

aus: Beyond the Blue...

<http://www.beyondmag.co.uk/cave/tlines.htm>

TOWING THE LINE



The cave diver's number one rule is always lay a line. Those ignoring this rule have usually ended up paying the ultimate price. But how many times have you been inside a wreck without laying a line...? As a cave diver I'm often told by open water divers that I must be mad to dive in caves, but in many respects entering a wreck even just a little way is exactly the same as cave diving, except far more dangerous! Caves are natural features and by their very nature inherently stable, whereas wrecks are man made and not generally designed to last underwater. Time and the elements soon start to take their toll on a wreck's structure, rapidly weakening it. After a while a situation can often develop where the density of the water surrounding it is all that supports the remaining structure. Replace that water with pockets of air (your exhaust bubbles) and that support is suddenly altered. In an extreme case this can result in the collapse of the whole structure although more often the short term result is the collapse of small particles into the water rapidly reducing the visibility. In practice, ceilings and walls can attract large deposits of silt, algae and rust particles, all of which are easily dislodged by a passing diver's bubbles. It's the fact that the diver is passing that makes the situation doubly dangerous as they are often unaware of what is happening behind them.

A diver swimming into a wreck is always moving into relatively clear water and it's not until turning round to exit that they encounter silt stirred up on the way in. By then it's too late to do anything about it. Visibility can rapidly reduce to a few inches blotting out all light and finding the way out becomes a matter of luck. Whilst not totally eliminating the dangers, a well laid line and an awareness of the threat to your visibility from above as well as below can greatly reduce the risks involved in this type of diving.

Line reels come in a wide range of shapes and sizes designed for many different applications. For short wreck penetrations probably the most obvious starting point for an open water diver is an SMB reel. These will usually hold about 40-50 metres of line and most divers already own one. This unfortunately is about their only advantage! Most SMB reels have some form of ratchet system to lock the reel unless a finger catch is released. Whilst ideal for towing an SMB around this can be very awkward when trying to lay line smoothly. For this application you're far better off either removing the catch system from an old SMB reel, or ideally buying a purpose built exploration reel. Purpose built reels come in a variety of designs and sizes usually made from a combination of plastic and aluminium. Aside from different capacities two main designs exist, open or enclosed. Open reels are generally cheaper and lighter but the line can sometimes spill off the sides causing the reel to jam. Enclosed reels generally avoid this problem although having said that, if you do get a jam on an enclosed reel they can be much harder to sort out underwater. Ultimately it's a matter of personal choice. Small safety reels are designed for jumping gaps between permanently laid lines or as personal search reels and usually carry about 50 feet of line. All divers undertaking any sort of penetration diving should consider such a reel as essential safety equipment regardless of whether they are following a pre-laid line or are laying their own line. Next up in size a Standard or Primary is used for laying the main exploration line. Holding anything up to 400 feet of line generally only the lead diver would carry a primary reel.

Various larger exploration reels are available and obviously if you build your own the sky's the limit but generally these only have applications in major cave explorations. Two points of caution here, firstly don't be tempted to load too much line onto a reel, particularly an open spool type as it can easily spill off the side of the spool leaving you with a jammed reel and a dangerous tangle of loose line. Secondly for the same reasons think very carefully before building your own reels. A reel which falls apart on you underwater could leave you with a lethal 'net' of several hundred feet of loose line between you and your exit point. So unless you're very confident of your engineering skills think twice before building your own reels...

In an overhead environment your dive line can be both your best friend and your greatest enemy. Not laying a line is undoubtedly the greatest cause of cave diving accidents, with badly laid lines running a close second. Just trailing a line behind you is not enough. The two most basic rules are keep the line taut and think where it's going to end up when you pull it tight when you next tie it off. Laying a line down a passageway and round a few corners in good visibility can be really simple. Trying to follow it back out again when you can only feel the line and not see it can be a different story. Good belaying (fixing the line to solid objects) and an awareness of where the line may pull into constricted sections difficult to negotiate on your return is the key to safe exploration. Wrecks usually provide a wealth of 'natural' belay points although these should always be checked for integrity and any sharp edges before use. Once inside, lines should ideally be laid in straight runs, belay to belay. Always try to avoid zig-zagging down passageways. A line which keeps jumping about means that you will probably have to keep crossing it. When crossing a line you are at maximum danger of getting snagged in it and also you'll have to change hands if physically following it. Changing hands may not seem a dangerous thing to do but that depends on how you are following the line.

If the line in your hand is under any tension as soon as you let it go it can easily 'ping' off into the gloom and unless the viz (visibility) is good you can easily lose it. If you are physically following a line you should do so using only your finger and thumb ringing the line in an OK signal. This will stop you actually pulling yourself along the line but you still need to be aware of any sideways tension you're applying.

So what to do if you do accidentally lose the line? Rule No. 1 - as ever in any diving situation, don't panic! At this stage it's probably only an arms reach away. The most important thing is that you don't lose your orientation so immediately grab hold of something close by or settle to the floor. If the visibility is good enough, do a visual search with your light remembering that if you hold the lamp as far away from your eyes as possible you will get less backscatter and better apparent visibility, (the same principle as car fog lights). Think carefully about how the line was laid on your way in. Which side of the passage was it on? It's now that you'll appreciate good line laying technique.



If you're in a large or complicated space and you still can't find your guideline you need to make a search using your safety reel. Tie your line off to a suitable belay on the passage floor and then assuming you have not lost your orientation turn at 90 degrees to the direction you think the main line runs. Then laying your safety line behind you but not belaying it on route do a detailed search in a loop along the floor, up the wall, across the roof, down the other wall and back to your safety line belay. If your main line has pulled against the floor or walls anywhere you should find it on route, whereas if it is free floating in mid passage by pulling in your looped safety line you should have ensnared it. Losing the line in the first place can be scary enough but finding it again and then not knowing which way to swim to safety can be just as bad. In cave diving situations lines are tagged with both distance and

direction markers, particularly at any junctions. Various systems are adopted, from simple knots in the line through adhesive tape markers to specially designed plastic arrows, which fix to a pre laid line.

Loosely laid line can be nearly as dangerous as no line at all, but even well laid line can sometimes catch out even the best diver. Check your kit configuration and look for things that might catch on the line. Secure all your gauges and hoses firmly so they don't hang down loose and tape up any loose fin straps and buckles. Fin straps are the most common thing to snag a dive line and next to back mounted tanks and valves can be the hardest to escape from. Only as an absolute last resort should you cut the line to escape from it, and then only after making sure you have a firm grip on the outward line you should cut it as close to your body as possible. Reaching a leg mounted knife can be difficult if you're in a confined space or have just trussed yourself up like a chicken so think about wearing an arm mounted knife. Most line entanglements are very simple and easily escaped from, but thrashing around trying fight the line can make things ten times worse quickly destroying any viz you may have had in the first place. So as soon as you realise you have a problem stay as still as possible and try to work out what's happened. Usually a simple movement in the right direction will free you or if your buddy is close to hand stay still and let them sort it out. The Domino Factor is a well understood phenomenon in cave diving. Don't let a simple loop of line round your fin strap get out of hand. A simple line snag won't kill you, but destroying the viz and losing the line just might...All this may seem rather over the top for a simple wreck penetration. In many situations this may be true but remember a wreck can be just as dangerous as any cave, often more so, and few cave divers would ever stray far from the safety of their guideline let alone ever dive without one.

Line laying and following sound all very simple but whole chapters of books have been written on the subject. So next time you see a film on the TV of cave divers squeezing through tight passages deep underwater and think we're all totally mad just sit back a moment and consider the last time you swam into a wreck without a line...

By Gavin Newman.