Marine Fire Fighting for Land-Based Fire Fighters

Course Plan

Course Details

CTS Guide:	Marine Fire Fighting for Land-Based Fire Fighters (2019)
Description:	This course provides the knowledge and skills needed for the land-based fire fighter to work safely and efficiently at a marine fire incident or exposure. This training program includes an awareness of the maritime domain; organizational roles, structures, and resources; vessel types and transported products; vessel construction and terminology; vessel safety and hazards; and fire detection, signaling and suppression systems. It also includes operational strategies and tactics for sizing up a marine incident; controlling access to, boarding, and evacuating a vessel; establishing water supply connections; monitoring fire conditions; protecting an exposure; accessing a fire compartment; attacking a fire; conducting a search and rescue operation; ventilating smoke; and removing water from a vessel. This course incorporates training based on NFPA 1005 (2019).
Designed For:	Land-based emergency personnel with responsibility for responding to incidents in a marine environment.
Prerequisites:	OSFM Fire Fighter 2 certification
	or
	Meet the minimum job performance requirements for Fire Fighter 2 in NFPA 1001: Standard for Fire Fighter Professional Qualifications related to safety; fire behavior; portable extinguishers; personal protective equipment (PPE); ladders; fire hose, appliances, and streams; overhaul; water supply; ventilation; and forcible entry as demonstrated through two (2) years' full-time or four (4) years' part-time/volunteer experience.
Standard:	Attend and participate in all course sections
	Successful completion of all activities and skills
	Successful completion of summative exam with a score of 80%
Hours (Total):	40 hours
	(24.75 lecture / 15.25 application)
Minimum Class Size:	15

Maximum Class Size: 30

Instructor Level: SFT Registered Marine Fire Fighting for Land-Based Fire Fighters Instructor

Instructor/Student Ratio: 1:30 (lecture)

1:5 (application/skills) – a minimum of one Registered Marine Fire Fighting for the Land-Based Fire Fighters Instructor per IDLH prop or scenario, and as many Skills Coaches as needed to meet the 1:5 student ratio)

Restrictions: See Equipment, Facilities, and Personnel requirements

SFT Designation: CFSTES

Table of Contents

Required Resources

Instructor Resources

To teach this course, instructors need:
- *Marine Fire Fighting for Land-Based Firefighters* (ISFTA, 3rd edition, ISBN: 978-087939641-1)
- NFPA 1005: Standard for Professional Qualifications for Marine Fire Fighting for Land-Based Fire Fighters (2019 or current)
- NFPA 1925: Standard on Marine Fire Fighting Vessels (2018 or current)
- Full structural PPE and SCBA

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:
- *Marine Fire Fighting for Land-Based Firefighters* (ISFTA, 3rd edition, ISBN: 978-087939641-1)
- Full structural PPE and SCBA

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 training site with the NFPA 1005 and NFPA 1925 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 Marine Fire Fighting for Land-Based Fire Fighters curriculum

Equipment

Student safety is of paramount importance when conducting the type of high-risk training associated with this course. The equipment listed below is the minimum for the delivery of this course. The student is responsible for providing all personal protective equipment and ensuring that it meets AHJ and site requirements.

The following equipment is required to deliver this course:

15 Students	30 Students	Equipment
1	2	Line gun (optional per AHJ)
2	4	Pry bar
1	2	Bolt cutter
2	4	Pike pole
2	4	Scoop shovel
2	4	Shovels; round point, long handle
2	4	Shovels; square point, long handle
4	6	Adjustable hydrant wrench
1	1	Sprinkler shut-off wedge
15	30	Utility rope
1	2	Floating stretcher with harness (optional per AHJ)
2	4	Portable extinguisher
2	4	Dry chemical extinguisher
1	2	Electrical extension cords
2	4	Flathead axe
2	4	Pick head axe
15	30	SCBA cylinders; 1 per student
1	1	SCBA cascade/fill station or mask unit
2	4	Halligan tool or equivalent (optional per AHJ)
1	2	Spanner wrench
2	4	Sledgehammer
2	4	Grappling hook (optional per AHJ)
2	4	Ropes in a throw bag
2	4	Heaving line
2	4	NFPA 1983 life safety rope
TBD	TBD	Jet siphons; 2½" to 3½" or larger
1	2	Positive pressure fan; portable, size determined by AHJ
1	2	Chainsaw; gas-powered with fuel can, chain oil, and extra chain
1	1	Generator; with extension cord

1	2	Hydraulic rescue tool; gas-powered or manual
2	4	Atmospheric monitor; with tubing
1	1	Circular saw
4	8	Salvage covers
15	30	Head lamp
15	30	Flashlight/streamlight
TBD	TBD	Hose; supply line, attack line (determined by AHJ)
TBD	TBD	Fire apparatus; with associated equipment (determined by AHJ)
1	1	Fire boat (optional)
5	5	Smoke machines; with liquid smoke and extension cords
TBD	TBD	Gas meters
TBD	TBD	Thermal imaging camera (TIC)
TBD	TBD	R95 masks (for instructors)
1	1	International Shore Connection (ISC)
TBD	TBD	Gated wyes
TBD	TBD	Low pressure (75 psi) variable fog nozzles for handlines
1	1	Manikin
1	1	ATTACK™ Digital Fire Training System (with weighted hoses and nozzles) (optional)
*Assuming you use Storz connections TBD = AHJ hosting course determines minimum requirements based on vessel or vessel prop and activities		

Training Props

The following training props are required to deliver this course:

- Access to a vessel or a vessel prop that enables students to practice skills and complete course objectives

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 Marine Fire Fighting for Land-Based Fire Fighters class.

Personnel

The following personnel are required to deliver this course:

- A minimum of one Registered Marine Fire Fighting for the Land-Based Fire Fighters Instructor per IDLH prop or scenario, and as many Skills Coaches as needed to meet the 1:5 student ratio for application and skills

Time Table

Segment	Lecture	Application	Unit Total
Unit 1: Introduction			
Topic 1-1: Orientation and Administration	0.75	0.0	
Topic 1-2: Marine Fire Fighting for Land-Based Fire Fighters Certification Process	0.25		
Unit 1 Totals	**1.0**	**0.0**	**1.0**
Unit 2: Awareness			
Topic 2-1: Understanding the Maritime Domain	1.0	0.0	
Topic 2-2: Understanding Organizational Roles, Structures, and Resources	0.5	0.0	
Topic 2-3: Identifying Vessel Types and Potential Products Transported	1.5	0.0	
Topic 2-4: Defining Common Marine Vessel Construction and Terminology	1.5	0.0	
Topic 2-5: Describing Vessel Safety and Hazards	1.0	0.0	
Topic 2-6: Identifying Fire Detection, Signaling, and Suppression Systems	1.0	0.0	
Topic 2-7: Retrieving a Vessel Fire Control Plan and Other Specified Documents	0.25	*	
Topic 2-8: Identifying a Specified Location on a Vessel	0.25	0.5	
Topic 2-9: Collecting and Reporting Vessel Stability Information	0.5	*	
Unit 2 Totals	**8.0**	**0.5**	**8.5**
Unit 3: Operations			
Topic 3-1: Sizing Up a Marine Incident	0.75	0.25	
Topic 3-2: Locating a Marine Facility or Vessel Representative	0.5	0.0	
Topic 3-3: Controlling Access to a Vessel	1.0	*	
Topic 3-4: Boarding a Marine Vessel	1.0	*	
Topic 3-5: Transmitting and Receiving Messages	1.0	*	
Topic 3-6: Evacuating a Vessel or Exposure	1.0	*	
Topic 3-7: Establishing Water Supply Connections	1.5	0.5	
Topic 3-8: Monitoring Fire Conditions on a Vessel	1.0	0.0	
Topic 3-9: Assisting in Deploying Extinguishing Agents	1.0	0.5	
Topic 3-10: Protecting an Exposure on a Vessel	1.0	*	
Topic 3-11: Accessing a Fire Compartment	1.0	0.0	
Topic 3-12: Attacking a Fire on a Vessel	2.0	*	

Topic 3-13: Conducting a Search and Rescue Operation on a Vessel	1.0	*	
Topic 3-14: Ventilating Smoke from a Vessel	1.0	*	
Topic 3-15: Removing Water from a Vessel	1.0	*	
Unit 3 Totals	**15.75**	**1.25**	**17.0**
Other			
Field Trip (walk and talk through vessel)	**0.0**	**4.0**	**4.0**
Formative Assessments			
* Skill Sheets Completed on Vessel or Prop	**0.0**	**8.0**	**8.0**
Summative Assessment			
Written Exam	**0.0**	**1.5**	**1.5**
Course Totals	**24.75**	**15.25**	**40.0**

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 and student ratios 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.

Topic 1-2: Marine Fire Fighting for Land-Based Fire Fighters Certification Process

Terminal Learning Objective

At the end of this topic a student will be able to identify the requirements for Marine Fire Fighting for Land-Based Fire Fighters certification and be able to describe the certification task book and examination process.

Enabling Learning Objectives

1. Identify the differed levels of certification in the certification track
2. Identify the prerequisites for certification
3. Identify the course work required for certification
4. Identify the exams required for certification
5. Identify the task book requirements for certification
6. Identify the experience requirements for certification
7. Identify thee position requirements for certification
8. Describe the certification task book process
9. Describe the certification examination process

Discussion Questions

1. Determined by instructor

Application

1. Determined by instructor

Instructor Notes

1. None

Unit 2: Awareness

Topic 2-1: Understanding the Maritime Domain

Terminal Learning Objective

At the end of this topic a student, given information about ports, marinas, and the maritime environment, will be able to understand the maritime domain, so that land-based fire fighters are prepared to respond to a marine incident.

Enabling Learning Objectives

1. Describe risks unique to marine fire fighting
2. Describe environmental concerns when responding to a marine incident
   - Weather
     - Wind
     - Temperature extremes
   - Ocean/water body movement
     - Tides
     - Currents
     - No wake zones
   - Vessel traffic
   - Man overboard/person in water
3. Identify port facilities and resources common to the AHJ
4. Identify port services and systems that may impact operational decision making
5. Describe port equipment that may impact operational decision making
   - Mooring equipment
     - Mooring line danger zone
   - Facility firefighting equipment
6. Identify marina facilities and resources common to the AHJ
7. Describe marina equipment that may impact operational decision making

Discussion Questions

1. How do marine environmental conditions (tides, wind, etc.) impact firefighting operations?
2. What port services and systems might impact emergency response?
3. Why are mooring lines dangerous? How large is a mooring line danger zone?
4. What are some differences between ports and marinas?

Application

1. Determined by instructor

Instructor Notes

1. None

CTS Guide Reference: None

Topic 2-2: Understanding Organizational Roles, Structures, and Resources

Terminal Learning Objective

At the end of this topic a student, given marine domain organizational roles, structures, and resources, will be able to understand the organizational roles, structures, and resources associated with marine firefighting, so that marine firefighting operations are carried out in accordance with applicable laws, standards, policies, and procedures.

Enabling Learning Objectives

1. Describe the role of port authorities during a marine incident
   - Manages port and port operations
   - Pre-planning emergency operations with fire service
   - Responsible party (harbor master, vessel agent, qualified individual) to grant vessel access
2. Describe the organizational structure of a commercial vessel as it relates to fire fighting
   - Master, Captain, person in charge
   - Vessel station bill or muster list documents organizational structure
   - Identify engineering officer (or equivalent)
3. Describe the organizational structure of a military vessel as it relates to fire fighting
   - Commanding Officer (CO), Captain
   - Emergency response team always on board
   - Identify Engineering Officer
   - More people on board on a military vessel than a commercial vessel
   - More defined chain of command than a commercial vessel
4. Describe the role of land-based fire fighters at a marine incident
   - Respond to any fire or rescue incident within response area or as directed
   - Work under authority of unifying command to carry out strategies and tactics
5. Identify governmental organizations that may be involved in a marine incident
   - Federal
     - U.S. Coast Guard
     - Customs and Border Protection
   - State
     - Department of Fish and Wildlife
     - Cal OES
     - CAL FIRE
   - Local
     - Municipal fire departments
     - Law enforcement
     - Emergency Operations Center (EOC)
     - Port authority or harbor department
     - Local U.S. Coast Guard sector control
6. Describe legal considerations for land-based fire fighters at a marine incident
   - Maritime law is different and more complex than state and local laws (i.e., permission to board, who is in charge, etc.)

7. Identify policies and procedures associated with marine incident response
8. Identify resources that may be available during a marine incident

Discussion Questions

1. What is the role of a land-based fire fighter at a marine incident?
2. Who gives permission for fire fighters to board a vessel?
3. What resources are available during a marine incident in your AHJ?

Application

1. Determined by instructor

Instructor Notes

1. None

CTS Guide Reference: CTS 1-1

Topic 2-3: Identifying Vessel Types and Potential Products Transported

Terminal Learning Objective

At the end of this topic a student, given general information on vessel types common to the AHJ, awareness level information on products transported by marine vessels, AHJ policies and procedures, and overall scene safety considerations at marine incidents, will be able to identify marine vessel types and potential products transported, so that the scene of the incident and the hazards are recognized.

Enabling Learning Objectives

1. Identify characteristics of generalized marine vessel types
   - Passenger vessels
   - Pleasure craft
   - Floating structures
   - Tankships
   - Cargo vessels
   - Special purpose vessels
   - Military vessels
   - Other vessel types
2. Identify awareness-level hazardous product information
3. Identify general hazard classes of product and structural firefighting PPE compatibilities

Discussion Questions

1. What type of vessels are common in your AHJ?
2. What hazards are associated with those vessel types?
3. What can cause stability issues with those vessel types?

Application

1. Determined by instructor

Instructor Notes

1. None

CTS Guide Reference: CTS 1-1

Topic 2-4: Defining Common Marine Vessel Construction and Terminology

Terminal Learning Objective

At the end of this topic a student, given vessel construction terminology, marine vessel terminology, and general structural hazards associated with marine vessels, will be able to define common marine vessel construction and terminology, so that Land-Based Fire Fighters have a working knowledge of general terms when communicating with marine vessel personnel.

Enabling Learning Objectives

1. Describe marine vessel terminology
   - Bow/stern
   - Port/starboard
   - Forward/aft
   - Main deck (identified on fire control plan)
   - Above/below deck
   - Transom
   - Keel
   - Gunwhales
   - Rudder
   - Helm
   - Hull/superstructure
   - Cleat
   - Draft/freeboard
2. Describe general marine vessel construction
   - Framing systems
   - Bulkheads
   - Decks, platforms, levels
   - Construction materials
3. Identify arrangement and hazards of vessel spaces
   - Control spaces
     - Bridge
     - Engine control room
     - Fire control room
   - Machinery spaces
     - Engine space
     - Fire pump and foam room
   - Accommodation spaces
     - Berth
     - Galley
     - Head
   - Storage spaces
     - Cargo
     - Tanks

- Void spaces
4. Describe common vessel markings
    - Interior
        - Exits
        - Frame numbering
        - Fire stations
        - Hazardous materials
        - Ladders, escape trunks
    - Exterior
        - Draft markings
        - Load lines
5. Identify vessel compartment access and egress points and methods
    - Watertight/weathertight doors
        - Quick acting
        - Individual dog
    - Interior joiner (standard) doors
    - Hatches/hatchways
    - Ladders, escape trunks
    - Stairs
6. Identify the major systems necessary on a large vessel
    - Power generation and lighting
    - Heating, refrigeration, air conditioning, ventilation
    - Fuel and ballast transfer
    - Mooring
    - Steering
    - Propulsion and thrusters
    - Cargo handling
    - Bilge
    - Communication
7. Describe challenges associated with smaller vessels
    - Not required to meet large vessel design and construction standards
    - May not have fire detection, containment, or suppression systems
    - May use combustible materials not permitted on large commercial vessels
    - Do not have flooding resistance or containment features found on large vessels
    - Likely to flood, become unstable, capsize, or sink more rapidly than large vessels
    - Likely to have smaller passageways, compartments, doors, and hatches than large vessels
    - Often modified by owners compromising safety and stability

Discussion Questions
1. How do the differences between large and small vessels impact operations?
2. Where is "frame zero"?
3. Where are draft markings located? What do they indicate?
4. Where is the bridge located?

Application
1. Determined by instructor

Instructor Notes
1. Marine terminology and fire service terminology have similar terms (ladder, line, draft, etc.) with different meanings. Be clear about intended meaning when teaching this class.

CTS Guide Reference: CTS 1-2, 1-4, 2-1, 3-2

Topic 2-5: Describing Vessel Safety and Hazards

Terminal Learning Objective

At the end of this topic a student, given hazards unique to marine incidents, personal protective equipment (PPE), requisite equipment, and available specialized resources, will be able to recognize common vessel hazards 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 considered.

Enabling Learning Objectives

1. Describe safety measures to take at a marine incident
   - Personnel accountability
     - System determined by AHJ
     - Working with impaired communications
       - Louder or echoed environments
       - Radio failure
       - Dampened/compressed sound
   - Respiratory protective equipment
     - Determined by AHJ
   - Emergency response access/egress
     - Door safety
       - Opening sequence
       - Pressure changes
       - Securing doors
       - Knife edges
       - Trip hazards/coaming
       - Heat transfer
     - Gangways
       - Overloading
       - Movement
       - Falls
     - Ladder safety
       - Overloading
       - Falls
2. Identify hazards unique to a marine incident
   - Water hazards
     - Falls into water
       - Water rescue (self/RIC)
       - Personal flotation devices
       - Throw ring
   - Environmental (natural) hazards
     - Slick surfaces
     - Freezing temperatures
     - Changes in water level

- o   Water currents spread pollutants and flammable liquids
- o   Lightning
- o   Wind
- o   Waves
- Vessel hazards
  - o   Construction
    - ▪   Deck openings/knife edges
    - ▪   Automatic doors
    - ▪   Metal hulls and superstructures
    - ▪   Overhead hazards
  - o   Confined spaces
    - ▪   Atmospheric hazards
  - o   Machinery and systems
    - ▪   Crush hazards
    - ▪   Exposure, electrical shock, explosions
    - ▪   Noise
    - ▪   Pressurized contents
- Cargo types and hazards
  - o   Break bulk
    - ▪   Anticipate Class A combustibles associated with dunnage and packaging materials
  - o   Roll-on/roll-off (RO/RO)
    - ▪   Fuel
    - ▪   Lithium batteries
    - ▪   Electrical wiring
    - ▪   Tire explosions when exposed to fire
    - ▪   Unknown contents (propane tanks, ammunition, dangerous goods)
  - o   Containerized
    - ▪   Lack of access to containers
    - ▪   Unknown contents
    - ▪   Exposure of adjacent containers
  - o   Liquid bulk
    - ▪   Flammability
    - ▪   Vapor clouds
    - ▪   Severe damage to human tissue
    - ▪   Storage vessel failure
    - ▪   Explosions
  - o   Dry bulk
    - ▪   Atmospheric hazards
    - ▪   Shifting loads
    - ▪   Engulfment
    - ▪   Explosions
- Pier, wharf, dock hazards
  - o   Stability

- o Weight limits
- o Overhead hazards
- o Mooring lines
- o Moving vehicles
- o Trains and train tracks
- o Electrical hazards
3. Describe personal safety practices to take at a marine incident
   - Stay aware of surroundings
   - Never step backwards without looking
   - Note path taken through a vessel
   - Face ladders while descending
   - Slide or shuffle feet
   - Assume any closed space can be hazardous
4. Describe vessel monitoring procedures
   - List
   - Draft
   - Trim

Discussion Questions
1. What is your AHJ's personnel accountability system? How might you need to adapt it in a marine environment?
2. What are some common atmospheric hazards in a marine environment?
3. How does the natural environment contribute to marine hazards?

Application
1. Determined by instructor

Instructor Notes
1. None

CTS Guide Reference: CTS 1-3, 2-1, 5-1

Topic 2-6: Identifying Fire Detection, Signaling, and Suppression Systems

Terminal Learning Objective

At the end of this topic a student, given an incident, an assignment, standard operating procedures, and communications equipment, will be able to identify onboard vessel and land-based fixed fire suppression systems as a member of a team, so that the system is activated or shut down when information is requested by the Incident Commander.

Enabling Learning Objectives

1. Identify fire detection and signaling systems
   - Smoke detection
   - Heat detection
   - Flame detection
   - Alarm system control units
   - Automatic system operations
   - Vessel watch and patrol systems
2. Identify types of fire suppression systems found on vessels
   - Water
       - Limited gallons per minute
       - May be unreliable
       - Not intended as a primary water supply
       - May be used to support boundary cooling
   - Chemical
   - Inert gas
   - Foam
3. Describe hazards associated with operating suppression systems and agents
4. Describe appropriate times to activate fixed suppression systems on vessels
   - Determined by onboard crew
5. Identify land-based fire suppression components found at ports and marinas
   - Fixed
       - Hose cabinets
           - Wet
           - Dry
       - Fire department connection (FDC)
       - Hydrants
       - Monitors
   - Portable
       - Extinguisher
       - Apparatus
       - Pump
6. Recognize fire suppression system controls
7. Operate communications equipment in a fire suppression control room
8. Understand vital precautions to take when activating fire suppression systems

Discussion Questions

1. What types of fire detection systems can be found on vessels?

2. What types of land-based fire suppression components are available in a marina or port?
3. What are the advantages and disadvantages of using water?
4. What are the advantages and disadvantages of using carbon dioxide?
5. What are the advantages and disadvantages of using foam?

Application

1. IFSTA Skill Sheet 6-1: Locate and Identify Onboard Fire Suppression Systems (optional)

Instructor Notes

1. None

CTS Guide Reference: CTS 2-2

Topic 2-7: Retrieving a Vessel Fire Control Plan and Other Specified Documents

Terminal Learning Objective

At the end of this topic a student, given a vessel, an assignment, a vessel fire control plan and other documents, and any necessary equipment, will be able to retrieve a vessel fire control plan and other specified documents from a cold zone on the vessel, so that the vessel fire control plan and documents are located and brought to the Incident Commander within the time specified by the AHJ.

Enabling Learning Objectives

1. Identify the purpose of the fire control plan during emergency response
   - Assist with control of fire emergencies on a vessel
   - Assist land-based fire fighters
     - Develop pre-incident plans
     - Develop incident action plans
     - Deploy rapid intervention teams
   - Help plan primary and secondary access and egress routes
2. Identify other important documents
   - Passenger/crew list
   - Stability, trim, and loading documents
   - Dangerous cargo manifests
   - Cargo loading manuals
3. Describe location(s) on the vessel where the vessel fire control plan and other documents are stored
4. Identify location of the command post
   - Deliver fire control plan to appropriate command based on incident complexity
     - Operations
     - Branch/Division
     - Incident Command

Discussion Questions

1. Are all vessels required to have a fire control plan?
2. On vessels greater than 300 tons, where is the fire control plan required to be located?
3. Where might fire control plans be located on vessels weighing less than 300 tons?
4. What other vessel documents are relevant to marine fire fighting?

Application

1. IFSTA Skill Sheet 7-1: Locate and Retrieve a Fire Control Plan from a Vessel

Instructor Notes

1. None

CTS Guide Reference: CTS 1-4

Topic 2-8: Identifying a Specified Location on a Vessel

Terminal Learning Objective

At the end of this topic a student, given a vessel fire control plan and an assignment, will be able to identify a specified location on a vessel, so that the assignment is completed and reported.

Enabling Learning Objectives

1. Describe terminology and symbols used on a vessel fire control plan
2. Identify contents of a vessel fire control plan
   - Fixed fire-suppression systems
   - Portable/semiportable fire-suppression equipment
   - Vessel construction features
   - Fire detection systems
   - Ventilation system
   - Means of access and egress
3. Describe how to interpret and use a vessel fire control plan
4. Negotiate vessel ladders, decks, and corridors
5. Operate vessel doors and hatches

Discussion Questions

1. How would you identify your specific location on a vessel?
2. What types of information can you gather from a fire control plan?

Application

1. Given a fire control plan, have students work in groups to research and identify vessel features, frame numbering, means of egress, and the location of fire suppression systems.

Instructor Notes

1. None

CTS Guide Reference: CTS 1-4, 2-1, 3-3

Topic 2-9: Collecting and Reporting Vessel Stability Information

Terminal Learning Objective

At the end of this topic a student, given a vessel, an incident, an assignment, measuring devices, and standard operating procedures, will be able to collect and report vessel stability information, so that any current or potential hazards to stability are recognized and reported according to procedures.

Enabling Learning Objectives

1. Identify basic vessel stability concepts
   - Heel, list, trim
   - Center of gravity
   - Center of buoyancy
   - Danger angle
2. Describe the effect of tides, wakes/waves, and currents on vessel stability
3. Describe vessel draft marking systems and how to assess and monitor vessel stability
   - Draft markings
   - Trim lines
   - Load lines
4. Describe vessel stability as it relates to fire fighting
   - Stability impacts if/when to board and evacuate vessel
   - Fire damage can shift loads
   - Addition of external water impacts stability
5. Describe procedures for reporting information
   - Report information to appropriate command based on incident complexity
     - Operations
     - Branch/Division
     - Incident Command
6. Visualize the position of a vessel
7. Use internal and external measuring devices or procedures

Discussion Questions

1. What is the difference between heel and list?
2. How do you assess and monitor vessel stability?

Application

1. IFSTA Skill Sheet 10-1: Collect and Report Vessel Stability Information

Instructor Notes

1. None

CTS Guide Reference: CTS 3-4

Unit 3: Operations

Topic 3-1: Sizing Up a Marine Incident

Terminal Learning Objective

At the end of this topic a student, given an incident, background information and applicable reference materials, will be able to size up an incident, so that operational mode is defined, resource availability and response time are determined, types of rescues are determined, resource needs are assessed, and information required to develop an incident action plan is obtained.

Enabling Learning Objectives

1. Identify size up considerations
    - Fuel type
    - Vessel type and construction
    - Vessel occupancy/service
    - Vessel trim and stability
    - Life hazards
    - Water supply
    - Fixed systems
    - Street/wharf/dock access
    - Staging and safety areas
    - Environment (weather, tides, current, etc.)
    - Exposures
    - Fire location
    - Time of day
    - Hazardous materials
2. Identify steps to take after size up
    - Establish incident command
    - Request additional resources (as needed)
    - Issue appropriate notifications including marine/vessel responsible party
3. Conduct scene size up

Discussion Questions

1. Why is it critical to determine vessel fuel type as soon as possible?
2. What size up information can you determine from a pier (without a 360 evaluation)?
3. How will size up of a larger vessel differ from size up of a smaller vessel?

Application

1. Given incident scenarios, background information, and applicable reference materials, have students size up an incident and share their findings with the group.

Instructor Notes

1. None

CTS Guide Reference: None

Topic 3-2: Locating a Marine Facility or Vessel Representative

Terminal Learning Objective

   At the end of this topic a student, given a marine facility or vessel and an assignment, will be able to locate a marine facility or vessel representative, so that a line of communication is established between the fire department and the facility or vessel representatives.

Enabling Learning Objectives

   1. Identify locations on a vessel where the ship's master, mate, engineer, or ship's agent can be located
   2. Identify marine frequencies monitored by the vessel master
   3. Identify locations where facility representatives are normally located
   4. Identify methods for contacting representatives after normal working hours
   5. Operate marine facility and vessel communications equipment
   6. Board a vessel
   7. Negotiate or travel through the facility or vessel

Discussion Questions

   1. What are some common marine radio channels?
   2. Where would you find the responsible party on a ship?
   3. Where would you find thee responsible party at a marina?

Application

   1. Determined by instructor

Instructor Notes

   1. None

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

Topic 3-3: Controlling Access to a Vessel

Terminal Learning Objective

At the end of this topic a student, given a vessel, an incident, an accountability system, an incident management system, and response personnel, will be able to control access to a vessel, so that all emergency responders boarding the vessel are noted and accounted for.

Enabling Learning Objectives

1. Describe accountability systems used by the AHJ
2. Identify personnel who are authorized to operate a marine incident
3. Identify methods for controlling access to a vessel
   - Staging areas
     - On land for shore response
     - On the vessel for onboard response
   - Fireline tape
   - Physical barriers
   - Personnel stationed at the access point
   - Documentation (physical or digital)
4. Use accountability tactical worksheets

Discussion Questions

1. Why is it important to control access to a vessel during an incident?
2. How does your AHJ document personnel accountability?
3. How are vessel staging areas different from land-based staging areas?
4. What resources can you use to control access?

Application

1. IFSTA Skill Sheet 5-3: Control Access to a Vessel Using Accountability Tactical Worksheets

Instructor Notes

1. ELO 1 is already covered in Topic 2-5. Students just need a reminder of how to use it in context here.

CTS Guide Reference: CTS 3-3

Topic 3-4: Boarding a Marine Vessel

Terminal Learning Objective

At the end of this topic a student, given a vessel, gangway, approved PPE, water survival techniques, approved hand tools and suppression equipment, and AHJ policies and procedures, will be able to board a marine vessel, so that Land-Based Fire Fighters are transferred to the vessel in a safe manner.

Enabling Learning Objectives

1. Describe effect of vessel movement due to tide, wakes, currents, or other factors
2. Describe effect of water depth
3. Describe gangway uses and hazards
4. Identify key components of gangway safety
   - Maintain 10 feet spacing between personnel
   - Distribute weight of personnel, tools, and equipment
   - Always face/travel forward
   - Maintain three points of contact
5. Describe water survival techniques
   - Self-rescue
     - Stay calm
     - Assess surroundings
     - Roll onto back
     - Move away from debris
     - Notify others
     - Group together (if there are multiple people in water)
     - Use available equipment for added flotation
     - Use SCBA (if needed)
     - Doff PPE
   - Witnessing a person in the water
     - Illuminate (if needed)
     - Maintain visual contact (serve as a lookout)
     - Initiate Mayday/man overboard call
     - Throw flotation device
6. Don approved PPE
7. Transfer tools and equipment to the vessel in a proper and safe manner
8. Climb a gangway

Discussion Questions

1. How can tidal changes impact gangway operations?
2. What should you do if you fall into the water?
3. What should you do if you see someone else fall into the water?
4. How far apart should personnel be on a gangway?

Application

1. IFSTA Skill Sheet 5-2: Board a Marine Vessel

Instructor Notes

1. None

CTS Guide Reference: CTS 1-3

Topic 3-5: Transmitting and Receiving Messages

Terminal Learning Objective

At the end of this topic a student, given marine facility and vessel communications equipment and standard operating procedures, will be able to transmit and receive messages via marine facility and vessel communications equipment to vessel personnel and other agencies responding to an incident, so that the information is accurate, complete, clear, and relayed within the time established by the AHJ.

Enabling Learning Objectives

1. Identify marine communications terminology and procedures
2. Identify proper frequencies to use
   - Marine radio frequencies
   - Land-based frequencies
3. Describe types, capabilities, and limitations of communications systems
   - Vessel systems
   - Port systems
   - Marina systems
   - Fire department systems
4. Identify other agencies that respond to marine incidents
   - Government
   - Law enforcement
   - Medical
   - Mutual aid agencies
   - Aerial assets
5. Describe methods for overcoming language barriers
   - Translation services (or apps)
6. Operate marine facility, vessel, and fire department communication systems
7. Operate marine radios

Discussion Questions

1. What channel is used for marine emergencies?
2. How would you determine which frequencies to use for communication interoperability?
3. What other agencies might respond and impact communications at a marine incident?

Application

1. IFSTA Skill Sheet 4-1: Operate Communications at a Marine Incident

Instructor Notes

1. None

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

Topic 3-6: Evacuating a Vessel or Exposure

Terminal Learning Objective

At the end of this topic a student, given an occupied vessel or exposure, an incident, an accountability system, an incident management system, and response personnel, will be able to evacuate a vessel or exposure, so that all personnel are removed from the hazard area to an area of refuge.

Enabling Learning Objectives

1. Describe AHJ vessel evaluation and accountability procedures
2. Describe how to evacuate a vessel of exposure
   - Determine need for evacuation
   - Contact marine facility or vessel representative
   - Identify established evacuation routes (fire control plan)
   - Establish alternate evacuation routes (as needed)
     - One at the bow and one at the stern
     - Out of the way of attack routes
   - Control and direct passenger and crew movement to an area of refuge
   - Use accountability system
   - Ensure all personnel are evacuated
   - Isolate affected area
   - Address security and/or Customs issues with international personnel or passengers (if applicable)
   - Complete all required documentation
3. Control, direct, and move passengers and crew

Discussion Questions

1. How do you determine if a vessel has an established evacuation plan?
2. What equipment can you use to create alternate evacuation paths?
3. How will you ensure that all personnel are evacuated?

Application

1. IFSTA Skill Sheet 5-1: Control, Direct, and Move Passengers and Crew to Evacuate a Vessel or Exposure (optional)

Instructor Notes

1. ELO 3 will be taught but not practiced.

CTS Guide Reference: CTS 4-5

Topic 3-7: Establishing Water Supply Connections

Terminal Learning Objective

> At the end of this topic a student, given international shore connections, will be able to establish connections for the water supply at an incident, so that an uninterrupted supply of water is established, and all hoses are connected and positioned according to procedures and in coordination with the ship's crew.

Enabling Learning Objectives

1. Identify reliable water sources
   - Hydrant
   - Drafting
     - Tidal changes create challenges
     - Establish a secondary supply
   - Water tender
   - Fire boat
2. Identify an international shore connection
   - Supplies firefighting water to a vessel's fire main from an off-ship supply
   - At least one required on either side of the vessel
   - Two-part system
     - A standard-size flange with nuts, bolts, washers
     - A coupling suitable for supply hoses
   - Do not exceed maximum pressure rating of 150 psi
3. Use an international shore connection

Discussion Questions

1. What is the purpose of an ISC?
2. How do you find the ISC?
3. What is the designed pressure rating for an ISC?

Application

1. IFSTA Skill Sheet 8-3: Establish an International Shore Connection

Instructor Notes

1. Give students an opportunity to practice this skill on a prop in the classroom before they do it on a vessel or in a prop.

CTS Guide Reference: CTS 3-1

Topic 3-8: Monitoring Fire Conditions on a Vessel

Terminal Learning Objective

At the end of this topic a student, given a vessel, an assignment, an incident, approved PPE, a hose or safety line, a thermal imaging camera, and communications equipment, will be able to monitor fire conditions on a vessel as a member of a team, so that vessel integrity is maintained and changes to fire conditions are reported to the Incident Commander.

Enabling Learning Objectives

1. Describe fire behavior on vessels
2. Describe how to operate a thermal imaging camera
3. Describe how to monitor fire conditions on a vessel
   - Vessel systems
     - Smoke detection
     - Heat detection
       - Heat transfer
       - Thermal layering
     - Flame detection
     - Alarm system control units
     - Automatic system operations
     - Vessel watch and patrol systems
     - Fire suppression systems
   - Vessel exterior
     - Heat conduction
     - Smoke patterns
     - Exposures
   - Fire location and boundaries
     - Extension
     - Smoke
     - Heat
4. Describe safety procedures for operating in or near fire compartments on a vessel
   - Personnel accountability and communication
   - Heat conducted through metal
   - Air management
   - Appropriate lighting
   - Emergency egress procedures
   - Fatigue (proper rehab)
   - TICs may have limited search capability due to excessive heat in metal walls
5. Negotiate vessel ladders, stairs, corridors, and decks
6. Operate in high heat and vision-obscured areas utilizing a thermal imaging camera

Discussion Questions

1. How does heated steel impact TIC use?
2. What can you monitor using the vessel's systems?
3. What can you monitor from the vessel's exterior?
4. What can you monitor near the fire location or fire boundaries?

Application
1. Determined by instructor

Instructor Notes
1. ELO 6: Students will have a chance to practice in vision-obscured areas but not in high heat areas.

CTS Guide Reference: CTS 3-2, 5-1, 5-2

Topic 3-9: Assisting in Deploying Extinguishing Agents

Terminal Learning Objective

At the end of this topic a student, given a vessel, an incident, an assignment, approved PPE, select extinguishing agents, and agent application equipment, will be able to assist in deploying extinguishing agents other than water, so that the need is identified and communicated to the Incident Commander and agent is applied.

Enabling Learning Objectives

1. Identify appropriate extinguishing agents
   - Based on fire location and fuel
2. Describe effects of various extinguishing agents
3. Describe hazards associated with various extinguishing agents, including onboard systems
4. Identify sources of bulk extinguishing agents
5. Identify role of land-based fire fighter in assisting with deploying extinguishing agents
   - Determine if agent has already been deployed
   - If vessel crew is present, work in collaboration and follow direction/assist
   - If vessel crew is absent, assess risk, request approval, and act
6. Read cargo manifests and technical information on extinguishing agents
7. Deploy and operate extinguishing equipment and agents

Discussion Questions

1. Determined by instructor

Application

1. Given fire scenarios (instructor power point or photos), have students identify:
   - Requirements for use
   - Steps to take before use
   - Hazards of use

Instructor Notes

1. Use Table 6.1 Guidelines for Marine Use of Fixed Fire-Suppression Systems in textbook to build out this topic.

CTS Guide Reference: CTS 5-6

Topic 3-10: Protecting an Exposure on a Vessel

Terminal Learning Objective

At the end of this topic a student, given an assignment, an exposure, a water supply source, approved PPE, fire hose, nozzles, and equipment, will be able to protect an exposure on a vessel as a member of a team, so that the exposure is protected.

Enabling Learning Objectives

1. Identify potential fire boundaries on a vessel
   - Six-sided approach (four sides, above, and below)
   - Set boundaries as soon as possible
     - Primary
     - Secondary
   - Secure utilities for the fire location
     - Ventilation system
     - Electrical system
2. Describe how to set fire boundaries on a vessel
   - Secure hatches and doors to contain fire
   - Remove combustibles
   - Use firefighting water (attack line) to cool decks or bulkheads adjacent to fire compartment (if necessary)
     - Less than one inch in areas above the fire
     - Short bursts (not continuous flow)
     - Consider vessel water system for boundary cooling
   - Monitor conditions
   - Maintain continuous communication
   - If fire fighter must retreat
     - Close all hatches and doors upon departure
     - Communicate with Command
3. Identify potential exposures around the vessel exterior
   - Fully engulfed vessel impacting vessels, docks, structures, or equipment
   - Land-based fire impacting vessels
4. Participate as part of a team to protect exposures
5. Operate handlines
6. Operate master streams

Discussion Questions

1. Why is it important to set fire boundaries?
2. When would you expand a boundary?
3. What exposures exterior to the vessels might exist in a marine environment?

Application

1. IFSTA Skill Sheet 8-2: Protect Exposures by Operating Handlines and Master Streams

Instructor Notes

1. None

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

Topic 3-11: Accessing a Fire Compartment

Terminal Learning Objective

At the end of this topic a student, given a vessel, an incident, and an assignment, will be able to access a fire compartment as a member of a team, so that vessel integrity is maintained, doors and hatches are opened, tools are used, barriers are removed, and the opening is made ready for entry.

Enabling Learning Objectives

1. Identify when to access a fire compartment
   - Observing fire conditions
   - Life hazard/survivability profile
   - Applying agents
   - Ventilation
   - Dewatering
2. Describe desired entry methods for various tactical operations
   - Open door, hatch, scuttle, window
   - Breaching (smaller vessels)
3. Describe how to access a fire compartment
   - Secure utilities for the fire location
     - Ventilation system
     - Electrical system
   - Observe door conditions (cracks, paint peels)
   - Quick acting doors
     - Relieve pressure
     - Stand on non-hinged side
   - Dogged doors
     - Opening order
       - Hinged side: top, bottom, middle
       - Non-hinged side: top, bottom, middle
     - Don't open final dog until fully prepared for fire attack with charged hose

Discussion Questions

1. Why would you access a fire compartment?
2. How do you determine if it safe to access a fire compartment?

Application

1. Determined by instructor

Instructor Notes

1. None

CTS Guide Reference: CTS 3-3

Topic 3-12: Attacking a Fire on a Vessel

Terminal Learning Objective

At the end of this topic a student, given a vessel, an incident, an assignment, an attack line a secondary line, approved PPE, and tools and equipment, will be able to attack a fire on a vessel as a member of a team, so that vessel integrity is maintained, attack line is deployed, access is gained to the fire compartment, effective water application practices are used, and fire is extinguished and overhauled.

Enabling Learning Objectives

1. Identify types of fuels (things burning) found on a vessel
   - Determines extinguishing agent to use
   - Determines strategies and tactics
2. Describe factors to consider when placing attack lines
   - Water source
     - Location
     - Source (must be an off-vessel source)
     - Pressure
     - Volume
     - Friction loss
   - Proper hose compliment
     - Number and location of lines
     - Size
     - Length
     - Nozzles
   - Available personnel
3. Describe how to develop a water supply to the vessel
   - Transport hose and fittings to vessel
     - Aerial ladder
     - Hoist/cargo nets
     - Carry manually
     - Drop bag
   - Lay out uncharged hose
   - Use chocks, bits, or fairleads to guide hose
   - Secure hose with ladder strap or webbing
   - Terminate supply line at an appliance
4. Describe strategies and tactics to advance hose from vessel edge to the warm zone
   - Use fire control plan to determine location and route
     - Route must be upwind of fire
     - Route should not impede access/egress
   - Locate seat of fire
   - Use two hoses (attack and backup from separate sources if possible)
   - All teams should advance from the same direction
   - Attempt to advance from same level as the fire

- Position all personnel on same side of fire hose
- Maneuvering through doors
  - Position personnel at pinch points to manage hose
  - Closing doors can sever hose lines
  - Trip hazards
- Maneuvering up and down ladders/stairs
  - Sounding for stability
  - Three points of contact
  - Face the ladder/stair when ascending/descending
  - Someone above or below feeding hose
  - Place hose over shoulder while ascending/descending
- Identify evacuation escape routes and signals
5. Describe strategies and tactics to advance hose line to hot zone
   - Offensive vs. defensive strategy
   - Verify hose lay before charging
   - Final personnel safety check
   - Evaluate heat
   - Cool deck above fire compartment
   - Rotate personnel frequently to avoid heat exhaustion
   - Tend to hot spots to avoid ruptured hoses
   - Access fire compartment with charged hoseline
6. Describe hazards associated with advancing hose line to a fire on a vessel
   - Impaired visibility
   - Narrow approach routes
   - Limited operational space
   - Higher temperatures
   - Less access to fresh air
   - Smoke and steam compromising access/egress, escape routes
   - Flooding
   - Entrapment
   - Disorientation
   - Trip/fall hazards
   - Pinch points
   - Knife edges
   - Doors and hatches
   - Ladders
7. Identify types and application of attack lines used on vessels
   - Supply lines
   - Attack lines
     - Primary
     - Secondary
   - Boundary cooling lines

8. Describe effective application of fire streams
   - Direct
   - Indirect
9. Advance charged and uncharged hose lines up and down vessel ladders and stairs, through corridors, and across decks
10. Advance multiple hose lines for fire attack
11. Operate fire streams

Discussion Questions
1. Determined by instructor

Application
1. IFSTA Skill Sheet 8-5: Attack a fire on a Vessel Using Water
2. IFSTA Skill Sheet 8-6: Determine Appropriate Extinguishing Agent for Onboard Cargo (optional)
3. IFSTA Skill Sheet 8-4: Attack a fire on a Vessel Using Appropriate Extinguishing Agents Other than Water (optional)

Instructor Notes
1. None

CTS Guide Reference: CTS 5-4

Topic 3-13: Conducting a Search and Rescue Operation on a Vessel

Terminal Learning Objective

At the end of this topic a student, given a vessel, an incident, an assignment, a vessel fire control plan or other documents, a person, approved PPE, forcible entry tools, and other equipment, will be able to conduct a search and rescue operation for a missing person on a vessel as a member of a team, so that areas where the person could be located are searched, the person is located and removed, and vessel integrity is maintained.

Enabling Learning Objectives

1. Identify psychological effects of operating in vision-obscured conditions
2. Identify likely locations of passengers, crew members, shipyard workers, and contractors
3. Describe methods to determine if the area is tenable
    - Determines "go / no go"
4. Describe primary and secondary search techniques
5. Identify search and rescue considerations
    - Establish RIC
    - Work with vessel representative
    - Identify last known location(s)
    - Wear full PPE and SCBA
    - Have hoseline available in immediate area
    - Mark areas already searched to avoid duplicated efforts
    - Identify escape routes, temporary refuge areas (TRA), and safe zones
    - Don't assume all victims are located until fire is extinguished, smoke is ventilated, and a second search is complete
6. Describe location and use of emergency escape breathing devices (EEBD)
    - Even if EEBD are available, land-based fire fighters should use RIC kit breathing apparatus
7. Describe victim removal methods
    - Vessel design and construction may make it difficult to use standard victim removal techniques
8. Use forcible entry tools
9. Use self-contained breathing apparatus (SCBA)
10. Access remote or enclosed compartments
11. Advance charged and uncharged hose lines up and down vessel ladders and stairs, through corridors, and across decks
12. Remove victims

Discussion Questions

1. Where are victims likely to be found on a vessel?
2. How is victim removal on a vessel different from victim removal in a structure?
3. What conditions on a vessel determine a "go/no go" search and rescue decision?

Application

1. IFSTA Skill Sheet: 8-7 Locate and Remove a Missing Person on a Vessel

Instructor Notes
1. None

CTS Guide Reference: CTS 5-5

Topic 3-14: Ventilating Smoke from a Vessel

Terminal Learning Objective

At the end of this topic a student, given a vessel, an incident, an assignment, approved PPE, ventilation equipment, and standard operating procedures, will be able to ventilate smoke from a vessel as a member of a team, so that equipment is positioned for ventilation, vessel integrity is maintained, a specified ventilation opening is created and left unobstructed, and ventilation barriers are removed.

Enabling Learning Objectives

1. Describe construction principles of a vessel that affect ventilation operations
   - Location of ventilation space
      o Above deck
      o Below deck
   - Available onboard vessel ventilation systems
2. Describe principles, advantages, limitations, and effects of ventilation
   - Horizontal vs. vertical
   - Natural vs. forced
      o Positive pressure
      o Negative pressure
      o Combination positive/negative
      o Hydraulic
   - Compartmentalization vs. ventilation to open air
3. Describe safety considerations when venting a vessel
   - Impact of ventilation flow path on surrounding spaces
   - Signs, causes, effects, and prevention of backdrafts or hostile smoke events
   - Improper use of vessel ventilation systems
   - Use "intrinsically safe" ventilation techniques when ventilating potentially flammable environments
4. Describe how to ventilate a vessel after extinguishment
   - Evaluate current conditions
   - Communicate with chief engineer (or vessel representative)
   - Follow ventilation plan
   - Reassess and adjust plan as needed
5. Transport, deploy, and operate ventilation equipment on a vessel

Discussion Questions

1. When would you use smoke compartmentalization versus smoke ventilation?
2. What type of hostile smoke events can occur during ventilation operations?
3. How does the location of the ventilation area (above vs. below deck) impact ventilation operations?
4. How can the flow path of smoke be used to identify a potential escape route?

Application

1. IFSTA Skill Sheet 8-1: Ventilate Smoke on a Vessel

Instructor Notes

1. None

CTS Guide Reference: CTS 5-1

Topic 3-15: Removing Water from a Vessel

Terminal Learning Objective

At the end of this topic a student, given a vessel containing water, an assignment, dewatering equipment, and approved PPE, will be able to remove water from a vessel as a member of a team, so that hazards are identified, water is removed, and vessel stability is maintained.

Enabling Learning Objectives

1. Identify dewatering operations in large vessels
   - Larger vessels will have a salvage plan
     - Documents work to be done matched with available resources
     - Schedules work
     - Documents responsibilities of individuals and organizations
     - Provides coordination of all salvage efforts to meet target dates and times
2. Identify primary methods for dewatering a vessel
   - External drains from weather decks
   - Internal drains
   - Pumping equipment
     - Fixed
     - Portable
3. Describe dewatering considerations
   - Rate and volume of water accumulation
   - Operational status of bilge pumps
   - Availability of contracted boom services
   - Using portable pumps as needed
   - Working in coordination with Incident Command, divisions, and groups
4. Describe hazards associated with water collecting in various areas of a vessel
   - Vessel stability
   - Spreading hazardous substances/pollution
   - Flammable liquids
   - Electrocution
   - Falling through hatches
   - Water obscures floor visibility
   - Impacts access and egress routes
   - Impacts dynamics in other compartments
5. Describe safety precautions to be taken when working in water
   - Monitor water levels
   - Secure electrical systems
   - Shuffle feet when traveling
   - Remove people from water before dewatering
6. Describe hazards associated with water removal in a vessel
   - Vessel stability
   - Large vessel pumps can deplete air

- Initiation potential/shock hazards from equipment
- Releasing contaminants into marine environment
7. Deploy and operate dewatering equipment

Discussion Questions
1. How does dewatering a large vessel differ from dewatering a small vessel?
2. At what point should you begin dewatering operations?
3. What tasks might land-based fire fighters perform regarding vessel stability?
4. How does the addition of water impact stability?
5. How does the removal of water impact stability?
6. What do you do with contaminated run off?

Application
1. IFSTA Skill Sheet 10-2: Deploy and Operate Dewatering Equipment

Instructor Notes
1. Ships and large vessels are required to have salvage and overhaul contracts in place. This topic assumes fire fighters are working in smaller vessels where they will participate in dewatering.

CTS Guide Reference: CTS 5-3

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.