

Submarine Rescue since the KURSK sinking

From the perspective of InDepth Project Management Pty Ltd, an independent consultancy specialising in submarine rescue and safety management.

2000 will probably become one of the defining years in submarine rescue. The year began with the closure of tenders by the US Navy for a new rescue system to replace its Deep Submergence Rescue Vehicles (DSRVs). Plans were announced by NATO for a Project Definition Study into its seemingly eternal Submarine Rescue System (SRS) and two major submarine rescue exercises were held: *Sorbet Royal* in the Mediterranean and *Pacific Reach* in the South China Sea. Interspersed between all of that was the tragic loss in August of the Russian Oscar II submarine, the *KURSK*.

THE KURSK

Not surprisingly, the issue that occupies the thoughts of submarine rescue professionals the most is the loss of the Russian submarine *KURSK*. Coming at a time when both NATO and a group of Western Pacific navies were, coincidentally, planning major submarine rescue exercises, the disaster contained all the lessons one could ever hope to learn from such a mishap.

The first lesson is to recognise that information will be sketchy, especially at first. Despite, or perhaps because of it, the world's media will descend upon the unfortunate naval headquarters seemingly like vultures in their quest for news.

Aligned with the first lesson is the second: Unless national security is directly threatened, be as honest and open as possible. If the spokesperson does not know the answer, say so. Merely announcing as facts what is probably a guess is as damaging as direct deceit.

The third is right up with or perhaps even ahead of the first two: Maintain and practise an effective, deployable rescue capability,

recognising all the time that others around the world will be keen or even desperate to help.

The inherent inertia in political circles makes early escalation to that level vital when a foreign submarine is involved since little or no understanding of the issues can be assumed. It may even be that the differences between plucking yachtsmen from the ocean and deploying a unique submarine rescue system halfway around the world are not easily understood, difficult as that may be to believe.

Theories abound as to the cause of the sinking. For what it's worth, my view is that collision is the least likely of all the ideas being bandied about. Submarines are remarkably resilient to pressures from outside – internal explosions are far more difficult to withstand and the recent experiments with liquid propellants such as high test peroxide do more to recall the explosion in HMS *SIDON* in 1953 and the problems associated with *EXPLORER* and *EXCALIBUR* than the high performance offered by the fuel. If the theories are correct that the Russian navy was trialling HTP as a replacement torpedo propellant, then some form of hot run may well have been the trigger.

USN PRESSURIZED RESCUE MODULE

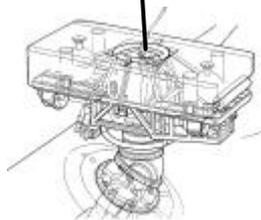
To adopt a phrase from the British TV series, *Yes, Minister*, the US Navy made a courageous decision in the late 1990's in embarking upon a Submarine Escape and Rescue Revolution. This "revolution" was centred upon use of a Remotely Operated Rescue Vehicle (RORV) (or Pressurized Rescue Module (PRM) in USN terminology) to replace the sophisticated but expensive DSRVs.

The revolution also includes the incorporation of the UK Mk 10 Submarine Escape Immersion Equipment into the US submarine fleet, development of pressure-tight pods for "posting"

of Emergency Life Support Stores (ELSS) into a disabled submarine and development of the "Newtsuit" into a 2000 ft "Hardsuit" as an Advanced Underwater Work System.

The PRM was inspired by the success of the Australian *Remora* system and will be designed and built by Hardsuits Inc of North Vancouver sharing the pedigree of both *Remora* and the Hardsuit. As with any new concept, the concept has its share of detractors, with the most common concern being the risk of snagging by the umbilical.

It is appropriate here to put that misconception to bed. Not only has the offshore oil and gas industry been managing umbilicals in and around all sorts of underwater obstructions for several years, but the umbilical used by RORVs such as *Remora* and the PRM is nowhere near as the flaccid "hosepipe" associated with small ROVs *Scorpio*. The diameter of the RORV umbilical is 40mm in **before** the addition of armour plating and is suspended vertically by a series of floats. These disengage the RORV from surface as providing a means of umbilical clear should it ever prove necessary to jettison the device.



The risk of snagging such an umbilical is far less than that experienced by a Hardsuit or small ROV, both of which are happily deployed in every submarine rescue scenario known to this writer.

As with every form of submarine rescue, the PRM will have its share of compromises. Utilising the skills resident **and practised** in the offshore oil industry, it should be very cost-effective since there will be far less of a requirement to deploy purely to keep piloting skills alive and, apart from a core team, the bulk of the pilots will be drawn

from industry. Since it is based on offshore oil industry technology, it will be similarly deployed from ships of opportunity, typically one of the thousands of rig support vessels plying the oilfields of the world. That will bring its own launch and recovery limitations with rescue under ice difficult if not impossible to achieve.

Transfer Under Pressure from submarine to treatment chambers is second nature to saturation divers although the pure logistics of treating an entire crew from the largest SSBN has forced the scale of the system to be wound back to a more realistic 62. The USN will finally, however, have access to TUP, a capability denied it since the decommissioning of the ORTOLAN class rescue ships.

Adoption of the same industry "norms" has resulted in widespread use of the ISO shipping container dimensions meaning the largest component will be able to fit into a C-130 Hercules. Larger aircraft merely make the problem less complex.

Control of the vehicle from the surface may remove the pilot from feeling he/she is almost touching the target but will also remove the pilot from the pressurization aspect of submarine rescue as well as allowing a far more comfortable operating environment. After all, ROV pilots have been undertaking extremely complex tasks for some time now. All in all, PRM will be a modern system using industry to sustain its skills.

NEXT EDITION

In forthcoming issues, I plan to expand on the submarine rescue exercises *Sorbet Royal* and *Pacific Reach* as well as Australian plans for development of its Submarine Escape and Rescue Service. Feedback is welcomed and, if desired, will be published. Contact us at the addresses below.

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