Dealing with Entrapment of a Sailor Under a boat/and or in rigging

Entrapment happens when a sailor becomes stuck (connected unintentionally) to, or under a boat and is at risk during an emergency situation. This can happen during a capsize, turtle etc…. The purpose of this section is to minimize risks through safety standards and procedures.

Capsizing is a common occurrence in dingy sailing. Without quick reaction from the crew, a capsized boat will continue to turn over until the boat is turtled. Turning turtle means that the hull has completely turned over and the mast is vertical or nearly vertical below the water. Turtling is not a situation to be irrationally afraid of, however it is important for both athletes and coaches to understand the risks involved and be adequately prepared for situations where crew members may become tangled in rigging or submerged under the hull.

Situations where an athlete may be under the boat in a turtle or tangled in lines may occur on occasion. Coaches should aim to orchestrate a rescue from within the coach boat whenever possible. The coach boat is your primary safety platform and best tool for ensuring the safety and security of your athletes. The following is a basic response that can be applied any time an athlete MAY be stuck under the boat.

1. Immediately do a visual check of a capsized boat for sailor(s) depending on number originally in boat.
2. If only one of multiple sailors is visible, make sure the visible sailor is working toward or on the dagger/center board to prevent the boat from turtling.
3. If no sailor is visible or there are missing sailors, use a VHF radio to hail another coach boat or a coach on shore and indicate that you may have a crewmember stuck under the boat. If one coach immediately blow fleet to control (or shore depending on EAP) while working rescue.
4. Drive the coach boat to the mast side of a capsized boat, or far side of a turtled boat and look for the missing sailor(s).
5. If the sailor(s) are not visible:
   a) If turtled, attempt verbal contact with sailor:
   b) If the sailor is tangled but safe (established through verbal contact) in the air pocket, it is better to leave the boat in the turtled position until sailor can be cleared of the tangle. Forcing the boat into a capsize could cause greater injury or cause the sailor to lose the air pocket.
   c) If contact cannot be made, using either the shroud or the mast, begin to right the boat. Stabilize the boat in a capsize position (us a spare PFD to top of mast or leave the mast on the gunwhale of the coach boat).
   d) Skiffs (self-draining boats) have virtually no viable air pocket especially in rough weather so speed with safety is important

6. If this is a two-person rescue (instructor or safety volunteer), one may enter the water if it is safe, to free the athlete from the tangle, using either a knife or wire-cutters stored on the coach boat. If only one instructor is on the scene position the coach boat in such a way that you can access the athlete and attempt to free them with a knife or wire cutters.
7. It is important to remain calm and talk throughout the process. Fear or shock could turn a rescue into a life-threating situation for both the entrapped sailor and rescuer.
8. Once clear, if the trapped athlete is not responding immediately, activate your EAP.
9. Following all emergency procedures, debrief all athletes, coaches and parents of entrapped athlete on the incident and fill out required emergency form(s).

Most incidents will not progress past step 4 Most of the time, once the mast is stabilized the athletes are able to free themselves without any secondary injury.

Be prepared – Steps for on water training

1. Create a plan that integrates with a standard EAP that instructors use every time a boat capsizes.

2. Every coach boat on the water should have cross-over cutters suitable for cutting steel wire rope (Felco C7 are a reputable brand).

3. All coaches and mature athletes (especially those using spinnaker and trapeze with enhanced entrapment risk) should carry a sharp rigging knife with a sheep foot or Wharncliffe type blade attached to their PFD.

4. All coaches should also carry a VHF or Personal Radio that is monitored by other coaches and on shore, and a sharp knife in addition to the required safety equipment.

5. Instructors must be regularly reminded of the inherent dangers of sailor entrapment with capsizing. It is very easy to become complacent during a season.

6. Clubs need to share their problems and solutions. Communicating frequently with all staff members, administrators and volunteers will improve the safety of every program.

Rope or webbing cutters are also effective in releasing athletes from harnesses that become tangled in rigging. Gill, Spinlock, Magic Marine and other manufactures make a version that will cut up to 6mm line but are completely encapsulated in a nylon handle making it virtually impossible for a panicked sailor to cut themselves. Dive knives or Leatherman style knives should be avoided, as it is too easy to cut yourself when in an emergency. Usually cutting either both or one of the trapeze retractor shock cord or trapeze adjuster line releases the tension on the hook and allows the sailor to free themselves or at least gain enough freedom of movement to allow them to stay on the water's surface. Most of the other issues can be solved with a pair of wire cutters.

Club Responsibilities

Coach & Instructor Practice: As part of ongoing professional development coaches should be run through entrapment scenarios on the boats that they will be coaching prior to the start of their season. This will enable coaches to be calm and safe in a real rescue situation. This is especially important in boats using spinnaker & trapeze.

Sailor Practice: On low / no wind days, as an alternative lesson, athletes should practice entrapment procedures to reduce fear and phobias many sailors have getting stuck. This must be done carefully in a very controlled setting. Coaches / Instructors must be monitoring each sailor as they rotate through the drill.

1. The easy drill at a CANSail 1 & 2 level, is to have athletes turtle boat, then take turns going under the boat, into the air pocket and back out. One coach / instructor may be under boat for support. Remember do not force athletes through this drill if they are not comfortable.

2. Another drill is to use a capsized boat with buoyancy on mast. Have athlete punch way across under the sail.

3. When advancing to using Spinnaker & Trapeze, students should practice release trapeze techniques.

Common Entrapment Issues

Bridles: Many classes of boat have specific length and bridal heights, one of these reasons is to prevent booth athletes and other parts of the boat getting tangled in them which may lead to capsize, turtle or collisions.

Ex. Opti: Once satisfied that the bridle is tensioned correctly, add the bridle preventer. The bridle preventer should restrict the bridle to pulling no more than 10 cm from the boom in the event it loosens.

Safety Note: A loose boom bridle can hang below the boom in a "v" shape. It can trap a sailor's head resulting in possible capsize and catastrophe.

Vangs: Loose vangs, like loose bridals, easily get stuck on a sailors clothing, head or other parts. The vang should always have min tension to prevent it from sagging. If possible avoid line hanging down from vang.

Halyards: Two major issues with halyards in connection with entrapment include: loose line getting tangled after hoisting, which leads to feet and legs getting tangled on them in the bottom of the boat. As well as danger of collisions and capsize when trying to drop sails in rough weather. Some dingies have a pocket on the sail for halyard ends or a pocket on spinnaker bag that they can be put away in. At the very least loose lines should be coiled and tucked behind the tight halyard to hold against the mast.

Another major issue is halyards not being fully hoisted, causing the boom to be too low, leading to entrapment of sailors and increased capsize risk, not to mentioned increased risk of concussion. All boats should have halyards checked prior to sailors leave the dock.

Carabiners: These have become a cheaper securing method on some boats like Optis, instead of snap shackles or safety trigger shackles. These are not a safe solution, as clothing or other line can easily get pushed into them leading to entrapment, capsize and collisions. At minimum, a locking carabineer should be used.

Some athletes are using carabineers to attach water bottles and dry sacks to their boats. This is also a risk if line or clothing can get pushed in to the jaws.

PFDs: These can be another source of entrapment. Snug rash guards prevent lines or equipment from snagging on to the edge of the PFDs, however ill-fitting PFDs are problems themselves. Within junior sailing programs PFDs with collars and or crotch straps are a huge problem, the collars can get caught in bridals, vangs and mainsheet, crotch straps get caught on dagger boards and cleats. . No club should use collar PFD's for dingy sailing programs.

Load: Load is the pressure put upon a boats rigging. Heavy load can cause sailors to be pinned by the vang or boom, but also increase risk of capsize and breakage. A common issue that occurs in opti and laser sailing, is athletes raising the board too high. When gybing with heavy load, the vang pins the board preventing sheeting and leads to a capsize.

Toe straps: Many Skiff type boats use toe straps to assist trapezing. This could make it hard for Sailors to remove their feet if the straps are too tight. Athletes need to ensure that straps fit feet appropriately.

Masts: Hollow masts fill with water and go from being 25lbs to over 75lbs, making recovery harder turtling more likely, and increasing entrapment risk. Some classes have foam built into the headboard on the main sail to prevent this and many clubs use empty detergent bottles attached to head of sail, or pool noodles on shrouds, to help prevent or slow capsizing and turtling.

Phobia/Panic: Sailors will inevitably capsize either to leeward or to windward. The most important consideration when training sailors to deal with capsizes is to emphasize the importance of remaining calm. For instance, it's not uncommon for a sailor to end up underneath the mainsail or jib when a boat capsizes to windward. At first a sailor might be inclined to panic when he or she senses that there is something overhead. In this case, the sailor should be reminded that these sails are small enough that he or she can easily swim out from underneath. Another common scenario is for sailors to feel line or hardware caught around their limbs or on their trapeze hooks. Again, sailors must be reminded to calmly work to untangle themselves.

Entrapment and Trapezing

Coaches must be reminded that trapezing is a skill, not a reward.

Trapeze Entrapments
In order to manage the power of a doublehanded boat, sailors must trapeze. That is, they must wear a harness that features a hook, which is then clipped on to a bale suspended from the mast. The sailor then hangs, or trapezes, off of the side of the boat at full speed. Trapezing is exhilarating, but one of the inherent dangers is that during a capsize, the sailor may be unable to unhook from the trapeze and becomes trapped under the boat.

Solution: Reduce the Risk
Trapezing is often treated as a reward, or a fun thing to do at the end of a camp. This attitude increases the risk of dinghy entrapments because untrained sailors are introduced to the skill without the knowledge needed to deal with entrapment issues. Coaches must be reminded that trapezing is a skill, not a reward. Risk can also be retained by teaching sailors how to release themselves effectively.

Trapezing requires proper training and practice to do safely and efficiently.

Dinghy Entrapments: Trapeze bales
Stock trapeze bales have an extra loop, which sailors frequently catch on when they capsize, preventing them from unhooking and swimming away from the boat.

Solution: Eliminate the Risk
Replacing the bales with Ronstan bales removes this danger, allowing sailors to unclip easily, uninhibited by the extra loop.