

CHAPTER 3 – LIFERAFTS AND OTHER BUOYANT APPARATUS

TIME: One hour

GOAL: Students will learn the different types of survival craft required under the Fishing Industry Vessel Safety Act and how to use them.

NEED STATEMENT:

1. Liferafts and survival craft have saved thousands of lives.
2. At sea, your boat is your shelter. In an abandon ship scenario, you need to know how to launch, board and use your survival craft.
3. Don't assume what lies within the "mystery canister" on deck.
4. Practice increases survival rates by reducing panic.

OBJECTIVES:

1. State applicable USCG requirements for survival craft.
2. Identify three basic types of survival craft (BA, IBA, liferaft).
3. List ten items contained in a SOLAS A liferaft survival kit.
4. Identify and state the purpose of a Thermal Protective Aid (TPA) in the survival craft SOLAS kit.
5. List the seven Steps of Survival as they apply in the liferaft situation.
6. Describe standard procedure for recovering survival craft and survivors.
7. Complete emergency instructions and station bill for abandon ship.

SKILLS CHECKLIST:

1. Demonstrate proper liferaft launch procedure, including hydrostatic release mechanism.
2. Right a capsized liferaft.
3. Demonstrate proper entry into a survival craft wearing PFD or immersion suit.

EQUIPMENT NEEDED:

Inflatable liferaft

Air compressor or pump for inflation

Sample emergency instructions (abandon ship)

Hydrostatic release

SOLAS A pack (or examples of items)

NOTE: Crewmembers whose vessels are equipped with lifeboats and davits should seek out specialized USCG-approved training. Such operations are beyond the scope of this curriculum.

TEACHING TIPS:

- *Allow students to practice with liferafts in class. Draw attention to location and use of accessories.
- *Turn the lights out and have students don immersion suits, enter the liferaft and close the canopy. Other students can rock the raft from the outside of raft.
- *Have students handle and practice with the equipment in the survival pack (mechanical patches, signal mirrors, etc.) by passing out the contents of the pack to class and having them identify the object in their hands from the list of contents.
- *If possible, students should see a life raft, in a canister, being inflated. If a liferaft cannot be deployed, videos are available to show this.
- *Use local examples of liferaft use and misuse; use the class experience.
- *Repack stations are a good source of condemned rafts, canisters and survival packs for training purposes.
- *This lesson should be followed and reinforced by the in-water practical.
- *Point out liferaft features like the ballast system, throw rings, sea anchor, knife, etc.
- *Use local examples of liferaft use and misuse; ask class to share experiences.
- *Fill out a station bill.

INSTRUCTIONAL OUTLINE:

I. USCG REQUIREMENTS

- A. Whether or not you are required to carry survival craft and what type is determined by:
1. If the vessel is documented
 2. Area of operation
 3. Number of persons on board
 4. The mean temperature of the water
- B. Refer to *Federal Requirements for Commercial Fishing Industry Vessels* to determine what survival craft your vessel is required to have on board.

II. TYPES OF SURVIVAL CRAFT

- A. Inflatable liferaft with SOLAS A or B survival pack
1. Provides shelter and buoyancy.
 2. Inflatable floor provides insulation from cold water; and canopy protects you from the elements and conserves heat.
 3. Ballast system to improve stability and prevent capsizing.
 4. Automatically or manually inflated via CO₂ system.
 5. Must be equipped to float free, self-deploy and inflate in the event of sudden capsizing.
 6. The emergency equipment pack included with the raft increases your inventory and ability to carry out the Seven Steps.
 - a. SOLAS A has the most equipment including food and water. >50 nm
 - b. SOLAS B has more limited supplies, no food or water. 20-50nm
 - c. Coastal Pack has the fewest supplies. < 20nm.
 7. 4-25+ person capacity. (4-person liferaft can be USCG-approved but is not SOLAS-approved)
 8. Stored in rigid fiberglass canister and cradle aboard deck.

9. Requires annual servicing at a Coast Guard-approved, factory authorized facility (or two years from date of manufacture)

B. Inflatable liferaft

1. Provides shelter and buoyancy.
2. Single or double canopy; inflatable floor optional.
3. Ballast system to improve stability.
4. Inflated via CO₂ system.
5. Hydrostatic release for automatic launching is optional.
6. Emergency equipment pack more limited than SOLAS A or B, no food or water.
7. 4-8 person capacity.
8. Can be deck-mounted in a rigid, fiberglass canister, or stored in fabric valise for stowage.
9. Requires annual servicing at a Coast Guard approved, factory authorized facility.

C. Ovatek® – hardshell liferaft

1. No annual repack but survival pack must be serviced/items replaced.
2. Must have clearance above to float free.
3. Maintain Hydrostatic release.

D. Inflatable buoyant apparatus

1. Provides buoyancy and keeps people out of the water.
2. Basically a large life ring with a floor. Not a liferaft but a means to provide out of water flotation.
3. No ballast chamber or canopy.
4. Inflated via CO₂ system; hydrostatic release optional.
5. Limited emergency equipment pack similar to coastal pack.
6. 4-75 person capacity.

7. Available in rigid canister deck mount or valise for stowage.
8. Requires annual servicing at a Coast Guard-approved, factory authorized facility

E. Life float (not approved for FVs after January 15, 2016)

1. Provides buoyancy.
2. Rectangular ring made of a urethane inner core with a fiberglass shell.
3. Drop net floor, no ballast system or canopy.
4. Ready to go; does not depend on self inflation mechanism or manual inflation.
5. Capacity 6-25 persons.
6. Lights, flares, EPIRBs optional.
7. Not designed to get people out of the water.

F. Buoyant Apparatus (not approved for FVs after January 15, 2016)(Pending as of 7/1/16)

1. Provides buoyancy, no shelter.
2. Rigid foam or plastic life ring.
3. No floor, ballast system or canopy.
4. Ready to go; does not rely on inflation mechanism. Float free.
5. Capacity 2-22 persons.
6. Not designed to get people out of the water.
7. Minimal emergency equipment pack optional.

III. LAUNCHING LIFERAFTS

A. Liferaft deployment and proper use

1. Train the crew in proper procedure during orientation.
2. Practice during monthly drills.

B. Deployment Procedure

1. Begins with proper stowage

- a. Accessible to crew but located to float free if the vessel should sink suddenly.
- b. No overhead obstructions.
- c. Away from heat sources that can damage the gasket on the canister and allow deterioration of the raft inside.
- d. Not at deck level to be exposed to boarding/freezing seas. Also, best with painter facing aft to avoid plug dislodging or filling with water.
- e. Mounted with float free mechanism (hydrostatic release or float free rack) to permit self deployment and inflation.
- f. Painter secured to deck via hydrostatic release if not a type of float free arrangement.
- g. Painter or hydrostatic release has a weak link designed to break and release the inflated raft from a sinking vessel.

2. Proper launching – before the boat sinks

- a. Manually release hydrostatic release.
 1. Release pelican hook on disposable Hammar® releases.
 2. Hit button on older style stainless steel bell shaped releases.
- b. CARRY, do not roll, canister to lee side (unless the lee is unsafe because of a vessel fire)
 1. Designated embarkation station.
 2. Away from obstructions.
 3. Launch leeward side of vessel except for fire.
- c. Make sure water is clear of debris and people.
- d. Painter secured to vessel, toss canister into water.
- e. Pull painter until liferaft inflates (up to 250 ft. of painter)
- f. Hissing sound ok after inflation, overinflation valves are working.

g. May inflate upside down.

C. Boarding Procedures

1. Try to enter liferaft dry.
2. Avoid jumping on canopy, esp. if more than 15 ft.
3. Beware of sharp objects on your person or in the water.
4. From water:
 - a. Without SOLAS entry ramp:
 - Facing entrance, use buoyancy of immersion suit/PFD to spring up.
 - Legs together, dolphin kick.
 - Grab top tube, then straps inside raft to pull in.
 - Get help from people inside the raft.
 - b. With SOLAS ramp:
 - get head/chest on ramp.
 - pull on loops to enter raft.
 - c. In either method, enter raft and keep head/face off bottom of floor.
5. Righting the liferaft.
 - a. Find side with CO₂ cylinder.
 - b. Grab righting strap in open hand (don't wrap around hand or arm).
 - c. Stand on the cylinder and lean back.
 - d. Land in water on back.
 - e. If the raft lands on you, keep calm/stay on back; create an air pocket by pushing up on the raft floor and follow the righting strap to the outside of raft.

D. Life In The Raft: Seven Steps to Survival

1. Recognition – still in danger. People have died in rafts while vessels stayed afloat.

2. Inventory:

- a. Account for personnel
- b. Assess raft status; free of debris, rigging, sinking vessel.
 - 1. Ready to cut free if vessel goes down. Note raft's knife.
 - 2. Beware of fouling liferaft painter and sea anchor.
- c. Open equipment pack and secure all gear to raft or into attached equipment bag.
- d. Issue sea sickness medication.
- e. Give first aid, as needed.
- f. Sea anchor usually deploys automatically; spare in equipment pack. Adjust length to sea conditions as needed
- g. Post lookout; assign/rotate duties.

3. Shelter:

- a. Secure canopy and doors.
- b. Inflate floor, bail.
- c. Top off buoyancy tubes with air.
- d. Check for damage/correct operation.

4. Signals:

- a. Check canopy lights.
- b. Activate EPIRB or radio.
- c. Tie up with other rafts.
- d. Acquaint crew with signals (e.g., flares) in equipment pack; how and when to use.

5. Water:

- a. Take sea sick medications.
- b. Decide on water rations; look for ways to collect and store

rainwater.

c. Don't drink seawater or urine.

6. Food:

a. Decide on food rations.

b. No water? Don't eat.

7. Play:

a. Take measures to improve morale.

b. Improve your life in the raft

E. Liferaft Care and Maintenance

1. Life expectancy depends on:

a. Regular servicing.

b. Waterproof gaskets on canister.

2. Select your raft with care and note features of different brands.

3. Maintenance:

a. Repack at a Coast Guard-approved service facility that is also authorized by the manufacturer of your particular raft.

b. New rafts go two years from date of manufacture before servicing; most manufacturers recommend annual service.

c. Yearly repack will help increase your raft's life expectancy and help ensure it will work properly in an emergency.

d. Nothing should sit on the canister to avoid weakening it.

e. Do not inflate before sending in for repack:

-CO₂ can damage hoses and weaken fabric.

-Adds to the cost of repack.

d. Insure painter line is secured to deck or hydrostatic release, depending upon type of float free arrangement. If no hydrostatic release is used the painter must be secured to the deck and be equipped with a "weak link."

- e. Hydrostatic release properly installed on raft in a float free rack.
- f. No tie down lines attached to raft.
- g. Liferaft cradle should be through bolted to the deck.

IV. LIFERAFT SURVIVAL PACK

- A. Acquaint crew with contents.
- B. SOLAS A pack contents
- C. SOLAS B pack contents
- D. Coastal pack
- E. You can customize your pack beyond requirements during repack.
 - 1. Personal medications, spare eyeglasses, Personal Locator Beacon (PLB), water purifiers.
 - 2. Limited space is available.

V. RECOVERY OF LIFERAFT AND SURVIVORS

- A. Preparation of rescue vessel:
 - 1. Vessel positioning
 - 2. Crew preparation:
 - a. Crew don PFDs.
 - b. Secure raft with survivors to rescue vessel.
 - 3. Prepare means of getting survivors on board e.g., scramble nets, rescue slings and/or cranes and hydraulics.
 - 4. If rescue crew needs to enter water, don immersion suits and secure to vessel with tether line with detachable clip.
 - 5. Prepare to treat survivors.
 - 6. Thermal Protective Aids (TPAs) help slow heat loss and are found in SOLAS grade liferaft packs.
- B. Precautions:

1. Treat victims gently and assist as much as possible, monitor closely for at least 24 hours.
2. Always have advantage over the victim: PFD, tether line, lifting device.
3. Don't expect victims to assist in any way.
4. Insure that rescuers do not become victims.

VI. SUMMARY

- A. Know what type of survival craft is required for your vessel.
- B. Train your crew in proper deployment and practice monthly during drills. Assign duties.
- C. You're still not out of danger once in the liferaft; commence the Seven Steps.
- D. Life expectancy of your survival equipment depends upon care.
- E. Repack annually at an authorized dealer. Log in safety maintenance log.
- F. Acquaint your crew with emergency equipment pack contents.
- G. In recovering survival craft, don't let rescuers become victims.
- H. Treat survivors gently; monitor closely.
- I. Emergency instructions include:
 1. Location and embarkation station for survival craft(s).
 2. Fire, emergency, abandon ship signals and procedures.
 3. Location of immersion suits, donning instructions.
 4. Procedures for making distress calls.
 5. Station bills.

REVIEW QUESTIONS:

1. What determines the type of survival craft you are required to carry under USCG regulations?

ANS: If a vessel is documented, area of operation, number of persons on board, time of year fishing, water temperature.

2. List at least four types of survival craft.

ANS: Inflatable liferaft, SOLAS A/B pack; coastal liferaft; inflatable buoyant apparatus; lifefloat; buoyant apparatus.

3. List ten items contained in a SOLAS A liferaft.

ANS: Refer to list, lots of possibilities here!

4. Describe two precautions used when recovering liferafts and survivors.

ANS: Treat survivors gently and assist as much as possible; insure rescuers don't become victims; avoid hauling raft with occupants over the stern/side with hydraulics; beware of liferaft lines and ballast pockets.

SKILLS CHECK:

1. Liferaft launch procedures can be demonstrated using an empty canister set on a cradle with hydrostatic release. An appropriate length painter can be contained inside.
2. Liferaft entry and righting can be demonstrated and checked off during the in-water practical or practice drills.

LIFE RAFT EQUIPMENT

Standard Equipment

Insulated canopy
Insulated inflatable floor (optional)
Painter
CO₂ cylinder
Sea anchor
Towing bridles
Righting strap
Lifelines
Heaving line
Paddles
Automatic locator light
Automatic interior light
Inflating and bilge pump

Leak stoppers
Repair kit
Knife
Survival manual
Pressure relief valves
Rainwater catchments
Rainwater storage bags
Water stabilizing pockets
Quoit with heaving line
Pressure relief valve plug
Sponge
Whistle
Signal mirror
Survival instructions
Immediate action instructions
Repair kit
Pump or Bellows

Note:

Know the equipment in YOUR raft. If possible be present during the annual repacking of your raft. Some items such as parachute flares are difficult to operate at night if you are not familiar with them!

Limited Service (SOLAS B)

contains standard equipment and the following:

First Aid kit
Flashlight
2 spare flashlight bulbs
3 spare flashlight batteries
Sponge
Bailer
Jackknife
Parachute distress flares
Hand-held flares
Smoke flare (optional)
Copy lifesaving signals
Antiseasickness pills
Thermal Protection Sid
Container for above

Ocean Service (SOLAS A)

contains standard equipment, Solas B items and the following:

Signal mirror
1½ quarts water per person
2375 calories food/person
Additional bailer
Additional sponge
Additional parachute flare
4-6 hand-held flares
Signal whistle
Anti-seasickness pills
Graduated drinking vessel
Fishing kit
Tin opener

See attached diagrams