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MANAGING RISK

Based around C-Scope technology from Kongsberg Nor-control IT, the new Vardø VTS enables the Norwegian Coastal Administration to monitor ships from the Russian border in the Barents Sea to Rørvik, Norway.

It is located at 70°21'N – 31°02'E, making it one of the northernmost VTS operations in the world. And covering some 11 000km of coastline, a figure which increases to 25 000km if islands are included, it is also one of the world's largest. In fact, says Project Manager Høgne Sperre, it is equivalent to the distance around the earth's equator. 'Flying from top to bottom could take up to two and a half hours,' he adds.

The primary function of the system is to monitor the oil and gas transportation along the environmentally sensitive Norwegian coastline, where fisheries and tourism are key industries. 'A key aspect of the

specification was to keep track of dangerous cargoes. The waters are very harsh and the region is in permanent darkness for six months each year. And it was necessary to supervise the increasing tanker traffic navigating the area,' explains Sperre.

Safety focus

All ships over 5000gt and ocean towages entering the Norwegian Exclusive Economic Zone (EEZ) are requested to report to the Vardø VTS when entering the coverage area. Operators typically monitor about 200 vessels daily, of which 10-20 receive special attention due to their size or risk of pollution. Sperre believes that the safety record of tankers has, together with their size, increased in recent years. 'In general, they are better maintained and in better condition,' he states.

Nonetheless, there are always exceptions to the rule.

'The condition of some Russian vessels is questionable and if they experience, for instance, engine trouble they are not forthcoming with this information. They sometimes inexplicably lose speed and as a result their movements can be unpredictable. This presents a safety risk not only to themselves but also to other vessels nearby,' he says. To reduce this risk, if a vessel's speed falls below a certain threshold, an alarm is raised on the VTS operator station.

Furthermore not all vessels have access to sufficiently accurate or up-to-date navigational charts. If this is the case, the VTS operators may be required to guide the vessel, especially during difficult weather/rough seas in the winter. Another task is to oversee ship-to-ship cargo transfer. 'We are seeing more and more ice-classed tankers. Once they reach northern Norway, the cargo they are carrying is trans-

ferred on to conventional vessels. From an environmental perspective, this is a particularly risky operation,' explains Sperre.

Indeed just two months after the Vardø VTS went online, it proved its worth when the VTS team had to work in close cooperation with the Norwegian Joint Rescue Coordination Centre at Bodø to assist in saving the 101m long oil tanker, BBC *Iceland*, from grounding. The ship was carrying a mixture of pollutants including heavy oil and diesel oil and at one point was only 1nm from shore.

This incident also demonstrated the effectiveness of the procedures put in place for operators. According to Sperre, designing these operational procedures is typically one of the biggest challenges involved in ensuring the success of a project. The task was made all the more difficult by having to cater for international — and in particular Russian — traffic as well

Big in Vardø

In January this year one of the world's largest VTS was switched on at Vardø on the northern tip of Norway. *MIT&E* takes a look at the technical specification

ticular Russian — traffic as well as a growing number of cruise and other passenger vessels.

Operator support

The Vardø VTS includes multiple VTS operator workstations, dedicated maintenance facility, and redundant web interface. A distinguishing feature, however, is the special Operator Support System (OSS), which is in place next to the standard graphical chart interface. The OSS — developed by the Norwegian-outfit Alliance Software based in Stavanger — is in many ways similar to Personal Information Management (PIM) system, but has been specially tailored to take into account the extra risk factors involved in vessel tracking. For example, it provides a repository for storing and distributing information relating to a vessel's expected route and arrival time as well as any known history of accidents.

However the OSS is not wired to the VTS directly. Communication between the two applications is achieved via an intermediary programme known as MessageCentral, which was developed in-house at Kongsberg but is broadly based on Microsoft's BizTalk architecture. This solution not only binds the OSS to the VTS but also allows other connections, primarily the Coastal Administration's intranet and externally to the internet.

This architecture, says Sperre, can be harnessed in various ways. As an example, the operator can select a track in the VTS, pull it up in the OSS and display dynamic data either from the AIS or that other operators have inserted. MessageCentral will then access resources on the internet to check for relevant data from SafetyNet and other ship databases, and collate and present this information to the operator.

Sperre says: 'The system has been a long time in the making and it is still very new. But the extra connectivity it provides is invaluable to the VTS operator. It is an immensely powerful tool.'

He believes that a similar

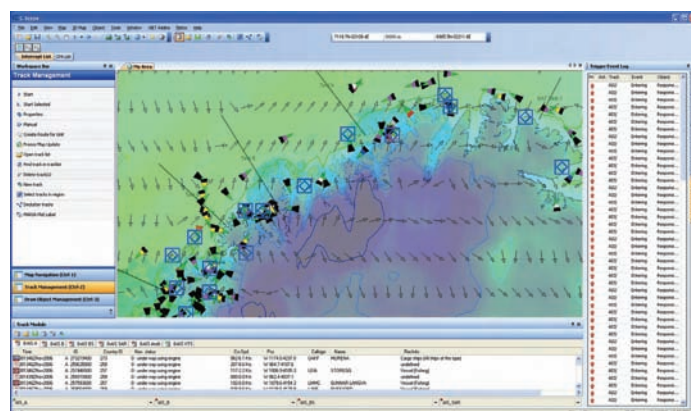


▲ The operator has four screens. The two to the right are the VTS screen and actual traffic. The two screens to the left are the OSS and an administration PC

architecture will be used in future projects. 'BizTalk utilises web-services to communicate with external databases. It satisfies a need for an integrated yet open approach, which is increasingly being called for, especially for bigger projects,' he maintains.

Military radar

Eight of the sensors in the Vardø VTS network are NATO funded military radars. According to the specification these needed to be directly connected with the AIS, but security restrictions imposed by NATO meant this was not possible. A workaround was developed by which there are two interfaces. One provides a non-sensitive data stream for purely civilian purposes, while the other offers a higher level of resolution but is isolated and only accessible to the VTS operators.



There is also an option to install a newly constructed civilian radar station, which will be funded by Statoil. The Norwegian oil company's interest in ensuring safety of navigation in the region is clear. It is heavily involved in the Snøhvit project, the first offshore development in the Barents Sea. The project will exploit the resources of three gas fields in the Barents Sea; Snøhvit, Albatross and Askeladd, which lie about 75nm northwest of Hammerfest in Norway. The processing plant on Melkøya is Europe's first export facility for liquefied natural gas (LNG). These activities have all contributed to the increased number of vessels transiting Norway's Arctic coastline.

The Norwegian government has imposed stringent environmental requirements on the offshore oil and gas industry. Part of

▼ Weather maps are continuously downloaded and, depending on the VTS operator's preference, can be superimposed on the console

this has been to develop transport corridors and the introduction of an IMO approved mandatory traffic routing system along a 600nm route between Vardø and Rørvik. This routing system consists of eight separate Traffic Separation Schemes (TSS) and seven recommended routes, with the objective of shifting maritime traffic about 30nm from the coast of Norway and thus increase response time for oil-spill operations.

Extended functionality

Another characteristic is improved integration with meteorological data services. Weather maps are continuously downloaded and, depending on the VTS operator's preference, can be superimposed as an extra layer of information on the console, with arrows and different colours showing current or forecasted pressure, wind direction and speed, wave types. As with other external resources, the information is piped by the MessageCentral interface.

Data stored on the intranet on the operational status of navigational aids such as lighthouses and buoys — invaluable for operators trying to guide a vessel remotely — can also be channelled in a similar way.

Furthermore MessageCentral can be programmed to periodically check for updated navigational charts. If a newer version is found to exist, this will be automatically downloaded. However the decision whether or not to load the new data remains with the administrator.

In addition to AIS and conventional radar, Kongsberg is looking to incorporate KSAT into the VTS system. Regular readers of MITE will recall that KSAT provides tracking images via satellite and, apart from watching vessel traffic, can be utilised to monitor icebergs to predict their speed and course (see MITE, July/August 2007, p22). While this is still undergoing development, Sperre believes it could prove to be a useful extra tool in both environmental and Search And Rescue operations. ◀◀