Flood Rescue Boat Technician

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### Time Table

Segment	Lecture Time	Activity Time	Total Unit Time
<b>Unit 1: Introduction</b>			
Topic 1-1: Orientation and Administration			
Lecture	1:00		
Activity 1-1: To be determined by instructor		0:00	
<b>Unit 1 Totals</b>	<b>1:00</b>	<b>0:00</b>	<b>1:00</b>
<b>Unit 2: River and Flood Rescue Review</b>			
Topic 2-1: Describing Hydrology and Identifying Travel Paths in Dynamic Water			
Lecture	0:15		
Activity 2-1: Identifying Hydrologic Features and Hazards and Travel Paths		0:30	
Topic 2-2: Describing the Components of Managing a Water Rescue Incident			
Lecture	0:30		
Activity 2-1a: Reviewing an IAP		0:15	
Activity 2-1b: Organizing and Managing an Incident		0:15	
Topic 2-3: Evaluating Hazards, Identifying Safe Current Vectors, and Locating Safety Zones			
Lecture	0:30		
Activity 2-3: Providing a Safety Briefing		0:30	
Topic 2-4: Swimming and Navigating Dynamic Water			
Lecture	0:30		
Activity 2-4: Swimming and Navigating Dynamic Water		1:00	
Topic 2-5: Identifying Rules and Regulations Governing Vessel Operation			
Lecture	0:30		
Activity 2-5: To be determined by instructor		0:00	
<b>Unit 2 Totals</b>	<b>2:15</b>	<b>2:30</b>	<b>4:45</b>
<b>Unit 3: Communications and Navigation</b>			
Topic 3-1: Communicating with Other First Responders and USCG			

## River and Flood Rescue Boat Technician

Segment	Lecture Time	Activity Time	Total Unit Time
Lecture	0:30		
Activity 3-1: Demonstrating Marine Communications		0:30	
Topic 3-2: Describing and Using Navigational Aids and Devices			
Lecture	0:30		
Activity 3-2: Describing and Using Navigational Aids and Devices		1:00	
<b>Unit 3 Totals</b>	<b>1:00</b>	<b>1:30</b>	<b>2:30</b>
<b>Unit 4: Boat Trailing</b>			
Topic 4-1: Describing Critical Trailing Elements			
Lecture	0:30		
Activity 4-1: To be determined by instructor		0:00	
<b>Unit 4 Totals</b>	<b>0:30</b>	<b>0:00</b>	<b>0:30</b>
<b>Unit 5: Boat Components and Terminology</b>			
Topic 5-1: Describing and Assembling Rescue Boat Components			
Lecture	1:00		
Activity 5-1: Assembling Boats		1:00	
Topic 5-2: Describing Equipment and Demonstrating Equipping the Boat			
Lecture	0:30		
Activity 5-2: Equipping Boats		0:30	
Topic 5-3: Describing Basic Safety Considerations and Rescuing a Crew Member			
Lecture	0:30		
Activity 5-3a: Self-Rescuing Crew Members		1:00	
Activity 5-3b: Operator Rescuing Crew Members		1:00	
Topic 5-4: Demonstrating Pre- and Postoperational Checks			
Lecture	0:30		
Activity 5-4: Demonstrating Operational Checks		1:00	
Topic 5-5: Performing Motor Maintenance			

## River and Flood Rescue Boat Technician

Segment	Lecture Time	Activity Time	Total Unit Time
Lecture	0:45		
Activity 5-5: Performing Motor Maintenance		1:00	
<b>Unit 5 Totals</b>	<b>3:15</b>	<b>5:30</b>	<b>8:45</b>
<b>Unit 6: Basic Boat Handling</b>			
Topic 6-1: Demonstrating Launching and Recovering			
Lecture	0:30		
Activity 6-1: Launching and Recovering a Rescue Boat		1:00	
Topic 6-2: Operating a Rescue Boat and Demonstrating Crew Positions			
Lecture	0:30		
Activity 6-2a: Basic Boat Handling with Paddles		1:00	
Activity 6-2b: Flipping Overturned Boats		1:00	
Activity 6-2c: Basic Boat Handling with Motors		2:00	
Topic 6-3: Maneuvering and Docking			
Lecture	0:30		
Activity 6-3: Maneuvering and Docking the Boat		1:00	
<b>Unit 6 Totals</b>	<b>1:30</b>	<b>6:00</b>	<b>7:30</b>
<b>Unit 7: Advanced Boat Handling</b>			
Topic 7-1: Operating in Dynamic Water			
Lecture	2:00		
Activity 6-1: Operating in Dynamic Water		8:00	
Topic 7-2: Towing a Rescue Boat			
Lecture	0:30		
Activity 7-2: Towing a Disabled Boat		1:00	
Topic 7-3: Managing and Performing a Search			
Lecture	0:30		
Activity 7-3a: Managing and Performing a Search		1:00	
Activity 7-3b: Performing a Night Search		2:00	
<b>Unit 7 Totals</b>	<b>3:00</b>	<b>12:00</b>	<b>15:00</b>
<b>Lecture, Activity, and Unit Totals:</b>	<b>12:30</b>	<b>27:30</b>	<b>40:00</b>

## River and Flood Rescue Boat Technician

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### Course Totals

Total Lecture Time (LT)	12:30
Total Activity Time (AT)	27:30
<b>Total Course Time</b>	<b>40:00</b>

## Acknowledgments

State Fire Training gratefully acknowledges the following individuals and organizations for their diligent efforts and contributions that made the development and publication of this document possible.

### Cadre Leadership

**Kevin Conant**

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## River and Flood Rescue Boat Technician

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**Paulo Brito**  
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### Partners

State Fire Training also extends special acknowledgement and appreciation to the Conference and Training Services Unit with the College of Continuing Education at California State University, Sacramento, for its ongoing meeting logistics and curriculum development support, innovative ideas, and forward-thinking services. This collaboration is made possible through an interagency agreement between CAL FIRE and Sacramento State.



# RIVER/FLOOD RESCUE BOAT TECHNICIAN New Curriculum Implementation Plan

Issued: July 12<sup>th</sup>, 2019

## OVERVIEW

This document is intended to provide information for all State Fire Training (SFT) stakeholders on the new River/Flood Rescue Boat Technician (2018). This was a collative effort with the Office of the State Fire Marshal, State Fire Training, the Office of Emergency Services, Fire and Rescue Branch and CAL FIRE, Training Center (Ione) to develop a number of curriculums requested by you the Stakeholders. The curriculum was translated into the SFT format for Curricula from the original course plans from CAL OES (2015). Stakeholders are encouraged to study this information carefully and seek clarification from SFT if questions arise.

## IMPLEMENTATION

**River/Flood Rescue Boat Technician (2018)** The new Course Plans have been developed based on the authority of the current National Fire Protection Association (NFPA) Standards, which includes NFPA 1006, Standard for Technical Rescue Personnel Professional Qualifications (2017). In addition, ICS-420-1, Field Operations Guide, ICS-SF-SAR-020 Swiftwater/Flood Search and Rescue Recommended Training, Skills and Equipment List (current edition), NFPA 1500, 1521, 1561 aided among others as supporting documents when creating these Course Plans. The Course Plans will be available on the SFT website.

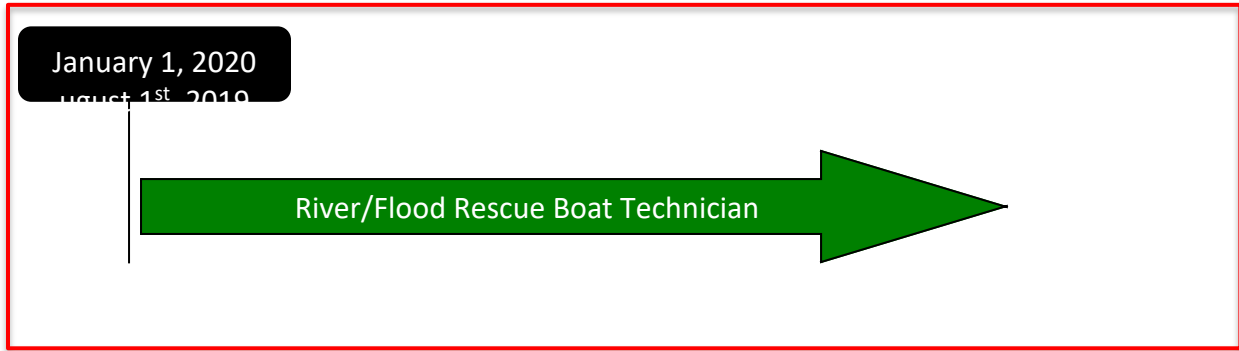
**New (2018) Curriculum ..... Available January 1, 2020**

<div style="background-color: #00FF00; border: 1px solid black; padding: 5px; display: inline-block;"> <b>River/Flood Rescue Boat Technician (40 hours)</b> </div>
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**Old (1998) Curriculum ..... Phase out December 31, 2019**

Effective December 31, 2019 SFT Rescue Boat Operations (1998) and OES River/Flood Rescue Boat Technician (2015) curriculums will be retired. The Rescue Boat Operations Course will no longer be available in the SFT catalog and the OES River/Flood Rescue Boat Operator Course will be no longer available through OES.

New (2018) FSTEP ..... Available January 1, 2020



## INSTRUCTOR REQUIREMENTS

**Instructor Registration ..... Available January 1, 2020**

Current registered instructors with State Fire Training that presently are instructors for the OES (Office of Emergency Services) Course titled: River/Flood Rescue Boat Technician (2015) are authorized to teach the new River/Flood Rescue Boat Technician (2018).

Current SFT instructors that are teaching the current Rescue Boat Operations (1998), which is a 24-hour course will **not** be able to facilitate the New River/Flood Rescue Boat Technician course, which is a 40-hour curriculum. Instructors of Rescue Boat Operations (1998) will be required to take the River/Flood Rescue Boat Technician (2018) course or apply for PACE II.

New instructors for this course shall meet the SFT requirements for Registered Instructor and will be required to either take the course or apply for a Pace II review of their instructor qualifications, including appropriate education and practical experience relating to course content.

Additionally, a new instructor of the River/Flood Rescue Boat Technician (2018) course, the following experience requirements shall apply:

1. Rank and Professional Experience:
  - a. Held a permanent position and/or performed rescue duties within a Recognized Fire Agency in California for a minimum of three (3) years.
  - b. Must have specific expertise in Technical Rescue as it relates to the River/Flood environment.

## SFT STAFF COORDINATION

This FSTEP course are new to State Fire Training.

## POTENTIAL AGENCY IMPACTS

Fire agencies utilizing the existing CAL OES (Office of Emergency Services) River/Flood Rescue Boat Technician should have little or no impacts making the transition from that course to the new update curriculum format for training or operational implementation.

**NOTE:** A Special attention should be paid to these new updated FSTEP courses, are NOT included in any of SFT certification tracks at this time.

Accredited Regional Training Programs (ARTP), Accredited Local Academies (ALA), community colleges and all other local delivery venues need to review the curriculum and seek approval from their curriculum committee/program sponsor, as appropriate.