

BOAT HANDLING

Learning Objectives:

As a result of this session the participant should:

- Become familiar with built-in and portable tank fueling operations.
- Understand the effects of single and twin screw maneuvering.
- Become aware of loading and departure procedures.
- Become familiar with getting underway techniques.
- Become familiar with maneuvering underway techniques.
- Become familiar with docking techniques and mooring to a buoy.
- Understand the types of anchors and their applications

Resources:

Boating Skills & Seamanship, Eleventh Edition, U.S. Coast guard Auxiliary, Chapter 4
The Squadron Boating Course 2001, The United States Power Squadrons, Section 8
Chapman Piloting Seamanship & Small Boat Handling, 62nd Edition, Hearst Marine Books, Chapter 8, 9

Material and Equipment:

Equipment Items

Overhead Projector, as required by instructor

1 Motorboat (Approximately 16 - 18 feet) and motor (Approximately 50 - 75 HP) per crew

1 "Man Overboard" Dummy or Buoy

1 Mooring Buoy system

1 Dock (At least 40 feet in length)

A set of at least 4 buoys to form a rectangular or a minimum of two boats anchored approximately 60 feet apart for tight maneuvering.

Material Items

Provide one copy for each participant:

Fueling Safety Checklists

Underway Checklists

Ground Tackle Handout

Instructor Qualification:

U.S. Coast Guard Auxiliary Trainer presence required for USCGAUX Certificate Program

U.S. Power Squadron Instructor, Council Venturing Trainer or equivalent

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Time Allocation: 3 Hours

Session Plan:

Classroom Session (1 Hour)

1. Module Introduction.

- a. Introduce yourself and each member of the module staff.
- b. Explain the objectives of this module.

2. Safe Fueling Practices.

- a. Explain safe practices involved with built-in tanks and portable tanks.
- b. Distribute the “Fueling Safety Checklists” and discuss before, during and after fueling operations.

3. Propeller Characteristics and Maneuvering.

- a. Explain propeller selection for efficient boat operations;
 1. Propeller Characteristics (diameter, pitch)
 2. Propeller Safeguards
 3. Cavitation
- b. Describe single-screw inboard and twin-screw maneuvering;
 1. Turning
 2. Stopping
 3. Backing Down

- c. Explain small outboard motor installation and adjustments.

[Jet drive propulsion is included in the Personal Water Craft module]

4. Loading and Departure Responsibilities.

- a. Explain proper loading and the adverse effects if not done correctly.
- b. Distribute the “Underway Checklists” and discuss the equipment and boat system checklist items.

5. Getting Underway.

- a. Discuss the departure checklist and techniques for leaving the dock under.
 1. No wind/current conditions
 2. Wind/current off the dock conditions.

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3. Wind/current on the dock conditions.
 4. Wind/current on the bow.
 5. Wind/current on the stern.
6. **Underway Maneuvering.**
- a. Explain speed acceleration and deceleration effects to boat operations and environment.
 - b. Discuss maneuvering in tight quarters.
 - c. Discuss “Man Overboard” Procedures;
 1. Sound the alarm
 2. Keep track of person overboard (Throw a PFD to person if possible)
 3. Return to person overboard (discuss Williamson Turn)
 4. Retrieve person overboard.
7. **Docking and Mooring to a Buoy.**
- a. Discuss docking techniques and mooring to a buoy under;
 1. No wind/current conditions
 2. Wind/current off the dock conditions.
 3. Wind/current on the dock conditions.
 4. Wind/current on the bow.
 5. Wind/current on the stern.
8. **Anchoring (Ground Tackle).**
- a. Explain the anchor terms “rode” and “scope
 - b. Describe the types of anchors and their applications;
 1. Danforth (Lightweight High-Penetration)
 2. CQR or Plow (Heavy Partial-Penetration)
 3. Northill
 4. Mushroom
 5. Grapnel
 - c. Describe anchor setting, anchor retrieving (weighing), and anchor line markers
 - d. Distribute the handout “Ground Tackle”.

Waterfront Session (2 Hours)

[In the stand-alone mode, the expectation is to have one motorboat per crew. When the session has more than one crew, plan to add one additional motorboat and schedule this activity with another outdoor/waterfront area session in a round-robin format.]

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1. **Getting Underway Operation.**
 - a. Have crew experience getting underway from a dock.

2. **Underway Operations.**
 - a. After crew gets underway have they practice a “Man Overboard” Drill by throwing a dummy (buoy) overboard and then retrieving it.

 - b. Have crew practice maneuvering in a tight space. Use a buoy marked rectangular area or two boats anchored approximately 60 feet apart.

3. **Docking Operation.**
 - a. Have crew moor to a buoy.

 - b. Have crew return to dock and tie motorboat along side properly.

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FUELING SAFETY CHECK LIST

PRIOR TO FUELING

1. Close all doors, hatches and ports. _____
2. Turn off all electrical equipment. _____
3. Extinguish all open flames. _____
4. Turn off galley stove and heaters. _____
5. PROHIBIT SMOKING _____
6. Instruct crew and passengers on safe practices. _____
(Consider passengers go ashore during refueling)

WHILE FUELING CHECKLIST

1. Keep the pump nozzle in constant metal-to-to-metal contact with the filler pipe to prevent static electricity that could ignite fuel vapors.
2. Estimate the amount of fuel needed and fill fuel tanks only 95% full to allow for expansion of the fuel and prevent spillage from overfilling.

AFTER FUELING CHECKLIST

1. Open doors, hatches, and ports. _____
2. Operate blowers for at least 4 – 5 minutes. _____
3. Clean up all fuel spills. _____
4. Check all compartments by “sniffing” for fuel fumes. _____
5. Have a fire extinguisher at hand for engine start. _____

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GETTING UNDERWAY CHECKLISTS

EQUIPMENT CHECKLIST

1. Personal papers (operator's certificate or license if required) _____
2. Vessel's papers (registration or documentation certificate) _____
3. Personal Floatation Device for each person _____
4. Throwable Flotation Device _____
5. Fire extinguishers _____
6. Visual distress signals _____
7. Horn and or bell _____
8. Anchor and anchor line _____
9. Compass _____
10. Charts and navigation tools _____
11. Boat hook _____
12. Paddles or oars _____
13. Tool kit and spare parts _____
14. Dock lines _____
15. Flashlight and spare batteries _____

BOAT SYSTEMS CHECKLIST

1. Bilge free of fumes and water _____
2. Fuel supply at proper level _____
3. Fuel system free of leaks _____
4. Engine oil and transmission fluid checked _____
5. Battery charge and fluid level checked _____
6. Gauges and indicator lights operating _____
7. Engine cooling system full _____
8. Electronic equipment working properly _____
9. Drive belts seated and tight _____
10. Navigation lights operative _____
11. Steering and shift mechanisms fully operative _____
12. Outboard mounting tight _____
13. If applicable, sails, rigging, grab rails, lifelines all properly mounted _____

DEPARTURE CHECKLIST

1. Disconnect all utility lines (power, water, etc.) _____
2. Take in all dock lines and fenders (except if required for departing) _____
3. Sound proper horn signals _____
4. Keep a lookout at all times for boats, persons , and objects in water _____
5. Keep watch for dangerously low overhead wires _____
6. Proceed slowly whenever leaving or returning to a dock. _____
7. After leaving the dock, take in all remaining dock lines and fenders _____

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GROUND TACKLE HANDOUT

Suggested Ground Tackle Sizes <i>(For Ordinary Use and Moderate Shelter from the Seas)</i>				
Item	Boat Size			
	-15'	16-20'	21-25'	26-30'
Danforth Anchors:				
Standard working	4S*	8S	8S	13S
Standard Storm**	8S	13S	13S	22S
Hi-Tensile Working	--	5H	5H	12H
Hi-Tensile Storm	5H	5H	12H	12H
Plow:				
Working	5 lbs.	10 lbs.	15 lbs.	15 lbs.
Storm	10 lbs.	15 lbs.	20 lbs.	25 lbs.
Yachtsman Storm	25 lbs.	40 lbs.	50 lbs.	60 lbs.
Shackle, Galvanized:				
Working	1/4"	5/16"	5/16"	5/16"
Storm	5/16"	5/16"	5/16"	3/8"
Chain, Galvanized:				
Working***	1/4"	1/4"	1/4"	1/4"
Storm	1/4"	1/4"	5/16"	5/16"
Nylon Line (3-strand):				
Working****	5/16"	3/8"	7/16"	1/2"
Storm	3/8"	7/16"	7/16"	1/2"
<p>* Data in the body of the table are anchor and other item sizes</p> <p>** For this table, winds over 30 knots (34 MPH) are considered in the storm range.</p> <p>*** The proof test load (elastic limit) for chain is 1/2 the load at the breaking point.</p> <p>**** The working load for 3-strand Nylon line is 1/5 the breaking strength and the loaded length is 1.5 times the rest length.</p>				

Source: BOATING Skills & Seamanship, U.S. Coast Guard Auxiliary, 11th Edition