Boat Control On-Water Training

INSTRUCTOR MANUAL

Module 3: Open Water Boat Handling

Single Engine Boat

Approx. 3-hour session

National Safe Boating Council
Waiver and Release of Liability

I, _____ agree to participate in the National Safe Boating Council's *Module 3: Open Water Boat Handling.* I understand that this program will have on-the water sessions, and, like any program involving water, is inherently dangerous because of the possibility of immersion and even death. I also understand and am aware that each participant will be engaging in the training that involve risk of serious injury, which might result not only from their own actions, inactions or negligence but the actions, inactions or negligence of others or the conditions of the premises or of any equipment used.

I agree to abide by the rules and regulations as set forth by the National Safe Boating Council (NSBC). I agree to obey the instructor(s) and the supervisor(s) of the training. I promise to wear any safety equipment as required by an official of the NSBC such as, but not limited to personal flotation devices, non-slip footwear and appropriate clothing for the weather conditions. Prior to departing the ramp or dock, a pre-departure checklist and safety brief will be conducted to inspect the equipment to be used, and if anything is unsafe, they will immediately advise their instructor or supervisor of such conditions and refuse to participate until condition(s) is corrected.

I certify that I am in reasonably good health and that I am able to participate in this activity without adversely affecting any health problems. I will notify the supervisor and instructor(s) of any condition that may affect any participation and of any medication which I am currently taking.

Having read this waiver, I do hereby agree to release, waive, hold harmless, and discharge the NSBC, all sponsors, representatives and volunteers, any involved government organizations or other organizations and the boards, trustees, officers, employees, or volunteers of any of them, and if applicable, owners and leasers of premises used to conduct this event from any and all liabilities to the undersigned, his or her heirs and next of kin for any and all claims, demands, losses or damages or damage to property, caused or alleged to be caused in whole or part by the negligence of the persons, entities or otherwise.

I also grant permission to the NSBC and its sponsors to use any photographs, motion pictures, recordings or any record of this training for educational and legitimate purposes.

_____ _____
Signature Date

_____
Cell Phone Number

_____ _____
Emergency Contact Name Emergency Contact Phone Number

_____ Check here if you are a weak or non-swimmer

_____ Check here if on medication or have health problems that may affect participation.
(Please list on the back of this page your health problems and/or medications)

_____ _____
Signature (guardian if participant is a minor) Date

IMPORTANT NOTES

- Boat Control On-Water Training Modules 1-4 are the property of the National Safe Boating Council, Inc.
- Only current National Safe Boating Council instructors may use the instructor and course materials to ensure students receive exceptional instruction.
- The National Safe Boating Council's Boat Control On-Water Training Modules 1-4 are designed to cover all elements of EDU-1 On-Water Power Standards, the American National Standard for on-water, recreational powerboating skills. A student must complete all four modules to meet the ANS standard.
- Modules 1-4 were adapted from National Safe Boating Council's Close-Quarters and Open Water Boat Control curriculum.
- This course is approximately 3 hours long, but time length may vary depending on the age and boating experience of the student.
- A single engine boat should be used.
- This module presents skills in various environmental conditions, using a variety of boat types, which simply will not all exist during a course. Given the variables of weather, wind, current, and facilities, it may be necessary for the instructor to adapt or alter the skills progression. If the day of the course is breezy, the calm condition skills must be adapted or omitted. Likewise, if there is no wind, or no current, some skills must be altered or omitted.

Instructor: *Please copy this form and complete for each course you teach.* A copy of this form is required when you report the course to the National Safe Boating Council to maintain your certification.

Boat Control On-Water Training | Module 3: Open Water Boat Handling		
Instructor Name:		
Date:	**Location:**	**Number of students:**
Environmental Conditions		
Wind:	**Current:**	**Temperature:**
Note: The skills in Modules 1 and 2 should be practiced and understood before Module 3 is presented. The sequence of skills as presented is a progression where some skills require proficiency of one or more previous skills. This module presents skills in various environmental conditions, using a variety of boat types, which simply will not all exist during a course. Given the variables of weather, wind, current, and facilities, it may be necessary for the instructor to adapt or alter the skills progression. If the day of the course is breezy, the calm condition skills must be adapted or omitted. Likewise, if there is no wind, or no current, some skills must be altered or omitted.		
Boat Description		
Type:	**Length:**	**Color:**
Student Roster		
First and last name(s):	**Boat Operator License No.:**	**Age:**

Preparation (20 - 30 minutes)

Completed while tied to the dock or in a protected open water location.

- ☐ Conduct pre-departure checklists and safety briefing.
- ☐ Life jacket mandatory wear policy for everyone on board including proper adjustment and fit, proper for activity being used, and serviceable condition.
- ☐ Inspection of boat systems and safety equipment.
- ☐ Obtain weather conditions and forecast.
- ☐ Discuss any potential hazards or conditions in the area.
- ☐ Explain how to safely enter and move about the craft with three points of contact maintaining stability.

1. Boat Trim (Load) (5 minutes)

1.1 Balance (trim) the boat load

A. Assess the balance (trim) of the boat due to the load.

B. Load the boat (persons and gear) to make it level:

- Side-to-side so the boat is not listing to port or starboard. Position the load near the centerline as much as practical.
- Fore and aft so the boat is not bow down or stern down. Position the load near amidships as much as practical to avoid heavy loads in both the bow and stern.

C. Check that trim tabs (if equipped) are fully up. *Note: Using trim tabs and engine trim to enhance boat performance may be discussed later in the course.*

2. Starting the Engine/Engine Stop Lanyard (10 minutes)

2.1 Attach the engine stop lanyard

Note: During this module, the engine stop lanyard will be worn by the instructor or the operator, at the instructor's discretion.

A. Attach the correct end of the lanyard to the engine stop switch.

B. Attach the correct end of the lanyard to the operator or the instructor. Be sure to attach the lanyard to something secure (such as a belt, life jacket strap, or other fitting that will not tear).

2.2 Cold start the engine

A. Check that the engine is tilted/trimmed fully down.

B. Start the engine using choke as needed.

C. Check to be sure the cooling system is operating.

2.3 Test the engine stop lanyard

A. With the engine running, pull the lanyard until it disconnects from the engine stop switch. The engine should stop.

B. Reattach the lanyard and restart the engine. Do not use choke for warm restarting.

2.4 Engine restart without the engine stop lanyard

Note: In the event the operator is thrown overboard, with the lanyard, another person aboard may need to restart the engine to retrieve the person overboard.

A. With the engine running, pull the lanyard until it disconnects from the engine stop switch.

B. Move the engine stop switch back into the “on” position without attaching the lanyard.

C. Restart the engine. Do not use choke for warm restarting.

Note: Properly reattach the lanyard before continuing.

3. Wheel Control (Review - 2 minutes)

3.1 Wheel control

A. Find the range of the wheel.

B. Center the wheel.

C. Get comfortable with a preferred method of turning the wheel to maintain awareness of wheel position.

4. Shifting and Throttle Control (Review – 5 minutes)

4.1 Shifting control

A. Practice finding the gear shift lever(s) without looking.

B. Perform a forward shift to idle and return to neutral.

C. Perform a reverse shift to idle and return to neutral.

D. Perform a forward shift to idle followed by a reverse shift to idle (5-count between gears). Return to neutral.

E. Perform a reverse shift to idle followed by a forward shift to idle (5-count between gears). Return to neutral.

4.2 Throttle control

A. Increase throttle: shift into forward gear at idle, smoothly increase throttle.

B. Decrease throttle: smoothly decrease throttle to idle, avoiding neutral. Return to neutral.

C. Increase throttle: shift into reverse gear at idle, smoothly increase throttle.

D. Decrease throttle: smoothly decrease throttle to idle, avoiding neutral. Return to neutral.

E. Pulse throttle: shift into forward gear at idle, smoothly and quickly pulse the throttle (briefly increase throttle and promptly return to idle). Return to neutral.

4.3 Maintain a proper lookout (Introduce S.C.A.N. Technique) (15 minutes)

Note: While performing all Student Performance Objectives (SPOs), at all times maintain a proper look-out by sight and hearing as well as by all available means appropriate in the prevailing circumstances and conditions so as to make a full appraisal of the situation and of the risk of collision. To insure the student knows how to maintain a proper lookout teach the S.C.A.N. technique.

Explanation of How to SCAN

What is scanning, exactly? Scanning is looking for boats people and objects on the water that may pose a risk of collision. Even if you are not 100% sure that something may be a risk of collision, analyze what is happening in your boat's relationship with another boat or object to negotiate what action is appropriate or required. Err on the side of caution every time.

In keeping a proper lookout, it is important the boat operator keep their mind busy scanning the area where they are operating. To better understand the process, the National Safe Boating Council (NSBC) will use the acronym **SCAN**: Search, Concentrate, Analyze, and Negotiate.

Search the area all around your craft. This is a 360-degree examination of everything on the water, around your boat. Distances away will depend on your speed or the speed of the observed boat or object. The faster you are operating, the farther out you will need to search.

Concentrate on what you are seeing. Is it a boat? What type? What is it doing? What is its relative speed? Is it a stationary object? Floating or anchored? These are questions you can ponder while you look at the various observed boats or objects.

Analyze what you are watching. Is it closing in on your position or going away from you? Remember, if the object you are observing is at a constant bearing decreasing range (meaning you are getting closer to it and its relative position to you is not changing), it is on a collision course. If it is another boater, do you believe they see you? Never assume you are seen by the other person. Determine this by the way and direction they are operating. Analyze how far away the boat or object is and how fast it is closing.

Negotiate – What are you going to do? Slow down, turn away from the boat or object, and head in a different direction? Remember the Navigation Rules. Review the NSBC's "Boat On Course" educational initiative at www.boatoncourse.com for a solid review of the proper action to take while meeting, head on, crossing, or overtaking another boat.)

Guidelines on Using SCAN

Establish Your SCAN pattern
SCANing is how you choose to examine the objects on the water. What is your SCAN pattern? You have two basic choices when SCANing the water.

1) Side to Side: SCAN from side-to-side. Before moving the boat, perform a 360-degree SCAN to determine all is clear. Once moving, SCAN out from the right rear corner* of your boat all the way to the left rear corner. Glance directly behind you. Once you have completed your SCAN one side, SCAN back to the other side.

When first starting, start close to you and extend your SCANing range out to a distance in which you believe there is not an issue of possible collision. Keep SCANing from side-to-side, eyes going in a straight line, from side-to-side. Remember you have a 360-degree responsibly; however, the direction you are heading and the objects in your path or those that may cross your path are of the greatest concern and deserve additional attention.

**Why start on the right? The Navigation Rules define the right side of your boat as the Danger Zone. This means that you are obligated to give way to any boat that is on a collision course with you from the right (starboard) side. When on a collision course, turn right to turn away from danger.*

Conversely, any boat approaching from your left (port) side is obligated to give way to you. While you still must monitor your left side (and take appropriate action if on a collision course and the other boat does not respond), you have a higher responsibility to monitor traffic on the right side.

2) SCAN in and out in a line while moving left to right: Begin SCANing from the closest position to a location in which the boat or object is too distant to be concerned with at this point in time. Search all the way out, then come back close to your boat and work the SCAN back out in a right-to-left then left-to-right pattern. Eyes going in a straight line, from close to far until you reach that point of no immediate concern.

How fast should I SCAN? The speed of your SCANing will depend on boat traffic and the speed you are traveling. The greater the congestion the faster you need to SCAN. The faster you are traveling, the quicker you need to SCAN.

4.4 Comply with the Steering Rules (Navigation Rules)

A. While performing all Student Performance Objectives, at all times determine if risk of collision exists and if risk of collision exists, maneuver to avoid collision in compliance with the Steering Rules.

4.5 Identify Navigation Aids

A. While performing all Student Performance Objectives, observe and identify any navigation aids encountered and respond appropriately.

Operating in Displacement Mode

5. Finding Displacement Mode (10 minutes)

5.1 Find the RPM range of displacement mode

A. Check the course ahead and look all around for other boats or hazards.

B. Shift into forward gear, idle speed. Note engine RPM. (This speed is the lower end of displacement mode.)

C. Steer straight at a distant object.

D. Look all around for other boats or hazards.

E. Smoothly and gradually increase throttle until the bow begins to rise slightly into plowing mode.

F. Smoothly decrease throttle enough for the bow to come down and the boat to level out.

G. Look astern to observe size of wake. If wake is excessive, decrease throttle until wake size is appropriate.

H. Note engine RPM. Memorize the RPM. (This speed is the upper end of displacement mode and will be referred to as “Maximum Displacement RPM.”)

I. Decrease throttle to idle speed. Shift into neutral.

J. Maintain proper lookout.

6. Steering Straight in Displacement Mode (15 minutes)

6.1 Steer straight toward a distant object (500 yds.)

A. Center the wheel.

B. Keep left hand in one place on the wheel.

C. Check the course ahead and look all around for other boats or hazards.

D. Shift into forward gear, smoothly increase throttle to Maximum Displacement RPM.

E. Aim for a distant object, keeping eyes mainly on the bow and the distant object.

- When the bow drifts off course, turn the wheel the opposite direction to correct.
- When steering, use brief, small adjustments, turning the wheel briefly as needed, then return to center.

Avoid over-steering by correcting before getting too far off course and by allowing time for the boat to respond to the previous correction.

F. Maintain proper lookout.

6.2 Steer at a different object

Starting Position: Steering straight at a distant object at Maximum Displacement RPM.

A. Select another distant object nearly ahead.

B. Look around for other boats.

C. Steer gradually and smoothly to aim at the new object. (At a 45-degree angle from previous course)

D. Steer straight at the new object.

E. Maintain proper lookout.

7. Crossing Waves in Displacement Mode (5 minutes)

7.1 Encountering waves and wakes in displacement mode

Starting Position: Steering straight at a distant object at Maximum Displacement RPM.

A. Guidelines for encountering large waves/wakes:

- Steer to cross at about a 45-degree angle and then steer back on course.
- Adjusting throttle may be necessary.
- Prevent crossing large waves/wakes head-on.
- Prevent taking large waves/wakes on the beam.
- When a destination is directly into large waves a zigzag course may be warranted.
- When a destination is parallel to large waves a zigzag course may be warranted.

B. Guidelines for encountering moderate waves/wakes:

- Steer to cross at a slight angle (less than 45-degrees) and then steer back on course.
- Adjusting throttle may be necessary.
- Avoid crossing moderate waves/wakes head-on if necessary for safety and comfort.
- Prevent taking moderate waves/wakes on the beam if necessary for safety and comfort.

C. Guidelines for encountering small waves/wakes:

- Make adjustments to crossing angle and speed as needed for comfort.

D. Steer straight at the new object.

E. Maintain proper lookout

8. Stopping in Displacement Mode (10 Minutes)

8.1 Standard Stop

Starting Position: Steering straight at a distant object at Maximum Displacement RPM.

A. Look astern and all around for other boats.

B. Decrease throttle to idle speed, shift into neutral.

C. Coasting in neutral, keep the bow straight while steering with rudder effect only.

D. When headway is minimal, center the wheel, shift into reverse at idle speed, and steer to keep the bow straight.

- If bow goes right, turn wheel right to correct.
- If bow goes left, turn wheel left to correct.

E. While keeping the bow straight and still in reverse, use boater's eye to determine the instant the boat is stopped.

F. Shift into neutral when stopped.

G. Assess whether the boat is stopped, still making headway, or now making sternway. Announce when boat is stopped

H. Maintain a proper lookout

8.2 Urgency Stop

Starting Position: Steering straight at a distant object at Maximum Displacement RPM.

A. Look astern and all around for other boats.

B. Decrease throttle to idle speed, shift into neutral.

C. Coasting in neutral, keep the bow straight while steering with rudder effect only.

D. Count 1-2-3-4-5. Center the wheel, shift into reverse at idle speed, increase throttle slightly above idle, keep right hand on lever(s), while steering to keep the bow straight.

- If bow goes right, turn wheel right to correct.
- If bow goes left, turn wheel left to correct.

E. While keeping the bow straight and still in reverse, use boater's eye to determine the instant the boat is stopped.

F. Decrease throttle to idle and shift into neutral when stopped.

G. Assess whether the boat is stopped, still making headway, or now making sternway. Announce when "boat is stopped"

H. Maintain a proper lookout.

9. Avoiding Objects in Displacement Mode (15 minutes)

9.1 Swerve to avoid object ahead

Starting Position: Steering straight while operating at Maximum Displacement RPM.

A. Observe an object dead ahead in the water (floating object placed by instructor).

B. Determine the object is too close for a stopping maneuver (within about 5-10 yards).

C. Shout “Hold On!”

D. Swerve the bow sharply away from the object when the bow is within a few yards of the object (about 3-5 yards). Note that this action swerves the stern and prop toward the object.

E. Immediately swerve the bow sharply toward the object to swing the stern away from the object.

F. Assess how near the boat came to the object.

G. Repeat the maneuver, adjusting distances farther as needed to avoid hitting the object, or nearer as needed to learn limitations of the maneuver.

H. Maintain a proper lookout

Ferrying in Wind and Current

10. Ferrying: Bow-to-Wind & Stern-to-Wind (20 minutes)

10.1 Ferry sideways, bow-to-wind

A. Determine wind direction.

B. Position the boat bow-to-wind (near a fixed target object to help monitor effectiveness).

C. Ferry to starboard: Set the wheel some to the right, shift into forward.

D. Stay in forward long enough to acquire the desired ferry angle with the wind slightly on the port side.

E. Steer to maintain the desired ferry angle.

F. Shift between forward and neutral, staying in gear just long enough to offset leeway (stay adjacent to target object).

G. End sideways drift: Steer bow back into the wind using some wheel to the left, shift into forward until bow-to-wind.

H. Ferry to port: Set the wheel some to the left, shift into forward.

I. Stay in forward long enough to acquire the desired ferry angle with the wind slightly on the starboard side.

J. Steer to maintain the desired ferry angle.

K. Shift between forward and neutral, staying in gear just long enough to offset leeway (stay adjacent to target object).

L. End sideways drift: Steer bow back into the wind using some wheel to the right, shift into forward until bow-to-wind.

M. Maintain a proper lookout

10.2 Ferry sideways, stern-to-wind*

Note: This maneuver should not be performed if waves are large enough to splash aboard over the stern.

A. Determine wind direction.

B. Position the boat stern-to-wind (near a fixed target object to help monitor effectiveness).

C. Ferry to starboard: Set the wheel some to the right, shift into reverse (for twin engine shift port engine only).

D. Stay in reverse long enough to acquire the desired ferry angle with the wind slightly on the port side.

E. Steer to maintain the desired ferry angle.

F. Shift between reverse and neutral, staying in gear just long enough to offset leeway (stay adjacent to target object).

G. End sideways drift: Pull stern back into the wind using some wheel to the left, shift into reverse (for twin engine shift starboard engine only) until stern-to-wind.

H. Ferry to port: Set the wheel some to the left, shift into reverse (for twin engine shift starboard engine only).

I. Stay in reverse long enough to acquire the desired ferry angle with the wind slightly on the starboard side.

J. Steer to maintain the desired ferry angle.

K. Shift between reverse and neutral, staying in gear just long enough to offset leeway (stay adjacent to target object).

L. End sideways drift: Pull stern back into the wind using some wheel to the right, shift into reverse (for twin engine shift port engine only) until stern-to-wind.

M. Maintain a proper lookout

11. Holding Station: Bow-to-Wind and Stern-to-Wind (20 minutes)

Note: Holding station means staying in the same position over the bottom, despite what the wind is doing to the boat. This skill is basically the same as ferrying except the desire is to avoid moving sideways while also avoiding downwind movement. The challenge is to use ferrying skills to keep the ferry angle so minimal that the boat does not inadvertently drift off station.

11.1 Hold Station, bow-to-wind

A. Determine wind direction.

B. Position the boat bow-to-wind (near a fixed target object to help monitor effectiveness).

C. Hold station for 2 minutes without drifting more than 2 boat lengths off station.

D. Maintain a proper lookout.

11.2 Hold Station, stern-to-wind*

*Note: This maneuver should **not** be performed if waves are large enough to splash aboard over the stern.*

A. Determine wind direction.

B. Position the boat stern-to-wind (near a fixed target object to help monitor effectiveness).

C. Hold station for roughly 2 minutes without drifting more the 2 boat lengths off station.

D. Maintain a proper lookout.

12. Ferrying: Bow-to-Current (20 minutes)

Note: Emphasize not to attempt ferrying stern-to-current.

12.1 Ferry sideways, bow-to-current

A. Determine current direction.

B. Position the boat bow-to-current (near a fixed target object to help monitor effectiveness).

C. Ferry to starboard: Set the wheel some to the right, shift into forward (for twin engine shift port engine only).

D. Stay in forward long enough to acquire the desired ferry angle with the current slightly on the port side.

E. Steer to maintain the desired ferry angle.

F. Shift between forward and neutral, staying in gear just long enough to offset drift (stay adjacent to target object).

G. End sideways drift: Steer bow back into the current using some wheel to the left, shift into forward (for twin engine shift starboard engine only) until bow-to-current.

H. Ferry to port: Set the wheel some to the left, shift into forward (for twin engine shift starboard engine only).

I. Stay in forward long enough to acquire the desired ferry angle with the current slightly on the starboard side.

J. Steer to maintain the desired ferry angle.

K. Shift between forward and neutral, staying in gear just long enough to offset drift (stay adjacent to target object).

L. End sideways drift: Steer bow back into the current using some wheel to the right, shift into forward (for twin engine shift port engine only) until bow-to-current.

M. Maintain a proper lookout

13. Holding Station: Bow-to-Current (20 minutes)

Note: Emphasize not to attempt holding station stern-to- current.

Note: Holding station means staying in the same position over the bottom, despite what the current is doing to the boat. This skill is basically the same as ferrying except the desire is to avoid moving sideways while also avoiding down-current movement. The challenge is to use ferrying skills to keep the ferry angle so minimal that the boat does not inadvertently ferry off station.

13.1 Hold Station, bow-to-current

A. Determine current direction.

B. Position the boat bow-to-current (near a fixed target object to help monitor effectiveness).

C. Hold station for 2 minutes without drifting off station

D. Maintain proper lookout.

14. Shoreline Landing and Departure

Note: Select a landing spot protected from wind/waves/current and deep enough for your boat with the bow close enough for crew and passengers to safely step ashore and clear of hazards and people. Ensure the landing spot is not going to damage your boat hull or motor.

14.1 Shoreline Landings

A. Select a landing spot (see note).

B. Aim for a spot on shore, in forward gear at idle speed, steering straight.

C. Shift into neutral. Coast while aiming at the landing spot, steering with rudder effect only. If needed, raise the lower unit to ensure no damage is done to the prop.

D. When bow is close to the shore and headway is nearly stopped, shift into reverse to stop forward momentum then shift into neutral.

E. Shut off engine and raise lower unit as needed.

F. Secure the boat with line or anchor so passengers can safely step ashore (use three points of contact).

G. Maintain proper lookout throughout maneuver.

14.2 Shoreline Departure

A. Board boat using three points of contact.

B. Conduct pre-departure checklist, safety briefing, and boat system inspection/check.

C. Check surroundings to ensure departure path is clear of all hazards and people.

D. Lower outdrive to appropriate depth avoiding contact with the bottom. Start engine. Have crew prepare to depart shoreline. When ready give command to cast off lines/ secure anchor. Safely shift into reverse gear at idle speed.

E. Leave in a straight line from the shoreline without damaging the propulsion unit and avoiding people and objects in the water.

F. Maintain proper lookout throughout maneuver.

End of Module 3: Open Water Boat Handling