

Beneath the Waves



The Irish Naval Service Diving Section (NSDS), based in Haulbowline, fulfils an ever-growing number of challenging and potentially hazardous roles for the state. From search and recovery to drug interdiction, naval



and combat diving training, the Naval Diving Section is a highly trained, constantly evolving element of the service. Lt (NS) Darragh Kirwan speaks to SIGNAL Magazine. By Ruairi Kavanagh.



Diving-A Brief History

The first known dive was in effect a combat diving operation. During the war between ancient Greece and Persia, during a naval campaign, the Greek sailor Scyllis was taken aboard ship as prisoner by the Persian King Xerxes I. When Scyllis learned that Xerxes was to attack a Greek flotilla, he seized a knife and jumped overboard. The Persians could not find him in the water and presumed he had drowned. Scyllis surfaced at night and made his way among all the ships in Xerxes' fleet, cutting each ship loose from its moorings; he used a hollow reed as snorkel to remain unobserved. Then he swam nine miles to rejoin the Greeks off Cape Artemisium.

The desire to go under water has probably always existed: to hunt for food, uncover artefacts, repair ships or indeed sink them and perhaps just to observe marine life. Until humans found a way to breathe underwater, however, each dive was necessarily short and frantic. How could one stay under water longer? Breathing through a hollow reed allows the body to be submerged, but it must have become apparent right away that reeds more than two feet long do not work well; difficulty inhaling against water pressure effectively limits snorkel length. Breathing

from an air-filled bag brought under water was also tried, but it failed due to re-breathing of carbon dioxide. In the 16th century people began to use diving bells supplied with air from the surface, probably the first effective means of staying under water for any length of time. The bell was held stationary a few feet from the surface, its bottom open to water and its top portion containing air compressed by the water pressure. A diver standing upright would have his head in the air. He could leave the bell for a minute or two to collect sponges or explore the bottom, and then return for a short while until air in the bell was no longer breathable.

In 16th century England and France, full diving suits made of leather were used to depths of 60 feet. Air was pumped down from the surface with the aid of manual pumps. Soon helmets were made of metal to withstand even greater water pressure and divers went deeper. By the 1830s the surface-



Lt Darragh Kirwan (NSDS).

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All naval divers in the Defence Forces fulfill other more conventional roles within the Naval service.

supplied air helmet was perfected well enough to allow extensive salvage work.

Starting in the 19th century, two main avenues of investigation - one scientific, the other technological - greatly accelerated underwater exploration. Scientific research was advanced by the work of Paul Bert and John Scott Haldane, from France and Scotland, respectively. Their studies helped explain effects of water pressure on the body, and also define safe limits for compressed air diving. At the same time, improvements in technology - compressed air pumps, carbon dioxide scrubbers, regulators, etc., made it possible for people to stay under water for long periods.

Since then, continuous progression in technology, technique and safety have rapidly changed the practice of diving, and what began as something of necessity has developed into a highly advanced and skilled discipline.

Modern Naval Diving In Ireland

The Naval Service began to see the need for divers back in the late-1960s. At that time it was mainly for checking the underside of ships and making sure everything was clear and in working order. They would be relatively simple tasks in maybe 10 or 20 metres of water. From that it evolved into other aspects. The role of naval divers grew to encompass other roles, such as search and rescue and search and recovery.

“From the late 1960s to early 1980s, our Naval Diving personnel trained with the Royal Navy,” explains Lt Kirwan. “What happened was, people who had an interest or a proficiency in diving here were sent over to the UK to receive a recognised qualification. We already had links with the Royal Navy through our naval cadetship programmes, so it was just an expansion of that link. In 1982 we acquired a recompression chamber here which enabled us to train our own divers from a health and safety point of view since the majority of accidents occur in training. From the start of the 1980s onwards we started conducting our own training here in Haulbowline. As a diving unit we are different from many other similar units in other military organisations. Naval Diving is something which our divers do in conjunction with their other roles in the navy. There is a rotation system in place to ensure that we have enough divers on-call at any time while other members are going about their other naval duties. So when we are not at sea or engaged in our other jobs within the service we are on-call for the Naval Diving Section.



The recompression chamber.

This requires constant drilling and equipment checks to ensure we maintain a high state of readiness.”

The courses that the Naval Diving Section have conducted from the start of the 1980s include: basic naval diving, supervision course, recompression chamber course and they are also involved in training the Army Ranger Wing (ARW) in combat diving. “We are a purely operational unit who specialise in all areas of naval and combat diving, with

they react to the water and to possible effects of claustrophobic equipment such as face masks. It is vital that we focus on the mental aspects at this stage because once the course starts it plays a major role. We also conduct a full diving medical which is fairly intensive in terms of fitness, this is designed to highlight such things as any deficiencies in lung capacity. The medical is in addition to the standard Defence Forces medical examination. Then the naval diving course itself

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continuous drills, procedures and training. The very nature of our job requires a high and consistent skill level.”

The Training

To become a member of the Naval Diving Section you have to register for a pre-course, open to anyone in the Naval Service of all ages. This course involves a water-based aptitude test, where candidates undergo a basic test of their water skills. This involves some jumps and simple dives to see how they react to the environment.

“In the very early stages we focus on the mental aspects of the students, such as how

starts. It begins with three weeks physical conditioning, this would include weight training and water fitness designed to build up both upper and lower body strength. Finally, swimming is vital in the Naval diving section, especially in areas where boats cannot reach but a diver can on the surface, where he can then commence his dive.”

This phase of the course culminates with a specialist diving fitness test which is quite stringent. If students progress from that they move on to the diving phase of the training. The diving course lasts nine weeks. “The first two weeks we focus on water orientation, safety drills and endurance. In the first

10-14 days we aim to have recruits in the water for 1500 minutes. At this phase we are concerned with making our divers comfortable in the water, they need to know how to react and how to stay calm in this environment, one that is potentially lethal, that's something we constantly reinforce. At this stage it will become evident if there are some people who are not up to the demands of the

where each diver is. It is in that week we would be looking to have our divers clocking in well over 1000 minutes, which is a hell of a lot of time to spend in the water. On Tuesdays and Thursdays we also conduct night dives, which is of course another vital attribute of the Naval Diving Section, the night dives also help us gain a further insight into the mental attributes of the students."

Throughout the training, obviously reaching a peak in the later stages, we also train students to work with underwater tools. These tools are required for such tasks as cutting and burning through various heavy materials, such as gaining entry to a sunken vessel. To hone these skills we normally spend two weeks on Bere Island in West Cork where we conduct pre-planned diving searches off the coast as well as an introduction to Surface Supplied Diving Equipment, where compressed air is pumped down umbilicals to the diver below. This equipment was used during the salvage of the Kursk submarine in the Arctic ocean. Typically we would send divers to search for a vehicle or vessel which we know to be lying on the seabed in a certain area. For the students it is their first encounter with the true nature of operational naval diving.

To exacerbate both the physical and mental demands that are requisite in the Naval Diving Section, courses are held either directly before or after Christmas, when weather conditions are at their most severe. "The reason we do this is to try and replicate the conditions which our divers may be most likely to encounter. The water here in Cobh can be quite pleasant in the summer, but it would serve little purpose training our divers in such conditions," explains Lt Kirwan. "Our mem-

Our members are far more likely to be called to an incident that occurs in dark, cold water in the dead of winter, that's when accidents are more likely to happen.

course and it becomes necessary for us to jettison them. It's not something that we look forward to doing but unfortunately it is the stark reality of naval diving. In the second week we progress to what are basically underwater racetracks. They are designated circuits which recruits use to further build up endurance, swimming skills and breathing techniques. These circuits have markers which can tell us

The next phase of training involves building up operational experience for divers. "This is again another step forward for our personnel as they move to another operational environment. In this phase they would be working on the underside of vessels, learning how to maintain their buoyancy and work mid-water in currents. We then carry out seabed and river searches, which also form a big part of the job.



Mine clearance off the Southern Iraqi coast. A well-placed mine in a shipping lane can cause chaos according to Lt Kirwan.

bers are far more likely to be called to an incident that occurs in dark, cold water in the dead of winter, that's when accidents are more likely to happen, when the water is pitch black and visibility is basically zero."

Procedures and Technology

"In our own Section, we exclusively practice air diving, which is limited to 50 metres. This is related to the breathing mixture that we use. To go deeper requires mixing of nitrogen and/or helium with oxygen. For our own operations and drills, we can dive up to 42 metres without requiring access to a recompression chamber. Anything deeper than that requires a chamber. These are our safety procedures which we adhere to strictly. We have never lost anyone in either training or during an operation because we adhere strictly to these procedures. That said, diving is highly unpredictable, on any given mission at any given time something can go wrong."

The Naval Diving Section also conducts orientation weeks which introduce divers and recruits to the equipment most frequently used in the Naval Diving Section such as the recompression chamber and the Remote

operated vehicle (ROV). The ROV is a small submersible vehicle connected to the surface via a tether. It has proved highly valuable in a wide range of operations and is fitted with its own sonar, cameras and grab arm. "Our technology in general has improved massively, we now have equipment that enables us to create an image of a search area prior to diving."

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These technological advances have greatly increased the capabilities of the naval diving section, what previously depended almost exclusively on manpower can now be ably assisted and enhanced by technology. "This technology is a massive help, but manpower and indeed luck will always play a very large part in any Naval Diving operation," says Lt Kirwan.

The Roles Of The Naval Diving Section

The roles of the Naval Diving Section have

constantly evolved to answer new challenges since the notion of establishing a diving unit was conceived originally. All the roles which the unit undertakes are done in conjunction with their other assigned roles within the Naval Service.

Search & Rescue: "It is not entirely accurate to list Search & Rescue (SAR) as one of our functions. Although we do have SAR capabilities, we are not a standing SAR service. When we are called to respond to any such incidents it would be better to describe our function as Search and Recovery, as we are generally used to recover whatever may be lost, be it a vessel, an object or indeed a body. We work alongside the Gardaí, Customs & Excise, Coastguard and the Fire Service in many of these operations."

Underwater Engineering: "We work on our own naval vessels in this respect, carrying out surveys, repairs and fault checks on our fleet."

Ordnance Disposal: "We have divers trained with the Royal Navy in this discipline. We send our officers over once every four years

in order to keep our training level current. I am a certified Clearance Diving Officer, I did my course in '98 and was the fourth member of the service to complete it, the course qualifies me to participate in and supervise mine clearance operations. The course consisted of four months diving and two months ordnance disposal."

While the very use of mines has attained an abhorrent status; the continued presence of mines in many theatres of conflict comes down to one simple reason according to Lt Kirwan. "Mines are still an effective military tactic, particularly in a maritime scenario. If you have one mine tactically located in a sea-lane, you can effectively delay an entire attacking force. In the '91 Gulf War, the Iraqis had deployed a poorly designed minefield in the Persian Gulf but they still caused a considerable delay for Allied landing craft. The most common tactic is to clear one straight



ROV: An integral asset for modern Naval diving.

path and move all your vessels through there, but mines also have a powerful mental stigma.

"If you find one, how do you know there is not another? And another? Our personnel are trained to counteract the many different types of mines that could be encountered in a naval operation. The most common designations are buoyant mines and ground mines. Modern mines are designed to be almost intelligent in some respects. For instance ground mines can be fitted with rockets that will make them launch toward something. Buoyant mines on the other hand are set to a certain depth, generally two or three metres below the surface. They work indiscriminately. If any vessel comes into close proximity or contact with the mine a circuit is triggered and the mine explodes. While a standard buoyant mine would be unlikely to sink a ship, they can cause considerable damage and delay." They also last a very long time, even today operational buoyant mines dating from the Second World War can be found in Irish waters.

Security and Surveying: "This is a role which we occasionally have to fulfill. For instance, we have done security sweeps for the passage of the QE2. Basically we carry out any sub-aqua security tasks that may be required by the state and relevant agencies within the state. In a surveying capacity we have worked alongside the national heritage service, An Dúchas, in a number of surveys and searches. That is interesting, if occasional, work."

The above broadly defines the roles of the Naval Diving section, but it is a unit which is constantly evolving to meet new challenges. "If we are needed to do something and it is within our capabilities to do that task, then we are ready to do it."