# Lessons To Be Learnt

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On the 19th of November 2006, three VSAG boats with some eleven divers headed out for a days diving from the Sorrento Boat Ramp. Based on conditions, it was decided to make the J2, or Broken, submarine the first dive.

**Background of the J2**

The J class submarines were built in 1917 and were given to the Royal Australian Navy by the British Government in 1919. Due to high operating costs and post WWI cuts in the defence budget, they saw little service. This soon resulted in a decision to scrap the submarines. Two became breakwaters, the J7 at Sandringham and J3 at Swan Island. In 1926 the J1, J2, J4 and J5 were towed outside the Port Phillip Bay heads and sunk in the ships graveyard.

The 84 metre long J2 settled in water 3 kilometres South of Point Lonsdale. The wreck is often referred to as the 38m Sub, but its exact depth varies according to the tide with the stern at approximately 34 metres and the bow at approximately 42 metres.

In the process of sinking the J2, the hull was blown apart just in front of the conning tower. For this reason the J2 is also know as the "Broken Sub". The break gives divers easy access to the inside of the submarine. Thus it has become popular with divers since it was rediscovered in 1974.

**On The Day**

Rob and Benita were the first pair to descend to the J2 from John Lawler's boat. John Lawler and I buddied up as the second pair. While having dived and penetrated the J4 submarine on a Wreck Dive as a part of my Advanced Open Water Course some months earlier, this was to be my first dive on the J2 submarine. I was treating this as a deep dive, with no intention of penetrating away from the light zone. I knew I would be quite safe with John as my buddy and the conditions were excellent.

Benita and Rob had a great dive and reported that visibility was about 7 to 10 metres. John and I entered the water, journeyed down the shot line, and started to explore the J2.

John showed me inside a rear entrance looking into the stern of the J2. Then we proceeded on the outside of the submarine towards the bow, checking out the break just forward of the conning tower along the way. Once at the bow we headed back towards the conning tower.

The amount and variety of fish about was brilliant. Visibility was about 7m to 10m. I was expecting there to be much less light at this depth and that the range of colours to be seen would be very limited. Yet I was surprised at the vibrant colours of the marine life that was all about us.

By the time we were back at the conning tower we had been underwater for 13 minutes, with a max depth of 38.4 metres and I was down to 100 bar. I signalled this to John, and we started our ascent together up the shot line. After some pauses

on the way, we stopped at 5m and hung around for the required deco time. It was a most delightful dive. (See http://www.borrett.id.au/divelog/index.php?nr=52 for my dive log and profile.)
Once everyone was back up and aboard the three dive boats, we all motored back inside the heads and stopped at Point Nepean to have our lunch. Then we headed off for a second dive on the Eliza Ramsden.
How good is this for a day out diving! Great company, great enthusiasm, great conditions and great dive locations.

**At Days End**

Back onshore after the days diving, Benita and I headed off to The Scuba Doctor in Rye, to get our cylinders filled and catch up with Peter Fear and some of the other divers we know who frequent Peter's dive shop.
Peter knows my diving history and is doing his bit to educate me in the ways of this fabulous sport. When I told Peter that we had dived the J2 he said, "You do realise that three people have died diving on the J2?"
Well of course, I didn't know this. Peter loaned me his folder of Coroners Reports and Incident Reports to read and learn from. What follows is my distillation of what I have now read about the last fatal dive on the J2 submarine in the Coroner's Report and an article written by the Victoria Police divers involved.

**Deaths On The J2**

In turns out that for many years divers untrained in penetration diving have been taken by commercial dive charter boats, plus ventured out in private boats, to dive on the J2 and other subs outside Port Phillip Heads. Many of these divers have successfully completed penetration dives. However, the anecdotal evidence is that many of them have also got into trouble.
Records reveal that in 1981 there was a fatality at the J2 sub when a diver "went missing". Some years ago another diver "disappeared" while diving at 38 metres on the "New Deep Sub". Then in January 1997, a women diver became the third fatality.
She was 28 years old and had been doing a penetration dive through the J2 submarine with her husband. She had 83 dives, 8 below 30 metres, and her husband had between 200 and 300 dives. They had both completed their Advanced, Rescue and Deep Diver certifications. Her husband had also completed his Dive Master certification and was also doing his course to qualify as an instructor.
The overall experience and qualifications of the group of 12 divers that dived from the dive charter boat that day was very high and included four Dive Masters and two Instructors. However, of the 12 divers, only three had any training in penetration dives in a closed overhead environment. Those three divers had all independently decided that conditions were so adverse that they wouldn't penetrate the J2 this day.
It was a warm overcast day, not particularly windy and the sea conditions were slightly choppy. The couple were first in at 9:50 am, with the Dive Master and deck hand having checked that their air tank was on, but not recording their air pressures. The couple checked each other's gear. They had decided that they would look at the wreck, but did not set complete parameters to their dive plan. There was no specific decision made as to whether they would or wouldn't penetrate the wreck.

Water visibility several metres below the surface was between 2.5 to 4 metres. At 39 metres, outside the sub, visibility was described as between 1 to 2 metes. One diver said that at the bottom of the shot line he could not see the submarine and after swimming around, found it 3 metres away!
After reaching the bottom they entered the J2 via a hatchway at the top of the submarine. They swam the length of the submarine inside, past the broken section and past the first and second bulkheads in the front broken section. There it started to silt out, further limiting visibility. They became disoriented and the decompression alarm was sounding on his dive computer.
He eventually made it back to the break, but then realised his wife was no longer with him. With just 50 bar of air left he proceeded back into the hull to look for her. Visibility was now nil. After experiencing a number of difficulties and extremely low on air, he was forced to abandoned the search. He made it back to the break and outside of the hull. Being so short of air, he had to make a rapid ascent to the surface, missing 27 minutes of decompression time.
Once those of the surface were alerted to the situation, rescue attempts were soon made by two of the more experienced divers on the boat. They knew it was likely that they would run out of air during the second dive and that residual nitrogen in their system from the first dive raised the possibility of decompression illness.
One diver, who started with 100 bar of air left in his tank and a small pony bottle which had already been partly used on the first dive, managed to explore on the outside of the J2 for signs of the missing diver. He ran out of air at 20 metres on his ascent, but made it to a hang tank with regulators, suspended on a line 9 metres below the surface. He remained at the hang tank until his dive computer indicated that he was out of decompression mode, then surfaced. He suffered significant decompression sickness and ended up having 10 treatments over a two week period in the decompression chamber at the Alfred Hospital.
The other diver, who started back down with just 100 bar of air in a 95 cubic foot tank, penetrated about 15 metres into the hull from the break as a part of his search efforts. His pressure gauge indicated he was out of air while still on the bottom. He did a mid water ascent to about 8 metres where breathing became difficult and intermittent. He tried to breathe slowly and ascended to about 3 metres. After about 1 minute at 3 metres he ran out of air, held his breath at that depth for about a minute, and then surfaced. To this day he remains a paradox in hyperbaric medicine, because he didn't exhibit any signs of decompression illness.
It was noted that while these two divers had courageously risked their own safety in an attempt to locate and save the deceased, this attempted rescue exercise had the potential for causing more than one fatality.
Conditions were now worse but a surface and air search was conducted. The Victoria Police Search and Rescue Squad decided to adjourn the underwater search until the next day because of the adverse conditions. However the next day, with a 3 metre swell on the surface and with winds gusting to 45 knots, the Police divers set about to retrieve the body. Conditions had become so rough, that the Lorne "Pier to Pub" swim event was cancelled.

Two Police divers descended with surface supplied breathing apparatus. One diver entered the section forward of the break while the other remained outside. The body of the deceased diver was found about 35 metres from the break, lying face down in a position that indicated she was probably swimming away from the entrance point. Her equipment was in place and subsequent testing of her equipment found that its condition was not a contributing factor.

**Coroners Report**

An Investigation was held and the Coroner, Max Beck, reported, "I find that she died when diving to a depth of at least 40 metres she penetrated 35 metres into the enclosed overhead environment of the bow section of the J2 sub where upon experiencing a complete silt out resulting in zero or near zero visibility she became separated from her dive buddy, disoriented and lost. As a consequence of being unable to escape from the hull of the submarine she ran out of air and drowned."

Max Beck, himself, was an enthusiastic sport diver, having completed many training courses including cave diving. It is reported that he took particular interest investigating this death, driving his clerks to frustration with the volume of evidence and material he had collected for the inquest.

At the end of the inquest, the Coroner found that the responsibility for contributing to the diving fatality was shared by the deceased herself, her dive buddy/husband and the dive master. The Coroner also made some interesting and quite insightful points about the voluntary Victorian code of practice, and suggested some changes to the standards be adopted.

The Coroner's comments about the dive included…

**On Penetration Diving the J2**

"Entering the enclosed overhead environment of the bow section of the J2 sub is clearly a technical penetration dive and such dives are always potentially risky because the usual direct route back to the surface (up) is not available. Such a dive should only be attempted by an experienced, properly trained and equipped buddy pair. And at this depth the need for extreme caution cannot be overemphasised. Deep diving compounds and increases the risks associated with a penetration dive. To safely attempt a very technical dive such as this, a diver should be certified by an accredited diver training authority, not only for deep diving, but also in skills relating to silt avoidance, silt management, avoiding entanglement, overcoming darkness, air supply management and the techniques in using special equipment such as torches, lines and reels in limited visibility."

**On Buddy Pairs**

"Broadly, a duty of care is owed by one to another whenever a relationship between them is sufficiently proximate and where it is reasonably foreseeable that a failure to act with reasonable care may cause harm to the other. The very nature of scuba diving, which entails some risk, means that dive buddies owe each other a duty of care. In circumstances where one dive buddy has considerably greater experience than another, the more experienced diver is reasonably expected to make decisions constant with that level of experience."

**On Wreck Diving Certification**

"Certifications by the Cave Diving Association of Australia are graded in four levels according to the degree of difficulty of the dive. Common sense suggests that wreck diving certifications should be graded in a similar fashion perhaps as follows:

Wreck Diver (exterior hull only)
Wreck Diver (penetration in light zone only)
Wreck Diver (penetration in non light zone, enclosed overhead environment, for a specified and limited distance).
The present system of certification of "wreck divers" is not consistent among the various diver certification agencies and has the inherent danger that a diver equipped with that ticket together with his natural, and, sometimes overwhelming, curiosity, may be inclined in the belief that he can execute a wreck penetration dive that he is not trained for. If wreck diving certifications were graded in three levels then it would make it clearer to divers (and Dive Masters) the limitation of their training and qualifications."

**On Dive Masters**

"I have this advice for Dive Masters on dive charter boats. They are the last thing between the diver and the deep blue. They have no control over the divers after they enter the water. I believe it imperative that they have a tailor made, typed up, (or written), laminated, formatted, detailed dive brief for every special or difficult dive. It can be handed to divers en route to the dive site to read and read aloud at the dive site and then hung on a clip in some convenient location for all to observe. This small piece of house keeping will not only protect Dive Masters, it may also save lives."

**On Reflection**

The sport of scuba diving that we love must always be undertaken with appropriate care and consideration for the associated risks.
Having been involved with sailing and gliding over the years, I'm very aware that major incidents like those described above, occur when a combination of things go wrong. After reading the material supplied to me by Peter Fear, I'm now even more aware of some of the things that can go wrong while scuba diving. It's important for one to learn from these incidents so as to avoid putting yourself in the same situation.
So, what have I learnt so far…
I've certainly learnt that I need to take even more responsibility for my diving and not rely as much on those I'm diving with. Just because you're the least experienced diver in the group, you shouldn't assume you can rely on anyone else. When you think it through, the buddy system in diving comes with some interesting Catch 22 type considerations. Yes, you're safer diving with a buddy, but it's not safe to rely on your buddy being there for you. In some ways, diving with a buddy actually increases your chances of being put in harms way. So the more you're both able to operate independently and not be reliant on each other, the safer you both are.
I should make sure I know more about any special or potentially difficult dive sites I dive on.
I should set more complete parameters as to the dive plan with my dive buddy.
I should better pre plan my dives. I suspect that I, like most people coming through the training system these days, tend to rely too much on my dive computer. Had mine failed during many of the dives I've done recently, I would not have known how much bottom time I was allowed or how long to spend at the various decompression/safety stops. Yes, I would have switched to the "standard" backup measures, but I should have been better prepared.
I should make changes to my dive equipment as appropriate for special dives. For example, even though we were not penetrating the wreck while diving on the J2, we were doing a

deep dive. For such a dive it would have been more prudent to have an independent second air source such as a pony bottle, rather than simply relying on having access to my dive buddy's air supply. Not knowing we were doing the dives we were, I hadn't taken my torches, line and reel, plus SMB onto the dive boat. They were back in the boot of my car where they were of no use to me.

I should learn to better understand my dive computer, its capabilities and limitations. Mine is supposed to be able to help me with the pre dive plan, and I need to learn how to use that feature.

I should be more aware of the emergency measures that can be deployed and the resources available in an emergency. Yes, John made sure everyone on board the boat was aware of where emergency resources such as the emergency oxygen, flares etc. were. But I'm not trained in the use of most of these resources and I need to do something about that. It was suggested that we have a deco bottle 10 metres down the shot line. Now that I better understand the benefits of this on such a dive, I'd certainly ensure it happened next time.

Okay, so I'm a relative newbie to this sport with an awful lot still to learn. But as with any higher risk sporting activity, no matter how much experience you have, one can't afford to become too complacent about what you're doing.

As you can see, it's all about taking more responsibility for ones own diving and making sure you're properly prepared for the task at hand. By doing so, each of us can enjoy their diving more and dive in greater safety.