

Line Tended Underwater Operations

Williamson County Emergency Management Agency Underwater Operations Unit
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General Considerations

Line tending is an extremely important part of a search and recovery dive operation. Underwater operations nearly always use a diver linked with a line to a surface tender. The line is used for communication, as guide for search pattern, and as a route for a safety diver to follow in the event diver assistance is needed. The third team member, the safety diver is also an integral part of this team operation.

Most search patterns utilize a diver and tender buddy team. For UOU searches, the diver and tender are truly a buddy team.

If the diver or tender comes off line, the diver should surface immediately and give the OK signal. Don't look for the line or waste time doing anything else. Coming off line is a buddy separation, and needs to be corrected immediately. Remember, the line is the only means of communication between the surface crew and diver in a non-FFM wireless search.

Because the line is serving as a communications device, the line should always be kept taught. If there is slack in the line, the diver and tender will not be able to communicate with line signals. Keeping the line taught is the responsibility of the diver, and only the diver. Although now have the ability to communicate with wireless audio interface between the diver, safety diver, and surface personnel, we will always use the rope as a life line during the arc search.

Line tender techniques

The line tender has several functions in a search operation. First, he/she is responsible for communication with the diver through the lifeline, and relaying any pertinent information to the DOC or other surface personnel.

The second function of the tender is to provide a base point (or in parallel searches a base line) for the search pattern. Because the base point of the pattern is critical, it is extremely important that the tender not move the base point. This usually means that the tender cannot move during the search period. For this reason, the tender should get into a comfortable position before setting the base point. Sitting down on a stool, bucket, or other stable platform is usually a good practice. A diver may search for up to an hour, so don't stand up if you can avoid it.

Providing a good base point can be especially troublesome in a boat search. A diver can exert sufficient force to move even a large boat if not properly secured. If a search is conducted from a boat, the boat must be anchored securely so that the base point will not move. A three point mooring may be needed if wind, current, or other conditions are causing the boat to move. Anchors should be of proper size, weight, and style to provide a secure hold.

The tender also provides a measured amount of line to the diver so that the search covers all of the given area. The amount of line the tender will provide to a diver varies with the type of search and must be agreed upon by the diver, tender, and DOC before the search pattern begins. Generally, when searching for smaller objects such as a handgun, shorter lengths of line are paid out with each pass. When searching for larger objects such as cars, more line can be given to the diver with each pass. Whatever the length, it should be the same for each pass. To search every inch of an underwater surface, no more than one arm's length should be paid out for each pass.

It is important to keep track of the distance between the diver and tender. If an object were found, the distance to the object may be an important piece of information for law enforcement personnel. If a diver were to come off line, we would need to restart the search from the point where it left off. For these reasons, we mark every pass a diver makes with a knot in the line. This has the added advantage of giving the tender a good handhold on the line.

Safety factors dictate that the search lines not exceed 120 feet in total length. If the diver had any problem requiring assistance at a distance of more than 120 feet, it could take too long for a safety diver to reach the search diver. In many cases, even distances less than 120 feet may be unacceptable. Use good judgment and don't let your diver go too far.

Perhaps the hardest part of the job for the line tender is to keep their mind on the job they are doing. There may be distractions from other people such as team members, members of the press, or law enforcement personnel. There may be discomfort due to bad weather or other bad conditions. There may be other duties such as note taking, or map drawing to be performed in addition to tending. And there is

the possibility of boredom or fatigue. The tender must always remember their primary responsibility is for their diver. No other duties are more important, and no distractions may divert the tender's attention. If the tender feels tired or bored, he should notify the DOC and bring the diver to the surface. A new tender should then be assigned.

Diver techniques

The diver's role in most searches is to act as the hands for the surface personnel. The diver's every move (within reason) is guided by the tender. The tender signals when to stop, when to go, when to turn, and when to surface. We express this philosophy by somewhat unceremoniously calling the diver the "dope on the rope". This is a rather rude statement, but it nevertheless is important to keep in mind.

The diver holds the search line in the hand closest to the tender and searches with the other hand. The diver must keep the search line taught so he is at the correct position in the pattern, and so he can communicate with the tender. The diver must keep the same anchor point for a good search pattern. We recommend holding the line in to the chest area. Many divers place a thumb or finger on a BC strap to easily maintain position.

For tended bottom searches, the diver needs more weight than for untended operations like sport diving. At least 5 extra pounds is needed, and 10 pounds may be used. When searching for small objects in zero visibility, it is important to feel with the hand and entire forearm. Sufficient weight is needed to keep the diver's entire body down in the mud. Ankle weights not only add total weight, but also help balance the weight load.

To change directions, rotate the body away from the rope and change hands on the line. The best methods for changing hands are where the second hand is secure before the first hand lets go.

Line Signals

Tender to Diver

- 1 Stop
- 2 Change Directions
- 3 Surface

Diver to tender

- 1 Return tender's signal - Stop
- 2 Return tender's signal - Change Directions
- 3 Found Object
- 4 Help

Other info

We have found the best line for tending is 3/8" polypropylene. This line is easy to work with, because it knots and unknots easily. It works quite well with a stuff sack. Stuff sacks allow the line to pay out smoothly and also allow the line to dry for storage. The line is thin enough that drag through the water is not a problem, but thick enough to be easy to hold on to. This line is static so it does not stretch.