



Boat Control On-Water Training **INSTRUCTOR MANUAL**

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Module 4: Open Water Advanced Maneuvering 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 4: Open Water Advanced Maneuvering*. 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 4: Open Water Advance Maneuvering		
Instructor Name:		
Date:	Location:	Number of students:
Environmental Conditions		
Wind:	Current:	Temperature:
<p><i>Note: The skills in Modules 1, 2, and 3 should be practiced and understood before Module 4 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.</i></p>		
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. Recognizing Plowing Mode (Demo) (5 minutes)

1.1 Recognize plowing mode (Demonstration Only)

Note: Demonstration only! The purpose of this exercise is to recognize plowing mode so as to learn to avoid/minimize plowing during transition between displacement mode and planing mode.

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

- A. Smoothly increase throttle (500 RPM increments) until the bow begins to rise excessively into plowing mode.
- B. Notice the bow rises to obstruct the view ahead and the stern drops. Notice the sound of the laboring engine, changes in steering control, and increased wake size.
- C. Continue increasing throttle until boat enters planing mode. Note engine RPM.
- D. Smoothly decrease throttle to Maximum Displacement RPM.
- E. Decrease throttle to idle speed. Shift into neutral.
- F. Maintain a proper lookout.



2. Transitioning to/from Planing Mode (10 minutes)

2.1 Coming up onto plane

Starting position: Steering straight at Maximum Displacement RPM.

- A. Announce "All Ready?" (Advise passengers of intent to go up onto plane and ensure each person is holding on).
- B. Check the course ahead and look all around.
- C. Announce "Coming Up" loud enough for all to hear.
- D. Center the wheel.
- E. Increase throttle steadily and aggressively while keeping the bow straight.
- F. As the bow rises into plowing mode keep a good lookout ahead. Minimize time in plowing mode. Continue increasing throttle until the bow drops and the boat levels off into planing mode.
- G. As the boat enters planing mode the boat speed will increase rapidly. Continue steering straight as helm becomes more responsive.
- H. Slowly decrease throttle until the boat *just* begins to return to plowing mode (the bow *just* begins to rise).
- I. Increase throttle *just enough* until the bow drops and the boat levels off into planing mode.
- J. Note engine RPM. Memorize the RPM. (This speed is the lower end of planing mode and will be referred to as "Minimum Planing RPM.") When going up onto plane, as the boat levels out and speed increases, quickly decrease throttle to Minimum Planing RPM.
- K. Maintain a proper lookout.

2.2 Coming down off plane

Starting Position: Steering straight in planing mode at Minimum Planing RPM.

- A. Look all around for other boats or hazards, especially astern for overtaking boats.
- B. Announce "Coming Down" loud enough for all aboard to hear.
- C. Decrease throttle steadily and aggressively while keeping the bow straight.
- D. As the bow rises into plowing mode keep a good lookout ahead. Minimize time in plowing mode. Continue decreasing throttle until the bow drops and the boat levels off into displacement mode.
- E. Look astern and assess the stern wave as it catches up with the boat.
- F. Maintain enough headway so that the stern wave washes under the boat and does not splash over the transom. Pulse the throttle, if needed.
- G. After the stern wave washes under the boat, adjust throttle to Maximum Displacement RPM.
- H. Maintain a proper lookout.



3. Boat and Engine Trim in Planing Mode (15 minutes)

3.1 Use of trim tabs to correct listing

Starting position: Both trim tabs fully up, engine trimmed fully down, load balanced. Steering straight in planing mode at Minimum Planing RPM.

A. Correct list to starboard:

- Make sure list is not due to an unbalanced load.
- Make sure port trim tab is fully up.
- Gradually adjust starboard trim tab down until list is corrected.

B. Correct list to port:

- Make sure list is not due to an unbalanced load.
- Make sure starboard trim tab is fully up.
- Gradually adjust port trim tab down until list is corrected.

3.2 Use of engine trim to adjust bow attitude

Starting position: Both trim tabs fully up, engine trimmed fully down, load balanced. Steering straight in planing mode at Minimum Planing RPM.

A. Correct bow up (lower bow):

- Gradually adjust engine trim in (down) to lower bow.
- If engine is fully down, gradually adjust both trim tabs down.

B. Correct bow down (raise bow):

- Make sure trim tabs are fully up.
- Gradually adjust engine trim out (up) to raise bow.
- If boat begins to porpoise, gradually adjust engine trim in (down) to lower bow to correct.

C. Correct Porpoising: (caused by bow too far up)

- Gradually adjust engine trim in (down) to lower bow enough to stop/reduce tendency to porpoise and decrease pounding when crossing waves or wakes.

3.3 Find cruising speed (RPM)

Starting Position: Steering straight in planing mode at Minimum Planing RPM.

A. Adjust engine trim and/or trim tabs as needed until the boat rides smoothly and efficiently.



4. Steering Straight in Planing Mode (15 minutes)

4.1 Steer straight toward a distant object (for 500 yards)

Starting Position: Steering straight in planing mode at Minimum Planing RPM.

- A. Keep left hand in one place on the wheel.
- B. Use right hand on wheel also, as needed.
- C. Aim for a distant object, keeping eyes mainly on the bow and distant object.
 - When the bow drifts off course, turn the wheel slightly 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.
- D. Maintain a proper lookout.

4.2 Steer at a different object

Starting Position: Steering straight at a distant object at Minimum Planing RPM.

- A. Select another distant object nearly ahead (slight course change).
- B. Look all around for other boats.
- C. Steer gradually and smoothly to aim at the new object.

Announce "Turning" for larger course changes.
- D. Steer straight at the new object.
- E. Maintain a proper lookout.



5. Turning in Planing Mode (15 minutes)

Note: The following is a drill intended for use on boats of various designs. Due to differences in boat design (range of the wheel, hull shape, etc.) the amount of steering wheel rotation should be slight as a starting point. With instructor guidance, the student will discover the amount of wheel rotation needed to result in wide turns and avoid tight turns. Begin each drill with slight steering adjustments. Repeat the drill several times with incrementally greater wheel rotation. If the amount of wheel rotation results in cavitation, or side-slipping at the stern (spinout), then the upper limit of wheel rotation has been surpassed for the boat in use.

5.1 Gradual (wide) turns on plane

Starting Position: Steering straight in planing mode at Minimum Planing RPM.

- A. Steer straight at a distant object.
- B. Select another distant object about 45° off the bow, either to port or starboard. (Using the present heading as 12 o'clock on a clock face, a 45° course change is between 10 to 11 o'clock to port or between 1 and 2 o'clock to starboard using the clock face as the reference.)
- C. Announce "Turning!" Steer gradually and smoothly to aim at the new target using a *slight* turn of the wheel. Steer straight at the new target.
- D. Announce "Turning!" Steer gradually and smoothly to turn 45° in the opposite direction to aim back at the previous target using a *slight* turn of the wheel. Steer straight at the previous target.
- E. Repeat until proficient, adjusting the amount the wheel is turned, so as to result in a gradual turn.
- F. Repeat sequence A-E, selecting a distant object that results in a **90° turn** to port or starboard.
(Using the present heading as 12 o'clock, a 90° course change is 9 o'clock to port or 3 o'clock to starboard.)
- G. You can continue this drill using 120-degrees, 150-degrees, and 180-degrees turns for practice. Remember these turns can be a little more difficult and you should be prepared to cross your own wake.
(You can continue to use the clock face reading especially if it is easier for the student to understand in do the drill.)

Maintain a proper lookout throughout the turning process.



*Note: The following is a drill intended for use on boats of various designs. Due to differences in boat design (range of the wheel, hull shape, etc.) the amount of steering wheel rotation should be slight as a starting point. With instructor guidance, the student will discover the amount of wheel rotation needed to **safely** result in tight turns.*

Begin each drill with slight steering adjustments. Repeat the drill several times with incrementally greater wheel rotation. If the amount of wheel rotation results in cavitation, or side-slipping at the stern (spinout), then the upper limit of wheel rotation has been surpassed for the boat in use. Adjustments in throttle may be needed to safely and efficiently perform tight turns.

5.2 Sharp (tight) turns on plane

Starting Position: Steering straight in planing mode at Minimum Planing RPM.

- A. Steer straight at a distant object.
- B. Select another distant object about 45° off the bow, either to port or starboard. (Using the present heading as 12 o'clock, a 45° course change is between 10 and 11 o'clock to port or between 1 and 2 o'clock to starboard.)
- C. Announce "Turning!" Steer quickly and smoothly to aim at the new target using a *slight* turn of the wheel. Steer straight at the new target.
- D. Announce "Turning!" Steer quickly and smoothly to turn 45° in the opposite direction to aim back at the previous target using a *slight* turn of the wheel. Steer straight at the previous target.
- E. Repeat until proficient, incrementally adjusting the amount the wheel is turned, so as to result in tighter and tighter turns.

Note: As turns become sharper a decrease in throttle may be needed, followed by an increase in throttle once the new course is attained. If the hull begins to slide or the propeller begins to cavitate, the limit of sharp turns has been exceeded without a decrease in throttle.

- F. Repeat sequence A-E, selecting a distant object that results in a **90° turn** to port or starboard.
(Using the present heading as 12 o'clock, a 90° course change is 9 o'clock to port or 3 o'clock to starboard.)
- G. You can continue this drill using 120-degrees, 150-degrees, and 180-degrees turns for practice. Remember these turns can be a little more difficult and you should be prepared to cross your own wake.
(You can continue to use the clock face reading especially if it is easier for the student to understand in do the drill.)

Maintain a proper lookout throughout the turning process.



6. Crossing Waves in Planing Mode (10 minutes)

6.1 Encountering waves and wakes in planing mode

Starting Position: Steering straight in planing mode at Minimum Planing 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, adequate to avoid launching the boat over the wave. Avoid burying the bow in the wave due to decreasing throttle too much
- 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.

*Announce “Wake” or “Hold On” as appropriate and remember **keep a proper lookout.***



7. Stopping in Planing Mode (15 minutes)

7.1 Coasting Stop from Plane

Starting Position: Steering straight in planing mode at Minimum Planing RPM.

- A. Look all around for other boats or hazards, especially astern for overtaking boats.
- B. Announce “Coming Down” loud enough for all to hear.
- C. Come down off plane.
- D. Decrease throttle to idle speed, shift into neutral.
- E. Coasting in neutral, keep the bow straight while steering with rudder effect only.
- F. If a complete stop is desired or warranted, perform a Standard Stop. (See Skill #9.1)
- G. Maintain a proper lookout.

7.2 Urgency Stop from Plane (within 5 boat lengths)

Starting Position: Steering straight in planing mode at Minimum Planing RPM.

- A. Look all around for other boats, especially astern for overtaking boats.
- B. Announce “Coming Down” loud enough for all to hear.
- C. Come down off plane. Stop the boat from planing within five boat lengths ensuring the wake does not overtake the stern and with consideration of passengers/crew and gear. Use the following steps:
 - Decrease throttle to idle speed, shift into neutral.
 - Coasting in neutral, keep the bow straight while steering with rudder effect only.
 - Count 1-2-3-4-5. Center the wheel, shift into reverse, increase throttle 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.
 - While keeping the bow straight and still in reverse, use boater’s eye to determine the instant the boat is stopped.
 - Decrease throttle to idle and shift into neutral when stopped.
- D. Ensure the wake does not overtake the stern and with consideration of passengers and gear
- E. Assess whether the boat is stopped, still making headway, or now making sternway.
- F. Maintain a proper lookout.



8. Avoidance Turns (“S” Turn) on Plane (20 minutes)

Note: The following is a drill intended for use on boats of various designs. Due to differences in boat design the distances specified should be viewed as an approximate starting point. With instructor guidance, the student will discover the approximate limits of distance to an object ahead at which this maneuver should be performed. Begin the drill at a safe distance then repeat the drill at incrementally shorter distances.

8.1 Swerve to avoid object ahead

Starting Position: Steering straight in planing mode at Minimum Planing RPM.

Do not exceed Minimum Planing 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 (about 10 boat lengths as a starting point for this drill).
- C. Shout “Hold On!” or “Turning Port/Starboard!”
- D. Swerve the bow sharply (about 45°) away from the object when the bow is within about 6 boat lengths of the object (as a starting point for this drill). 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 directed to avoid hitting the object or nearer as directed to learn limitations of the maneuver.
- H. Repeat the maneuver to practice this turn both to port and to starboard.
- I. Maintain a proper lookout



9. Emergency Stop (“L”-Turn) from Plane (15 minutes)

Note: The following is a drill intended for use on boats of various designs. Due to differences in boat design the distances specified should be viewed as an approximate starting point. With instructor guidance, the student will discover the approximate limits of distance to an object ahead at which this maneuver should be performed. Begin the drill at a safe distance then repeat the drill at incrementally shorter distances. This can be a dangerous drill and depending on the boats design may have the tendency to throw operator and passengers from the boat.

9.1 Stop to avoid object ahead

Starting Position: Steering straight in planing mode at Minimum Planing RPM. Note: This maneuver is used when the distance to an object close ahead is far enough to provide room to stop the boat in time to avoid collision.

Do not exceed Minimum Planing RPM!

- A. Observe an object dead ahead in the water (floating object placed by instructor).
- B. Shout “Hold On! Coming Down!” and “Turning Port/Starboard!”
- C. Swerve the bow sharply 90° away from the object, in the chosen direction.
- D. Decrease throttle rapidly to idle. **Use extreme caution to avoid shifting into reverse!**
- E. Observe and avoid the stern wave as needed before shifting into neutral. Shift into neutral.
- F. Assess distance it took the boat to stop. Goal is to stop the boat from planing or normal operating speed in less than two boat lengths, turning to ensure stern wave passes behind the boat with consideration of passengers and gear.
- G. Repeat the maneuver, adjusting distances farther as directed to avoid hitting the object or nearer as directed to learn limitations of the maneuver.
- H. Repeat the maneuver to practice this turn both to port and to starboard.
- I. Maintain a proper lookout.



10. Person Overboard Retrieval (30 minutes)

10.1 Return to and retrieve a person overboard within 10 feet in less than one minute

Starting Position: Steering straight in planing mode at Minimum Planing RPM.

- A. Crew observes a person falling overboard (floating object placed by instructor), shouts “Person Overboard!” and throws a Type IV toward the victim.
- B. Crew member points at the victim and does not take eyes off the victim or stop pointing at the victim until the boat returns to the near vicinity.
- C. Perform proper lookout and announce “Hold On, Turning!” and/or “Coming Down!” as appropriate.
- D. Quickly decrease throttle and turn sharply to a heading to return to the victim.
- E. Decrease throttle to idle. Approach the victim at idle speed to a distance about 10 feet abeam and hold station.
- F. Direct a crew member to throw a line or reach the victim with a pole.
- G. Shut off engines when the victim has a firm grasp on the line or pole. Be prepared for the boat to weathervane.
- H. Direct the crew member using the line or pole to pull the victim to the boat without injury to the person in the water.
- I. Direct the crew to assist the victim in re-boarding without injury to the person.
- J. Maintain a proper lookout (360-degree check).

End of Module 4: Open Water Advanced Maneuvering