

Report on Sailor Retrieval, Capsize Recovery, and Entrapment Tests

Concern about safety on the water has taken on urgency in the wake of five accidents (four of them fatal) since June 2011, including the loss of a young sailor entrapped in a capsized Club 420 at Annapolis, Md.

In response to that accident, and to provide information and photographs for instructional materials, volunteers conducted three days of on-water tests of dinghy safety methods and equipment in California and New York.

On July 13, Chuck Hawley (chair of U.S. Sailing's Safety-at-Sea Committee and a safety-at-sea seminar moderator) and five other volunteers tested capsize recovery methods with a Flying Junior and a RIB at the Stockton, Cal., Sailing Club.

On August 27-28, Timmy Larr (a member of the National Faculty of U.S. Sailing's Training Committee), myself (author of a report on the Annapolis accident, a member of the Safety-at-Sea Committee, and a safety seminar moderator), and more than a dozen other volunteers conducted trials with 420s and powerboats at the State University of New York Maritime College, Ft. Schuyler, N.Y., and American Yacht Club, Rye, N.Y.

The volunteers participated as individuals, not in official capacities.

Below is information based on the tests that we believe sailors should have.

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September 28, 2012

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1. Recovering People in the Water without Special Equipment

Techniques and equipment for recovery of a person in the water, with and without a second rescuer and special equipment, were tested using a hard-sided whaler-type boat and a RIB with a T-top. The testers observed several standard safety rules: Rescuers should evaluate the situation before taking action. A rescuer should not go into the water (that puts another life at risk and adds to the rescuers' problem). A person in the water must not be near an engine, whether or not it is turned on. Instructions should be simple, clear, and timely.



Tests of the vertical life jacket lift, vertical under arm lift, and the leg and arm roll were held with a whaler-type boat and a RIB, with one or two rescuers.

Vertical life jacket lift. One or two rescuers in the boat lean over the rail, grasp the straps of the life jacket of the victim, “bounce” the victim down and up three times, and pull decisively upward, keeping the victim in column as long as possible to relieve strain, and then into the boat. “Bouncing” employs the life jacket’s buoyancy to launch the victim upwards as the rescuer starts

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to lift. The life jacket may be inflatable or foam, but it must be a close fit and should have thigh or crotch straps. There was no indication of damage to life jackets.

This method was easy to explain and understand, and crews were impressed by its effectiveness. It was not always successful. A single 155-lb. rescuer retrieved a 230-lb. swimmer, yet a 125-lb. rescuer was unable to rescue a 120-lb. swimmer. A second rescuer may be required depending on the first rescuer's ability and the swimmer's weight and condition. As with each of these methods, technique can be as important as strength.

Vertical underarm lift. One or two rescuers in the boat lean over the rail, grasp the victim's armpits or arms, and pull decisively upward, keeping the victim in column as long as possible. Because there are reports of separated shoulders or other injuries on the part of the victim, this technique was conducted with care. Two postures were tried: victim's back to the boat and victim's face to the boat. With a RIB, the victim reported that both postures were comfortable. With the whaler-type, the face-to posture was comfortable but the back-to posture was painful.

This method was also fast, effective, and easy to explain and understand. It should be done with care. A second rescuer may be necessary.

Leg and arm roll. The victim lies horizontal alongside the boat, head toward the bow, and lifts the upper arm and leg over the rail. One or two rescuers grab the arm and leg and roll the victim over the rail into the boat. The small rescuer who was unable to perform the life jacket lift on a 120-lb. person was successful with the leg and arm roll

Awkward as it looks, this method is easy to explain and simple to use. The swimmer needs a hand-hold to grab, which may be difficult with a RIB's smooth tube. A second rescuer may be necessary.

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2. Righting Dinghies from Inversion (Turtling)

Quickly righting a turtled boat is a valuable skill at any time, especially when sailors may be under the boat. In its reports on its 2005 study of 44 entrapments in capsized dinghies, Great Britain’s Royal Yachting Association stated, “The most effective rescue of a trapped sailor is to right the boat as rapidly as possible,” and “no technique was faster than the basic one using leverage from sailors to right the boat.”

Righting a turtled boat is not easy. An upsidedown boat is extremely stable, and the centerboard offers very little leverage to right the hull.



This 175-lb sailing instructor was able to right a 420 from a turtle, but not a 155-lb. instructor.



The young sailors at American YC put 230 lb. or more on the centerboard by piggybacking.

Self-rescue of a turtled boat. In its 2005 report on entrapment, the Royal Yachting Association concluded, “The fastest reliable rescue technique which worked for all boats was found to be two heavy sailors aboard the inverted boat, pulling on the centre board. Nearly all boats could be righted consistently inside 35 seconds in a range of conditions.”

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How much weight is “heavy”? To find out, sailors of different weights attempted to right turtled 420s. A man weighing 230 lb. (the boat’s weight) quickly got a 420 upright singlehanded. Pairs of 420 sailors whose total weight was around 240 lb. also had little trouble when they both pulled on the centerboard or piggybacked, with one sailor hanging off the board and the second hanging off the first sailor’s back.

A 175-lb. sailing instructor succeeded in getting a turtled 420 upright singlehanded. Yet another instructor who weighs 155 lb. was unable to do it even when he exerted a series of hearty jerks and pulls on the board. Occasionally a well-practiced, athletic small sailor can do the job. A 125-lb. woman sailor succeeded in righting a turtled 420 in the New York tests. At Stockton, a 138-lb., 5’9” 18-year old man righted a turtled Flying Junior in about a minute.

A crew or sailor weighing about 200 pounds or more should be able to right a Club 420 from a turtle except in extreme conditions. Technique is important; sailors should practice self-righting. If only one sailor is available, people in safety boats should be prepared to go into the water and assist in righting a boat in which there may be an entrapment. Obviously, every aspect – including hand signals, securing the rescue boat, radio procedures, and recovering the people – must be thought through, planned, and practiced.

3. Sailor Entrapment

The most serious concern with any capsized boat is that a sailor might be trapped in or under the hull. This was the cause of the fatality in the June 2011 accident at Annapolis. The factors at play include buoyancy, turtling, and entrapment by the rig. An on-shore reenactment of the Annapolis accident clarified these factors.

Entrapment by the rig. The young sailors wore “pinnies” (tight-fitting Lycra shirts) pulled over their life jackets and harnesses to prevent accidental snags with the rigging. They reported that some regattas ban pinnies because they may be used to disguise illegal life jackets.

By all accounts pinnies are effective. Their use should be encouraged.

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