**Safe Work Procedure**

**Marine Water Sampling from Small Boats Revised 2018.07.17**

**Safe Operation of Vessels**

* Vessels are to be operated within the manufacturer's limitations
* Lifejackets or PFD are recommended to be worn at all times onboard vessels.
* Conduct a Pre-Trip Inspection and Safety Meeting prior to the first trip of the day.
* File a Trip Plan for each voyage prior to departure.
* Do not operate this vessel without a functioning radio, or with missing essentials (lifejackets, first aid kit, flares, fire extinguishers, emergency contact numbers)
* Must have a Certified Master, and training certificates of master and crew onboard
* Boat trip log to be filled out at the end of each day
* The master or crew must not be under the influence of drugs or alcohol that may impair their ability to safely operate the vessel

**Associated Hazards**

* Risk of hypothermia and/or drowning.
* Boat crashing, capsizing, filling with water, sinking, catching on fire.
* Crew falling overboard, suffering hypothermia, drowning.
* Getting lost or stranded due to inclement weather, boat breakdown, or not familiar with Transport Canada’s “Collision regulations” including the Canadian Buoyage System.
* Body injuries from boat, trailer or sampling equipment.
* Staff insufficiently trained.
* Boat communication problems; unable to contact on-shore check in.
* Soft tissue (ergonomic) injuries due to improper lifting techniques, driving posture, etc.
* Persons getting seasick.
* Damage to boat, trailer, or missing & defective equipment.

**Mandatory Requirements**

**Training**

1. Small Vessel Operator Proficiency (SVOP) and Small Non-Pleasure Vessel Basic Safety (MED A3 – Marine Emergency Duties) for boat operator.
2. Practical hands-on boat operations specific to the type and size of boat and engine.
3. Marine Basic First Aid.
4. Use of Portable Fire Extinguishers.
5. Trailer towing.
6. Launching and retrieving small boat from trailer.
7. Use of VHF radio; Restricted Operators Certificate (ROC).
8. Use of GPS and marine charts
9. Proper lifting techniques (ergonomics training for material > 20 Kg).

**Safety Equipment**

1. Lifejackets sufficient for all personnel
2. Life raft
3. Lifebuoys
4. Buoyant heaving line
5. Oars & anchors
6. Bailers and bilge pump
7. First aid kit (see Appendix 1. for list of contents)
8. Distress alerting equipment (flashlight, flares, VHF) (refer to Procedures for Dealing with Emergencies).
9. Fire safety equipment (refer to Procedures for Dealing with Emergencies).
10. Boats should be equipped with proper navigation and communication tools such as VHF radios, cell phone, marine charts, compass, GPS, Satellite phone.

**Personal Protective Equipment**

1. Canadian Coast Guard (CCG) approved Personal Flotation Device (PFD)
2. Anti-exposure suits/jackets
3. Closed-toed foot wear, steel-toed if lifting heavy objects
4. Work gloves
5. Communication devices such as a cell phone, satellite phone, whistle, VHF.
6. Sunglasses with anti-glare finish and a minimum of 90% UVA and UVB protection
7. Sunscreen, with a minimum SPF 30
8. Insect repellent

**Procedure**

# Planning the trip

1. Check weather / marine forecast (both current & predicted) observing especially: wind, fog, sea state, currents & precipitation.
2. If necessary, postpone trip until weather conditions improve.
3. Check tides to help determine best route (for example: avoiding low tides in shallow sample areas and avoiding exposure to high winds opposing large tide changes).
4. Plan route of travel being aware of exposed crossings and areas of rough seas. Identify safe accessible harbours for refuge if route must be abandoned.
5. File a sail plan with the shore crew, other boat crews, and, if necessary, Coast Guard. Establish Estimated Time of Arrival (ETA) and overdue procedures. Any changes in ETA should be communicated to the shore crew as soon as possible.
6. Boats should be equipped with proper navigation and communication tools such as VHF radios, cell phone, marine charts, compass, GPS, Satellite phone.
7. Shore crew must have copies of the sail plan which includes all contact numbers, ETAs, vessel descriptions and persons onboard.
	1. **Training requirements**

1. Boat operators must hold a proper boat handling certification according to the craft they are operating, including basic navigation, weather awareness and emergency handling. Operators must have been designated as Captain in Command (CIC) and must have experience operating the type of boat they will be using.
2. Junior staff should be trained to perform tasks and be under direct supervision and oversight of a CIC. Junior staff may only operate the boat when under the guidance and direction of a CIC.
3. The crew must be trained in the use of all safety equipment. The required safety equipment, according to boat size and craft type, must be present on board and comply with the requirements specified by the Canadian Coast Guard Safe Boating Guide.
4. Boat operator should give the crew a pre-trip safety orientation.

#  Pre-departure - assemble boating gear (checklist – Appendix 2)

1. Test all electronic equipment prior to leaving dock. Complete marine radio check. Ensure GPS, depth sounder, wipers, and running lights are working properly.
2. Ensure safety knife, throw ropes (2) and sea anchor are easily available.
3. Ensure “kill switch” is attached on boat operator.
4. Ensure all required safety gear is on board and in good working order.
5. Ensure all required equipment is stored properly so that weight is evenly distributed, loose objects are secured, and crew movement is not restricted.
6. Check boat engine for proper oil level and fuel level.
7. Ensure that all crew are wearing a CCG-approved personal flotation device that is adequate for the anticipated weather and sea conditions (for example: horse collar in calm summer weather, anti-exposure suit in cold weather or rough seas).
8. Ensure that personal flotation devices are equipped with safety accessories (for example: strobe light, whistle, compass, flare, toque, mitts).

# Driving the boat

1. **ALWAYS WEAR AN APPROPRIATE PERSONAL FLOTATION DEVICE WHILE ON THE BOAT.** Have all other CCG recommended Personal Protective Equipment (PPE) on your person. **Two people must be on board when the vessel is underway and at least one of them must be a CIC.**
2. Be alert to changing weather conditions; check weather and marine forecasts frequently.
3. Choose a protected route whenever possible, and be prepared to abort the trip if conditions worsen. Know locations of safe, accessible anchorages along the route.
4. Inform shore crew or other boat crew or Coast Guard if route changes or must be aborted or if ETA changes.
5. Be alert to changing water conditions from protected bays to open crossings, and areas where wind and tide may combine to create severe sea conditions. Be aware of areas with strong currents, riptides, rapids, whirlpools, and ferry wakes.
6. Have crew members not operating the vessel acting as spotter for dangers such as debris, logs, dead heads, and other vessels in distress.
7. Both the boat operator and crew should be aware at all times of the location of the boat relative to the land, using charts and GPS to reduce risk of collision with hazards (for example: shoals, submerged rocks, whirlpools ). Use GPS as a guide but do not rely on its accuracy at all times. Have navigational charts available to aid in ensuring the accuracy of your location.
8. Ensure “kill switch” is attached to boat operator.
9. Boat operator and crew should know the marine “rules of the road” and be familiar with both light and sound signals. Boat operator should be practiced in collision avoidance.
10. Use anti-exposure suits when there is a risk of hypothermia due to cold weather or cold water.
11. Boat shall be operated by a CIC when conditions are considered adverse.

# Sampling

1. Boat operator should progress slowly and pay attention to the GPS, depth sounder, marine chart, and immediate surroundings to avoid grounding or striking underwater hazards. Sampler should be on bow of boat watching for hazards.
2. Sampler should ensure footing is stable at all times, and be prepared for a sudden impact or engine reverse.
3. Crew must be trained in man-overboard retrieval.
4. Samplers should exercise caution with heavy lifting.

# Docking and unloading the boat

1. Ensure that all limbs are inside the boat when approaching docks.
2. Ensure footing is stable at all times.
3. Approach dock at reduced speed and from an angle ensuring the most visibility and taking advantage of wind conditions.
4. Properly secure the boat to the dock or shore before loading and unloading contents.
5. Use proper lifting technique to transfer equipment from boat to dock. Use two people to carry equipment over 20 kgs.
6. Ensure any deficiencies or mechanical problems with the boat or safety equipment are reported and fully corrected prior to the boat being used again.

# Boat trailering

1. Ensure that the Commercial Safety Inspection for the trailer is up to date
2. Hook up trailer:

When assisted in hooking up ensure that:

* the assistant can be seen at all times by the driver
* that both driver and assistant understand the hand signals to be used
* the assistant is not caught between the vehicle and the trailer
* the driver makes no attempt to move the vehicle while the assistant is connecting the trailer tongue to the tow ball
* keep hands clear at all times, both driver, if alone, and assistant
* ensure that the trailer is always equipped with the correct safety chains and that they are always used

# check the trailer hitch / socket to ensure they are of a compatible size and tight

* always use trailer safety chains (crossed) and surge brake line, and make sure that they are in good condition and properly set. Ensure that the safety chains are connected to the diagonally opposite point on the hitch
1. Trailering:
* ensure the driver has been trained for towing a trailer
* use a tow vehicle that has sufficient power and braking ability to tow the loaded trailer
* regularly inspect and maintain the boat trailer for the job
* check tire condition, inflation and tire load rating
* the driver is aware of any extreme dangers in the local vicinity (for example: cliffs or steep banks)
* inspect the boat ramp for dangerous conditions and obstacles
* load the trailer ensuring that the boat is properly secured
* ensure boat safety chain is attached to bow eye of the boat and boat tie down straps are tight
* ensure that all items in the boat are properly secured
* ensure the engine is raised and resting on the engine support block
* ensure all antennae are taken down for travel
* always flush trailer brakes with fresh water before leaving dock or marina
* check all electrical connections, signal lights, trailer brake lights and trailer visibility from tow vehicle mirrors
1. Unhooking trailer:
* ensure that the ground or surface where the trailer will rest is firm and not on an unreasonable incline
* block the trailer wheels to ensure it won’t roll
* make sure that there is solid surface on which the tongue support can rest if applicable
* ensure that the pivoting front trailer jack is securely locked into place
* raise trailer jack until trailer tongue is well clear of the ball
* unhook trailer safety chains, lights and surge brake lines
* lock trailer tongue
1. **Refueling**

[should include a section on refueling, especially to cover the need for fueling at a dock (Appendix 3).

|  |  |  |
| --- | --- | --- |
| Manager’s name & signature / Date |  | Employee’s name & signature / Date |

**Appendix 1.**

## First aid kit

## Every vessel must have:

1. an up-to-date first aid manual or up-to-date first aid instructions, in English and French,
2. 48 doses of analgesic medication of a non-narcotic type,
3. six safety pins or one roll of adhesive first aid tape,
4. one pair of bandage scissors or safety scissors,
5. one resuscitation face shield,
6. two pairs of examination gloves,
7. 10 applications of antiseptic preparations,
8. 12 applications of burn preparations,
9. 20 adhesive plasters in assorted sizes,
10. 10 sterile compression bandages in assorted sizes,
11. 4 m of elastic bandage,
12. Two sterile gauze compresses,
13. Two triangular bandages, and
14. A waterproof list of the contents, in English and French; **or** a first aid kit that meets the requirements of the *Marine Occupational Safety and Health Regulations* or of provincial regulations governing workers’ compensation, with the addition of a resuscitation face shield and two pairs of examination gloves if the kit is not required to contain them.

**Appendix 2**

Pre-departure checklist, e.g. below from IOS



**Appendix 3.**

| **Refuelling** |
| --- |
|  | Check that the dispensing point is equipped with appropriate firefighting appliances. |
|  | Put all passengers ashore and clear any refuelling equipment. |
|  | Turn off pilot lights to gas refrigerators.  |
|  | Cut off electric power at main switch. |
|  | Close all hatches and openings to prevent fumes from getting into the hull and the bilge. |
|  | Turn off all mobile phones. Do not smoke. |
|  | Place a discharge bucket under air/overflow pipe and close scuppers in case of overflow. |
|  | Have a cloth at hand to catch any spills. Use one for the filler hose and one to monitor airflow from the fuel tank vent. Have sawdust/oil spill equipment ready. |
|  | When refuelling, do not start the dispenser until the outlet nozzle is inserted in the tank. Hold the nozzle open by hand only – do not lock or jam the trigger of the dispenser in the open position. |
|  | Keep the hose touching the filler neck at all times during refuelling to prevent static sparks.  |
|  | Carefully monitor the filling rate to avoid overfilling.Use your hand where possible to check for air escaping from the vent. When the tank is nearly full, you will feel a distinct increase in airflow which is the signal to stop filling. |
|  | Do not remove the filter hose until the fuel flow has stopped. |
|  | Lift the hose to drain all remaining fuel into the tank |
|  | Thoroughly clean up all surface spills with an absorbent cloth |
|  | If fuel has spilt into the bilges, pump the bilges manually into sealed containers or pump ashore and leave boat wide open for at least 30 minutes to vent. |
|  | When completely satisfied that the boat is free of fumes, start the blower and let it run for [four minutes – more if that’s the manufacturer’s recommendation]. |
|  | Start the engine before allowing passengers to board. |
|  | Dispose of absorbent cloths, sawdust or other fuel soaked items properly.  |