Egress Device Build & Safety Procedures for PFD Competency Testing

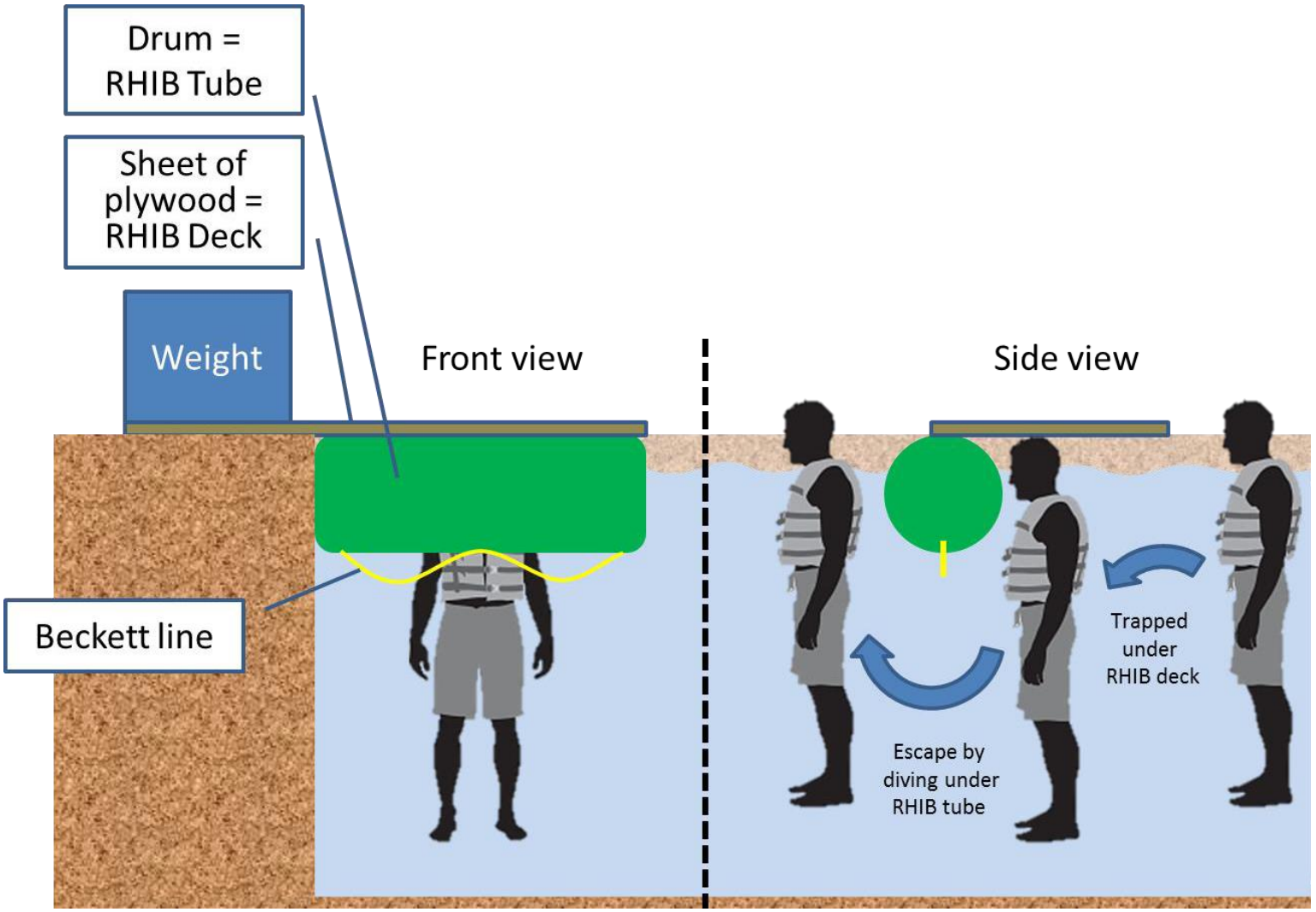
The PFD Competency Rig was built to simulate egress from an overturned RHIB. The rig includes three key elements:

- A sheet of 18mm plywood, which simulates the RHIB's deck. The sheet is also used to cantilever the whole assembly over the pool. In our tests the deck was about 10" from the waterline, thereby making it uncomfortable to stay under the deck (instilling a sense of urgency) and it also allows the tester to push themselves deeper underwater with their arms to clear the tubes during egress. This means significant upwards force might be placed on the ply sheet at times, hence the need for heavy counterweights on the pool's side (garbage cans of water and an adult were used in this demo)

- Garbage cans simulating the RHIB's tubes. 20 gallon Rubbermaid cans with a diameter of 18" mounted back to back were used, but other cans can be used for different tube diameters. Garbage cans were found to be just as slippery and rigid as Hypalon tubes, making the exercise quite realistic.

- Poly line attached to the garbage cans is used to simulate the becket lines. These lines are essential since for testers to use them to propel themselves from under the rig – and conversely the lines might snag the PFD, as could happen on a real RHIB.

- After an incident referenced in a Safety Bulletin "PFD Competency Testing" in June 2018 (posted and circulated), a modification was introduced and approved by the STC. This modification includes installation of cam-cleat releases on the becket lines for safety as described herein. This modification is a recommendation by the STC and not currently a mandatory requirement.


Drum = RHIB Tube
Sheet of plywood = RHIB Deck
Weight
Beckett line
Front view
Side view
Trapped under RHIB deck
Escape by diving under RHIB tube

Fabrication:

A standard 2x4 stud is used to attach the garbage cans together and to the sheet of plywood. At the far ends of both garbage cans attach a perpendicular piece of 2x4 to ensure the open end of the cans don't collapse under the pressure of the tester pushing on the "tubes".

Cut off the handle and rim of the cans on the side where they would be attached to the sheet of ply to make for a flat surface. The bottoms of the two cans are attached together with a bolt to prevent them from moving independently.

The garbage can assembly is mounted on one corner of the plywood sheet along the long side, with two large bolts going through the 2x4 stud.

The poly line is attached to the cans by drilling holes at both ends of each can, inserting the line through the hole and a metal washer, and then tying a large knot in the line.

You can leave the end handles on the cans, but they could easily be cut off if needed.

The rig is cantilevered over the pool/dock, with about half of the ply sheet over the water and the other half of the pool/dock side loaded with counterweights. If the water level is too high, you can raise the rig above the pool/dock with bricks/blocks of wood.

Modification of the PFD Rig

To increase safety and provide for release of a candidate who may become entangled in the becket lines, the design of the PFD competency rig has been modified so that the becket lines at either end of the two barrels pass upwards through a hole in the plywood deck and from there, to cam-cleat releases at each end of the upper plywood deck. One cam-cleat is located on the inboard end of the plywood deck and is operated by the top-side spotter and the other is located on the outboard end of the plywood deck and is operated by the spotter in the water. On releasing the becket lines from the cam-cleats, the line drops free and allows movement of a person entangled in the lines.

TESTING PROCEDURES & SAFETY CONSIDERATIONS (INLDUING CAM-CLEAT MODIFICATION)

Preparation for Testing:

- Testing should be done in good visibility in the ocean, lake or pool with sufficiently deep water to prevent candidates from touching bottom, with groups of several persons for safety, and easy access to remove a person from the water by use of a ladder, adjacent beach and par-buckling devices.
- Electrical Shock Drowning (ESD) considerations must be respected (see Ops/Safety Bulletin Nov. 22, 2021).
- Overall, a minimum of three persons is required:
    - One person top-side on the rig
    - one person in the water (spotter and helper)
    - candidate/member performing test

All of which are equipped with a sheathed sharp knife. All participants must exercise close-loop communication.

- Testing should be done with an AED, CPR mask and a vessel first aid kit close at hand.
- Persons in the water must wear a full set of approved RCMSAR PPE:
    - dry suit or cruiser suit, PFD if wearing a dry suit, SAR vest, helmet, and appropriate footwear
- The testing is to simulate either escape from an overturned vessel or entry to retrieve a trapped person, thus two passes beneath the tubes, one in each direction from inside the device to outside and from the outside in, are desirable. **In no case should a candidate pass under a tube towards a dock or floating structure where they could become entrapped**.

Testing Procedure (Passes under the Rig):

- In preparation for the procedure, all candidates being tested must have a **full briefing on the procedure,** regardless of whether they have had prior experience with it or not, **with emphasis being placed on possible entanglement with the becket lines and the need to control them during the procedure.**
- The candidate and the spotter then enter the water, expel any trapped air in their dry suits if using dry suits, and position themselves at the testing rig. The candidate takes a position to prepare to pass under the tubes while the spotter reaffirms with the candidate, using closed loop communication, the need to seize and control the becket lines, before proceeding under the rig. If cam cleat releases affixed, the spotter in the

water positions him or herself close to the becket line release mechanism while observing the candidate.

- The candidate will seize the becket lines, take a large breath of air, and then duck under the tubes using their arms and hands to assist in overcoming buoyancy and passing beneath the tubes.
- Upon surfacing on the opposite side of the barrel, the candidate shall move clear and provide a "thumbs up" signal to the spotter.

Emergency Procedure:

- Should an entanglement occur, the in the water spotter comes quickly to the aid of the candidate, providing assistance to keep his or her face out of the water and by releasing the becket line cam-cleat on the outboard end of the plywood deck. The topside observer simultaneously releases the becket line cam-cleat on the inboard side of the plywood deck. **If using a rig where becket line modification is not in place, a knife should be used to cut the lines if entanglement occurs.**
- Once removed from entanglement, the candidate should be escorted out of the water and any assistance rendered as required.
- It must be recognized that it is very difficult for the spotter to lift the rig in the water with an entangled person in it due to the weight of the entangled body and the fact they have nothing to brace against. Similarly, personnel topside will have great difficulty moving the rig containing an entrapped person as it is very heavy. **If the counterweight barrel is removed, there may be increased risk as the rig will be unstable in the water. Accordingly, the barrel should not be removed to avoid this situation.**

Gear Maintenance after testing:

All gear used for testing should be thoroughly washed with fresh water and attention should be given to fresh water flushing of the inflation mechanism of SAR vests. Dry suit zippers should be lubricated with appropriate dry suit zipper lubricant to ensure proper operation and water seal.

Testing with various PPE:

While testing with only a single full set of PPE is required, members are encouraged to try different RCMSAR approved PPE with the device, to gain experience with the floatation differences between gear types- i.e. full set of gear with a dry suit vs. a cruiser suit which has floatation in the legs.