

## 9. Small Boat Operations

### 9.1 Introduction

This course is designed to expand a diver's knowledge in Small Boat Operations and is primarily intended for a qualification system. This course is a compilation of minimum knowledge and skills that an individual must demonstrate in order to qualify to stand watches or perform other specific routine duties necessary for the safety, security or proper operation of a small craft in emergency response diving.

### 9.2 Student Prerequisites

1. Minimum age 18
2. Provide proof of current CPR, first aid and oxygen provider, where local law permits
3. Qualified to operate a small craft in accordance with local regulations

### 9.3 Qualifications of Graduates

Upon successful completion of this course, graduates may carry out vessel-based rescues, and perform stand watches or other specific routine duties necessary for the safety, security or proper operation of a small craft in non-commercial emergency response operations.

### 9.4 Who May Teach

1. Any ERDI Instructor or ERDI Non-Diving Specialty Instructor that has been certified to teach this ops component

### 9.5 Administrative Requirements

#### Administrative Tasks:

1. Collect the course fees from all the students
2. Ensure that the students have the required equipment
3. Communicate the schedule to the students
4. Have the students complete the:
  - a. *ERDI Liability Release and Express Assumption of Risk* Form

#### Upon successful completion of this ops component the instructor must:

1. Issue the appropriate ERDI certification by submitting the *ERDI Diver Registration* form to ERDI Headquarters or registering the students online through member's area of the ERDI website

## **9.6 Student to Instructor Ratio**

### **Academic**

1. Unlimited, so long as adequate facility, supplies and time are provided to ensure comprehensive and complete training of subject matter

### **Confined Water (swimming pool-like conditions)**

1. N/A

### **Open Water (ocean, lake, quarry, or river)**

1. Student to Instructor ratios are not to exceed the designated vessel capacity; it is the instructor's discretion to reduce this number as conditions dictate.

## **9.7 Course Structure and Duration**

### **Classroom briefing**

1. Approximately 8 hours

### **Small Boat Orientation**

1. A minimum of 3 hours

### **Open Water Operations**

1. A minimum of 5 hours

## **9.8 Required Equipment and Materials**

1. Same equipment required for ERD Tender Ops
2. Small Boat (or vessel meeting the needs of training and operational standards)
3. Personal protective equipment (to include appropriate personal flotation device (PFD) for all active participants))

## 9.9 Approved Outline

**Instructors may use any additional text or materials that they feel help present these topics. The following topics must be covered**

1. Operational Risk Management (ORM)
  - a. ORM concept
  - b. The three levels of ORM
    - i. In- depth ORM
    - ii. Deliberate ORM
    - iii. Time critical ORM
  - c. The four principles of ORM
  - d. Steps of the ORM process:
    - i. Identify the hazards
    - ii. Assess the hazards
    - iii. Make risk decisions
    - iv. Implement controls
    - v. Supervise
  - e. Name the four steps of the Time Critical Risk Management mnemonic and discuss how they relate to execution of deck operations
  - f. Safety precautions to be observed during boat operations in regard to weather and hazards to navigation
  - g. Safety precautions to be observed while fueling
  - h. Procedures involved in recovering a Man Overboard from the water
  - i. Use of portable firefighting equipment for your boat
  - j. Safety precautions to be observed by the boat crew when hoisting and lowering a boat
  - k. State the requirements for wearing inherently buoyant life preserver vest type with collar
  - l. Importance of a proper fit test and pre-operational maintenance of floatation device
  - m. Safe working load of the davit assigned to your boat
  - n. State the passenger and cargo capacity of your boat in various conditions/evolutions
  - o. Use of pre-operational check-off lists prior to getting underway
    - i. Pre-operational check list
    - ii. Post-operational check list

**Note:** The ultimate responsibility for boat operation rests with boat operators. It is their duty to refuse to operate a vessel if, in their judgment, conditions are unsafe or if they would be violating federal, state, or local laws. It is a boat operator's responsibility to be familiar with and follow all federal, state, and local laws pertaining to the safe operation of the vessel.

2. Small Boat/Rigid Inflatable Boat (RIB)
  - a. Basic characteristics of small boats
  - b. Team's lowering and hoisting capability; equipment and configuration
  - c. Procedures, importance of, and requirement for starting the boat prior to the boat becoming water borne
  - d. Team's procedures for launching and recovering small boats
  - e. Basic responsibilities and duties for:
    - i. Boat Officer
    - ii. Coxswain
    - iii. SAR swimmer
    - iv. SONAR Operator
  - f. Proper deployment and recovery the Search and Recovery (SAR) swimmer
    - i. Hand signals
    - ii. Flare signals
    - iii. Light signals
  - g. Lay out and use of SAR Equipment
    - i. Medical kit
    - ii. Medevac litter
    - iii. AED
  - h. Use of:
    - i. Bow/stern lines
    - ii. Steadying lines
    - iii. Fenders
    - iv. Life ring
    - v. Boarding ladder
    - vi. Compass
    - vii. Anchor
    - viii. Oars
  - i. The effect and typical situations of the following on small boats
    - i. Side force
    - ii. Frictional wake current
    - iii. Screw current

- j. Maneuvering situations
  - i. Port side to landing and getting underway
  - ii. Starboard side to landing and getting underway
- k. Function of the anchor
  - i. Precautions that must be observed when anchoring a RIB
- l. Define and discuss the following handling characteristics for the RIB
  - i. Planning speed
  - ii. Pivot turns
  - iii. Prevention or tripping
  - iv. Prevention of becoming airborne
- m. Procedures to be followed when approaching and recovering a survivor in the water
  - i. Pilot rescue
  - ii. Conscious/unconscious victim
  - iii. Proper employment/Safety precautions when deploying SAR swimmer
- 3. Basic Operation Fundamentals
  - a. Define the following terms:
    - i. Vessel
    - ii. Power-driven vessel
    - iii. Sailing vessel
    - iv. Underway
    - v. Restricted visibility
    - vi. Safe speed
    - vii. Risk of collision
    - viii. Distress signals
    - ix. Give-way vessel
    - x. Crossing situation
    - xi. Overtaking situation
  - b. Discuss the arc of visibility, range of visibility, and color of the following lights:
    - i. Forward masthead
    - ii. Aft masthead
    - iii. Port running light
    - iv. Starboard running light
    - v. Stern
    - vi. All-around lights
    - vii. Flashing light
    - viii. Towing light

- c. Sound and light signals required during restricted visibility
    - i. Power-driven vessel underway
      - 1. Making way
      - 2. Making no way
    - ii. Power-driven vessel towing
    - iii. Vessel at anchor
      - 1. 100 metres or longer
      - 2. Less than 100 metres
    - iv. Vessel aground
  - d. Whistle signals used by a boat in inland waters:
    - i. Head on (meeting) situation
      - 1. One short
      - 2. Two short
    - ii. Overtaking situation
      - 1. One short
      - 2. Two short
    - iii. Crossing
      - 1. One short
      - 2. Two short
    - iv. Three short
    - v. Five or more short
  - e. Situation requiring one prolonged blast
  - f. Explain in the following situation, which vessel is give-way, which vessel is stand-on, and action required of both vessels to pass safely:
    - i. Head-on situation
    - ii. Crossing situation
    - iii. Overtaking situation
  - g. The rule of good seamanship
  - h. Action required to avoid collision
4. Navigation Fundamentals
  - a. Describe the following chart symbols:
    - i. Buoys
    - ii. Obstructions
    - iii. Shoals
    - iv. Depth contour lines
    - v. Compass rose

**Note:** Because printing PDFs can alter the scale, color and/or legibility of a chart, PDF charts should not be considered suitable for navigational use. Only printed charts provided by NOAA-certified Print-on-Demand (POD) providers or The United Kingdom Hydrographic Office fulfill a vessel's requirement to carry a navigational chart "published by the National Ocean Service" "or The United Kingdom Hydrographic Office" in accordance with federal regulations.

- b. Five basic buoy shapes
  - c. Types of buoys and purpose
    - i. Lateral marks
    - ii. Special purpose
    - iii. Preferred channel
    - iv. Cardinal
    - v. Safe water
    - vi. Day markers
  - d. Define the following terms:
    - i. Tide
    - ii. Mean lower low water
    - iii. Flood current
    - iv. Ebb current
    - v. Tidal current
    - vi. Slack water
    - vii. Set/drift
  - e. How to convert a course to a true/compass course
  - f. Deviation, variation and their effect on a magnetic compass
5. Start-Up and Shutdown Fundamentals
- a. Preoperational procedures
  - b. Liquid levels for the following:
    - i. Oil sump
    - ii. Expansion tank
    - iii. Fuel tank
    - iv. Transmission
    - v. Steering fluid
  - c. Start-up procedures
  - d. Normal operating ranges for the following:
    - i. Engine oil pressure
    - ii. Jacket water temperature
    - iii. Tachometer
    - iv. Voltmeter

- e. Emergency procedures:
    - i. Over speed engine
    - ii. Loss of steering
    - iii. Loss of throttle
    - iv. Loss of lube oil pressure
    - v. Overheating
  - f. Shutdown procedures
  - g. Emergency shutdown procedures
6. Radar System
- a. Principles of operation
    - i. How do the components work together to achieve the system's function?
    - ii. What indications are received if the system is malfunctioning?
  - b. Variables that can affect minimum/maximum ranges
  - c. Outside influences that affect the operation of the system
    - i. Adverse weather conditions
    - ii. Loss of electrical power
    - iii. Power fluctuations
    - iv. Electromagnetic interference
  - d. How the system interfaces with the navigation equipment
7. Global Positioning System (GPS)
- a. What are the principles of operation of a GPS to achieve the system's function?
  - b. What is the sequence of component involvement to accomplish:
    - i. Mode/on
    - ii. Initialize
    - iii. Enter way points
    - iv. Enter routes
    - v. Navigate by way points
    - vi. Display track
    - vii. Mode/off
  - c. What indications are received if the system is malfunctioning?
  - d. How do the following outside influences affect the operation of this system?
    - i. Inclement weather
    - ii. Fog
    - iii. Electrical/electronic interference
    - iv. Overhead obstruction
    - v. Satellite
    - vi. Radar
  - e. How does this system interface with Radar?



8. Dive Team Applications to Small Boat Operations
  - a. Operational structure
    - i. Vessel command structure
    - ii. Divers working with vessel crew
  - b. Prep and boat layout for dive operations
    - i. Diver positions
    - ii. Equipment positioning and storage
    - iii. Medical equipment storage, availability, and access
  - c. Current
    - i. Vessel positioning
    - ii. Diver/Swimmer safety
  - d. Deploying divers
    - i. Entry methods
    - ii. Current and diver entries
    - iii. Equipment hand-off
    - iv. Support equipment (storage, availability, and use)
  - e. Diver-Boat Communications
    - i. Hand signals
    - ii. Wireless communications
      1. Signal capabilities
    - iii. Hardwire communications
      1. Tethering
      2. Dangers related to moving water
  - f. Recovering divers
    - i. Vessel approach
    - ii. Equipment loading
    - iii. Diver recovery methods
  - g. Recovering secondary items
    - i. Support during evidentiary recovery
    - ii. Body recovery
    - iii. Chain of custody requirements
    - iv. Hull tie-downs
    - v. Towing
    - vi. Diver positioning and safety
  - h. Unloading
    - i. Evidentiary and secondary item transfer
    - ii. Possible chain of custody requirements
    - iii. Equipment offload
    - iv. Diver offload
    - v. Vessel stand-down

## **9.10 Required Skill Performance and Graduation Requirements**

**Students are required to successfully complete the following:**

1. Prepare small boat for hoisting and lowering, or deployment (adjust for departmental needs)
2. Convert true course to compass course
3. Maintain and log compass course to and from destination
4. Demonstrate VHF/Handheld radio transmission protocol (minimum of 2 times)
5. Make PORT/STARBOARD landings to:
6. Accommodation ladders (minimum of 2 times)
7. Boat landing (minimum of 2 times)
8. Transit a four-way point using GPS (minimum of 2 times)
9. Supervise loading and unloading of cargo/personnel
10. Deploy/recover SAR Swimmer
11. Demonstrate SAR Swimmer hand signals
12. Deploy and recover 2 divers, maintaining communications throughout
13. Conduct two towing scenarios (one towing, one being towed)
14. Use/identify distress signals
15. Serve as a coxswain for mooring procedures
16. Complete and pass written exam

## **9.11 To qualify to teach the ERDI Small Boat Operations Component, an Instructor must:**

1. Be an active ERD Instructor or Non-Diving Specialty Instructor
2. Provide proof of current CPR, first aid and oxygen provider
3. Hold a valid USCG Captain's license, or equivalent

**OR**

1. Successfully complete a Boating Skills & Seamanship (BS&S) course recognized by the U.S. Coast Guard, Essential Navigation & Seamanship Course recognized by the Royal Yachting Association (RYA) or equivalent
2. Provide verification of 360 days of boating experience, 90 within the past 3 years
3. Submit the appropriate paperwork with a complete ERDI Instructor Upgrade request to World HQ or Regional Office for processing