

UAF SFOS Fisheries Division

# **Small Boat Safety Manual**

September 2008

**Version 2**

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### **APPENDICES**

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- II Boat Operator Qualification Form
- III Mandatory Safety Equipment List
- IV Sample of Alaska Marine Safety Education Association Vessel Handling Drills

### **ACKNOWLEDGEMENTS**

This manual is adapted from University of California, Berkeley's Small Boat Manual. Therefore, thanks must be given to the unknown authors who gathered and documented the initial information.

We are grateful for the assistance offered by the Director of Alaska Marine Safety Education Association (AMSEA). The review of our manual and valued suggestions helped complete the adaptation. The input from marine safety experts only adds to the possibility of a favorable outcome should the worst happen.

# SMALL BOAT SAFETY MANUAL

## SECTION 1.00

### OVERVIEW

#### 1.10 PURPOSE

Small boat operations involve certain risks that must be addressed prior to beginning any field work. Knowing what equipment is required to be on the boat, the rules of the road, understanding the weather and its effects on the marine environment, and even the variations in operating one type of boat compared to another are all obstacles that must be overcome in order to minimize the risks to those on board, as well as maximizing efficiency in data collection.

The purpose of this manual is to establish good boating practices, to ensure that all boating is conducted in a safe and efficient manner; and to familiarize participants with the basic procedures that affect their own safety and the safety of their fellow user.

All Fisheries Division small boat operators and passengers are required to observe the provisions of this guide.

#### 1.20 CONTENTS

The Small Boat Manual contains policies and procedures for all boating operations. This Small Boat Safety Manual includes:

1. Policies and procedures that pertain to all boating operations.
2. Administrative procedures for conducting the small boat program.
3. Equipment and maintenance recommendations.

#### 1.30 APPLICABILITY

The provisions of this manual apply whenever Fisheries Division personnel are using small powerboats to conduct research under UAF SFOS Fisheries Division auspices, whether or not the boat is owned by the University.

Specific examples of boat operations under Fisheries Division auspices include but are not limited to: persons engaged in research; employees acting within the scope of their employment; students engaged in any research operation including those receiving or providing boat operation instruction or involved in boat checkouts.

For the purposes of this program, a small boat is *any boat less than 26 feet in length* (US Coast Guard Class 1 and smaller). At the time of this writing Fisheries Division has a 25 foot Boston Whaler on a trailer. However, this manual applies to any small boat staff, students or faculty are operating.

## **SECTION 2.00 RESPONSIBILITY**

### **2.10 MANAGER FISHERIES DIVISION**

The Manager will assure the Coast Guard recommended, and Fisheries Division required Online Boating course is taken by anyone checking out the small boat. And when appropriate assure all users have taken a Coast Guard Auxiliary condensed class. Also prior to solo operations by a boat operator the Principal Investigator/Academic Advisor/Supervisor must submit to the Manager, the Boat Operator Qualification form located in Appendix II of this manual. The Manager will communicate to the Principal Investigator and boat users the strong recommendation of this office to get CPR and First Aid certified. The Manager makes recommendations to the Director on changes to this manual.

### **2.20 DIRECTOR FISHERIES DIVISION**

The Director will have final judgment on a persons competency in boat operations should a conflict arise. The Director has the sole responsibility of approving or not changes to this safety manual.

### **2.30 BOATING SAFETY OFFICER**

Currently there is not an appointed Boating Safety Officer. The boating safety officer for Fisheries Division is appointed by the Director, in the absence of an appointed officer, the responsibilities reside with the Director. The Manager and/or Director will answer any concerns and route concerns to the Environmental Health and Safety Office.

### **2.40 PRINCIPAL INVESTIGATORS OR ACADEMIC ADVISORS OR SUPERVISORS**

Principal Investigators/Academic Advisors/Supervisors will assure all small boat operations that are part of a program under their direction are conducted in accordance with this manual. It is required that Principal Investigators/Academic Advisors who operate Fisheries Division boats or supervise those using the boats have taken the online course and/or any other training that is required as published in this manual. The Principal Investigators/Academic Advisors/Supervisors are also responsible for assuring all the required safety equipment as outlined in Appendix III is on board prior to use.

The Principal Investigator/Academic Advisor/Supervisor is required to submit the Boat Operator Qualification form for each boat operator working under them. This form is Appendix II in this manual.

### **2.50 BOAT OPERATOR**

In all boat operations, one individual shall be designated as the boat operator. The designated boat operator is responsible for all aspects of boating operations, regardless of the presence of any senior staff or faculty in the boat. These responsibilities include, but are not limited to:

1. The safe navigation of the vessel to and from the site(s) of operation.
2. The safe operation of all equipment, either in the collection of data, or the handling of the vessel.
3. Safe transport of the vessel to and from the launch site.
4. Insuring that all required operational and safety equipment is on board before getting underway and properly stowed upon return.
5. Enforcing safe behavior of all persons on board. Including the wearing of Coast Guard approved PFDs at all times while the vessel is underway.

Non-compliance with this manual is to be reported to the Manager or Division Director for review.

Any operator may deviate from the requirements of this manual to the extent necessary to prevent or minimize a situation that is likely to cause death, serious physical harm, or major environmental damage. A written report of such actions must be submitted within 24-hours to the Manager explaining the circumstances and justifications.

## **2.51 PASSENGER**

Passengers are required to comply with the mandates of this manual as it pertains to them. The boat operator is in charge at all times. Passengers are required to wear Coast Guard approved PFD's at all times. It is highly recommended that all passengers not wearing approved neoprene dive suits be wearing Fisheries Division provided or personal Mustang Suits. During rough seas it is highly recommended that all occupants of the vessel wear helmets. Passengers should acquaint themselves with all safety equipment on the vessel and ask for instructions on any equipment they do not know how to use. At no time even at the request of the boat operator should these safety guidelines be deviated from, unless a specific situation has occurred where following a guideline could cause personal injury, this however, is a decision to be made by the boat operator. If the passenger does not feel the weather and/or vessel condition is safe, it is their responsibility to inform the boat operator and not participate in the cruise. The passenger should inform Manager/Director of any unsafe conditions they encountered.

## SECTION 3.00

### ADMINISTRATIVE PROCEDURES

#### 3.10 GENERAL

The regulations in this manual must be observed wherever small boat operations are carried out under the auspices of UAF SFOS Fisheries Division. All operators must follow the provisions of the manual and all equipment used must conform to U.S. Coast Guard requirements (Appendix III of this manual). When using a small vessel owned by a cooperating agency boat operators and passengers who are staff, faculty or students of Fisheries Division must comply with not only the mandates in this manual, but also any policies set forth by the cooperating agency for their vessels.

#### 3.11 OPERATION AREAS

The regulations herein shall be observed at all locations where boating operations are conducted under the auspices of the Fisheries Division Small Boat Program.

Normally the Fisheries Division boat will be only used an area that will allow for a same day return. Special exemptions are possible at the approval of the Division Director.

#### 3.20 BOAT OPERATORS

Boat operators are expected to have basic knowledge and competencies for handling the vessel they intend to use, in the expected environment and conditions for their field work. Theoretical knowledge and an understanding of the “Rules of the Road” can be gained through any of several formal boating courses. These “Rules of the Road” are covered in the Coast Guard recommended on line course, and will be reinforced by the U.S. Coast Guard Auxiliary course when offered.

Boat operating experience is invaluable, and there is no substitute for time at the wheel on the water. Tide, cold weather, cold water, and unpredictable winds can add to the dangers of Juneau waters. Principal Investigators/Academic Advisors/Supervisors are responsible for making sure the boat operators they are sending out have the experience to recognize these dangers, and have taken the required online boating safety course (<http://www.boatus.org/onlinecourse/>)

#### 3.21 Useful Web Links

Other sources of boating safety, survival information etc.:

- [http://www.boatus.org/onlinecourse/states/stateguide\\_gen.asp](http://www.boatus.org/onlinecourse/states/stateguide_gen.asp)
- <http://www.uscg.mil/d17/d17rbs/d17rbs.htm>
- <http://www.dnr.state.ak.us/parks/boating/handbook03.pdf>

#### 3.30 BOATS AND EQUIPMENT

All boats and equipment used by authorized Fisheries Division operators will conform to U.S. Coast Guard requirements and to the standards set forth in this manual.

#### 3.31 STABILITY

The passenger capacity for the 25 ft *Nanook* with field gear is 6 people. It is the responsibility of the boat operator to stay within these limits and to have all weight distributed so that the boat will be trimmed properly. If the manufacturer's specifications have been altered or if a platform was designed and constructed for specific research the trim and stability modifications may be comprised. It is the responsibility of the Principal Investigator/Academic Advisor/Supervisor to verify the stability of any modification with the Manager.

#### 3.32 Equipment

The operator shall be familiar with the operation of the equipment and shall inspect all emergency equipment prior to departure (see Appendix III for a list of required equipment). Special attention should

be given to Personal Floatation Devices (PFD's) and communication equipment (radios and cell phones). He / She shall notify the Principal Investigator/Academic Advisor/Supervisor and the Manager of any malfunctioning equipment discovered during their operation. Coast Guard approved Personal Flotation Devices (PFDs) are to be worn at all times when the vessel is underway. Fisheries Division owns Mustang suits that can be checked out, any passenger not wearing a neoprene dive suit is strongly encouraged to wear a Mustang Suit.

### **3.40 BOAT FLOAT PLAN**

All Operators of boats must leave a float plan with some responsible party on shore. The minimum requirements for a float plan are:

1. The boat being used;
2. The planned date, time and place of departure;
3. The planned date, time and place of return;
4. The site(s) of operation;
5. The Principal Investigator;
6. The names and affiliation of people on board.
7. Communication schedule, i.e., cellular telephone number and/or VHF working frequency.
8. Safety equipment on board.

The Float Plan that is in Appendix I is required. This float plan can be adapted to any vessel by merely changing some information, i.e., vessel name and description.

### **3.50 COMMUNICATIONS**

Scheduled cell phone or radio communications with agreed upon frequency shall be maintained with a responsible person. To initiate any change in an approved schedule, the shore contact or assigned alternate must be notified and changes confirmed. If the boat operator, or their designee, is unable to notify the shore contact or assigned alternate, the filed plan must be adhered to. Failure to maintain scheduled radio or cell phone communications (within one-half hour) may cause initiation of U.S. Coast Guard Search and Rescue procedures.

The shore contact or the agreed upon alternate shall be notified by phone or in person upon completion of work. Notice of return is required within one hour after the scheduled time of return. If shore-based or radio contact is not made, procedures for U.S. Coast Guard action may be initiated. Vessel operators and shore contacts shall take into account the limited VHF radio and cell phone coverage in coastal waters.

### **3.60 WEATHER**

Use of any boat is always contingent upon weather conditions. Responsibility for monitoring weather conditions prior to departure and during operations resides with the operator. When small craft advisories are issued by the National Weather Service for the waters of a planned operation or experiment, boats that are scheduled for operations within that area should postpone their operations until more favorable conditions prevail.

### **3.70 SCUBA DIVING**

Any persons SCUBA diving are required to observe the provisions of the University's Diving Safety Manual.

Currently Ginny Eckert (796-6450) is our local Dive Safety Officer. In her absence please contact Sherry Tamone (796-6599).

The designated lead diver will be in charge of all diving operations. A Fisheries Division boat operator should remain aboard at all times during diving operations.

### **3.80 SAFETY CHECKS**

**3.81 Prior to Departure** the boat operator shall:

1. Perform a functional inspection of the boat and all equipment.
2. Assess all environmental risks—weather conditions, sea conditions.
3. Inform all passengers of emergency procedures—man-overboard, fire, and abandonment and methods for seeking assistance. Require all people on board are wearing PFDs while the vessel is underway.
4. Inform all passengers of the location of emergency equipment
5. Inform all passengers of additional hazards and appropriate precautions for the particular environment, weather and objectives of the operation.
6. File a Float Plan with a responsible shore party or Harbor Master.

**3.82 After Returning**

1. Upon return the operator will check in with shore contact person.
2. Note any problems with the boat or equipment that occurred and inform the responsible department within 24-hours.
3. Return a copy of the completed Float Plan to the Manger.

**3.90 RECORD KEEPING AND ACCIDENT REPORTING**

**3.91 Routine Records**

The Manager or designee shall keep a file of usage for the vessel including a log of scheduled and unscheduled maintenance for boat, boat trailer and outboard engine.

**3.92 Accident Reporting**

All accidents and incidents (collisions, near collisions, groundings etc.) involving boats must be reported to the Manager and/or Division Director. The Manager will contact the appropriate Risk Management personnel. The boat operator will be required to give a full written accounting of the accident/incident.

Definitions:

**Incidents** are defined as events that result in minor injures (cuts and scrapes) or “cosmetic” damage to vehicles or vessels (dents and scratches that don’t effect the operation of the vehicle or vessel.) Incidents also include near misses, such as when a situation occurred that could have led to an accident, which should be reported as well.

**Accidents** are defined as events in which a serious injury requiring medical attention beyond basic first aid occurred. An accident is also defined as a situation where major property damage occurred.

Reporting guidelines and resources:

1. Any accident and or incidents no matter how minor are required to be reported to the Manager and/or Director within 12 hours of occurrence. Manager’s # 796-6532 (home 789-0042). Failure to report injuries within this time could result in Worker’s Compensation claims being denied.
2. Any accident resulting in a fatality must be reported to the Manager or Division Director immediately after emergency personnel have been contacted.

# **APPENDICES**

<b>Appendix I</b>	<b>Fisheries Division Float Plan (2 pages)</b>
<b>Appendix II</b>	<b>Boat Operator Qualification Form</b>
<b>Appendix III</b>	<b>Mandatory Safety Equipment</b>
<b>Appendix IV</b>	<b>Sample of Alaska Marine Safety Education Association Vessel Handling Drills (5 pages)</b>

# FISHERIES DIVISION FLOAT PLAN

## Instructions for use:

This 2 page document is for your benefit and is required. In the event of mechanical difficulties, weather related problems, or other boating hazards, having a plan and the proper equipment to deal with these issues can make a huge difference in the outcome. Fill out this form as completely as possible and leave it with a responsible party (spouse, PI, Harbor Master) on shore. A copy of this form is to be left in the Main Administrative Office of Fisheries Division. In the event your return is delayed and communications are lost, this shore party should activate the appropriate response as detailed on this form. It is recommended that you bring a copy with you in the boat, but be sure you leave this form on shore. Please be specific in the areas you will be operating in.

Name and description of vessel: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Operator Name: \_\_\_\_\_ Telephone #: \_\_\_\_\_

Local address: \_\_\_\_\_

Principle Investigator/Academic Advisor/Supervisor \_\_\_\_\_ On board? \_\_

## SURVIVAL and SAFETY EQUIPMENT (Check as appropriate)

PFD's: _____ # _____ *	Paddles: _____	Bell/whistle/horn: _____ *
Working Radio: _____ *	Monitoring Channel: _____	Cell phone: _____ # _____
Day Signals: _____ *	Night Signals: _____ *	Exposure Protection: _____
Anchor: _____	Amount of line: _____	Fire Extinguisher: _____ * <sup>1</sup>
Bailing Device: _____	Tool kit: _____	
Compass and Charts or maps: _____		*represents required equipment <sup>1</sup> see USCG regulations for details

School Equipment checked out:  
\_\_\_\_\_

## NOTIFICATION

Shore Contact: \_\_\_\_\_ Phone# \_\_\_\_\_

If no contact is made with Shore Contact by: \_\_\_\_\_ (time) The contact will:

**Call the Coast Guard** at **463-2000** . After contacting the Coast Guard call the Manager at 796-6441 during business hours or 789-0042 after 5pm.

**Planned Activity:** (Include destination) (detailed information) \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_



# BOAT OPERATOR QUALIFICATION FORM

Date:

I have observed \_\_\_\_\_ in operations of the vessel and found this operator to be competent in the launching, operations, and returning the vessel to the trailer.

The operator has demonstrated the proper radio communications technique, knows about required safety gear, and vessel capacity.

The operator was given a copy of this manual. The operator has taken and passed the required online Boating Safety Course <http://www.boatus.org/onlinecourse/>.

\_\_\_\_\_  
Principal Investigator/Academic Advisor/Supervisor

DATE: \_\_\_\_\_

\_\_\_\_\_  
Boat Operator

DATE: \_\_\_\_\_

# MANDATORY SAFETY EQUIPMENT

## Don't Leave Port Without It!

We've put together a list of required and recommended boating equipment:

U.S. COAST GUARD MINIMUM EQUIPMENT REQUIREMENTS				
EQUIPMENT	Boats less than 16 feet	16 to less than 26 feet	26 to less than 40 feet	40 to not more than 65 feet
<b>Personal Flotation Devices (life jackets)</b>	Recreational boats must carry Coast Guard approved Personal Flotation Devices, in good and serviceable condition, and of the appropriate size for the intended user. Wearable PFDs must be readily accessible, not stowed in bags, locked or closed compartments or have other gear stowed on top of them. Throwable devices must be immediately available for use. There must be one Type I, II, III, or V PFD for each person on board or being towed on water skis, etc., PLUS one Type IV throwable device. Throwable, Type IV PFDs may no longer be substituted for wearable types on boats less than 16 feet. State laws on mandatory PFD wear may vary.			
<b>Fire Extinguishers (Coast Guard Approved)*</b>	At least one B-1 type (see below) Coast Guard-approved hand portable fire extinguisher. Not required on outboard boats less than 26 feet long and not carrying passengers for hire if the construction of such motorboats will not permit the entrapment of explosive or flammable gases or vapors, and if fuel tanks are not permanently installed.	At least two B-1 type approved portable fire extinguishes; OR at least one B-2 type.	At least three B-1 type approved portable fire extinguishers; OR at least one B-1 type PLUS one B-2 type.	
<b>Visual Distress Signals</b>	Must carry approved visual distress signals for nighttime use.	Must carry visual distress signals approved for daytime and nighttime use. For pyrotechnic devices (hand-held or aerial red flares, floating or hand-held orange smoke, and launches for aerial red meteors or parachute flares) a minimum of three required, in any combination that totals 3 for daytime and 3 for night use. Three day/night devices will suffice. Devices must be in serviceable condition, dates not expired and stowed accessibly. Exceptions are open sailboats less than 26 feet long and not equipped with propulsion machinery, and manually propelled boats; both required to carry only night signals.		

<b>BELL, WHISTLE</b>	Every vessel less than 39.4 feet (12 meters) long must carry an efficient sound-producing device.	Every vessel 39.4 (12 meters) long, but less than 65.6 feet (20 meters) must carry a bell and a whistle.
<b>VENTILATION (boats built after April 25, 1940)</b>	At least two ventilator ducts fitted with cowls or their equivalent for the purpose of properly and efficiently ventilating the bilges of every closed engine and fuel tank compartment of boats constructed or decked over after April 25, 1940, using gasoline as fuel and other fuels having a flashpoint of 110° F or less.	
<b>VENTILATION (boats built after August 1, 1980)</b>	At least two ventilator ducts for the purpose of efficiently ventilating every closed compartment that contains a gasoline engine and every closed compartment containing a gasoline tank, except those having permanently installed tanks vented outside the boat and containing no unprotected electrical devices. Also, engine compartments containing a gasoline engine with a cranking motor must contain power-operated exhaust blowers controllable from the instrument panel.	
<b>BACKFIRE FLAME ARRESTOR</b>	One approved device on each carburetor of all gasoline engines installed after April 25, 1940, except outboard motors. Device must be marked to show compliance with SAE J-1928 or UL 1111 Standards.	
* When fixed fire-extinguishing system is installed in machinery spaces, it will replace one B-1 type portable fire extinguisher.		

Coast Guard minimum equipment requirements vary with the size of the boat, type of propulsion, whether operated at night or in periods of reduced visibility, and, in some cases, the body of water on which it is used. For a more thorough discussion and complete details on how many and what types of equipment you must have aboard your boat, request a free copy of the pamphlet "Federal Requirements for Recreational Boats" from the Coast Guard. For a copy, call their Infoline at (800) 368-5647. Many state requirements go beyond Coast Guard requirements. Contact your state boating office for details. Alaska Boating Safety, <http://www.dnr.state.ak.us/parks/boating/pdf/boatrequire.pdf>

### **Recommended Equipment:**

Coast Guard minimum requirements are just that, minimum.

### **It is suggested you carry additional safety equipment, such as:**

- anchor with sufficient line/chain (at least five times water depth)
- bailer (bucket)
- oars or paddles
- first aid kit
- VHF radio – Cell Phone
- extra fuel & water
- tool kit
- sun protection
- flashlight
- Personal Locator Beacon (PLB)
- Grab and go Survival container



*AMSEA Vessel Operation Drill Sets, Certification Skills and Check off List*

**RB Drill Sets**

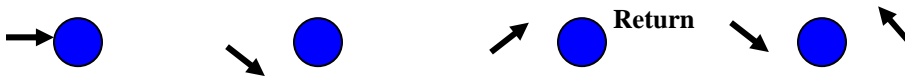
**Verbalize ALL Throttle And Direction Changes, Wait for Receive Crew Responses.**

- 1. Slalom Course**
- 2. Figure Eights**
- 3. Object Avoidance/Advance & Transfer**
- 4. Stopping Distance (Safe Speed)**

+++++

**1. Slalom Course**

**Set 3 or 4 buoys in a straight line, approx. 2 boat lengths apart each.**



- 1. Begin... Bow-on to first buoy
- 2. Back thru all (engines trimmed up lifts stern...)
- 3. Variations 1 – 2 engines
- 4. Bow thru all both engines

*(Engine(s) Trim, Advance and Transfer, Wheel & Throttle Ctrl, Crew Positioning and Help, Lookouts, Close-Qtrs...)*

+++++

**2. Figure Eights 8s**

**Set buoys approx. 200+ yards apart**



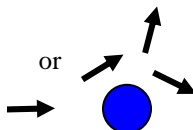
- 1. Begin 8s at minimum planning speed.
- 2. Turn as tight around buoys as possible.
- 3. Increase speed by approx 500 rpms and control max. to short of hooking a chine.  
This is NOT an E or J turn but continuous turns.

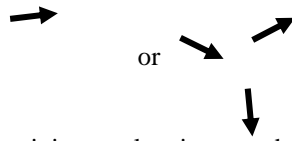
*(Hands on Wheel & Throttle, Centrifugal force, Advance and Transfer, Trim and Throttle, Safe Turning Speed, Verbalization, Crew Positioning, Lookouts assigned)*

+++++

**3. Object Avoidance / Advance & Transfer**

**Set one buoy/fender for run**





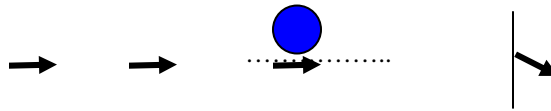
1. Begin first run(s) at minimum planning speed.
2. Instructor tap Coxn to announce object in time to closely avoid Approx. 30 ft.
3. Increase subsequent runs by 500+ rpms
4. Direction to Turn? Fish-tale to Avoid?

*(Hands on Wheel/Throttle, Advance and Transfer, Trim and Throttle, Safe Turning Speed, Verbalization, Crew Positioning, Lookouts assigned,)*

+++++

#### 4. Stopping Distance/Safe Speed

Use a fixed object attached to bottom (away from fast currents)



1. Begin first run(s) at minimum planning speed.
2. Abeam of object pull throttles to Clutch (not neutral)
3. Note stopping distance/seconds (stopped when wake catches stern)
4. Increase subsequent runs by 1000 rpms until reaching full throttle.
5. Note distance/seconds between *Minimum-Planning* and *Full Throttle*.

Note:

1. Instructor may throw over a fender to mark advance limits between runs.
2. Reducing to clutch instead of neutral keeps prop in gear for more drag...

*(Hands on Wheel/Throttle, Advance, Trim and Throttle, Safe Stopping Speed, Verbalization, Crew Positioning, Lookouts, , )*

## **SKILL-BASED OPERATOR CERTIFICATION**

Certification of operators is intended to assure that any person who operates a NOAA small boat has passed minimum criteria relating to knowledge and skill. The wide range of operational risks inherent in the vast array of NOAA small boat operations dictates that field activities must be responsible for implementing operator skill certification criteria. The importance of text-based training and evaluation toward establishing and verifying a basic knowledge base for all small boat operators is not superseded or replaced by certification through demonstration of practical skills.

Skill criteria should be used:

1. in conjunction with underway time accumulated with out accident in order to establish "grandfathering" criteria for existing operators,
2. to supplement the minimal operator training criteria in NAO 217-103 when that criteria is not sufficient or not applicable to address specific operational risks, or
3. as a means to ensure that boat operations are conducted in a safe and professional manner which, when visible to the general public, will reflect positively on NOAA.

The following exercises involve various degrees of small boat handling expertise and can/should be considered in developing skills-based certification criteria. For skill based certification to be meaningful, the successful demonstration of the skills must include specific criteria for evaluation and passing. For example, being able to dock a boat with out causing a 2" bolt standing on its head to fall over, is a specific criteria for passing a docking exercise.

### **Responsibilities and Requirements as a NOAA Small Boat Operator**

#### **Operational Risk Assessment**

#### **Vessel Inspections**

- Vessel integrity
- Engineering
- Safety Equipment

#### **High Speed Operation and Handling**

#### **Theory & Practical**

- Demonstrate bringing the vessel up to full speed
- Demonstrate and describe importance of maintaining a proper lookout
- Conduct tight radius turns without causing propeller cavitation and describe signs of propeller cavitation
- Demonstrate high speed avoidance techniques including turns and emergency astern

#### **Close Quarters Maneuvering**

#### **Theory & Practical**

- Maneuver boat through 360 degrees within two boat lengths by utilizing back and fill turns
- Maneuver boat astern around obstacles/bouys
- Maneuver boat through anchorages

#### **Docking/Undocking**

#### **Theory & Practical**

- Demonstrate use of various lines (fore and aft spring, endlass, breast, stern, bow) in getting away from and alongside a dock
- Demonstrate docking and undocking in currents and wind
- Demonstrate mooring a boat in a slip

**Anchoring                      Theory**

- Demonstrate dropping anchor, setting anchor, selection of proper scope for bottom characteristics
- Describe effect of scope, bottom type, and environmental conditions on anchor watch radius
- Raise anchor and discuss tactics or cautions in freeing fouled anchors

**General Operations                      Theory & Practical**

- Maneuver and hold station within 1 boat length of a fixed object (buoy, mooring, piling)
- Maneuver and take an adrift object alongside and aboard the vessel (PFD, float)
- Deploy and retrieve SCUBA divers - **Theory**
- Demonstrate coming alongside an underway vessel

**High Risk Operations                      Theory & Practical**

- Describe risks and demonstrate proficiency for landing and launching boats from low energy coasts
- Describe risks and demonstrate techniques for landing and launching boats in high energy coasts (Surf Zone or Beach landings).
- Describe risks and demonstrate techniques for towing vessels alongside or astern
- Describe risks (stability and general risks) and demonstrate deploying and retrieving fishing gear or heavy apparatus - **Theory**

**Miscellaneous                      Theory**

- Demonstrate safe speed and navigational techniques for various situations including reduced visibility, heavy weather, or large traffic avoidance
- Describe precautions to take prior to encountering heavy weather
- Identify signs of impending weather
- Identify local hazards to navigation

**Engineering                      Theory**

- Underway troubleshooting
- Corrective Actions

**Damage Control                      Theory**

- Emergency corrective actions

