Sub Lt O'Regan and Sub Lt James Deacon. Both officers are involved in the implementation of the Lirguard system.

The Naval Service is the arm of the Defence Forces tasked with enforcing National Policy at sea. In addition to its conventional role as part of the Defence Forces it is also tasked with many other responsibilities in areas such as Fishery Protection, Drugs/Arms interdiction, Pollution Control and Monitoring, Search and Rescue/Recovery.

As part of its Fishery Protection role the Naval Service is tasked with enforcing both National and European Union Fishery Law within Ireland's 200 mile Exclusive Fishery Limits (EFL). The 200-mile limit represents an area of approximately 132,000 sq miles or almost six times the size of Ireland. The Naval Service also conducts patrols in areas beyond the 200 mile limit as part of Ireland's contribution to EU commitments to international agreements, and operates the national Fisheries Monitoring Centre staffed on a 365 day basis, and tasked with monitoring all fishing activity in Irish waters. "Within those waters, we have the responsibility to monitor the activities of trawlers, as well as coordinate the activities of our patrol ships," explains Commander Gerard O' Flynn "Since January 2000 all fishing vessels over 24 metres are required to transmit their position via satellite. The Fisheries Monitoring Centre is responsible for monitoring these transmissions using a Vessel Monitoring System (VMS). This requirement was extended to all fishing vessels over 18 metres in length from January 2004 and will further extend to vessels over 15 metres in length from January 2005."

The Fishery Protection activities of the Naval Service and the Air Corps are co-ordinated and monitored by the Fishery Monitoring Centre.

The Fishery Protection activities of the Naval Service and the Air Corps are co-ordinated and monitored by the Fishery Monitoring Centre in conjunction with Naval Operations Command. In order to carry out its functions, the FMC liaises directly with a number of other external agencies such, such as the Department of Marine and Natural Resources, State Solicitors, Harbour Masters and other European Member State FMCs and other Third Countries. The Naval Service has automated its fishery protection function to a large extent using database and Geographical Information Systems (GIS), which have been developed and in use since the mid 1990s.

The Naval Service has undertaken a major analysis and design project in relation to its fishery control requirements. The project is known as Lirguard. The project

has identified a number of information systems that are required to support the Naval Service Fishery Protection activities.

What is Lirguard?

As Sub/Lt. James Deacon, who is the project manager, explains "Lirguard is basically an advanced Vessel Monitoring System (VMS) together with a series of applications that can analyse and display fisheries information, developed under contract with IT companies, such as Hewlett Packard and Bluefinger, UK. These applications include a Fisheries Information System, a Geographical Information System, and a Fisheries Legislation System. Lirguard also provides the communications infrastructure to enable fisheries information to be relayed by the FMC to all Naval ships and stakeholders, such as the Air Corps, the Department of Defence, the Department of Marine and Natural Resources (DCMNR), and the EU, on a near real-time basis".

Lirguard enables us to find out where all compliant trawlers are, at any one time within the Irish Exclusive Fishery Limits.

Each trawler transmits its position over satellite to a land-earth station. This geographical position is then transferred via a secure communications protocol known as X-25, to the Fisheries Monitoring Centre where it is processed and stored in the Fisheries Information System database. The Lirguard fisheries information is overlaid on a detailed interactive map of the Irish coastline and the Irish patrol areas. The position of all vessels fishing in Irish waters is displayed in the FMC, where Naval personnel can access data on each trawler by simply clicking on an icon. The icons representing each fishing vessel are colour-coded system for ease of identification. The Lirguard system can also access data on Irish trawlers operating anywhere in the world. All EU countries are required to have a comparable system to Lirguard, where they can access near real-time data on fishing activity in their waters. They can also monitor the activities of fishing vessels from their own countries operating in foreign waters. "Lirguard enables us to find out where all compliant trawlers are, at any one time within the Irish Exclusive Fishery Limits, and it also provide valuable information used to plan our naval patrols. Lirguard will enable our ships to access the fisheries information and a geographical display of fishing activity within a similar time frame to the FMC. It will also assist the Air Corps in directing their maritime patrols."

Lirguard Phase One

The first phase of the Lirguard project, named after the Irish god of the sea Lir,

Sub Lt James Deacon in his office at Haulbowline. The Lirguard system, when completed, will be a major boost for fisheries monitoring within the Naval Service.

Lirguard is designed to be flexible in relation to new EU fishery laws.

provided for the establishment of a Vessel Monitoring System or VMS. "Phase one has seen the successful establishment of VMS, and has been in use since 2000. To date VMS has only been available to the FMC and profiles of fishing activity are satellite faxed to our ships at sea". Other fisheries information ranging from basic details of each fishing vessel to records of inspections are entered on a database in the FMC and replicated on all ships systems. While at sea information is transmitted to ships via satellite.

Lirguard Phase Two

Phase Two of Lirguard, due to be completed in 2004, and has two main elements "One is the upgrading of our VMS system, the other is the amalgamation of our VMS data and all fisheries information that we obtain from our ships, DCMNR, the Air Corps and EU sources. We can then compile a geographical display of all relevant fishing activity, which can be accessed by Naval Patrol ships. They will be able to query the data in real-time." This phase of the Naval Lirguard Project will see the culmination of years of development and organisational learning, resulting in the real-time display of positional data in addition to a comprehensive upgrade of database services to the fleet and external clients ashore. Lirguard Phase Two will also include the setting up of an interface with the Department of Communications, Marine and Natural Resources to allow for the exchange of data concerning fishing activity, legislation, licence information, and inspections.

"We will also be receiving information from the Air Corps into the system, who in turn will be able to access Lirguard data to assist in the planning of a maritime patrol. After each flight they can upload their sightings onto our system for cross-referencing, and onward transmission to all Naval ships. We also have links to the EU providing access to vessel monitoring data from our system".Future enhancements include the possibility of using a radar picture taken by satellite to assist with this monitoring process.

Purposes Of Lirguard

"The Lirguard system has to be flexible to cater for any changes within fisheries law and fishing practices. For instance if new laws come into effect governing fishing in a certain zone, we can modify Lirguard accordingly".

The Lirguard applications automatically generate alerts based on the position of vessels in relation to restricted areas. For example, if a fishing vessel enters an unauthorised zone then an alert is generated on the system and Naval Operations directs the ships to take appropriate action.

"If a fishing vessel ceases transmission while at sea, Lirguard generates an alert in the FMC. The FMC is obliged to contact the operators and the fishing vessel is required to report by an alternate means until such time as the problem is rectified"

The development of Lirguard by the Irish Naval Service will give Ireland international recognition as a world-class user of information technology in the area of fisheries control and monitoring. "Although the Lirguard system is designed specifically for fisheries protection it also has a potential role to play in assisting safety at sea, or Search and Rescue (SAR) operations. For instance if a vessel got into

The Lirguard system has to be flexible to cater for any changes within fisheries law and fishing practices.

difficulties at sea, the system will provide its most recently transmitted position"

In that respect the Lirguard project has very useful ancillary benefits to seafaring in general. January 2005 will see a significant increase in the requirement to monitor fishing activities using VMS and Lirguard. All fishing vessels over 15 metres in length will be required to be VMS compliant from that date. Lirguard will assist the Naval Service to meet this requirement. However, there is still a heavy requirement for physical patrolling and enforcement by ships at sea. "For instance we may know that a vessel has spent too long in a restricted fishing area, but we don't know for definite that the vessel is fishing. There is still a reliance on physically patrolling these areas."

The system functionality includes the ability to run a video-type replay of a vessel's recent activity, which can be very useful both from a fishery enforcement and a sea safety perspective. The system can run a historic track, which gives an indication of the vessels' previous movements in Irish waters. The positional accuracy of the Lirguard system is based on the Global Positioning System (GPS), which gives an accuracy of approximately two metres. For instance, you can see down to a variance two metres where a fishing trawler is located at a pier in Dingle.

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Cdr Gerard O'Flynn has overall responsibility for the Lirguard project. "On a day-to-day basis the primary activity of the Naval Service is the provision of Fishery protection services based on outputs agreed with the Department of Communications, Marine and Natural Resources (DCMNR). We are fortunate within the Naval Service to have people who are capable of managing such a sophisticated project. Lirguard is another example of the Naval Service expanding its portfolio of activities, while simultaneously generating efficiencies in its use of resources. We are also benefiting from our ongoing engagement with companies such as Hewlett Packard and BlueFinger. Officers working on the project, such as S/Lt James Deacon, Lt Cdr Martin Brett, Lt Cdr Ronan Boyle, Lt Cdr Chris Nalty and Lt Tom Hobbins will in due course be rotated to sea, and their experience on the project will reap a generous dividend. Lirguard will enhance the effectiveness of our patrolling and provide for a more efficient deployment of our ships, in turn contributing to a strategic aim of providing value for money services. We are broadening our skills base and ensuring that all of the stakeholders are provided with relevant, accurate, and timely information."

"Lirguard is yet another example of the Naval Service expanding its portfolio of activities."