Digital Ship
September 2006
www.thedigitalship.com

Boeing buys C-MAP

FOLLOWING a year of speculation, Boeing has purchased maritime electronic chart company C-MAP, planning to incorporate C-MAP into its Jeppesen subsidiary, which produces electronic charts for aeroplanes.

The acquisition has been made, Jeppesen says, as part of its general strategy for growing the business.

"C-Map's broad portfolio of cartography and data services, along with its key relationships with hydrographic offices, OEMs, and customers, will accelerate Jeppesen's expansion in the marine information services market," the company said.

"We're expanding into new markets that leverage our core competences," added Eric Andersen, PR specialist with Jeppesen Corporate Communications.

Jeppesen plans a 'quiet period' of 90 to 120 days, where both companies continue with business as usual, but business plans will be put into place. After that it will announce any new changes. Competition authority approval applications will also carried out during this time.

Jeppesen has asked us to pencil in a speaking slot for them at the Digital Ship Cyprus conference in January and Digital Ship Scandinavia conference in March next year, when they will outline what their new plans are.

After conquering aviation electronic charts - can they do the same for maritime? Tim Suckle, senior vice president, Jeppesen Marine

The deal is understood to include C-MAP's Polish unit where electronic charts are produced, a Russian company focusing on software development, and C-MAP's Norway and UK subsidiaries. The price was not disclosed.

Why?

On one level, it is easy to see why Jeppesen was attracted to C-MAP.

According to the most recent information we have (Jan 2004), its electronic chart data is used on 15,000 professional vessels (fishing, navy, rescue, pilot and research vessels), and 1 million recreational vessels, and around 15 per cent of the SOLAS fleet (around 4,500 vessels).

These numbers are likely to have increased by around 10 per cent since then as the industry increasingly moves to electronic charts.

C-MAP also owns software which is used on many SOLAS ship bridge systems, giving it the potential to make it easier to run its own charts on SOLAS ship bridges rather than those of other companies, as a way to build its chart sales.

C-MAP also produces official electronic charts for the hydrographic offices in Italy, Norway, South Africa, Greece, Colombia, and Malaysia, and the fisheries and bathymetric database of the Nordic Hydrographic Offices.

C-MAP has a growing business selling official government electronic charts (ENCs).

It has also recently started developing a broader range of navigation services, including weather, tides, and 3D charts.

Producing non-governmental charts

On another level the deal raises a lot of questions.

SOLAS shipping companies are still, and probably always will be, forced to navigate using electronic charts made by government hydrographic offices; other electronic charts, including Jeppesen's, can only be used as an 'aid'.

This means that hydrographic offices, of which the UK Hydrographic Office (UKHO) is the largest, have a monopoly over electronic chart production enshrined in sacred international law.

For the business of getting chart data onboard vessels, C-MAP is once again competing with UKHO, which is aggressively building a business selling electronic charts and related services, and defending its margins so it can recoup the money it spends on chart data gathering and quality control.

Is Jeppesen planning to compete directly against UKHO?

You could argue that one major factor in C-MAP's success has been the delays from government hydrographic offices in producing electronic charts. This is being rectified.

Once there is global coverage of official vector electronic charts available, private vector electronic charts will become redundant in the SOLAS industry.

The role of commercial companies could be reduced to transferring the data from the hydrographic office to the ship.

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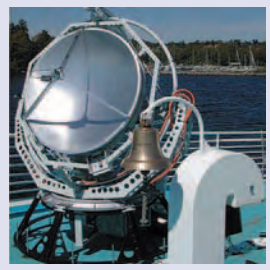
VSAT - special focus



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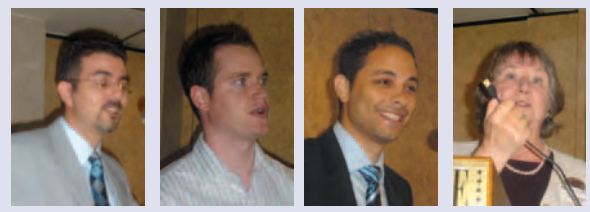

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Tanker Operator TMSA, October 18, 2006
Digital Ship Athens, October 19-20, 2006
Metropolitan Hotel
CYPRUS
Tanker Operator TMSA plus workshops, Jan 29, 2007
Digital Ship Cyprus, Jan 30-31, 2007
OSLO
Digital Ship Scandinavia, March 20-21, 2007
Telenor Expo Centre, Fornebu
DUBAI
Tanker Operator TMSA, April 16, 2007
Digital Ship Dubai, April 17-18, 2007
Jumeirah Beach Hotel
OSLO - AT NORSHIPPING
Conferences at Norshipping - June 12-15, 2007
satcoms, navigation, ship systems

ABC

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There are teething challenges at the moment, but this will ultimately become a challenge for Inmarsat and DHL, rather than anyone else, with a minor role for chart agents who can go onboard the ships and make sure it all works.

UKHO has also started providing its own shipboard chart display software through its acquisition of SevenCs, which only displays charts using open standards, and critically does not display C-MAP charts, which it wraps in its proprietary CM-93 and SENC formats.

C-MAP, of course, has plenty of other markets aside from deep sea shipping - such as non-SOLAS work boats, where at least 15,000 vessels use its charts, and 1 million recreational vessels.

The primary value C-MAP provides to these customers is its vector electronic chart database.

Jeppesen has its own database of world-wide electronic charts - it's not clear why it would want another one.

Changing rules?

There had been speculation in the industry that Jeppesen would try to change international shipping rules which require ships to navigate using charts provided by governments.

Jeppesen's charts are already used by most commercial aeroplane companies, and fully accepted by regulators, and the company was at one stage expected to try to argue a case at IMO that if the charts are good enough for aeroplanes they should be good enough for commercial ships.

It was expected to argue that it was able to offer something which official hydrographic offices were not able to offer - global chart coverage.

It is easy to imagine the US government supporting the commercial interests of one of its biggest companies, and taking up Boeing's case, particularly if its charts were demonstrably better than those on offer from government hydrographic offices.

Inmarsat shares up 9 per cent despite $9 million loss in earnings

www.inmarsat.com

Inmarsat has released its financial statements for the first 6 months of 2006, which have shown a $9 million fall in earnings, from $171.8 million during the same period last year to $162.8 million.

The company attributes this drop to some non-recurring events in the two periods, such as the southeast Asian tsunami, and reports a growth of 3.6 per cent (from $165.4 million to $171.4 million) in its adjusted earnings figures. Accordingly, adjusted revenues grew from $240.7 million to $245.9 million during the period.

The maritime side of the business saw an 11 per cent growth in data revenue and a 9 per cent growth in the number of active terminals in the market, though voice services have continued to decline, dropping 3 per cent compared to the same period in 2005.

Overall the results have been seen as positive by analysts, and Inmarsat shares saw a 9 per cent price increase immediately following the announcement. Reportedly poor sales levels at distributors Telenor and Stratos, who provide the bulk of the company's revenue, had led to predictions of a substantial drop in earnings, but the results were much better than had been feared.

This will be seen as a positive sign for the future, with the share price having fallen by approximately 20 per cent in the three months prior to the announcement, and Inmarsat hopes that its next generation BGAN service, and yet to be launched maritime equivalent FleetBroadband services, will promote further growth in the future.

CEO Andrew Sukawaty is expecting that BGAN will account for about $200 million in revenues by 2010, with the launch for maritime users planned for next year to be a significant factor. He foresees steep growth in demand with the release of this service.

A copy of the complete half year financial statements for 2006 can be downloaded at www.inmarsat.com/investor_relations.

Globalstar to launch IPO

www.globalstar.com

Globalstar has filed a registration statement with the US Securities and Exchange Commission for a proposed initial public offering of shares of its common stock.

The company says it intends to use the proceeds of the offering to fund the procurement and launch of its second-generation satellite constellation, upgrades to its gateways and other ground facilities, and the launch of eight spare satellites to augment its current constellation.

The number of shares to be offered and the price range for the offering have not been determined at the time of going to press.

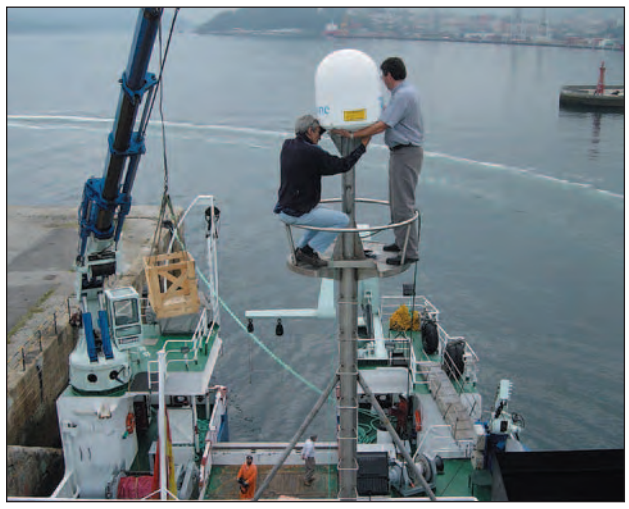
Thrane & Thrane to buy Nera SatCom

www.thrane.com
www.neraworld.com

Thrane & Thrane has agreed to acquire Nera ASA's mobile satellite communication activities, consisting of the Norwegian subsidiary Nera SatCom AS and its German subsidiary European Satellite Link GmbH.

The acquisition is expected to be closed this month, September 2006, subject to the approvals of competition authorities and Nera's corporate assembly. The transaction has already been approved by the board of directors of both Nera and Thrane & Thrane.

The deal has been agreed on a debt free, cash free basis, and is worth approximately DKK 523 million ($90 million), consisting of DKK 385 million ($66 million) in cash and 472,000 new Thrane & Thrane shares. This will correspond to 8.8 per cent of the share capital of Thrane & Thrane after the share capital increase, at the Thrane & Thrane closing share price on August 1, 2006 (DKK 293).



Thrane and Thrane - dominating the Inmarsat terminals market?

The company has reported that the two subsidiaries to be acquired generated about $82 million in revenue during 2005, with an operating profit of about $4.5 million.

Thrane expects that the acquisitions will generate cash synergies of about $6.8 million during the financial year 2007/08, but that the costs of integrating the new business units will be in the order of $8.5 million. These costs will be expensed in the company's accounts during this financial year.

In recent times Thrane & Thrane and Nera SatCom have been the two leading manufacturers of mobile satellite equipment for Inmarsat services. Thrane expects that the combination of the companies will provide it with the capabilities to overcome increasing product development investments and competition from manufacturers of equipment for other mobile satellite communication systems.

The move is part of a five-year business plan that Thrane has called 'Course 2011', with the goal of increasing company revenue to about $345 million by that date.

Increased revenues through expected synergies within product development, supply chain management, sales and marketing, and administration have been cited by the company as potential sources of additional income.

The new combined company is expected to have a market share of over 50 per cent f Inmarsat terminals

OSI Geospatial has reported Q2 2006 revenues of $6.1 million, up from $1.5 million for the same quarter in 2005. Marine systems revenue increased approximately $1.7 million compared to the prior year's quarter.

Tom Ridge, a former secretary of Homeland Security and Pennsylvania governor in the US, has joined the **Iridium** board of directors.

Iridium is to provide satellite data links for a new system of 31 ocean buoys being deployed by the US Department of Commerce National Oceanic and Atmospheric Administration (NOAA) National Data Centre. The ocean buoy system detects and monitors tsunami waves in the open ocean. **NAL Research** will supply the data modems for the buoys.

Bremen-based company **OHB-System** is to construct, integrate and launch six satellite buses for six communications satellites by US satellite operator **ORBCOMM**. The contract includes options for the construction of two additional satellite buses.

Arizona-based **World Communication Center** (WCC) has been acquired by the UK-based **SatCom Group.** The company will function as a subsidiary of SatCom and serve as a distribution and technology support centre for North America. It will continue to operate under the WCC name.

Telenor has acquired a 100 per cent stake in **Maritime Communications Partner** (MCP), purchasing the outstanding 61.3 per cent of shares not already owned by the company in early July.

Globecomm Systems, with **EMS Satcom** as a major subcontractor, has been awarded a contract valued at $7.8 million by NATO to provide a multinational global positioning satellite-based friendly force tracking system (FTS).

The UK **Maritime and Coastguard Agency** (MCA) will provide **Iridium** satellite phones to its firefighting teams responding to fires on ships in UK coastal waters. The Maritime Incident Response Group (MIRG) is a force of highly trained teams capable of being deployed by helicopter at short notice to fires and other emergencies at sea, consisting of approximately 700 firefighters based at 15 stations located around the coasts of England and Scotland.

Alvin B. Krongard has joined the **Iridium** board of directors. Mr Krongard was previously CEO and chairman of Alex. Brown Incorporated, an investment banking firm, and also served as executive director of the CIA from 2001 to 2004.

Globalstar has launched a new mobile to mobile tariff in Europe with rates from Euro 0.20 per minute, which can be used for ship to ship calls, or for communications with the company head office (if the company head office has a Globalstar handset connected to its switchboard). To get this rate, customers have to pay an additional Euro 9.95 per month on top of their regular monthly tariff.

Satellite communications provider **Marlink** has appointed Singapore-based **Norsk Marine** Electronics as a technical service and support partner.

Telenor Satellite Services has purchased the satellite communications activities of Norse Technology and has also acquired the majority of stock in Norse Electronics. **Norse Electronics** will become part of the customized solutions business segment of Telenor.

Websites

www.osigeospatial.com
www.iridium.com
www.orbcomm.com
www.satcomgroup.com
www.telenor.com
www.globecommsystems.com
www.emssatcom.com
www.stratosglobal.com
www.globalstar.com
www.marlink.com
www.telenor.com

France Telecom sells satellite communications business to investment group

www.francetelecom.com

France Telecom has sold, in principle, 100 per cent of the shares of France Telecom Mobile Satellite Communications (FTMSC) to Apax Partners. The completion of the transaction is expected very soon.

Apax Partners is a private equity investment group whose funds invest in specific industries, including telecommunications. This deal will enable FTMSC to consolidate its position on the international mobile satellite communications market, according to the company.

In 2005, FTMSC posted revenues of $201 million, and with an overall market share of approximately 20 per cent serves more than 100,000 customers through its global distribution network.

NCL, Carnival and Crystal to offer cell phone service on fleet

www.ncl.com
www.carnivalcruise.com
www.crystalcruises.com

Cruise line NCL has announced that it is the first cruise line to offer a fleet-wide cell phone service. Passengers aboard the NCL and Orient Lines fleet can now make and receive calls and send and receive text messages while at sea. Carnival Cruise Lines and Crystal Cruises have also announced plans to make cell phone services available to passengers on its cruises.

NCL is providing the service through Wireless Maritime Services, a joint venture of the American mobile phone company AT&T Wireless and Maritime Telecommunications Network (MTN).

Carnival will introduce the service on each of its 21 ships by early next year, also with Wireless Maritime Services, while Crystal will be assisted by SeaMobile, who acquired MTN earlier this year, in installing the service on two of its vessels.

NCL was the first cruise line to offer a cell phone service when it introduced the new technology on Norwegian Sun more than two years ago.

The service is said to be compatible with any cell phone and allows guests to make and receive calls anywhere in the world from any cruising region.

No additional software or special dialling procedures are required - guests simply make and receive calls, as well as transmit text and multimedia messages, as they would on land using their personal cell phone. International roaming fees apply to all shipboard cell phone calls.

Partnership to accelerate RFID research

www.gedcenter.org

Maritime Logistics Innovation Center (MLIC) and the Georgia Electronic Design Center (GEDC) have announced a partnership focused on furthering Radio Frequency Identification (RFID) based research. The research will use a working test bed provided by Savi Networks, which had already agreed to install its SaviTrak information service at Georgia's port terminal facilities.

GEDC developments targeted for testing include thin, flexible organics (such as liquid crystal polymer) and hydrophobic paper-based substances such as substrates into which RF antennas and ICs can be embedded.

The resulting paper-based RFID circuits are low-cost, mould to any surface, provide good RF performance and are highly weather resistant. The team has already presented a first paper-based 3-inch x 3-inch flexible RFID with a 100 foot plus range and power efficiency of 95 percent.

GEDC engineers will also look at maximising the performance of RFID tags by using optimised matching networks; directivity/gain enhancement; printable thin-film batteries; conductive inkjet printing; advanced sensors for temperature, pressure and humidity and single and dual polarized antennas.

They are currently putting together an RFID test for multi-standard (EPC, ISO) / multi-frequency (HF, VHF, UHF, RF) operation in a variety of environments.

Stratos share price drops following Q2 results

www.stratosglobal.com

Shares of Stratos Global Corp. fell 18 percent on the day after the telecommunications company reported a $4.1 million quarterly loss. The stock fell by C$1.07, or 18.6 percent, to C$4.68 in early trading on the Toronto Stock Exchange following the announcement.

Stratos had reported revenues of $139.3 million, a 50 percent increase compared with $92.7 million in the same quarter of 2005, with the growth primarily reflecting the recently completed Xantic acquisition earlier this year.

However, despite the increase the company suffered a net loss of $4.1 million for the quarter. The company attributes this loss mainly to the costs involved with the Xantic deal, such as severance costs and higher interest charges.

Debt taken on by the company to finance the deal amounted to $191 million, with interest payments jumping to $8.6 million from $2.9 million in 2005.

This loss represents a drop of about 10 cents per share, compared with a profit of $370,000, or 1 cent per share, for the same period a year earlier.

Revenue in the mobile satellite services division increased 75 per cent over the period, again due largely to the impact of the Xantic acquisition, while broadband revenues increased by only 1 per cent.

Iridium subscribers up 25 per cent

www.iridium.com

Iridium Satellite says that its subscriber base has increased by 25.4 percent compared to the second quarter of 2005, reflecting growth of its commercial and government businesses. The company had approximately 159,000 subscribers worldwide as of June 30, 2006.

Revenue in second quarter 2006 was $53.6 million, an increase of 31.4 percent over second quarter 2005. Second quarter 2006 EBITDA (Earnings Before Interest, Taxes, Depreciation and Amortisation) was $13.2 million, a 99.6 percent increase over the same quarter last year.

Commercial service revenue in the quarter was up 24.8 percent versus the same quarter last year, and comprises approximately 70 percent of Iridium's total revenue.

Iridium also says it is still in the process of conducting engineering studies for its future satellite constellation replenishment and replacement strategy. The company is collecting and analysing performance data from its existing 66 satellites, and evaluating technology like mobile TV, on-demand radio, and enhanced GPS services as possible future products.

Marlink Dubai wins 10 new VSAT contracts

www.marlink.com

Marlink's office in Dubai, United Arab Emirates, has reported sales of 10 maritime broadband communications systems during the first half of 2006. The most recent agreement is a three-year contract with CCC Underwater for a broadband very small aperture terminal (VSAT) system aboard the CCC Pioneer, planned to be installed this month (September).. The CCC Pioneer is a dynamically positioned multipurpose offshore construction support vessel.

Earlier this year Marlink also signed multi-year-year agreements with Abu Dhabi's National Gas Shipping Company Ltd and GeoBird, a third party ship-management company for seismic vessels based in Dubai.

National Gas agreed a deal for the delivery of eight global Sealink VSAT systems, which have been installed onboard the company's liquefied natural gas (LNG) transport vessels, while GeoBird will install one C-band VSAT system onboard the company's new flagship, the Hawk Explorer.

There are small signs that the ground might be changing in the maritime VSAT market. There have been plenty of examples of VSAT being installed on offshore / seismic vessels, where there is often a need to transfer high volumes of valuable data to shore, which can only be done with VSAT.

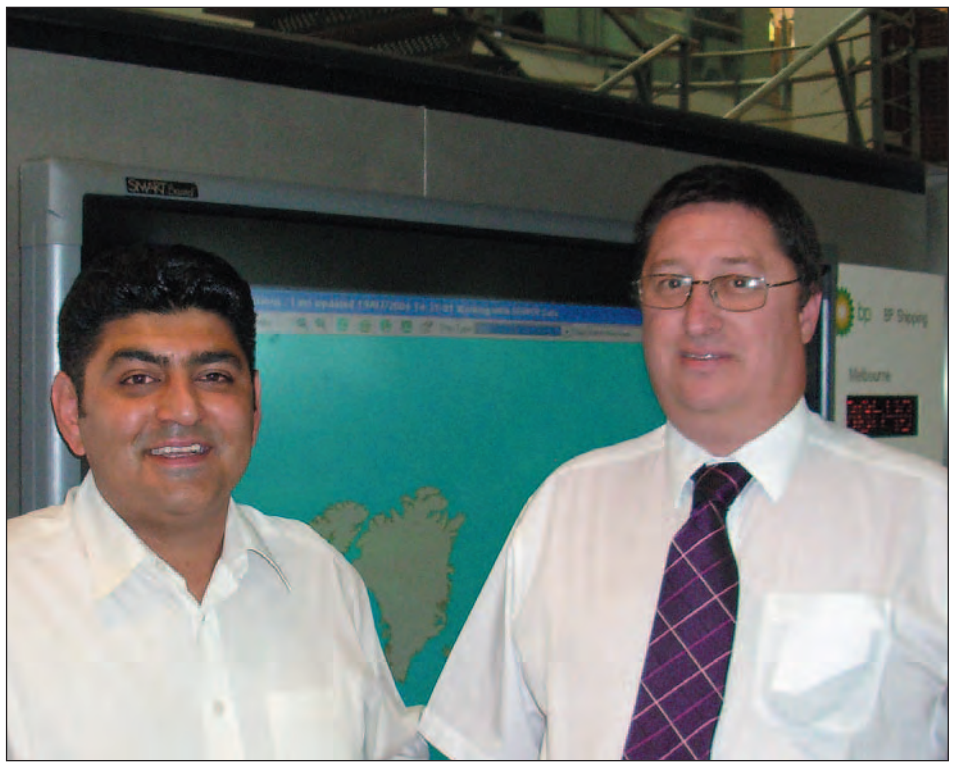
BP to fit VSAT on all its tankers

An industry first: BP has made a decision to fit VSAT satcoms on its entire tanker fleet of 50 vessels, including newbuilds, and completely upgrade its IT network. We asked BP's Wasim Kayani and Robert Ball why they chose VSAT and what they expect to get out of it

EARLY IN 2006, oil giant BP agreed a deal with Norwegian company Telenor to install high-speed VSAT satellite communications systems across its entire fleet. This will help to make its ships some of the most technologically advanced vessels to sail the oceans.

BP is now in the process of using these systems to help it create one of the most state-of-the-art vessel and office IT networks in the maritime industry.

"3 years ago we started looking at better ways to run our communications systems and how we could improve seafarer relations and introduce faster and quicker links," explained Wasim Kayani, service delivery manager for BP Shipping. "The internet was used by everyone in every office - were ships any different?"



The first in the industry: Wasim Kayani and Robert Ball have committed BP's entire tanker fleet to VSAT

"In the summer of 2003 we went to 9 or 10 vendors, looking for a solution to a problem (always-on communication) - 9 of those vendors said that a C-Band VSAT dish was the best way for us to improve."

"We soon realised that other areas of the business were also interested in having these kinds of capabilities available. So now we're installing VSAT on all of our existing ships, and on all of our newbuilds, so it's over 50 vessels."

A massive undertaking, BP feels that the decision is based on sound commercial and health and safety oriented reasoning, and will fit well with the way that the company wants to run its business.

"There were 2 main reasons for choosing VSAT - there were business reasons obviously, but there were also the softer issues like seafarers' welfare," said Robert Ball, electrical superintendent to the BP fleet technical management team.

"There wasn't one particular priority, they both run in parallel. We have to attract and retain the best crews for our vessels, and right now they are in short supply."

With tankers sailing to all corners of the earth, coverage was another item that obviously stood right at the top of the list of priorities.

"We needed to have C-band to have global coverage - I couldn't turn round to the CEO and say 'Of course you can have an HSSE conference call, but it will be next Tuesday!!'" said Mr Ball.

"We don't know where the ships are going to have to be at any one time," added Mr Kayani. "We have ships crossing several satellite regions in one trip. We do have Ku-band on one ship, but as a whole we need the global coverage - this will give us the best flexibility."

Standard systems for ship and office

The move to VSAT is part of a complete overhaul of the company communications systems, under a new project that the company has called SOE 3.0 (Shipboard Operating Environment).

"This infrastructure is a fancy name I put together for the ships' IT systems a few years ago, but, in a nutshell, it's a standard suite of hardware and software we use in the BP fleet," explained Mr Kayani.

"All of our ships are currently running SOE Version 2.0 (based around Windows 2000 server and client), and by maintaining standards across the fleet it has allowed us to reduce spares, deliver efficient training, reduce support calls and ensure users and support personnel are all singing from the same hymn sheet."

"When I started I was told that IT wasn't a critical system for the ships, I couldn't believe it. When my mobile used to go off at 3am on a Sunday morning, and a Master wanted his e-mail up and running again, I don't think he would have been happy if I had turned around and said 'Don't worry Captain, its not critical!'. He would have swum across the Atlantic to come and kill me."

"On my first ship visit, I had to fix a Windows 95 operating system error - I had just completed a Windows 2000 rollout at my last company. I had to tell BP that the system needed upgrading. There were two options - outsource it or otherwise get a good team together, and start getting some standards across the system."

Revolutionising vessel management

Realising the need to upgrade the IT network across the board was the beginning of the SOE series of ship systems.

"SOE 3.0, which is tied in with VSAT, will revolutionise the way our people manage and operate their vessels," Mr Kayani explained.

"It will consist of the latest hardware and software and, utilising an always-on pipe, will introduce cutting edge technology such as remote desktop takeover, software deployment, remote auditing, antivirus/spam updates, web-conferencing and much, much more. And this is the tip of a very big iceberg."

"SOE 3.0 is expected to be on the newbuilds coming in October or November, it will be all tested, all the applications will be ready, everything will be built-in," Mr Kayani continued.

"Maybe we'll have a new e-mail client as well, we've been talking to 5 or 6 vendors about the possibility. We want to bring on a mail service that can work with VSAT, and one with good filters for spam and viruses."

BP Shipping will use the VSAT to help keep the whole system working, and cut down the need for support. They say that they'll be able to send things like Windows XP patches that can be installed straight away, rather than posting out CDs, and will have the ability to use it to do condition monitoring from the office.

"Seafarers are not IT people, we have IT professionals who are paid to sit in the office, so now they can fix some problems remotely. They can do audit tracking to monitor what's going on onboard the ships. We're putting more emphasis on doing remote support, and on the resilience of the systems," said Mr Kayani.

Outsourcing IT support

BP has also done a deal with Fujitsu, outsourcing the IT support for 50 of its vessels to the Japanese company. So far this has this has proved to be very successful, Mr Kayani told us, outlining a system Fujitsu provides which allows for centralised fleet monitoring.

"Fujitsu has systems where office based servers send a text file to a central depository each morning detailing the status of the equipment, network, and so on," he said.

"By utilising the same technology in the fleet, it can provide BP with the ability to monitor the complete BP fleet from a single dashboard - proactive and not reactive maintenance."

"Before, a chief engineer could have been changing the back-up tapes for weeks not knowing if things had been backed up or not. That won't happen anymore, the chief won't have to worry about it."

Though the systems have become more complicated, having standards has meant that the number of problems and support calls has actually been fewer than before.

"At the time I started, I had maybe 30 or so support calls a week from 15 ships," said Mr Kayani. "Now we have about 15 calls a week from 50 ships, because of the new standards and more efficient systems."

Every ship has identical hardware, identical software, logins, and even mousemats. They have better support, and better reliability, but there's been no additional headcount and no significant increase in the costs for IT, Mr Kayani told us.

"With standard systems you just need one training course, one set of documents, one expert on the system to help out. It's growing, the resources are not increasing but BP has put in better systems, and in some places lowered the costs," he said.

"With the standardisation in hardware, whole systems can be built in Basingstoke (UK) by Fujitsu, and then transported to Korea and just bolted in to the newly-built ships. We've decreased the cost of putting the systems on the ships by nearly 60 per cent since the first new build in 2001."

With the standards in place BP can use its standard office PCs, and just need to adapt them slightly for the ships. This should save money on having engineers flying out to ships, and allow better redundancy and reliability from the systems.

Complementary systems

VSAT is just one piece of a radical rethink of the way BP Shipping runs its business - and may be a sign of things to come on a wider scale for the maritime industry.

"Delivering an always-on pipe to the BP ships is just one piece of the all important IT pie," said Mr Kayani. "Its like having a Porsche with no engine. All looks great on the outside, but if you can't do anything with it, then you might as well

not have bothered."

For BP, the other half of the pie is just as big as the VSAT slice. The introduction of a new IT infrastructure that seamlessly integrates with VSAT to deliver business systems and applications would truly see BP into the next technological era, the company believes.

"Skype, MSN and other fancy internet tools can all become available for the ships and ship superintendents. A ship superintendent would be able to have a conference with all of his ships at the same time," Mr Kayani continued.

"The whole world is turning to the web for information, applications, and so on, and much of this was talked about for years, but the company never had the bandwidth to work with. The balls are in motion."

"We'll also be able to use it to transmit company messages, like when the CEO wants to talk to the shipboard management team about safety," added Mr Ball. "We'll have things like medical webcams, where people can get advice from doctors and experts from the shore."

"We want to help get rid of the 'them and us' mentality that has separated the people on the ships and the people in the office. We used to have two types of PCs - beige and black. We've come a long way since then."

"It was a case of 'Auntie knows best' when developing the systems in the past, now we ask what people want. It used to be about 'them and us' - but things like VSAT have helped to bridge the gap."

Lack of maritime applications

One of the problems that faces BP in trying to adopt high-level, sophisticated systems is the lack of what it sees as useful maritime applications designed to work with the latest advances in communications.

"The maritime world has not been ready for VSAT, broadband or whatever open pipe there is available," said Mr Kayani. "There are no marine applications on the market designed for true broadband. I suppose if Inmarsat had a product available it might make a big difference, who knows?"

Mr Ball also felt that the high-speed services on offer were not progressing as quickly as some companies had led the industry to believe, and that delays in the release of new technologies was a factor in the BP selection process.

"For the last few years companies have made promises about high-speed services, things like 'it'll be here next week'," he said. "But you can only wait so long. We wanted to have the services now, that's why we went for VSAT. Inmarsat looks extremely exciting and so did Boeing before they folded - but proven results are what counts in this industry."

"People said 'BGAN is around the corner, why would you get VSAT?' - but we're tired of waiting," added Mr Kayani. "If FleetBroadband does what they've said it will do when it does finally comes out, I think we will see some big changes in the maritime industry. We think FleetBroadband will be good for the industry, it will be good to have healthy competition."

"The main thing is that we want to be right at the cutting edge of the technology. VSAT isn't cheap, but it's the best available. We're doing work today to find solutions where we are able to take real-time readings and keep it all online, for things like condition monitoring for the ships."

"Most importantly, with this technology we can also begin to look at non-maritime software companies, with the extra capabilities of the system," Mr Kayani said. "That will mean not having to pay a premium for the maritime product. Now we're also writing applications with always-on in mind."

Positive feedback

Both Mr Kayani and Mr Ball said that they had been pleasantly surprised by the overwhelmingly positive nature of the feedback they had gotten from their crews once they had got the chance to work with the VSAT system on board.

"So far we've just given phone and internet services to the crew, and the feedback has just been incredible," said Mr Kayani. "We get a 128k connection, which works very well. That's guaranteed up and down, though it can be used with burst transmissions. It can be used for things like video conferencing."

"One person said that it was 'the biggest change in shipping since coal to oil'. Another Master said it was 'the biggest change to life at sea in 25 years'. Some crew said that the service alone had convinced them to stay with BP."

"There was only one negative comment, from a guy who refused to go back to a non-VSAT ship after having used it! VSAT will be the medium to deliver services to our people on our vessels. The general outlook in shipping has changed. You can't put a figure on good morale."

Predictable costs, more options

The predictable costs involved also allows the company to be more flexible with the services it offers to its crews, without having to worry about potentially huge communications bills being run up and arriving on invoices a month later.

"VSAT is a fixed cost, so any use that you can find above the basic is essentially coming with no added cost," Mr Ball said. "Now a seafarer, talking to his family from onboard, doesn't have to think about the price of the call he's making. Things like MSN Messenger can be used without any worries, and they can use their own home email addresses on the ship."

Coincidentally, the ships tend to have a mix of Europeans, Indians, and Filipinos, so each group wants to use the phones at different times to call home.

"People expect the technology they've been used to on land," Mr Ball continued. "On the ships with VSAT, if people have a problem at home they can pick up the phone and call home, and not worry

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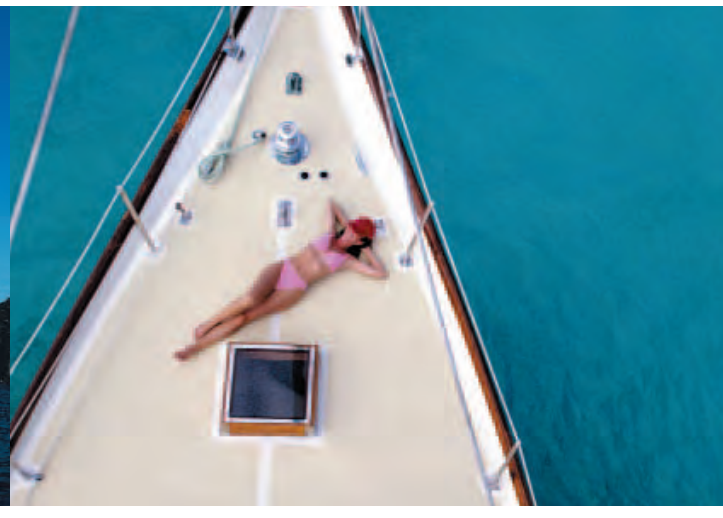

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about the expense."

There are controls on the system. BP Shipping will establish guidelines like length of phone calls and appropriate use of the internet, but they can change depending on the situation. It's managed the way services would be managed in any office.

"All of the calls are routed through the office in Sunbury, and are monitored that way. But it allows superintendents to do things like ring vessels for a quick chat, clarifying things and avoiding hours of e-mail 'ping-pong'," said Mr Ball.

"That was a problem with e-mail before. Someone might send an e-mail saying 'I want an indent number', which would then queue for four hours before the next dialup," added Mr Kayani. "Then the office would write a reply, which the ship would not receive until it next accessed the inbox another 4 hours later. A whole day to get an indent number."

Chief engineers can now do things like go to a manufacturer's website, look for parts and part numbers, and find exactly what they need. There are no more delays in locating the correct part or waiting for the office to e-mail the details.

BP Shipping can now offer seafarers things like Open University courses at sea and other long-distance learning options. The crews can also do things like on-line banking, and listening to whatever the local radio is for where they're from.

"These are lots of the things that are taken for granted onshore, but they will also be available to the crews," said Mr Kayani.

VSAT issues

The decision to adopt VSAT for the entire fleet was also heavily influenced by the reputations of the companies that provide the services.

"The tender for VSAT was very long, detailed and thorough," said Mr Kayani. "We had a joint tender with our North Sea oil rigs who were also looking for VSAT."

"Availability of spares is an issue that people talk about with VSAT, and it was considered, but Telenor is as good a company as any in this respect. The equipment is reliable, it's been used on cruise ships for 10 years. Their engineers are also very good, and fly wherever we need them."

"When we get to 50 vessels we may have to start putting certain spare parts in storage at strategic ports. After SOE 3.0 (when ships are running standard systems) it will become a necessity."

Mr Kayani does not foresee any major problems with lost signals from the ship's funnel entering the line of sight between satellite and antenna, or from losses of satellite connections.

"We have secondary comms on board, if there's a failure the business comms and the e-mail will still work," he told us. "We haven't had many problems with rain fade, or losing signals in the tropics."

"Switching regions is the biggest problem we've seen - but it seems to be improving," said Mr Ball. "It takes a little practice, a bit of familiarity with the process and might seem clumsy to somebody used to the instant changeovers of the Inmarsat service."

"Telenor says it will have programs to do it automatically in the near future. At this stage I think we have a big enough fleet of vessels using it to talk properly about its reliability."

BP has rolled out VSAT onto 17 vessels since August 2005, with the system installed on a total of 23 ships, and expects 32 ships to be online by the end of 2006. Installation for each VSAT takes less than one week.

"The installation can be done in 5 or 6 days," Mr Ball told us. "Being tankers, we have to wait for them to be in dry dock and be gas free before people go onboard with the welding equipment."

"We were originally looking at doing about 10 installations per year, but it's really taken off," added Mr Kayani.

The future of maritime IT

Mr Kayani feels that there is plenty of room for development in the maritime IT market, and that a change in attitude would help companies to improve themselves faster.

"Shipping, I'd say, is about 5 years behind the rest of the world for technology," he told us. "People are afraid to dive in - though I can understand that, as there's not much money available. People in the shipping industry don't want to spend money on IT, they want everything for no cost. The shipping IT managers' mentality scares providers / suppliers away from product development."

"Support and licence costs in the maritime sector are low, you see some mail applications being given away. People have to wake up and see the IT potential in shipping."

"VSAT has been out for 2 years, yet I'm surprised that people haven't been developing applications," Mr Kayani continued. "These VSAT dishes could potentially go up to 8 Meg in the future. IT and communications within the shipping industry, from a technological point of view, is about to explode."

"With the introduction of VSAT, ships can truly become what the industry calls 'floating offices'. For so long, shipping has remained a long way behind from the so called 'office' based IT systems, but now it seems the gap could be closing."

"5 years ago we were running our ships over 9.6 kbps Inmarsat -B with 1 email account. When it all began for me in 2000, BP Shipping managed a fleet of 16 vessels, IT support was done from the office, old PCs were handed down from the office to the ship and communication was through an old bean can with a long piece of string."

"Today, we manage a fleet of over 70 vessels, have outsourced the support, provide the latest PCs and use four bean cans - how times change!"

Mr Kayani hopes that this is just the beginning of a maritime IT revolution. DS

The future of maritime broadband

Round-the-clock internet access, high-speed connections, and unlimited amounts of data may seem like an obvious business choice - but only at the right price. With many ship operators unconvinced about the business sense of expensive always-on connections, *Digital Ship* spoke to VSAT companies Telenor, Broadband Maritime, CapRock, MTN, C2Sat and ND Satcom about why your vessel should move to broadband

THE ANNOUNCEMENT in August confirming the termination of the Connexion by Boeing high-speed satellite communications service has been seen by many as a confirmation that these types of services, at the price level currently offered, are simply not a viable option for most operators in the commercial shipping market, and that the cost is far greater than the benefits such systems can provide.

But the decision to close the system was almost entirely down to its lack of take-up in the aviation sector - the maritime business was to be a little extra. The shipping industry is still moving to broadband. We are all waiting for Inmarsat's FleetBroadband launch next year. And the VSAT providers are still very enthusiastic.

Why should the shipping industry switch to broadband? *Digital Ship* spoke to some of the major suppliers of VSAT (very small aperture terminal) high-speed maritime satellite services, as well as suppliers of VSAT-enabling technologies, to see their view of the future of communications in shipping.

Tommy Konkol Dybvad, Telenor

Norwegian company Telenor has installed its Sealink (C-band) and WaveCall (Ku-band) VSAT systems on over 600 vessels, and has recently signed a deal with British oil giant BP to supply its entire fleet with high-speed communications.

Telenor's always-on service starts from $3,000 per month, for unlimited data traffic. Installation costs can vary from $2,500 to $25,000, depending on the type of system and other ship-specific factors, with equipment capital costs built into the monthly fee.

Tommy Konkol Dybvad, commercial director of Sealink operations for Telenor, says he has been really encouraged by the growth that he has seen in the VSAT market.

"The market is quite boiling right now, it's becoming a very significant market," he told us. "It used to be just specialised vessels, but that's not the case anymore. The volume has started to go up, and the prices are coming down."

"The market areas have, up to now, been primarily oil offshore drilling rigs, seismic vessels, ferries, and cruise ships. Now, the merchant shipping industry is coming on quite fast. We recently have made several agreements to provide VSAT to merchant shipping fleets, like BP, Teekay, Neste Oil Shipping and Anders Utkilen Rederi."

Teekay has 24 shuttle tankers with Telenor VSAT, Neste Oil Shipping has 11 oil tankers, and Anders Utkilen Rederi has 17 chemical tankers.

What is 'maritime broadband'?

Mr Dybvad believes that the use of the term 'broadband' is a slight misconception

VSAT on 600 vessels - Tommy Konkol Dybvad, commercial director of Sealink operations for Telenor

when talking about maritime services, as the speeds available in the maritime market are only a small fraction of the capabilities in almost every office on shore.

"It's probably a bit of a misunderstanding really, when people talk about broadband for ships," he said. " It would be better to say 'always-on - fixed price', that's what it's really about, and that's the way that you can control costs."

"You can also have better control of your data flow because you are able to use the internet the same way as any other on-land office. Vessels today have a very short turnaround time, so they end up needing to do most of their work at sea - to do that they'll need to have applications like you have on shore."

Mr Dybvad thinks that the flow of data is a key factor in allowing companies to reorganise their operations in a way that will improve the performance of their business as a whole, as well as improving the working conditions of their seafarers.

"VSAT is all about creating efficiency of operations, and giving real-time information for people to make important decisions," he said. "It allows real-time help for problems on the ship, with remote connections at a controlled cost."

"Keeping the crew intact and keeping their morale up is also becoming more and more difficult, and VSAT can help to provide the ship with a way for the crew to keep in touch with the world around them. VSAT is a very effective tool to help keep the crew happy."

The challenge of creating communications solutions that can keep pace with the developments of terrestrial information technology is a never-ending one, but Mr Dybvad believes that the technology itself is not the biggest issue in closing the gap.

"The technology on the vessels will be able to keep up, but they need more time to be able to implement it," he told us. "Everyone talks about broadband, and things like DVB RCS, but things haven't happened yet because it's hard to provide a quality service based on such platforms."

"Bandwidth sharing can be one problem. It can be hard to maintain the quality of service. Reasons for bandwidth sharing are both to make some vessels' unused capacity available for other vessels, as well as providing higher bandwidth at lower cost. In order to achieve the latter you might (as an operator) have to overbook the capacity with high probability of low throughput and congestions in the communication system."

Encouraging usage

The advent of Inmarsat's FleetBroadband system is obviously a big talking point for those in the high-speed maritime communications sector, and Mr Dybvad, like many of his competitors, thinks that the Inmarsat service will bring more benefit than harm to the VSAT vendors.

"I think that FleetBroad-band will be good for the market, it will have good availability (coverage), and it will be easy to install and use (with small terminals and standardised interfaces)," he said.

"I think the market was already helped by the efforts of Connexion by Boeing and Broadband Maritime, they really opened up the market with some of their marketing, and improved awareness of the capabilities of maritime VSAT."

" I believe that when Inmarsat begins to market FleetBroadband, they'll get new

users in, but when they (the users) start to use it, I think that they really will take advantage of the possibilities of the service. Intensive usage will require a lot of bandwidth, which will lead to accelerating costs, as the more you use that system, the more you pay."

"A fixed-cost service makes a big difference. If it's for occasional use, then a 'pay as-you-go' system is okay. But if you use it a lot, it's not so good, because it will cost too much."

"Once people use it they will see the many demands of their business they can meet with these systems," he continued. "I think that some of the people who start off using the FleetBroadband service will start to see the benefits, and then migrate to VSAT."

VSAT-enabled services

A greater availability of high-speed connectivity, with fixed monthly costs, would also open up a whole host of opportunities for new services in the maritime market, in Mr Dybvad's opinion.

"In the future, I think that third parties will become more connected to the vessel," he said. "Companies like the engine manufacturers and manufacturers of other on-board equipment and systems will take advantage of monitoring, controlling or repairing remotely."

"As an example, companies will be able to offer 24/7 remote control to the vessels for systems maintenance. It's not there now, but I think it will come in the future, and we've already seen examples of companies doing all of their vessel IT maintenance from the shore-based office."

Mr Dybvad also stressed the importance of introducing systems that are standardised throughout different parts of the business to create efficiencies across the industry.

"It's important to standardise, at the moment there are shipping companies out there that have different systems on each of their vessels," he said.

"Standardisation will allow for easier maintenance, with high potential for cost savings, and with reduced requirements for different spare parts, knowledge of different systems, multiple service providers, and so on."

At the moment the market is just at the beginning of this technological development, but Mr Dybvad feels moves so far have been positive.

"It's definitely getting better, many people are now seeing it as a way of gaining a competitive advantage," he said. "With VSAT, you can use many different applications while at sea, and they can do this a lower, fixed cost."

"I would estimate that now there are more than 2,000 out of 20,000 potential vessels out there with VSAT installed - it's already started."

Mary Ellen Kramer, Broadband Maritime

US company Broadband Maritime has had its longest running VSAT installation in place for three and a half years, and has recently launched an upgraded system with an improved maritime antenna which it hopes will prove even more attractive to the commercial shipowner.

This C-Bird system, which operates globally on C-band, is one of the most affordable high-speed systems on the market for maritime, starting at approximately $2,500 per month for equipment lease and global 64 Kbps service. Services extend beyond that up to 256kbps upstream and 1Mbps down, with different pricing structures.

Mary Ellen Kramer, president of Broadband Maritime, sees demand for VSAT as still being very much in the early-adopter stage.

"The market depends a lot on the overall sophistication of the companies," she told us. "Some companies have tried to push automation through in their offices, and want to have broadband on all of their ships."

"The early adopters are mostly in Scandinavia, and the Greek market also has some. Awareness of the technology is more enhanced in Scandinavia."

"We're targeting the merchant shipping sector right now, some other sectors have been using VSAT for a while. Oil is one area, the exchange of information is very important for them. There'll be a slower uptake of broadband for the bulk market maybe."

Widespread installation of the systems will be a slow process, Ms Kramer believes. "I don't see any overwhelming penetration in the next 10 years," she said.

Decisions in real-time

Ms Kramer sees the provision of services that use real-time information to help shipping companies make better, and more valuable, commercial decisions as one of the key factors in any decision to move to a high-speed satellite connection.

Access to an always-on connection means there is no extra cost involved with receiving more and more data, which may allow some companies to streamline their processes across the organisation.

Fixed fee the biggest driver - Mary Ellen Kramer, president of Broadband Maritime

"The fixed-fee aspect of the service is, I think, the most important, it's always been a big driver," Ms Kramer told us.

"Most people don't need extreme bandwidth, the most important thing is that usage is not subject to increasing costs. There are requirements for charts and updates, crew e-mail - people want always-on services to deal with these things. It can be used to do things like planned maintenance, create a vessel LAN, and IT troubleshooting, as well as the regular communications."

"There are many uses of broadband, it opens the whole internet up," she continued. "Online updates, weather reports for voyage planning, managing fuel costs, you can have one database for all of the vessels, which is easy to update. You can generate KPIs and do comparisons. You can do maintenance and condition monitoring, you can do online procurement."

"Once you have bandwidth the challenge is to find ways to use it, it's the opposite to having a 'pay by usage' system where you're always trying to use the minimum."

The idea of connecting the vessel with the land-based office is one that is often highlighted by proponents of VSAT systems as a major benefit of high speed connections, and Ms Kramer believes that the disconnection of the ship from the shore is causing some growing difficulties for those on board.

"The gap is very wide now, if they're not using VSAT," she said. "Everything is moving fast on land."

The speed of development of terrestrial technology has meant that the modern seafarer, just like everyone else, has become more accustomed to instant and accessible communications services, and doesn't want to sacrifice the facilities he or she has been used to when working at sea, if at all possible.

"Crew problems will only be accelerated by this, people won't want to get on ships and be out of touch with their homes and their families," said Ms Kramer. "Crew shortages will increase."

"This issue is coming to the forefront, now shipowners are starting to see it as a real issue. For our fleets, where some of the ships have converted to broadband, the crew want to be on the ships that have it."

C-band vs Inmarsat

One development that is sure to have a big impact on the market for high-speed maritime communications services is the launch of Inmarsat's FleetBroadband service, currently scheduled for 2007.

Ms Kramer feels that this move will have a positive influence on the market, and does not expect that it will be able to directly threaten the VSAT service that her company provides.

"FleetBroadband will be very good for the industry, I don't see that we'll suffer," she said. "It will still have to be seen what is the availability of their network."

"They have some restrictions with their service, and I think that C-band will be more competitive (than FleetBroadband). It will be difficult for them to compete with VSAT."

While the competition may increase between the different products of the high-speed providers, Ms Kramer does not see much potential for any great downward pressure on VSAT pricing

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systems - and realises that cost is often the defining factor in many company's commercial decisions in the shipping industry today

"Satellites are finite resources, there is a portion of providing the service that can't come any lower," she said. "Antenna sizes are not likely to change much either, as a smaller antenna would lead to a higher price."

"The cost side of it drives the decision, but if your systems are better you can serve your customers better, and answer their issues quickly. You'll be able to attract more business."

"It's all in the same interest, making business more efficient. The difference in cost is minor when you add in things like fuel savings, savings from not having to send people to the ships - all of the non-communications costs."

The key to any growth in demand will come from shipping companies noticing the advantages that their competitors may be gaining from using VSAT systems, Ms Kramer said.

"One of the largest drivers for people to adopt new systems is 'my neighbour did it'," she told us. "Things are there to be used, Outlook for example - you don't have to get a special e-mail program (if you have VSAT). The applications are there, people just haven't been able to access them."

Randy Neck, CapRock

CapRock has been providing communications services for more than 25 years and has systems onboard more than 150 vessels and offshore facilities. Its first VSAT was installed on a cruise ship in 2002, and on a superyacht in 2004.

Randy Neck, vice president of marketing for CapRock

The company offers an always-on service, with global C-band and regional Ku-band, for a monthly fee starting at what they say is "several thousand dollars" depending on the type of installation.

Randy Neck, vice president of marketing for CapRock, sees the VSAT service as the next evolution in maritime communications.

"We've found that Inmarsat has been a solid service, but there is now an increased appetite for always-on services, for things like crew morale and other issues," he told us. "There's a slow, but growing need from people to move away from metered plans. It's slow, but it's evolving."

Mr Neck sees different markets pushing the demand for the differing regional and global offerings.

"We see demand for VSAT services in areas like containerised cargo, bulk cargo, and tankers," he said.

"Large ocean-going vessels that have to go anywhere at any time need a global service, but we've also seen a regional need, with Ku spot coverage, where they don't need global coverage but just their own region. We plan to address both markets. Ferries are also a good opportunity, as are superyachts."

"Operators of large ocean-going vessels require service providers to have global C-band service coverage before they will be considered, but there are a higher number of smaller vessels that tend to operate in more confined regions than the larger ocean-going vessels. I think there are probably more opportunities for VSAT in the regional market."

VSAT applications

One area that Mr Neck feels could help to increase the attraction of high-speed maritime services is the development of value-creating business applications that make better use of the extra capabilities.

"We were hoping we would find one, two, maybe three applications really driving demand across the industry, and we haven't seen that," he said. "We haven't seen the emergence of a new 'killer application' that will drive the need for more bandwidth."

"The only big thing at the moment is using VSAT for web access, to use the internet as a business tool. Communications is a lifeline for business, and we've seen some specific applications for specific businesses, but not for the whole industry."

"When you look at the terrestrial market, it's a 'chicken and egg' situation, the applications and the bandwidth have been waiting for each other to come first. The maritime market might follow this kind of trend. We haven't seen indicators that point to the availability of breakthrough applications, it's been more like small software houses with niche applications for special needs."

CapRock believes that VSAT will become more widespread, but that it will be evolution rather than revolution that will take the industry there.

"The time horizon we see, over the next 5 years we think there's going to be a big push to get broadband out there, and get applications out there," Mr Neck said.

"I think that the 'big bang' in the industry won't be for another 5 to 10 years, and it will come with the evolution of existing services."

"Things like crew services and weather routing are going to be important," Mr Neck continued. "Requirements by regulatory bodies is going to be one of the big areas to drive it, I think we'll start to see more advancements in these regulations. Things like vessel histories and logs of travel will all be included."

VSAT pricing

From a commercial point of view, cost obviously remains a key element in the choice of any system, and competition is an important factor in stimulating increased efficiency and lower prices - but is the market big enough to support the level of competition needed?

"I think so, if you look at some of the competitors there are quite a few players who see it as a good business," answered Mr Neck. "The interest generated by Connexion by Boeing with their product helped to create new awareness of the technology. We also see (Inmarsat's) FleetBroad-band as a force to be reckoned with."

"We're still seeing continued interest in the service. Though with the technology involved, and sophisticated infrastructures, you won't see price decreases at the same rate as you see them on land, there will be more incremental improvements."

"There will always be limitations from the gap between the offices and the vessels, there will always be a gulf. But I think that increases in

hardware technology will really take the hardware on the vessels to a new level, and provide new capabilities - though it will have to be slower than land."

The predictable pricing involved with an always-on service is the area that may be seen as most attractive if the monthly costs were to be lowered, said Mr Neck.

"We've seen pent-up frustration from the users with the metered services and the fees that come with them," he told us. "It's the fees more so than the technology that frustrates people. There's also a frustration at the lack of choices, we see more of that than a reluctance to move towards new technologies."

"The 'always-on' aspect of the service is what really gets people's attention. Once they have that kind of capability then they can begin to think about what they can do with it."

"Maybe metered services have been part of the cause of a reluctance to explore IT, to an extent. You can remove the shackles of communications costs when you have an always-on service."

Brad Briggs, MTN

Maritime Telecommunications Network (MTN), recently acquired by communications company SeaMobile Enterprises, has been operating in the communications market for 20 years and has VSAT customers in the cruise, oil and gas, military, commercial and super yacht market sectors.

MTN offers both global C-band and regional Ku-band services, ranging from $3,500 and $8,500 per month respectively for an 'always-on' connection to their high-speed network.

Brad Briggs, senior vice president of sales and marketing for MTN, feels that the VSAT market is in its early stages, but that recognition of the value that higher bandwidth services can create is growing.

"We've seen that there is rapidly growing demand," he told us. "The early adopters that have taken on the service saw that they had a need for more than just voice communications to run their operations."

"It's been driven by overall bandwidth demand growth in the market place, business applications are the most important aspect of it right now. Today people have stuff like cell phones, Blackberries, PDAs - the consumer wants to have the data flow, for their business applications and for their quality of life."

Mr Briggs believes that vessels with smaller crew numbers as well as larger ones would benefit from this type of service.

"Business also means employee retention, translating to quality of life service availability," he said. "Looking at the ships, they may not have hundreds of people on them. It's a challenging workplace, and we need to do anything we can to make it better."

While many see the high monthly cost involved with running a VSAT system as prohibitive, Mr Briggs says that he has seen companies using the system to eliminate other cost items in their budgets that may not be immediately obvious, and improving the quality of their operations.

"Commercial shipping is spending about $1,000 to $1,500 per month on traditional communications methods," he said. "If you look at the true costs, if you look at the invoices of all the things you have to spend money on, you can see the value of full-time, always-on services."

Brad Briggs, senior vice president of sales and marketing for MTN

"Weather reports, routing information, improvements in fuel costs and safety, better inventory management - these are some of the ways that VSAT can benefit the business.

"We offer a program called ShipTracker, which can be used over VSAT, and the customers who've used it have said they've saved on fuel. With better crew retention you can save on costs - on land, how much does a company calculate that it costs to find a new employee? Maybe half a year's salary? Then there are other areas, like maintenance, where you can also save money."

Mobile Phone access

One service that MTN has provided that they have seen to be successful is mobile phone access using the VSAT data pipe. This is an area that the company feels can be beneficial in keeping a happy crew on board the vessels.

"You can approach your decision on your satcom system by looking at the pure economics of the service, but there's not just one factor involved in the decision - there are also things like quality of life, and being able to provide new services to the people onboard," said Mr Briggs.

"If it changes the lives of the people on board the ship, if it's only for the benefit of the increased quality of life on the vessel, then that outweighs the cost."

"The GSM and CDMA services we've been able to provide have been very well accepted," he continued. "In speaking of developing systems for smaller vessels so they too may have wireless/cellular services aboard, we have also developed smaller affordable systems. We have systems now that can cater for 6,8 or even 20 cell phone users."

"Of course, if the staff give out phone numbers to people you'll get lots of incoming calls, so you need to be able to control that. You need to monitor or have systems in place to control use of voice, data and internet services, you need tools to control the use of the bandwidth. People are not looking to make money from their crews, they just want to control the use of the bandwidth."

"The vessels are being prepared for wireless capabilities, people may want those services. And once we have wireless installed we can use the cables to operate GSM services. We're selling a total solution, integrating voice systems, data systems, even accounting systems both on and off the ship."

Another area where VSAT can offer options to improve the efficiency of business operation is in the creation of networks linking the vessels with the shore based offices, with integrated systems for all business units.

"Once you put in VSAT, as far as the office gets ahead with technology, the ship will be able to catch up with it," said Mr Briggs. "Data is data, and VSAT allows the data to flow."

"Think about the inventor of the light bulb as opposed to the candle maker. The candle maker said that 'we don't need light bulbs', and lobbies against it. But if someone gets the light bulb and uses it, then suddenly the lights go on, so to speak."

VSAT applications

A high-speed connection, where costs don't vary with different amounts of data flow, may seem like a source of opportunity for companies to introduce new and innovative practices to their operations, but the flow of data is only an advantage to a company that has the right applications to make use of it.

The lack of a so-called 'killer application' to utilise this technology as a valuing adding service is often cited as a reason against adopting VSAT systems, with high-speed services remaining a costly luxury in many eyes as a result.

"I don't know what the magic application is, but we strive to make the internet available as a tool for the businesses, and to use their bandwidth more efficiently," said Mr Briggs.

"VSAT, for all of its benefits, has to be at a price to meet with the businesses needs. People have a budget for their communications, and they look at VSAT as a cost centre within that. But they're not seeing the benefits they might get, just the costs."

"Our challenge is to educate people in this, and to drive down costs to a level where they're affordable. It's not a low-cost open pipe like on land, it's maritime specialised."

"Specifically regarding the cell phones, everyone understands the value of having a cell phone in your pocket, and the accessibility it brings. I think this kind of idea will be the next great big thing in maritime, and will help VSAT to leapfrog into place as a necessary technology.

Fleet Broadband

With the recent demise of Connexion by Boeing and the projected 2007 launch of Inmarsat's FleetBroadband maritime BGAN service, the face of the high-speed communications market is rapidly changing - and competition can be expected to benefit the consumer first and foremost.

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"There are many services on offer from competitors, but in the forest of competition, if you're always looking over your shoulder it's no good, I prefer to always be looking forward," said Mr Briggs.

"Sometimes advances come from awareness, sometimes they come from needs. We're entering an era of more sophisticated IT managers, some are coming into the industry from outside shipping and asking why people are not using some of the capabilities available."

"I think that once people get a taste of that kind of high-speed bandwidth capability, they will realise some of the things they can do with it, and they will look at what kind of services they can get their hands on. So I think something like FleetBroadband will make the market better for all of the competitors."

Peter Neu, ND Satcom

ND Satcom, a German company specialising in the construction of VSAT integrating systems, has worked with more than 20 major maritime operators during projects spanning the last 10 years, providing modems and RF equipment to run high-speed connection services.

Peter Neu, manager of product marketing at the company, says he has seen the demand for VSAT systems grow steadily in recent times.

"Demand is still increasing," he told us. "The question is the definition of broadband - there are two kinds of communications, Inmarsat or VSAT. We see broadband as not being always required by everyone, it depends on the business case."

"There's a certain price point where VSAT becomes attractive with the amount of traffic that you have on your communications system. Inmarsat has a low level of initial investment compared to VSAT, but there's a much higher usage cost involved after a certain volume."

So far Mr Neu has seen customers like ferries, oil companies, drilling ships, and superyachts as the main customers for this type of service, but believes that might start to change.

"Other types of ships may begin to start using it, using services like TV and internet," he said. "In principle any business based on transport could make use of this system."

The availability of applications is, however, an area that does hinder widespread growth of VSAT installations in the commercial shipping sector.

"I don't see too many new applications coming, I think that most will be connected to entertainment and access to the Web," Mr Neu said. "I don't see any killer application out there. The bandwidth requirements for businesses are increasing every year, but I don't see a killer application."

"For ferries it's clear, it's needed for consumer services. Drilling vessels have requirements to be online with the office. Companies from time to time need to see information about where they have to go. But there's no specific killer application for commercial shipping."

Lower prices

Mr Neu does foresee reductions in the price of VSAT services in the future, and expects to see reductions in the capital costs involved in installing this type of system.

"There will be price reductions, everything comes down," he said. "The antenna is almost 80 per cent of the cost of the system, so as they

improve it will get cheaper. Then demand will increase."

"FleetBroadband (Inmarsat's high-speed service, scheduled for 2007) will introduce more price competition on VSAT prices. This should lead to increased demand for all of the companies in the high-speed maritime market."

"In principle everything is there (for a successful market), but it remains to be seen if the companies will spend the money to do it. If we make the solutions cheaper, then they will be used. I don't see such a gap in technology between the vessel and the office, it's just a matter of money."

Mr Neu does believe that the shipping industry has been a little conservative in its use of technology in the past, but thinks that it will become harder to ignore continuing developments in IT.

"I think that since IP is going everywhere and into everything, and people are handling PCs on a day-to-day basis, people on the vessels will be used to technology," he told us. "I think it will become more open in the future, when technology is part of normal use for everybody."

"In the future I would expect to see more general use of all of the new applications we already know, things like TV, internet, and business applications for ERP. Things that are already used in land-based offices. That and money together will drive the market. I think TV is one of the biggest options to motivate the crews. Entertainment is a key issue."

Mats Back, C2Sat

C2SAT is a Swedish company that specialises in the development and production of Ku-band VSAT antennae, aimed at improving the efficiency of data flow when using VSAT systems.

Mats Back, corporate communications manager at C2Sat, says that he has seen a strong demand for high-speed services in today's market, though not necessarily in the commercial shipping sector.

"We can see a strong demand from Asia and oil and gas related vessels like LNGs, FPSOs, and so on," he told us. "Areas like the military, and oil and gas and related supply vessels are showing rising demand. Modernisation of fleets and new LNGs, and FPSOs will contribute to high growth in the sector."

"In the future, I think that the new built fleets in Asia will be the first to really contribute to increasing growth, with more oil and gas related vessels. But the merchandise fleet that is still not equipped with modern communications will adapt, though more slowly, and will then be followed by the smaller vessels, less than 100gt."

While some people have expressed concern at the availability of suitable applications to properly utilise the capabilities of these systems, Mr Back feels that this is not the case, and that the applications are out there waiting to be realised by the shipping industry.

"The shipping industry is not waiting for any killer application out there," he said. "They first of all want voice, voice and voice, and then want the internet and e-mail, just like the companies ashore do. And they want to have them at prices they can afford."

Meeting new regulations

One particular use of VSAT the Mr Back envisions is in the provision of informa-

tion to regulatory authorities from the vessel. He expects that the regulations are likely to become more and more stringent, and require greater amounts of information to be transferred.

"Time will come when all info and documents for the port will be smoothly provided by digital communication," he said. "You will just have to write any document once, and then you'll be able to 'cut and paste' information to where it's needed."

"You'll also be able to save backups and usage histories just like in any CRM program at the onshore office, things like that. We are not there yet, however - and the key word to remember in all of this is standardisation."

Standardisation of systems would allow for greater centralised control, and a greater ability to identify and solve any issues that arise on the vessels before they become expensive failures.

"Monitoring and control on-line will save time and money, and service and maintenance alerts could be made to be automatic, like in modern cars," said Mr Back. " You could also do things like arranging what spare parts you will have waiting for you in the next harbour before a breakdown or damage occurs."

The area that will be most responsible for any growth in demand however, will be the need for a greater access to communications facilities for the crews onboard modern vessels, according to Mr Back.

"Most of all, modern ways to communicate will be demanded by seafarers on board the ships as things they have to have by default," he said. "I guess the same discussion came around when telex was invented."

Comparable communications

Despite the wish for comparable communications facilities at sea to those in use on land, Mr Back realises that the specific challenges of the maritime environment necessitate a different approach, and that maritime solutions will inevitably retain higher costs for the foreseeable future.

A Ku-band VSAT antenna, from C2Sat

"You cannot compare marine to land based applications, since at sea you do not have competition from fibre optics, other than on oil fields close to shore," he told us.

"Why try and compare? As long as the maritime sector improves and also experiences evolution, but more slowly and in less dramatic evolutionary steps, going forward is going forward, and that is a good thing to enjoy."

In common with most suppliers of VSAT systems, Mr Back sees price predictability as one of the main selling points for these services - as it has been for land based communications systems in the past.

"I think 'flat fee' will do the trick (to drive demand), since one big issue and obstacle has always been the uncertainty of the monthly fee to be paid," he said.

"Once you have the subscription, and the prices always only goes down, there will be fewer second thoughts about the monthly fee, as long as the price is right."

"There are two different worlds, with the cable factor ashore," he continued. "Whatever happens on-land, even if the technology gap keeps on growing, the maritime sector also will follow and pick up the mature and most successful applications that have already conquered terra firma."

Raising the market profile

Mr Back sees competition in the high-speed maritime communications market, particularly in the shape of Inmarsat's scheduled 2007 release of its Fleet Broadband service, as a positive influence that will raise the profile of all of the players in the market.

"I think it might give both market sectors a push forward, just like all antique stores gather in one part of the town and often even on the same street, door-to-door," he said.

"It will be talk of the town, and at the end of the day it will be a matter of creating a break-even point of price. Investment in equipment will be balanced against the traffic fees. Either you invest more in a VSAT and get the money back, depending on lower traffic fees, or the other way around. The wallets will speak, and that's where the answers will be."

Mr Back sees price competition as one of the ways that suppliers can combat what he has seen as a reluctance in the shipping industry to embrace new technologies as they are developed.

"There is an amount of technological conservatism in the industry," he told us, "and this is natural since the core business is to take the vessel from A to B and load or offload the cargo. If the monitor is from 1956 it does not matter as long as it works."

"Changes come more slowly and more subtly than they do ashore, but changes will come. A new generation of sea officers and seafarers having modern communications, as a default system, will come, and new vessels will start to be substituted for the old ones."

"The time will come, and we are now in the first quarter of the S-curve of growth," Mr Back continued. "The question is; how steep will it be, and when will the big boost come?"

"Some say within six months, some say within ten years. I agree with those who predict the big rise to come between 2008 and 2009. Many companies are now taking their positions to be there and not miss the golden moment. The best is that we all are invited to the party, both suppliers and customers, since the volumes will increase and prices will go down." DS

GMDSS needs a review

Captain Stephen Bligh, speaking at the ACI maritime communications and technology conference in London in May, says that the Global Maritime Distress and Safety System (GMDSS) needs a review.

CAPTAIN STEPHEN BLIGH was previously fleet marine manager with P&O Nedlloyd and chief executive of the UK's maritime coastguard agency (MCA).

"Technology is moving on so fast. Communications is running so fast. There are people who haven't even caught up with where we are today," he said, speaking at the ACI maritime conference.

"I would say, yes [GMDSS] needs a review, it needs to move forward."

GMDSS does not yet cover the world, he said, with coverage particularly lacking in developing countries.

"GMDSS is not a global system," he said. "There are still big holes in it. There was never any thought to developing nations and people who could invest in the infrastructure."

Captain Bligh suggested that the shipping industry should adopt measures towards those the aviation industry has to deal with.

"I'm learning to fly," he said. "And I cannot move my plane without communicating with [the authorities]."

"Aeroplanes are being tracked, the information is there," he said.

By contrast, users of recreational boats can typically just go out with their mobile phone and assume they will be OK. "We all know the battery runs out at the critical moment. There aren't too many waterproof versions," he said.

"We all know what happens, 6,000 alarms on ships, a piece of sticky tape stops all that noise."

Overall, Captain Bligh is positive about the impact of technology on the maritime industry.

"We're seeing planned maintenance systems, accident reporting systems," he said.

"Technology has helped an enormous amount."

"An average seafarer would say, "technology has been a bloody nuisance" In reality it means spares being delivered to the ship at the correct time."

"We have the correct compliment of people, we can prevent fraud."

"This has added to maritime safety."

"Its all certainly contributing," he said. "Data is power and knowledge."

Captain Bligh was still skeptical about the benefits of AIS, due to the large number of badly programmed units on vessels. "Much of the data put in is put in by the ship. Put rubbish in, get rubbish out," he said.

"There's no interface between the AIS and the screens. Its still an alphanumeric system."

"I think its getting better. But we still have fundamental flaws in it."

However Captain Bligh was skeptical about the level of concern which has been raised about putting AIS data on the internet, because it is not hard to work out where ships are.

GMDSS needs a review – Captain Stephen Bligh

"People threw their hands in the air," he said. "But all the cruise companies publish their schedules years in advance. Ferries leave the port on the morning and arrive at night."

Captain Bligh said that AIS was originally conceived as a monitoring system for flag states; people talked about it as a collision avoidance tool as a way to sell AIS to the shipping industry, he said.

Maintenance data shared

According to John Ramage, managing director of International Registries, shipping companies are starting to share a lot more data about the vessel when they are passed from one owner to another.

"It depends on the circumstances," he said. "If its a new ship then sometimes you can get all the information. The ship is only 25 years old, the level of handover will be less."

"But you would have a chief engineer sailing for a month before the ship is handed over - he can get all the information."

Mortgage companies are asking for a lot more data about a ship before agreeing to give finance for it, he said, so people are only able to buy vessels if the seller agrees to provide comprehensive data.

"We have received vessels into management where we have got nothing more than what is required," said Patrick Slesinger, chief information officer of Wallem Shipmanagement.

"In other areas we got all the information."

Long range tracking

Paul Morter, sales and product manager with Transas Telematics, talked about developments with long range tracking.

If your ship shows up on a satellite picture as being 50 miles from New York, but it has not given any information on its long range identification and tracking (LRIT) system, "you can expect a visit from an F16," he said.

The requirement to have a long range tracking system will enter into force on January 1, 2008, as part of SOLAS Chapter 5, after finally being adopted by the IMO's Maritime Safety Committee (MSC) in May 2006.

Newbuilds will need to fit long range tracking from December 31st, 2008, and existing vessels will need to fit one in their first radio survey after December 31st 2008.

Decisions have not yet been made about who will oversee the LRIT infrastructure but it is expected to be Inmarsat's overseers International Maritime Satellite Organisation (IMSO). "They are a prime contender, "he said.

Canada has hosted a working group to oversee the technology.

Under the rules, flag states will be able to see their own ships at any time. Port states can track ships which have declared an intention to enter the port.

Coastal states can track ships up to 1,000 miles from the coast, but there are some exceptions.

One likely exception is that one country is not able to track ships in coastal waters of a second country, which have the flag of the second country, even if the vessels are under 1,000 miles from the first country. "There will be 'let out clauses," Mr Morter said.

Ships in internal waterways cannot be tracked by another country.

Equipment will all need to be approved by the flag.

The costs of airtime and infrastructure will be paid for by governments; the communications costs will be paid by whoever requests the information.

Ships will be required to broadcast their position four times a day, with the data going into the central database. The vessel's flag will pay for the communications costs of this, unless it passes rules otherwise.

The equipment will also be able to respond to 'poll' commands - authorized parties can ask the vessel for its location.

The long range tracking system will run on mains and emergency power.

The data transmitted will be a secret identifier number for the ship, the position, and the data and time.

The data will be sent initially to 'application service providers', which will change the identifier number to the ships' known name and identity number.

Professor Nikitakos

Professor Nikitas Nikitakos, of the University of the Aegean, also president of shipping company IT manager's association AMMITEC, talked about the EU funded project SLM-VRT to develop a methodology for a centralised learning system for seafarers, where information is provided over the internet and satellite communications.

The project is led by the University of the Aegean; British Maritime Technology (BMT) and the University of Madrid are also involved.

Seafarers can use computer training materials and also interact with a human tutor.

The computer system might have a visual bridge and a navigation console, he said. DS

Sakhalin remote rig monitoring - no problems after a year

www.nera.no

A remote monitoring system installed on an unmanned rig under construction in Sakhalin 800km offshore has had no problems apart from one defective camera, reports Nera, manufacturers of the satellite communications terminal.

During the building phase, the rig can only be accessed by someone dangling from a helicopter, and so it was absolutely critical that all monitoring components would be absolutely reliable.

The oil company is Sakhalin Energy Investment Company, joint venture between Shell, Mitsui and Diamond Gas Mitsubishi Corporation. The rig is being built by Aker Kvaerner and Pharos Marine.

The system is to remotely monitor two unmanned offshore rigs under construction in Sakhalin.

The system sends back data every 15 minutes, including television pictures, fog monitoring, power generator performance, fuel levels, fire control system, doors on onboard containers and platform lights.

The data is monitored by Aker Kvaerner's control room in Oslo.

There are two rigs, Piltun-Astokhskoye-B (PA-B), for offshore oil extraction and Lunskoye Platform (LUN-A) for gas. They are linked to the shore by pipeline.

The longer term plan is to build fibre optic cables to send data back to shore, but the satellite communications is being used while the rigs are being built.

An Inmarsat Fleet 55 system, manufactured by Nera and designed for use onboard deep sea maritime vessels, is used for the satellite communications.

The first plan was to use Orbcomm for remote monitoring, but this plan was shelved when the project team discovered that Orbcomm was not type approved for this type of installation and did not have a license to be used in Russia.

Aase-Karin Ronningen from Nera reports that the original plan was to use a Nera World Communicator satellite terminal, designed for use on land, but put inside a protective maritime satcom radome, with a small heater (eg a lightbulb) inside to stop the system from freezing.

After one year, one defective camera was the only problem with the remote monitoring system

Before installation the whole system was tested by Nera, in Norway

A remote monitoring system, using Nera maritime terminals, has been a critical component in the Sakhalin construction process

Nera has made a few installations like this at oil and gas installations on land.

However for the offshore installation, the satcom engineers from JSC Ream Division decided that a more robust system was needed, due to possible vibration of the rig, possible damage due to steam condensation from heating elements inside the radome, and the difficulty in replacing any parts that broke. It chose the Inmarsat Fleet 55 terminal, designed for maritime use.

Before doing the installation, engineers from JSC Ream Division went through a special course of study to do installation work, and the whole system, including data loggers and cameras, was tested by Nera in Norway.

The rig has data logging equipment supplied by ITAS of Norway.

There is a CR1000 measurement and control system by Campbell Scientific Services. It has a 2Mb memory, a 16 bit Hitachi microcontroller with 32 bit internal CPU, and temperature compensated clock. It has a battery to ensure that data and clock time is maintained if there is a problem with the power supply to the unit.

Three rugged closed circuit cameras were used, supplied by Hernis of Norway, which have their own wipers and windshield washer fluid. Images from the cameras are recorded and processed by a TeleObserver TO3100.

Other sensors were supplied by Pharos Marine.

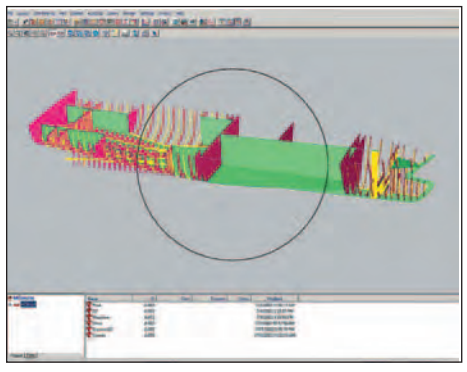
"Its a complex array of information and this is the first time Nera has used Fleet F55 in such conditions," says Nera. DS

Lloyd's Register - Fairplay has won the European Maritime Safety Agency (EMSA) tender to supply data on marine casualties and ship particulars through its web-based service Sea-web. This program provides a range of search capabilities about individual ships, companies and shipbuilders.

Lasse Kittilsen has been appointed manager products and markets at **MTS**. He was previously vice president business development for Wilhelmsen Maritime Services.

Crew manning software company **Manpower Software** has been appointed a Gold Certified Partner by Microsoft.

Autoship Systems Corporation has released Autostructure 3.1, the newest version of its internal structural design software.



Autoships' internal structural design software

ABS has released a new version of the CSR SafeShip for Tankers software. Version 6.8 is an upgrade of the previous version 6.63, which customers have been using to evaluate tanker designs for conformance with the new IACS Common Structural Rules (CSR) since February 2006.

BMT SeaTech has reported orders for 12 complete newbuild installations of a touchscreen version of its SmartStress hull stress monitoring system, from a number of tanker, bulker and LNG operators. The company says that the SmartStress system is now installed on 120 vessels of various types worldwide.

SpecTec has opened new offices in Hamburg, Germany, and Kiev, Ukraine, taking its number of global offices to 22.

ShipConstructor Software, developer of AutoCAD-based 3D product modelling and production planning software, has released the latest version of its software, ShipConstructor 2006. It includes a 'SmartParts' system, which allows designs to automatically react to changes of adjacent parts or pre-defined standards, updating themselves, as well as the production drawing.

Corpora PLC, a textual analysis software company, has won a contract worth an undisclosed sum with Fuji Trading Co to supply its ships with its iOra Maritime Data Replicator software. The software, which reduces the cost of sending documents via satellite, will initially be installed on 41 ships with the aim of rolling it out to more in the future, the company said.

U.K based **Marine Software** is to supply its Marine Planned Maintenance system to F.T. Everard & Sons, with the 'MV Speciality' the first of Everards' new 3750 dwt newbuildings to take delivery of the MPM system, after the initial database set-up.

Veson Nautical has opened a new office in Rotterdam, the Netherlands, to be headed up by Ramon Lagrand, new accounts manager, northern Europe. The company has also hired new staff members Mark Higgins, accounts manager, software engineers Michael A. Brown and Xiaobang Yue, and business operations associate Robert Marx.

Veson Nautical has agreed a licence deal with The National Shipping Corporation of Saudi Arabia (NSCSA) for Veson's Integrated Maritime Operations System (IMOS). IMOS will manage NSCSA's chartering and operational activities for its fleet of tankers and very large crude carriers (VLCCs). NSCSA evaluated IMOS for a period of 6 months prior to its decision to license the software.

Stolt-Nielsen S.A. is to use **Veson Nautical's** Integrated Maritime Operations System (IMOS) to handle all chartering, operations and accounting functions for the company's Inland Tanker division. SNTG's Inland barge fleet will use IMOS to handle all voyages, contracts, scheduling and communications from vessel to shore, while back office operations will use the IMOS Accounting Module integrated with the company's existing JD Edwards accounting package.

Staff from ARK, previously the Russian agency for AMOS, now acquired by SpecTec, with Giampiero Soncini, SpecTec's CEO (2nd from right)

SpecTec has purchased Russian company ARK, which was previously the Russian agency for Amos. The ARK office will be merged with the existing SpecTec Product Development branch office, bringing the total staff to 15, with 2 more hires expected before the end of the year.

Dredging company Van Oord has signed an agreement with **ShipServ** to trade with suppliers on ShipServ TradeNet. ShipServ reports that there are now 65 shipping companies using its system.

Star Information Systems (SIS) has released Star IPS version 3.0, an improved version of its integrated fleet and ship management software, which has been developed and tested with input from SIS customers. Odfjell, one of these customers, had been beta testing the program since April 2006.

Safmarine Container Lines has announced a 10-year agreement with IBM to upgrade Safmarine's IT infrastructure. **IBM** will provide IT strategy consulting services to help develop Safmarine's commercial strategy, running Safmarine's data centre operations and providing disaster recovery services. IBM will also manage the company's servers and desktop systems.

Arqiva has signed a deal with the UK's Maritime and Coastguard Agency (MCA) to extend its service contract to include laptop, desktop and server repair services. The value of the new contract is about £1 million per year, and will cover all hardware support for the MCA's 1,300 staff nationwide. A separate agreement has been signed with the vendor to support and maintain the MCA's radio communications infrastructure.

Teledata has invested an undisclosed amount in marine spill response company **ECM Maritime Services.** Teledata will also investing in on-line services, which will allow clients to access their own fleet specific information and to receive time sensitive data.

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ShipServ hits 2 million transactions

www.shipserv.com

ShipServ has reported the 2,000,000th transaction on its TradeNet platform, having only reached 1,000,000 transactions during July of 2005 after 5 years of trading.

The 2,000,000 transactions to date represent an estimated total value of US$600 million.

ShipServ has cited an increase in business in Japan as one of the drivers behind this growth, with a 70 per cent increase in the number of Japanese owned shipping companies using the system.

The company now says it has 60 shipping companies and over 5,000 suppliers signed up to its service.

Kongsberg develops 'Portable Classroom'

www.kongsbergmaritime.com

Kongsberg Maritime has developed a new training method to facilitate maritime companies and their mobile workforces, called the 'Portable Classroom'. The Portable Classroom is intended to be used at customer sites, Kongsberg Maritime Sites and onboard vessels.

Ten laptop PCs are also included, with software installed, to act as operator stations during training.

The first outing for the Portable Classroom was a one-week operator and technical training course in Integrated Automation Systems (IAS) for MaranGas in Athens, Greece, which the company reports as having been very successful.

A portable classroom, with networked laptop PCs

Online marine liability service launched

www.liginsurance.com

A new online marine general liability and maritime employers liability rating program has been released by LIG Marine Managers in Florida, USA. The 'Thunderstorm' program is designed to provide 24/7 instant service and quotes for a wide variety of marine-related accounts.

Risks quoted and bound in the Thunder-storm rating system through the end of October will earn an additional 2.5 percent bonus commission points, according to the company.

Risks quoted and bound in the Thunderstorm rating system through the end of October will earn an additional 2.5 percent bonus commission points, according to the company.

The program is designed for marine contractors, boat repairers, stevedores, terminal operators, wharfingers and related marine industries, and will be expanded to other lines over the next six months.

Information and complete program descriptions can be downloaded at www.liginsurance.com.

Customised software add-ons

There is a growing business building add-ons to standard maritime software packages, customised to the needs of a specific shipping company. *Digital Ship* asked Michael Johnson of Management Systems Consulting LLC, which builds customised add-ons, to explain how it works

MARINE ERP (Enterprise Resource Planning) software - tools for maintenance, purchasing, crewing, payroll, ISM - has in some respects become a commodity item.

The providers (ABS NS, SpecTec, SIS, Danaos, Maximo, ShipNet and others) are in the business of providing standardised software which appeals to a broad range of marine operators, both in shipping and offshore.

There are variant work flows and configuration options available within the software; however the fundamental premise is that the software providers provide the same basic package to all of their clients.

There is no doubt that the software fulfils the basic needs of operators, however, in many cases the software simply does not provide the company-specific capability required with respect to the data retained in these systems.

It would be naïve to believe that any one software system could provide the full and complete functionality required in all situations.

It is at this point that add-ons can be created for these systems which allows for the additional handling of this data and thereby extracts additional value from the existing software investment.

How it works

Add-ons are simply that, add-ons (extensions) to existing systems.

The common denominator with these add-ons is that they are an extension of your existing software investment and build upon the data which you already have.

Add-ons do not modify the existing data nor do they change the software application of the original provider.

Add-ons allow for additional value to be extracted from the system by taking data already collected by the existing system and adding value in a manner which is specific to the needs of the particular operator.

Added value can be in many forms; it could be additional reporting (operational and/or metrics based), it could be interfaces to other packages, it could be complete and new modules which build upon basic data collected by these marine ERP systems.

Examples

The following listing is just a short list of software add-ons:

- Purchasing metrics (Are orders coded to company requirements? What are the values of various key performance indicators? What exceptions do we have in our data?).
- Generation of governmental required data for arrival and departure.
- Union contribution management based upon actual embarkations, contracts, benefit contribution plans and overlap of positions.
- Seaman Pool management.
- Integration with freight forwarders logistics systems, allowing orders to be notified in the freight forwarders systems and then feedback provided back to vessels.
- Generation of payroll data from basic crewing records of the ERP package, and then the integration of this new payroll data with payroll bureaus or internal systems
- Corporate payroll tax management systems, which rely upon the payroll information contained in the ERP package or externally generated payroll as mentioned above
- Interfaces to various financial packages, which employ various business rules in the translation of data from the ERP to the accounting package.
- Direct integration with various banking systems for payments, whether it if direct wire transfer or positive pay for check settlements of crew payroll.

These are various customized reporting solutions, all of which are dependent upon how the ship operator wants to see the data. This not only includes the metrics surrounding the data, but also the quality/integrity of the data in the system, as this ensures quality reporting results. You must control the process before you can assess the performance.

Although these are just a few examples, add-ons can be designed which address almost any need, just as long as the genesis of the original data is in the marine ERP package.

In those cases where that data doesn't exist, custom software can be created to address those needs, which is also a common scenario.

Add-ons providers

Add-ons are provided by third party integrators, such as (my company) Management Systems Consulting LLC, SRO Solutions, and others.

Third party integrators are interesting, in that they bring many different qualities to clients.

They have experience with many clients using different ERP packages. This gives a broad view of ERP capabilities, requirements and implementations, thereby increasing the effectiveness of the solutions that they can offer to the clients.

They have exposure to very unique requirements from very different clients in terms of the extensions which are required. This allows for the successes and failures to be shared amongst clients, reducing the learning curve as well as increasing the chance of success

They have the ability to work outside of the box. These add-ons are not required to be designed around existing software frameworks, they can use the latest tools which minimise cost and provide the greatest flexibility.

Third party integrators have non-conflicting goals; they assist in getting the most value out of your existing system, irrespective of who the original provider may be. Also, there is no pressure or incentive to provide a solution which might only partially work for the defined requirements.

Add-ons can extract additional value from your software investment – Michael Johnson, Management Systems Consulting

In the end, the third party integrator provides value not only to the clients who use these add-ons, but also the original ERP providers, as the end result is clients with a complete system which fulfils all of their goals.

This fulfilment of the operator's requirements results in a satisfied client, and satisfied clients are good references for the original ERP providers.

What to look for

Based upon experience with many varied clients, a simple recipe of considerations is in order, as this will greatly enhance your evaluation and design process.

Define the end goal of the add-on/extension first; this will form a basis for the overall design.

Proceed with the project only if there is a financial advantage to be gained, either directly (process improvement) or indirectly (knowledge) through the proposed add-on/extension.

Select a quality add-on provider with marine experience and experience with improving upon marine ERP packages.

Work with your provider to develop a full and complete specification which takes into account the variability in business rules that you might require.

Ensure that the solution covers all facets of good design (data consistency checking, exception handling, and positive notification) and uses mainstream technology which is maintainable over time.

Consideration of these points will lead to a well designed and executed solution. DS

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Free crew e-mail - the story so far

Last year's IBF negotiations led to an agreement that from 2006 all member seafarers would have free access to e-mail. *Digital Ship* met with David Dearsley of IMEC (International Maritime Employers' Committee) to see how ship owners have adapted to the requirements

AS PART OF A PAY DEAL reached at the International Bargaining Forum (IBF) between groups of international maritime employers including IMEC (International Maritime Employers' Committee) and the ITF (International Transport Workers' Federation) at the end of 2005 it was agreed that all seafarers party to the agreement would now be entitled to free access to e-mail on board their vessels.

Coming into force on January 1st, 2006, the arrangement has now been in place for some time, and ship employers' representative IMEC says it has not had reports of any problems managing this facility from its members.

"E-mail was one of a list of benefits that were passed on to the crews," said David Dearsley, secretary general of IMEC. "There was an increase in pay, as well as other benefits - including e-mail. The deal delivered money as well as a lot of other things."

E-mail access was described as a 'social benefit' under the new pay agreement. The negotiations revealed the importance placed by seafarers and their representatives on access to communications facilities.

"They (the ITF) put a shopping list of demands to us, we had a look at the cost, and told them they had to prioritise what they want," said Mr Dearsley.

"So when they prioritised some things got whittled away - but the e-mail remained on the list. Seafarers need to have links with their families and their homes, so it's important in that respect."

"People with 150 ships down to 15 ships are represented by us. E-mail was seen as a cost item for them. Crew communications is a big part of making their crews' lives better and letting them stay in touch with their families."

E-mail costs

IMEC came to the negotiations with its own figures as to how much an e-mail service would cost if provided freely on a ship-wide basis.

"We did a study to see what the cost of e-mail would be per month for the seafarer," said Mr Dearsley. "The figures came from the calculations of our members."

"It was based on the cost per minute of sending e-mail, multiplied by a certain number of minutes per person, per month. One of our senior member companies did a lot of work in coming up with the figures."

"The ITF challenged our costings, they didn't like the way we had calculated the figures," Mr Dearsley continued. "Our original estimate was that e-mail would account for about 3.5 per cent of the total pay increase (which had been agreed as 7.5 of total wages, over 2 years). At the end of the day the e-mail agreement ended up being worth 1 per cent of that."

The pay negotiations are based on costs for a model ship of 23 crew. The amount of the increase agreed upon for this ship is then applied through local negotiations in the main labour supplying countries to the seafarers' wage scales. The cost of e-mail provision is included as part of that increase.

Seafarer representatives from each country involved in the agreement can decide how they want to split up the resources available through the increase, but the e-mail is compulsory everywhere.

Mr Dearsley told us that there are separate specific agreements with Poland, Russia, India, the Philippines, Sri Lanka, and Romania, and a further international agreement to cover other countries, based on the IBF deal. There's also a German agreement for German owned ships.

The agreements are all slightly different, but they all include e-mail.

Equipment grants

Ships covered by the agreement that do not have equipment to cater to the e-mail needs of their crew are able to apply for grants from IMEC towards purchasing the technology needed.

"The question did come up as to whether the ships were fitted with the right kit to make this available to the crews," said Mr Dearsley.

"Most companies already had some services for their crews anyway, or else they didn't have the kit to provide them."

"Even the smaller ones can say 'we don't have the kit', and can get grants, and they can then offset the cost of providing the e-mail against the pay rises they have to give to their crews anyway. It's a minority of ships that don't have it."

"Under the IBF agreement there is a welfare fund, to which ship owners have to contribute $240 per seafarer, per ship. We have access to 5 per cent of this, and we can use this money (about $900,000) to give grants to companies to get the equipment."

E-mail abuse

While the agreement does state that "seafarers shall be allowed access to email facilities at no cost while on board, subject to the ship's operational requirements" (taking the Polish agreement as an example of a typical clause), there are no further requirements or regulations mentioned - leaving some room for interpretation.

With the cost of providing e-mail depending greatly on the amount of data being sent via the satcom system it would mean that there would be the potential for seafarers to run up quite significant bills, depending on how they use their e-mail.

Many shipping companies transmit less than 1MB per day for their business e-mails. If the crew wants to start receiving digital photos of their children from home, for example, with file sizes that could be a number of megabytes each, the ship owner would presumably have to step in and prohibit such a costly facility.

This could, in theory, lead to problems where seafarers feel that their entitlements under the pay agreement are not being upheld.

However, up to this point Mr Dearsley has not heard any reports from members saying they have had issues of this sort, and hopes that a common sense approach on all sides will keep things running smoothly.

Sensible company rules should be enough to ensure that everyone can enjoy the facility without abuse, he told us.

"We sent a circular to our members that the system would be subject to company rules," he said. "I think that people will continue with 'reasonable use', quite similar to the situation before the agreement in many cases."

"Most companies have regulations in place to cover e-mail usage already. If they don't, they'll soon get them if it starts being abused. We haven't had any reports of any problems yet. If there are any, then we'll bring them in to the next round of negotiations, starting next year."

"There will always be grey areas in this kind of deal, but it's been agreed to by members that are sophisticated companies, and who want to have good crew," Mr Dearsley added. "Something like this is going to be a feature of all future pay negotiations." DS

Interorient antispam software saves $57k

Ship management company Interorient Navigation introduced a new e-mail filtering system from World-Link Communications for its fleet - and saved $57,000 by not transmitting nuisance spam messages

SPAM, unsolicited commercial e-mail, is a problem for all e-mail users. Researchers have estimated that spam accounts for more than one of every two e-mail messages sent over the world wide web today.

For most computer users, spam is just a nuisance which may lead to a few extra minutes of e-mail screening each day. However, when dealing with spam sent to ships, the problem is more than irritating - it's expensive, because unlike land-based industries spam sent to seagoing vessels travels the last part of its journey via costly satellite connections.

While not quite as severe as the one in every two e-mail messages worldwide, onboard vessels the level is close to being one spam message for five e-mail messages sent, mainly due to the fact that vessel e-mails have been somewhat protected because they are not advertised, are not participants in newsgroups, and aren't used for online transactions.

However, receiving one spam e-mail in five is still enough to let a virus is loose onboard.

Ship management company Interorient Navigation, with approximately 50 vessels under its management, had recognised that the cost of uncontrolled spam arriving onboard each vessel every day could be a potentially very serious problem.

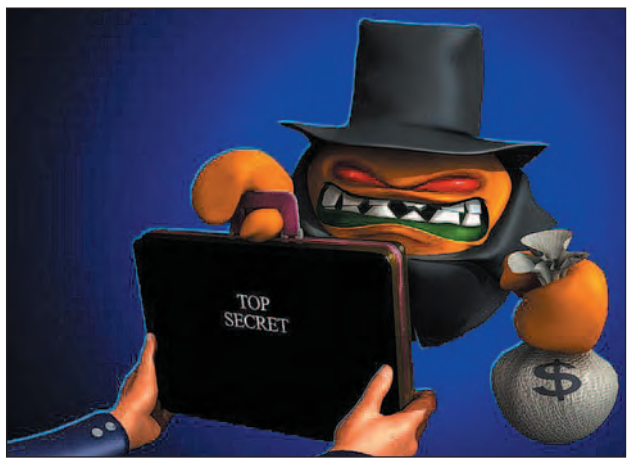
As such, the company's management decided to enlist its satellite services provider, World-Link Communications, to help them reduce spam to the lowest level possible.

Possible solutions

The first option the companies considered was to try and make sure that the existing spam-blocking facilities it had were working at an optimum level.

This included an update of spam signature databases every 15 minutes (as well as update of virus protection databases every 30 minutes), and a subscription to spyware services which send automatic updates each time new information is available.

The company also had subscriptions to online databases that identify spam-generating servers and IP addresses, and identify open relay servers used to spread spam.



Interorient has saved $57,000 by eliminating unwanted spam e-mail

The e-mail system has to check these databases before accepting any e-mail message sent to the ship.

Spam messages that do get through these precautions can be identified and returned to the queue, allowing the system to 'learn' by analysing the returned message.

Unfortunately, in spite of any attempts to improve spam-blocking strategies, spammers themselves are constantly developing new and better ways to avoid detection, so lists and methods need to be constantly upgraded and updated.

The White-list

One of the most effective spam-blocking options available to companies like Interorient is the employment of a 'white list' which prohibits the receipt of all e-mail except that from addresses maintained in the allowed (i.e. 'white') list.

Although this system would prevent nearly all spam, the danger with this approach is that legitimate messages could also get blocked.

For example, does a ship manager know all possible addresses a charterer might use to contact the vessel? Port authorities or security organisations the vessel is in contact with may also try to communicate using previously unknown e-mail addresses.

Because some legitimate e-mail might be blocked, the rejected mail must be continuously monitored by company management to spot any messages that should be delivered. The cost of the man-hours dedicated to this screening must be compared to the cost of limited spam reaching the vessel under a spam-blocking scheme.

In the case of Interorient Navigation, the company decided that the other spam blocking techniques it had initiated were workable at an effective level, and that it was not necessary to employ a white list.

The costs

The costs of making the wrong decision in the use of e-mail filtering technology can be quite severe.

A 2005 information security report from Sophos, a threat management company, estimated that at the end of 2005 there were 115,000 different viruses, worms, Trojans and other types of malware (malicious software) loose in cyberspace.

In addition, Message Labs, another messaging security company, reports that an average of one in every 67 e-mails carries a virus.

Based upon figures like this, Sophos predicts that a computer which is not protected has a nearly 100 per cent chance of becoming infected from a malicious attack after only 60 minutes online (though it would be presumed that the lower level of spam reaching ships would make this figure significantly lower for the maritime industry).

Infection with a computer virus can be an IT disaster - rectifying damage caused by a virus can take 5 to 10 hours per machine to return to a normal operating level, while regaining lost data can take days.

To disinfect the onboard computers, a technician must be sent aboard. World-Link estimates that this can cost between $1,500 to $3,000 per incident - without taking into account any operational delays and resulting costs.

While it is by no means certain that a vessel's computer system will become infected through the regular use of e-mail, it would seem that the potential costs would make this an area of serious consideration for maritime IT managers.

Interorient's results

Having implemented the precautions mentioned above, though falling short of going to a full 'white list' system, Interorient's masters have reported that spam on the fleet is down to somewhere between 1 and 1.5 per cent. The updated system has also resulted in a 40 per cent increase in identifying new spam messages.

As an example, one of the vessels showed spam to be 7 per cent of the total number of messages prior to the upgrade, but that it had dropped to less than 1 per cent of the total after the improvements.

With each spam message averaging about 9.2 KB, the system is now estimated to be blocking approximately 2,700 KB of useless data being transmitted per vessel per month.

By factoring in the differing transmission speeds for terminal types and computing costs, the company estimates that blocked spam now represents a cost saving of about $57,000 a year for the Interorient fleet.

The downloads required to keep the system constantly updated cost $250 per month via Mini-M, $80 per month via Inmarsat-B, and $55 per month via Inmarsat Fleet (ISDN), with daily update files ranging between 60 and 100 KB.

While this would mean a spend of $3,000 per year by Mini-M, which would be an expensive $150,000 for a 50-strong fleet, it would only be $660 per year with an Inmarsat Fleet link, or $33,000 for all 50 ships. With $57,000 worth of spam being blocked it would seem like an effective investment for those with faster satellite connections.

DS

Digital Ship at Posidonia report - part 2

The software and systems session of the Digital Ship Posidonia conference sparked discussions on ship-shore reporting, condition monitoring, and how an unprotected computer system can become infected by a virus within one hour of connecting to the internet. With presentations from Columbia Shipmanagement, Navigo Shipmanagers, Palantir, Wärtsilä, Datatrac, ShipServ, Navarik, and World-Link

EDDY NASSAR, network engineer for Columbia Shipmanagement, spoke to the Digital Ship Posidonia audience about his own experiences as an IT officer on board a cruise liner, and some of the successes he and the crew had seen in installing a new IT system.

"Beginning in 2005 I had the opportunity to join the Thomson Celebration cruise ship," he told us. "It had spent 6 months undergoing a complete refitting. My job was to work bringing in a new IT solution."

The first step was to install a good central server onboard, to replace the mass of jumbled wires that had existed in its place before. The server was then linked up to 60 terminals around the ship, with all of the software and data accessed from the server through a series of newly installed fibre-optic cables.

Using a server/terminal system makes it easier to fix problems – Eddy Nassar, Columbia Shipmanagement

"With Windows XP you have a remote desktop - with that you can log on to the server which has all of the software," said Mr Nassar.

"So why not have the software on each PC?" he said. "Well, this way it only needs to be installed once, and then any upgrades just done once, on the server. Secondly, there's nothing on the terminals, so when they break down we can replace the hard drive and get it back working."

"Everything, even all of the documents, are on the terminal servers. The rack for the servers is mounted on anti-shock rubber, in an air-conditioned, fireproof room."

Overcoming VSAT difficulties

Ship-shore communications were done via VSAT during Mr Nassar's time on board.

"We used stabilised VSAT - one problem with this was that the mountains in the Norwegian fjords would block lines of sight and we'd lose our communications, even down to the Inmarsat systems", Mr Nassar told us.

"The more North you go, the more the elevation of the dish, so the mountains can easily cut you off. The satellite downtime was reduced to about zero after the upgrade. The downtime we had left came from the mast or the funnel blocking line of sight. This doesn't apply to non-VSAT equipment."

"The VSAT gave us 128k, and up to 384k sometimes when other ships were not using it," he added. "MTN was providing it. But I was amazed at how fast a 128k connection could be when it was fully tested."

After upgrading the communications network, attention was turned to other systems.

"After the satellite link, the most important thing for a passenger vessel is the software," said Mr Nassar. "We took a new package from a company called Iisii cruise, a beta system."

"3 months after I joined we had the IT system running efficiently. All that was left was to train the crew."

Supplier's reliability is very important - George Spyrou

George Spyrou, Navigo Shipmanagers

The running of a successful selection and implementation programme for shipmanagement software was the topic of a presentation by George Spyrou, financial manager, Navigo Shipmanagers.

His company had found that incorporating the eventual users of the system into the process was extremely beneficial.

"It will be very useful to ask the users and act accordingly," Mr Spyrou told us. "It's proven, when people are involved in the process they are much more likely to accept. The most important part of the implementation process is to help people get used to the change."

"You need to train key crew members, but don't limit the scope of the training, do it for as many people as possible. You should also require the system to have a minimum number of users, to be user-friendly, to have a minimum number of import and export functions, and so on."

"Top management needs to be involved at all stages," he added. "If they don't take it seriously, then no one in the company will. And have an implementation plan. People say 'I will do the best I can'. This is not enough."

"You need to have one person responsible for the project, who is fully supported by the management, and who knows all of the company processes. Everyone must understand that they need to stick to the plan and the dates that have been decided in that plan."

Choosing reliable vendors

The software itself is only part of the equation - the identity of the vendor is another important consideration.

"Your suppliers' reliability is very important, as is the availability of local help to avoid barriers due to different time zones," said Mr Spyrou. "For the cost, things like maintenance, training, licences, they all add up. If you choose the wrong software you will have great difficulties."

Automating functions is the ultimate goal to judge if the software you are using has been a success.

"We have integrated our banking system with MultiCash," said Mr Spyrou. "We have automated electronic payments for the crew, automated payroll entries, and the automated import of daily exchange rates."

The automation of these functions has reduced the amount of time that employees need to spend on it, and cut costs as a result.

Otto Pedersen, Palantir

Otto Pedersen chief inventor, Palantir, spoke about the system that his company has developed for robust ship systems.

"The people on board your vessels are not IT technicians," he told us. "There should be no hands on the system if anything needs to be done for installation."

Mr Pedersen has seen that many IT solutions do not apply directly to mar-

itime functions, and need to be adapted to be suitable. One such area is system protection.

"A lot of the anti-virus providers presume that we all have a plug in the wall for downloading," he said. "Maritime is different. We take the anti-virus software and break it down, to make it better for maritime. Then we can work with a few hundred kilobits of updates, instead of 40MB or 50MB."

Full-scale compatibility

The system works with all kinds of computer applications.

"You can install whatever you want, anywhere around the world, without the cost of travelling to the vessel," said Mr Pedersen. "The easiest thing is that anything you put on the server, it will automatically be put on the ship at sea."

"All of the official programs for the company are installed on the server. You install software on the home server, and 1 e-mail goes to the ship server to update the system for everybody. It's free for you to choose what system you want to run in the background."

"We've had our first ever customer now running for 2 years, without having even 1 minute of downtime with the system," he added. "You can call any of our customers and see that this is true."

Mr Pedersen was asked if the system was Windows based.

"You run the system under Windows, you have Windows XP for the client computers, Windows 2000 for the server, but the system isn't Microsoft based," he said.

Otto Pedersen chief inventor, Palantir

Mr Pedersen was also asked if a user could fix PC drivers using the same system.

"It has a driver shelf, we make source codes for the system, and when you connect a new PC it self-selects the drivers it needs," he said.

Johan Pellas, Wärtsilä

Johan Pellas, manager for condition based monitoring, Wärtsilä, gave a presentation detailing some of his experiences in the use of condition based maintenance systems.

"You can save 1 - 4 per cent in fuel consumption by optimising," he told us. "And there can be maintenance cost savings in a range of 10 to 20 per cent during the life time of the equipment by optimized operation and maintenance."

"Our first installation has been on since 2001. The authorities are now moving to MCM monitoring, based on the real needs of the equipment."

"The basic idea of these systems is to find 80 per cent of the critical cases 7 - 14 days in advance, and to predict more than 80 per cent of the needed maintenance 1 - 4 months in advance," said Mr Pellas.

"The facts suggest that about 60 to 80 per cent of failure cases are because of human 'misjudgement'. In other words, the information was available but not understood or not acted upon correctly."

Condition Based Operation

"By having constant analysis we can know the exact conditions and plan better for the future," said Mr Pellas. "By collecting data on a daily basis you can have a good idea of the precise condition of the equipment. It's sort of Condition Based Operation really, not just monitoring."

"We use the existing systems and measure a set of parameters. You need to know all of the conditions for the measurements to really make sense. Things will be very different in the south in the summer from in the north in the winter, you need to know this and apply it for the data to make sense."

"Some parameters naturally show that you will need to do maintenance before the required time. You can reduce costs by operating as close to the optimal as possible. When you have control you can have the savings."

A remote condition monitoring system does require a large amount of contact between the vessel and the shore side offices, so communication is a big factor.

"The network to do this is there, all that's missing is the communications link," said Mr Pellas. "But today you can be connected all over the world."

"E-mails are automatically sent out, so no-one on board is disturbed. You can have a manual system, but then you will need people to take care of it."

One member of the audience asked if there were warranties based on Condition Based Monitoring. Mr Pellas replied that "on things that aren't measured it goes on the traditional basis. You can put in sensors on systems to do it if you want."

He was also asked if alarms were something that would be integrated into this kind of set-up.

"You get notification from us before an alarm would be necessary," said Mr Pellas. "With failures you would get an extreme value, and then there can be contact."

Jean Richards, Datatrac

Jean Richards, chairwoman of Datatrac, spoke about the significance of accurate data capture on board vessels, and how that relates to fines and penalties from regulatory authorities.

"We're talking about loads and loads of data now," she said. "We have the technology to work with - but do we use it 'just because we can' or because we need to."

"We are in an environment of 'too much'. Better communications has meant I can send you a message; therefore I do. But could you have done your job without it - probably. Might the message be useful some time in the future - possibly. Are you drowning in too many communication and too much information - certainly."

"The result is that you have your crew dealing with data and end up with nobody on the bridge. We have to make it easier for crews to do their jobs, and not try and turn them into secretaries."

Ms Richards thinks that people need to think more about their data requirements.

"We need to identify what we need," she said. "What will save time and save money? You need the data, but you don't need to read it all right now, you need bits of it to make decisions. It would be better to report by abstract and exception."

"Probably top of the priority list is the cost of fuel, followed by penalties for non-compliance. You need to be able to collect data in a way that can't be tampered with later. If you can collect the data and analyse it quickly it can pay for itself in half a voyage."

Data where it's needed

Managing data is a question of getting the information to where it is needed, and where it can help people to make the best use of it.

"A lot of data is easily available on board, but you need to get it where you can make better decisions," said Ms Richards. "Forms can be filled out while sailing, and the data can go into the database."

Datatrac's system can record particular bits of information as data, as specified by the company, and leave the irrelevant parts for reference later if required. One customer asked for specific information from the engine logs to be available.

"Only the bits of data they wanted was digital, the rest was sent as a 'jpeg' file," said Ms Richards. "You can have a completely digital engine log if you wish."

"We have to collect all the data for the Flag authorities, why not collect it only once and use it for what you like, when you like. You can have it in HTML, XML, whatever way you want it."

"Don't collect it if you don't need it. Store it, don't send it if you don't want it today. Capture it, don't type it. And choose carefully what you really need."

Ms Richards was asked by a member of the audience if this system was recognised by Flag state authorities.

"The UK has said that they like it, there's no problem there," she answered. "The Marshall Islands has been a bit 'chicken and egg', they say you can do things however you want to, but then say they need to see a signed log."

Jean Richards of Datatrac displays the latest data capture equipment

Freddy Ingemann, ShipServ

Freddy Ingemann, vice president of sales, ShipServ, talked about bringing the ships procurement systems closer to the shore with the use of electronic purchasing.

We need to link the buyers' and suppliers' processes – Freddy Ingemann, ShipServ

"We do electronic ship supply management solutions," he told us. "Electronic trading, linked with the communications network."

The network run by ShipServ is called TradeNet. It connects buyers and suppliers to allow them to trade for supplies electronically.

"There are 5,000 suppliers trading on TradeNet," said Mr Ingemann. "There's one connection per participant. This year we will reach 1.8 million transactions."

"To get the utmost out of the ship to shore connection we need to link the buyers' and suppliers' processes. There have been many different types of data going out to suppliers, which means they have had to do a lot of work. It's important we start creating quality data on the ship."

"TradeNet is based on MTML, it's a standard so it means that the suppliers can receive standard data," Mr Ingemann continued. "We have agreements with software providers because we use the same standard."

Online catalogue services

ShipServ has also started offering online catalogue services, in a further attempt to simplify and quicken the purchasing process.

"We now have catalogue management solutions," said Mr Ingemann. "We want

to create catalogues in a specific format. This is very important."

"You can install the catalogue on the server on the ship, and that can then be updated."

"The catalogue can be accessed from the web and downloaded. It's not just about links, it's about being able to deliver quality data."

"Now, more and more, we're seeing the catalogue being transmitted. The buyers are wanting more quality data to work from."

The company has developed a software package that can be used on board vessels to browse and make selections from the catalogues, called ShipCat.

"ShipCat is like a standard catalogue viewer, the 2 major generic catalogues use this standard," said Mr Ingemann. "This is the suppliers data, so when the supplier gets the orders back they can deal with it easily. When you search, you search all of the catalogues in the system."

Alex Murray, Navarik

Alex Murray, product manager for Navarik, talked about the new ship-shore reporting system that his company had recently supplied to Teekay, a standard integrity system for tanks, looking at corrosion pitting.

"Simplicity is the ultimate sophistication," he said, quoting Leonardo de Vinci. "You have to prepare for the internet. Until we can provide people with a service that is like the service on land the ship is not going to be close to the shore."

His company's system is used to generate ship reports easily and quickly, with a minimum of software. It can operate directly from a typical internet application, which doesn't have to be connected to the internet, with no other hardware required to be installed, and can be used to do remote updates to the source code.

Alex Murray, Navarik - Making ship shore reporting systems for Teekay

"You only need a web browser to use it, it's a lightweight client," said Mr Murray. "There's no additional software or components. You can create your own fields in the program."

"You have a one-time deployment on the vessel, and then do remote updating after that. No internet connection is needed to use the program."

No unique connection

The program doesn't have to open it's own connection to send the data.

"It bundles the XML reports and then piggybacks them on another message's connection," Mr Murray told us. "It only sends the data, not a web page, so there's no transmission of verification needed. You can graph the data coming from the vessel."

"The vessel logs directly into the shore side system. The ship side client can run in parallel when the connection is down."

"Teekay customers can login and they can see KPIs," he continued. "Vessel logs directly onto the shore side system. We'll run the ship side client in parallel, and

there are 80 charterer and terminal questionnaires available."

Mr Murray pointed out some important steps which he believes are important in minimising the amount of data required.

"First you should reduce the number of questions that can be asked - like last name, surname, family name," he said. "Show only questions that need to be addressed, and have precise search capabilities, for administrators to use before creating new questions."

"Assign questions for verification, and have quick controls, where you can pick things from lists. And make it scalable."

Asad Salameh, World-Link

Asad Salameh, president of World-Link, spoke about some of the dangers that exist once a computer is connected to the world wide web, and some of the massive costs that could result from an unprotected computer.

"There are imminent threats to your company's security," he told us. "Defence strategies are needed to protect the critical asset that data has become."

"We are asking more and more of the crew and their technical knowledge. All of these e-forms are replacing the paper trail that used to stretch from the ship to the shore. We've heard about XML web-based reporting to remote condition monitoring today."

E-mail seems to be the de-facto standard for ship-shore communications, with

Spam can average $230 per vessel, per month, over Mini-M – Asad Salameh, World-Link Communications

Mr Salameh noting that 90 per cent of the data transferred by his customers used this method.

However, once a connection with the internet is established there is the potential for security problems. Mr Salameh told us of reports saying that close to half a billion dollars has been stolen through malicious cyber crime against banking institutions alone in 2004. One such threat is a 'dialler' program.

"Diallers are programs that get into your computer and then start to dial up 900 numbers in the US, horoscopes, adult stuff, whatever," he said. "And you don't know anything about it until the bill comes."

"There has been a huge growth in threats identified in the last 5 years or so. It went from 10,700 to 15,900 identified threats in one year (2005). Now virus writers, spammers, and gangs of credit card thieves are teaming up together. We estimate that it costs about $3000 to bring back an infected machine to where it was before a virus hit."

Computer infections in 1 hour almost 100 per cent

The statistics emerging from research into this area make frightening reading for anyone running a company IT network. According to Mr Salameh, there is close to a 100 per cent chance that an unprotected machine will be infected with a malicious program of some sort within 1 hour of being connected to the internet.

Spam e-mail is another serious consideration for shipping, with the cost of communications meaning that spam can be an expensive waste of satellite connection time.

"In 2004, globally, almost 1 in 2 e-mails was spam, although that was before legislation in the US helped to curb things a little," said Mr Salameh. "Between 2,000,000 and 2,500,000 messages every day are estimated to be threats."

"Fleet e-mail addresses are usually protected, so they get it down to about 1 in 5 spam messages, though as the ships get more connected that number will start to increase. But they can do things like stealing address books from shore based offices, where they have the vessel e-mail addresses."

"A gateway appliance is a good way to protect 200 or 300 computers. A desktop software defence can lead to better filtering, but it will mean more IT support is needed. A managed third party system would be a mixture of both."

The cost of spam

Mr Salameh outlined some of the costs that just such a spam problem can create.

"With a spam message size of 9.2 KB, and spam per vessel per month of 2,700 KB, the transmission cost via Mini-M would be $230, via Inmarsat-B $67, and via Fleet (64K) $37," he said.

"There are signs of when you should consider a new solution," he continued. "If you have an increase in spam messages, if you have an increased exposure to threats, if you have insufficient time but important resources to protect, if you've had poor results from current solutions. Then you should consider a new defence."

World-Link offers a free anti-spam service, which Mr Salameh says has resulted in 96 per cent decrease in the number of spam messages sent to the vessels. The system is constantly updated, with update files usually between 60 to 100 kilobytes sent on a daily basis. DS

Original presentations from the Digital Ship Posidonia conference can be downloaded at www.thedigitalship.com

Carnival Cruises to expand use of shore-based power

www.carnivalcorp.com

Cruise fleet Carnival is to begin 'cold ironing' (i.e. using shore-based power) when its vessels arrive in San Francisco, with the company agreeing that ships will have to turn off their engines when they reach the port, once the system is up and running.

Two of the companies within the Carnival group already using, or planning to use, shore-side power for port calls, with Princess Cruises using facilities in Seattle and Alaska for a number of years, and Holland America Lines introducing the system on two of its ships this year.

The Seattle and Alaskan facilities are the only existing terminals of their type to date. Carnival intends to roll the system out across its fleet as more ports begin to offer shore-based electricity.

Seattle port had already indicated that it had eliminated the approximately 2,500 tons of carbon dioxide emitted by each of the Princess Cruises ships while docked during the cruise season, with the 116,000 ton vessels running their diesel engines 10 hours a day for 40 days to provide electricity for more than 2,600 passengers.

San Francisco authorities are said to be very enthusiastic about their own project, as they have the hydro-electric facilities in place necessary to provide the power required, and are predicting that reduction emissions from cruise ships could cut pollution by up to 80 per cent.

A new electric substation will also be built next to San Francisco's cruise terminal to assist in the provision of power to the ships.

Tom Dow, vice president of public affairs for Carnival, said that the system takes only thirty minutes to set up, and once in place reduces emissions from the vessel to zero.

Vessel conversion costs

While the potential environmental benefits may be quite substantial, the costs involved are also quite significant - the shore side facilities are expected to cost in the region of $2 million, with another $500,000 having to be spent on each ship, so running on shore-based power will not be a money saving exercise.

"The objective is price neutrality," said Mr Dow. "You need to have a critical mass to make it economic."

Mr Dow points out that savings that the company makes from not having to run its engines in port will be lost in installing and maintaining the equipment needed to operate the system.

There is the possibility of ancillary revenue accruing from payments for the offset of greenhouse gases under US environmental legislation.

The Seattle electricity company, City Light, paid $10,000 to Carnival last year in exchange for the right to offset greenhouse gases eliminated by the cruise company, though a similar type of arrangement elsewhere would be wholly dependent on local legal conditions.

Carnival was charged $0.06 per kilowatt hour to connect its Princess Cruise Line ships to the land based power grid during the 2005 cruise season, where its two ships spend about 400 hours a year on call.

Each ship has a custom built electrical connection cabinet that automatically connects the ship's electrical network to the on-shore power grid. Electricity is transmitted from the land-based transformer to the vessel using four 7.5 centimetre flexible cables connected to a special gantry system on the docks, which is designed to work with the rise and fall of the tide.

System standards

The need for standards has been one of the central issues in the development of cold ironing systems. For this type of initiative to grow it will be important for the ports to use common technology so that the equipment investment by the vessels can be put to use in as many areas as possible.

An absence of regulations to define the provision of power from shore has meant that risks are involved in the take-up of the technology, though San Francisco has accepted the same standard already in place in Seattle and Alaska, and it is hoped that other areas will follow that lead.

"There is no advantage to having a different system, and every advantage for standardisation," said Mr Dow. DS

Carnival Vessels - switching to shore power rather than generators when in port

US puts $1.15 billion into container screening contracts

The US Domestic Nuclear Detection Office (DNDO) has announced the award of $1.15 billion worth of contracts for its Advanced Spectroscopic Portal Program (ASP), which will comprise a base year with research-and-development money, followed by four years for acquisition of the various systems.

The companies involved are the Raytheon company, the Thermo Electron Company, and Canberra Industries. These companies will be expected to provide detection units to distinguish between threat and non-threat materials arriving at American container terminals.

The value of the research program contract is split to about one-third for each company, but as the contract moves towards acquisition totals DNDO says it will be based on need and the deployment strategy it has in place, which will not necessarily be split in even thirds.

It has been reported that Thermo and Raytheon will base their designs on sodium-iodide technology, while Canberra Industries will focus on high-purity germanium technology.

The sodium-iodide systems are expected to cost about $350,000 compared to $180,000 for current detection units. The high-purity germanium systems will be a little bit more expensive, and may be up around the $500,000 - $600,000 mark.

"The priority for the first year," said Varyl Oxford, director of the DNDO, "is to get units out immediately."

"We are ordering 80 units initially into New York container terminal. We're also taking some out to our permanent test bed in the Nevada test site for follow-on testing, and, starting early in this calendar year, we'll begin deploying these systems to Customs and Border Protection into the secondary screening locations."

Mr Oxford pointed to the advanced software used in the systems as one of the most important aspects of the project.

100 per cent biodiesel vessel to sail around the world

www.imperiumrenewables.com

American company Imperium Renewables has built what it says is the world's first pure biodiesel race boat, which emits 78 per cent less carbon dioxide than a regular engine.

Called 'Earthrace', the boat is soon to embark on a mission to break the record time for circumnavigating the world, currently held by British boat Cable & Wireless, which managed a time of 75 days in 1998.

Earthrace aims to complete the 24,000 nautical mile voyage in less than 65 days, while also being the first ship to achieve an official UIM Powerboat record using renewable fuel. Further information on the vessel and the challenge can be found at www.earthrace.net.

Singapore internet tidal data service

Singapore company Info@Sea (a joint venture between BMT Asia Pacific, the Maritime and Port Authority of Singapore and DHI Water and Environment) has developed StraitsForecast, a new information service which will provide high-resolution forecast tidal current flow patterns and tidal data in the region around Singapore and in the Straits of Malacca.

The Straits of Malacca and Singapore is one of the most important shipping lanes in the world with 50,000 ships passing through each year. A quarter of the world's sea trade, including 11 million barrels of oil per day, pass through the 500-mile long shipping lane annually.

Between Malaysia and Singapore to the east and the Indonesian Island of Sumatra to the west, the waterway is said to be at its most narrow (about 2.5km wide) just south of Sentosa. The currents in this area are strong and can be tricky to navigate.

StraitsForecast, an online planning tool for ships, berths and terminal operators, is intended to provide risk-management tools to assist in the management of efficiency, safety, security and environmental performance in the Port of Singapore. It is the world's first internet based service that delivers Met-Ocean data to the shipping industry within the confines of a port.

Calculating tidal conditions

The project cost US$ 630,000 and has taken two years to develop. The online portal system relies on underwater sensors and hydraulic formulas to calculate the tidal conditions it them makes available to users.

The program will provide high-resolution forecast tidal current flow patterns and tidal data to its users, to offer assistance to ships navigating through complex currents and terminals, and help them to establish safe berthing windows in strong tidal flows.

It can give ship and berth operators timely information on tides and currents, with a 10-minute time delay, which its creators feel is a marked improvement over a bi-annual tide timetable book.

"For large ships, for terminals it's difficult for them to get detailed predictions of the water movement hour by hour, minute by minute," said Mark Womersley, environmental manager at BMT Asia Pacific. He hopes that this tool will make their jobs a lot easier.

Return on investment

It is also hoped that the portal may enable ports to expand the use of their berths, hence delivering a greater return on investment, as well as saving fuel costs for ships and turnaround time at docks.

"Ship captains have to make a certain time at the pilot station," said Donald D'Cruz, CEO of Info@SEA.

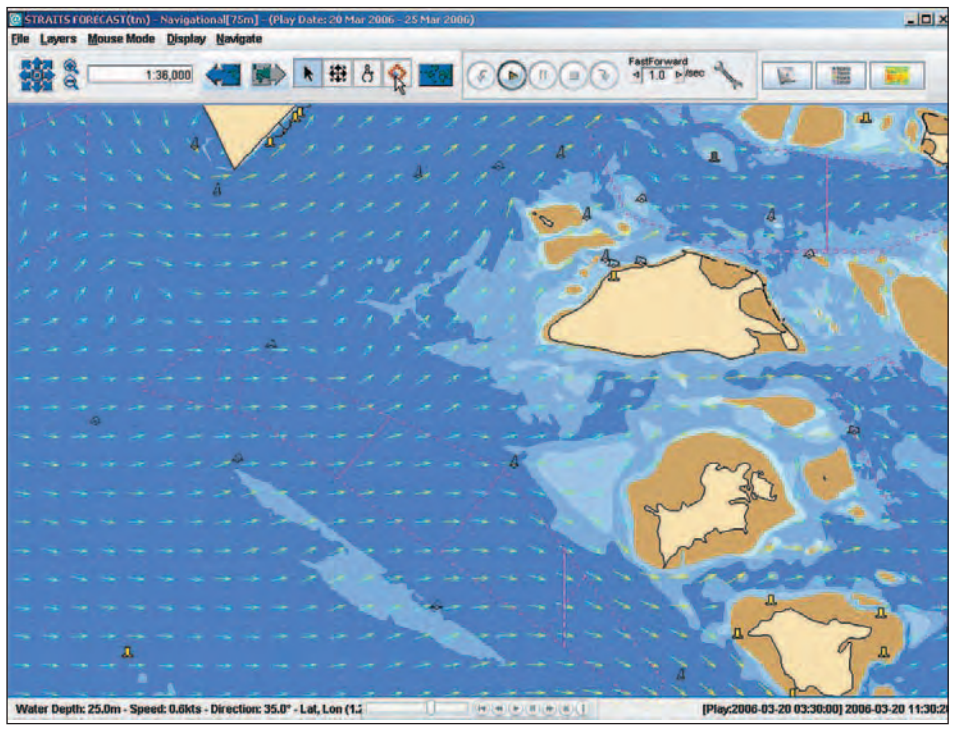
"If he does not make the berth on time, penalties may be imposed on the ship because contain cranes are waiting, the berth is empty and there is a lot of cost involved. Secondly, he saves fuel because he doesn't have to burn excessive fuel to get there on time."

"[We are hoping that the] web service will improve the overall safety of ships and shipping lines, initially in the Singapore Straits," added David Wignall, chief executive of BMT's Asia Pacific division.

"With Singapore being one of the busiest shipping hubs in the world, and the Malacca and Singapore Straits being a busy shipping passage, users of the information services will be able to apply analysis, prediction and forecast modelling to maritime activities in order to better manage risk."

Info@Sea is hoping to expand this service to provide digital tidal information for other waterways in the future. There are plans to expand the coverage to China and Australia, and the company expects to work with marine authorities in other neighbouring countries to do more research and development.

It also plans to explore other technologies, like the use of satellite systems, to complement the measurements from its underwater sensors.



Get tidal data online for Singapore using Info@Sea

World Shipping Council criticises container electronic seal 'standards' body

www.worldshipping.org

The World Shipping Council (WSC) has criticised a move by a group of technology companies, including General Electric, Siemens and Mitsubishi, to form an international organisation tasked with establishing global standards for container security devices, suggesting that financial interests may be part of the motivation in the foundation of this body.

WSC has been highly critical of the new International Container Standards Organisation's (ICSO) position regarding General Electric's 'CommerceGuard' container security device.

"While there is nothing surprising about General Electric (GE) trying to promote and protect its own business interests, this is an unnecessary and counter-productive initiative that is inconsistent with the extensive efforts of international ocean carriers, terminal operators and technology developers at the International Standards Organisation (ISO)," said the WSC, in a statement.

"It is also a strange coincidence that GE would undertake this initiative just as the ISO is about to finalise its years of efforts in developing a consensus international RFID container security technology standard - a standard that differs significantly from GE's product."

"The development of international standards is usually done through the broadly accepted International Standards Organisation. The ISO works hard to develop standards that are not proprietary in nature, by having competitors and users jointly develop a technology standard that is not driven by a specific product."

"While at times difficult and contentious, the process is deliberately designed to avoid proprietary standards that favour one manufacturer's product, while meeting the user community's broader needs."

WSC also said that the organisation "intended to deviate from the extensive work already done to date by technology developers, ocean carriers and marine terminal operators in developing a common, broadly accepted international standard for RFID container security technology at the ISO."

"It would be unreasonable to expect port facilities and shippers to install devices, reading infrastructures and data networks specifically for a GE or a new ICSO container security device (CSD) product that differs from the international standard the industry has just spent the last two years developing at the ISO."

"In addition, it is premature to develop a standard for a "container security device" before industry and Governments have discussed and agreed upon the security requirements should be for such devices."

Ansaldo to make fuel cells "commercially viable"

http://finmec.com/afco.asp

Ansaldo Fuel Cells, an Italian-based company, is producing a new fuel cell which it intends to be economically and environmentally viable for use in military and maritime applications.

Fuel cells directly convert fuel-stored chemical energy into electricity and heat - operating similar to a car battery. Cells can generate electrical power continuously, as long as a fuel (typically hydrogen) and an oxidizing agent (air) are fed to the cell's electrodes.

"Fuel cells have been around for a long time, the trick is can you make them commercially viable," said Dr Stephen Bryen, president of Ansaldo's parent-company Finmeccanica. Dr Bryen believes that the company will be able to do this.

Ansaldo has been working on fuel cells for the last 20 years and started prototypes for their current first generation Molten Carbonate fuel cells about 10 years ago. The most recent generation of mature technology has been up and running in an Italian-based plant for the past four years, Dr Bryen said.

The company also plans to put a Molten Carbonate fuel cell on a cargo ferry operating between Greece and Turkey by 2008.

"[The] fuel cells are very efficient at converting the chemical energy of the fuel into electrical energy - it has a 50 per cent electrical efficiency rate, and if we consider the heat it produces, it can go as high as 85 per cent efficiency,' said Dr Bryen.

"Compare this to the 20 percent efficiency rate for a gas turbine engine and you can see that hydrogen fuel cells are a smart alternative energy source."

One interesting aspect of this cell is that it can be fuelled by waste material. It has been used to produce electricity and heat in the paper-manufacturing industry in Italy by being fuelled with by-products of the manufacturing process.

"It can turn toxic waste into energy," said Dr Bryen.

With $160 million invested in the project in the last five years, Ansaldo is working on reducing the costs of the technology. Dr Bryen said that the company has already been able to half the cost since it began operating, and expects to trim it down by another 30 percent by 2008.

At present for a one megawatt plant, the rough cost of the Molten Carbonate fuel cell is about $2.5 million, though "that price may go down depending on how much we produce, a lot of things do bring the whole costs lower," Dr Bryen noted.

A podcast from the company discussing different aspects of the technology can be downloaded at http://finmec.com/audio/podcast15_Bartolomeo_Marcenaro.mp3

Correction

In our August issue (p16) we said that Veson Nautical had just signed up Morgan Towing Corporation as a customer and opened an office in Greece - the correct customer's name is Moran Towing Corporation - also Veson has had an office in Greece for several years, but has just opened a new office in the Netherlands.

ACR Electronics has promoted Tony Smith to the post of sales director assuming the responsibilities of marine and bridge electronics, government, outdoor and aviation sales for the company's international division, which covers Asia, the Pacific Rim and Latin America. Bob Pro has also been promoted to North America sales manager, marine division.

Pole Star Space Applications says it is offering a new integration service, called Alert Advanced, so that shipping companies with a range of different hardware on board their vessels can consolidate them all into one system. Other manufacturers' security alert equipment which doesn't meet IMO standards can also be integrated, to ensure that the ship owner's overall system meets the new regulations.

Arklow Shipping has ordered integrated bridge systems (IBSs) for six new ships to be built in Spain from **Sperry Marine,** featuring a new 'paperless' navigation capability. The IBSs will include dual electronic chart display and information systems (ECDIS).

Transas, with the South Kymenlaakso Vocational Institute and Kymenlaakso University of Applied Sciences, has completed what it calls the first ever distance simulation-based training of oil spill and rescue response operations. Russia, Finland and Estonia all cooperated in the operation as part of an EU funded long term project which allowed crisis response simulator training to take place simultaneously in three educational establishments.

The incident room at the MRCC in Ostend, Belgium

A new Maritime Rescue and Co-ordination Centre (MRCC) has officially been inaugurated in Ostend, Belgium. The centre will run with a **Barco** integrated vessel traffic monitoring system.

Kongsberg Norcontrol IT has reported that the UK Maritime and Coastguard Agency's (MCA) AIS Network is again operational, following a Site Acceptance Test (SAT) during March. Kongsberg delivered AIS hardware and software for 18 Maritime Rescue Coordination Centres (MRCC), one training centre, 51 remote physical shore stations, one AIS Service Management (ASM) site and a new Graphical User Interface called the C-Scope User Interface.

Transas will supply a range of simulators to the new Maritime Training Centre in Riga, Latvia. This includes a GMDSS TGS4100 with 8 workstations; Engine Room Simulator 4000 with 4 expanded operator workstations, Navi-Trainer Professional 4000 simulator, which comprises 2 instructor workstations, 1 bridge with 3 visualization screens and vessel-management machinery, as well as 3 bridges with 2 computers each designed for radio-locating training.

Transas Scandinavia has completed the first national-scale AIS Network for the Latvian Coast Guard. The Latvian AIS Network is based on the existing GMDSS structure and includes eight remote AIS sites with AIS Base Stations covering both Latvian internal waterways and entrances to territorial waters.

ChartCo has introduced a regional newspaper service to supplement its International News service, to be delivered worldwide through its existing broadcast network. The service will be launched with one supplement per day, with the country changing each day for a seven-day cycle. Countries currently covered are Greece, Philippines, India, Nigeria, Brunei, Pakistan and China.

Transas Scandinavia is to supply a Full Mission Ship Bridge Simulator to the Swedish Department of Shipping and Marine Technology, to be used at Gothenburg's Chalmers University.

OSI Geospatial has signed an agreement with **L-3 Marine Systems,** whereby the companies will jointly market and sell products, including integrated bridge systems and navigation systems.

ChartCo is to introduce a regional newspaper service to supplement its international news service, which will be delivered through the company's existing broadcast network. The service will include one supplement per day, with the country changing each day for a seven day cycle. Current countries covered are Greece, Philippines, India, Nigeria, Brunei, Pakistan and China.

The new UK Trinity House rapid intervention vessel Alert has been equipped with a **Sperry Marine** integrated bridge system. The ship will be used to establish a protective zone around any new shipwreck or other hazard to navigation around the south coast of England, as well as taking part in a hydrographic surveying and maintenance of aids to navigation.

Sperry Marine will supply navigation and communication electronics for two new passenger ferries being designed and built for Brittany Ferries at Aker Yards in Finland. This will include an integrated bridge system, including navigation radars, autopilot and manual steering systems, heading and speed sensors and other related bridge systems and sensors.

Sperry Marine will supply electronic navigation and communication systems for four 3,600 deadweight ton specialty tankers, which will be constructed at the Turkish Yardimci shipyard for Danish shipowner, the Clipper Group. This is a follow-on contract for two similar ships built last year.

The **Head Department of Navigation and Oceanography of the Russian Federation** (HDNO) and the **Norwegian Hydrographic Service** (NHS) have signed a bilateral agreement intended to 'enhance quality

and harmonisation' in the production of Russian and Norwegian ENCs. It builds on a bilateral HDNO-NHS agreement from 2003, which involved an exchange of products, data, materials and services in the field of hydrography and oceanography, as well as a sharing of expertise.

SAM Electronics has introduced two new VHF radiotelephones with DSC and message replay functions, the Debeg RT 5022 and RT 5020.

SevenCs and **Kelvin Hughes** have celebrated 10 years of ECDIS business partnership by signing a succeeding contract for another 10 years, whereby Kelvin Hughes will offer ECDIS and related applications with the SevenCs EC2007 ECDIS Kernel.

The Aberdeen Harbour Board (AHB) has ordered an upgrade of its Navi-Trainer Professional navigational and ship handling simulator from **Transas**. The upgraded simulator will be moved to AHB's new Marine Operations Centre at Aberdeen's North Pier.

MECys, Transas' distributor in Korea, is to supply a Navi-Trainer 4000 Professional simulator to Haeyoung Maritime Service Co. Haeyoung Maritime Service Co. is a sister company of Hyundai Merchant Marine Co. MECys will also supply an Integrated Navigation & VTS Training Centre (INVTS) for Pukyong National University.

Transas and local partner **ENL** have completed a VTS upgrade for the Port of Auckland, New Zealand, installing the latest version of the Transas Navi-Harbour software.

IMO's maritime safety committee is currently considering a joint proposal from the Bahamas and Denmark to amend the International Convention for the Safety Of Life At Sea (SOLAS) to require all passenger ships and all ships over 150 gross tonnage to fit a compulsory bridge navigational watch alarm system. The committee has noted this as a "high priority" in the wake of a high number of accidents related to slack watchkeeping practices.

Kongsberg Maritime has installed K-Bridge navigation systems onto four QuatarGas newbuilds in Korea. This installation is part of a $3.2m contract, which also includes the K-Line vessel management network and other key shipboard systems.

www.acrelectronics.com
www.purplefinder.com
www.transas.com
www.barcovesseltraffic.com
www.norcontrolit.com
www.chartco.com
www.osigeospatial.com
www.l-3com
www.chartco.com
www.primar.org
www.sevencs.com
www.kelvinhughes.com
www.imo.org
www.km.kongsberg.com

India to introduce own GPS

India is to spend $370 million to build and launch eight satellites to provide a regional GPS system.

This initially involves an $80 million investment to equip a satellite with technology that will provide an enhanced GPS service in India (called GAGAN - GPS aided geo augmentation navigation), which will then be followed by India's own version of GPS.

India is currently trying to encourage commercial firms to participate in the project, from both the technological and financial sides, with reports saying that the project won't go forward if the private sector does not provide an enthusiastic response.

Marine Electronic Highway wins World Bank funding

The proposed Marine Electronic Highway (MEH) Demonstration Project in the Straits of Malacca and Singapore is set to become a reality following the signing of a US$6.86 million grant agreement between the Global Environment Facility (GEF)/World Bank and the International Maritime Organization (IMO).

The four-year regional demonstration project aims to link shore-based marine information and communication infrastructure with navigational and communication facilities aboard ships travelling through the waterway.

Overall, it is hoped to enhance maritime services, improve navigational safety and security and promote marine environment protection and the sustainable development and use of the coastal and marine resources of the surrounding states of Indonesia, Malaysia and Singapore.

In addition to the $6.86 million assigned to IMO for the regional MEH demonstration project, the GEF/World Bank has also agreed to grant $1.44 million to Indonesia for the procurement of equipment for a differential global positioning system (DGPS) station and automatic ship identification (AIS) stations, as well as tidal instruments and an ocean data buoy.

The MEH will be built upon a network of electronic navigational charts using electronic chart display and information systems (ECDIS) and environmental management tools, all combining in an integrated platform covering the region that allows information to be made available to ships and shipmasters, as well as to shore-based users, such as vessel traffic services.

It is designed to assist in the overall traffic management of the Straits and provide the basis for sound marine environmental protection and management, and will include positioning systems, real-time navigational information (like tidal and current data), and meteorological and oceanographic information.

The implementation of the MEH comes after at the end of a preparatory phase that began in 2001, involving IMO, the states neighbouring the Strait, and other partners. It was funded by the GEF/World Bank, to the amount of $473,000.

The go-ahead for the finance for the project from the GEF/World Bank followed the signing, in Jakarta, Indonesia, in September 2005, of agreements to co-operate and collaborate to implement the MEH Project.

Signatories to those agreements included Indonesia, Malaysia and Singapore, IMO, the International Hydrographic Organization (IHO), the International Association of Independent Tanker Owners (INTERTANKO) and the International Chamber of Shipping (ICS).

Start-up activities of the regional component of the MEH got under way this summer, beginning with the recruitment of a project manager and consultants to establish the project management office in Batam, Indonesia. Preparation has already begun for the first Project Steering Committee Meeting, which is to be held within the year, as has preparation of bidding documents for various goods and services required by the project.

The project's experts will also prepare the bidding document for a hydrographic survey, scheduled to take place in 2007, of the Traffic Separation Scheme of the Malacca Strait Routing System from One Fathom Bank to Pulau Iyu Kecil, using multi-beam technology, with the aim of producing electronic navigation charts of the Straits.

EU funds project to advance maintenance technology

The European Commission has sponsored a project called 'Dynamic Decisions in Maintenance' (DYNAMITE) with the aim of advancing general understanding in industrial maintenance. The three and a half year program will be led by the Finnish technological centre VTT.

Research studied by the Commission has indicated that, around Europe, the direct cost of maintenance is equivalent to between 4 to 8 per cent of business turnover, with indirect maintenance costs (quality, lost productivity, consequential disruption across wider systems, etc) likely to be at least a similar amount.

The DYNAMITE project, with a budget of Euro 6.1 million, will focus on problems in technical and managerial areas of maintenance and on some specific devices.

It is expected to look at technologies that can be used for 'e-maintenance', such as 'smart tags' (intelligent labels identified by radio frequency), mobile computers (PDAs), low cost wireless communication devices (Bluetooth, Wi-Fi, GSM, UMTS) and sensor systems covering a broad range of techniques and applications.

Companies like Martechnic, Fiat and Volvo will be among 16 companies and organisations with expertise and experience in maritime fuel, lube and hydraulic oil testing and monitoring.

Martechnic has said that it will focus on the development of micro-sensors to monitor the condition of lubrication where the generated data is transmitted via various means to remote intelligent processors and data management systems.

Additional information on the DYNAMITE project is available at stand number 331 in Hall A1 at the Hamburg SMM Exhibition between 26 - 29 September 2006.

VDRs

Sperry Marine's Voyage-Master II Simplified Voyage Data Recorder (S-VDR) has been type-approved by the US Coast Guard.

ACR has reported that its RapidTrack S-VDR and MARIS S-VDR 2000 have been approved, and will be sold in markets in Europe, Asia, Pacific Rim and Amerasia.

Kelvin Hughes has reached an agreement with MARCAS, the Marine Contrac-ting Association, for the supply of Simplified Voyage Data Recorder (S-VDR) equipment to its membership. **MARCAS** represents a number of ship owners and operators totalling in excess of 700 ships, and acts to negotiate major supply contracts on behalf of its membership.

Offshore Systems will launch its new integrated ECPINS/S-VDR 5000 system at the SMM exhibition, which combines the normal mandatory S-VDR recording with screenshots of the ECDIS every few seconds. The company hopes that the system will also act as a training tool, to allow companies to analyse their own best navigation practices.

JRC is to launch its second-generation S-VDR system, the JCY-1850, at this month's SMM exhibition in Hamburg, Germany. The system has been upgraded with what the company says is "the latest network technology."

www.sperrymarine.northrop-grumman.com
www.acrelectronics.com
www.kelvinhughes.com
www.jrc.co.jp
www.osigeospatial.com

JRC's second generation S-VDR, to be launched at SMM

US NTSB to study Crown Princess VDR

The US National Transportation Safety Board (NTSB) is to examine the voyage data recorder (VDR) of Princess Cruises' Crown Princess to establish the cause of a steering incident that occurred earlier this summer.

A spokesman for the NTSB said it would concentrate on both the automechanical and operational aspects of the ship, but that it was too soon to comment on reports that a malfunction of the autopilot system caused the ship to list suddenly to starboard, 11 miles southeast of Port Canaveral.

The NTSB is conducting its investigation in conjunction with the US Coast Guard. The 113,000 gt Bermuda-flagged ship returned to port after the incident. Passengers were disembarked and 94 of the injured taken to hospital.

The Crown Princess - VDR data to be investigated

Singapore introduces new DGPS

A new Differential Global Positioning System (DGPS) infrastructure, developed by the Singapore Land Authority (SLA), is to become operational on September 1st.

The new system, which cost $1 million to create, will "mark a new era of high precision and improved productivity" for a variety of uses, including land and maritime surveying, emergency response, public transport fleet management and navigation activities, said SLA's chief surveyor Soh Kheng Peng.

With DGPS it will be possible to locate moving objects accurate to a margin of error of just one centimetre.

Similar systems have already been in use for the last five years in parts of America and Europe, particularly in Germany, which uses the system for its public transport fleet management.

Under DGPS, data is corrected by multiple sources - as compared to a single autonomous source with existing GPS systems, which can determine the location of stationary objects with an accuracy of a five-metre margin of error.

In comparison, the margin of error using DGPS could be as low as five millimetres.

Private companies wishing to use the system will have to pay the SLA at the rate of 50 cents a minute. Users not seeking the most accurate of results can opt for a plan that costs $100 a month.

Singapore's new DGPS infrastructure, Singapore Satellite Positioning Reference Network (SIRENT), has been developed by a four-man team from the SLA who started work on the project in June last year.

They worked on improving the existing network, SIMRSN (Singapore Integrated Multiple Reference Station Network), which was jointly developed in 2000 by the Nanyang Technological University (NTU), Australia's University of New South Wales, and the SLA. This system has a margin of error of about 30m, and is used by SLA to carry out its land surveys.

SIRENT will use five reference stations, with data from these stations processed at a control centre. In comparison, Malaysia, which also adopted DGPS technology recently, has about 25 reference stations throughout the peninsula.

"Users can tap into SIRENT to achieve accuracy levels down to the sub-metre," said Mr Soh.

In Singapore, DGPS is already being used by the Maritime Port Authority to track vessels in the Republic's waters, with its reference station situated at Raffles Lighthouse.

When the SLA's new system becomes operational, the DGPS network will cover Singapore's entire land mass, parts of its territorial waters and surrounding islands, except the Southern Islands, where a sixth reference station may be erected later.

MCA seeks supplier for new VTS

www.mcga.gov.uk

The UK's Maritime & Coastguard Agency (MCA) is currently looking for a supplier to build and test a new IT system to improve sea vessel safety and reduce the risk of environmental disasters.

The Consolidated European Reporting System (CERS) will help the MCA capture information about UK merchant vessels and share it with European Union (EU) member states, a response to 2002 EU legislation requiring member states to implement vessel traffic monitoring systems to improve their responses to potentially dangerous situations at sea.

By monitoring ships carrying dangerous or polluting goods, the EU hopes such systems will prevent repeats of the Erika oil tanker spill in the Bay of Biscay in 1999, that killed thousands of seabirds and devastated aquatic life.

The MCA eventually hopes to also develop IT systems that will help to meet the overall requirements of the European Safe Sea Network, by creating a telematics network to aid the collection and consistent exchange of maritime data across the EU.

Last December the European Commission said it would take legal action against the UK and seven other countries for failing to implement vessel traffic monitoring and information systems.

IMO adopts LRIT regulations

The IMO's Maritime Safety Committee (MSC), as of its 81st session earlier this year, has adopted proposed new regulations for long range identification and tracking (LRIT), together with associated performance standards and functional requirements.

The new regulation on LRIT is included in SOLAS chapter V on Safety of Navigation, through which LRIT will be introduced as a mandatory requirement for certain ships on international voyages, namely passenger ships (including high-speed craft) and cargo ships of 300 gross tonnage and upwards.

The SOLAS regulation on LRIT also establishes a multilateral agreement among SOLAS Contracting Governments for sharing LRIT information for security and search and rescue purposes.

The LRIT information ships will be required to transmit include the ship's identity, location and date and time of the position While this kind of information is already transmitted by the mandatory automatic identification system (AIS), it has been specifically mentioned that there will be no interface between LRIT and AIS permitted, for security reasons.

Data derived through LRIT will be available only to those entitled to receive such information, unlike publicly accessible AIS information, and safeguards concerning the confidentiality of those data have been built into the regulatory provisions.

SOLAS contracting governments will be entitled to receive information about ships navigating within a distance not exceeding 1,000 nautical miles off their coast.

The regulation foresees a phased-in implementation schedule for ships constructed before its expected entry into force date of 1 January 2008. It also identifies which authorities may have access to LRIT information.

Standards and requirements

The MSC has adopted performance standards and functional requirements for LRIT, and an MSC resolution on arrangements for the timely establishment of the long range identification and tracking system.

Under these guidelines the LRIT system will consist of the shipborne LRIT information transmitting equipment; the communication service provider; the application service provider; the LRIT Data Centre (including any related Vessel Monitoring System); the LRIT Data Distribution Plan; and the international LRIT Data Exchange.

Certain aspects of the performance of the LRIT system are expected to be reviewed or audited by an LRIT co-ordinator acting on behalf of all of the contracting governments.

Each Administration should provide a list of the ships entitled to fly its flag to the LRIT Data Centre it has selected. These ships will be required to transmit LRIT information, together with other relevant details, and should update such lists as and when changes occur.

Ships are to be advised that they should only transmit the LRIT information to the LRIT Data Centre selected by their administration.

Mandatory ECDIS - IMO takes first steps

The recent IMO NAV 52 meeting introduced mandatory ECDIS on high-speed craft - but stopped short of declaring plans for a universal carriage requirement. Digital Ship talked to Frode Klepsvik, director of the Norwegian Hydrographic Service and chairman of the NAV 52 working group considering 'Evaluation of the use of ECDIS and ENC development'

DISCUSSIONS at the IMO's sub-committee on safety of navigation last July have set out what might be the beginnings of a timetable for the introduction of a mandatory carriage requirement for ECDIS (Electronic Chart Display Information Systems).

Mandatory fitting of ECDIS on high-speed vessels has already been given the go-ahead following the discussions at NAV 52, under new amendments to the International Code of Safety for High-Speed Craft, and will be phased in from July 2008, initially on newbuilds. A decision on all other types of vessels is yet to be made.

Representatives of the committee have pointed out that the lack of any definitive decision on mandatory ECDIS is not a reflection of any reluctance on IMO's part to encourage the adoption of the technology.

"NAV 52 was not mandated to discuss mandatory use of ECDIS, the preparations for that kind of discussion hadn't been done anyway," said Frode Klepsik of the Norwegian Hydrographic Service (NHS), who chaired the NAV 52 working group discussing issues of the 'Evaluation of the use of ECDIS and ENC development'.

"For ECDIS as a carriage requirement, it's important to realise that NAV52 was only expected to make preliminary considerations."

Japan had made a proposal to NAV 52 about the issue, recommending that the timing of a specific implementation schedule should run parallel with the availability of official charts, but the chairman was careful to point out during the meeting that the consideration of the technology as a mandatory requirement will only happen properly from NAV 53.

Australia was another country that urged the maritime authority to act 'sooner rather than later' to make ECDIS a compulsory navigational tool, to encourage swifter progress in the development of the technology and coverage of the ENCs (official electronic charts) themselves.

"MSC 81 (IMO's Maritime Safety Committee) considered a proposal from Norway and Denmark to put a carriage requirement for ECDIS on the agenda," said Mr Klepsvik. "Because MSC 81 was so close to NAV 52 the issue was only given preliminary considerations at NAV 52, and it will be looked at properly at NAV 53 and NAV 54."

ECDIS cost efficiency

The main purpose of this meeting, it would appear, was to work towards gaining acceptance of ECDIS as a technology that will improve safety and be cost effective for the majority of vessels.

"A formal safety assessment (FSA) was carried out by DNV to study the cost effectiveness of ECDIS systems, to see if ECDIS is cost efficient and if it does indeed have a safety impact," Mr Klepsvik told us.

This FSA was part of the submission to MSC 81, but has not yet been considered by NAV.

"The results showed that except for very small ships ECDIS is considered to be cost efficient. Having results that cover all sorts of vessels, like bulk ships and ships with inexpensive cargo, showed that the figures are robust."

The study in question was a joint project between NHS, the Norwegian Maritime Directorate (NMD), Swedish Maritime Administration (SMA), Danish Maritime Authority (DMA) and the UK's Maritime and Coastguard Agency (MCA), and studied the results of ECDIS use on oil tankers, product tankers and bulk carriers.

The results of the cost / benefit analysis for an installed ECDIS showed that, with an implementation cost of $75,000 for each type of vessel, an 80,000 dwt oil tanker would achieve benefits of $396,000, a 4,000 dwt product tanker $175,000, and a 75,000 dwt bulk carrier $295,000.

These gains were mostly based on the results indicating that by utilising an ECDIS for navigation these vessels enjoyed a reduction in grounding frequency of 36 per cent, thus avoiding a large percentage of the cost associated with such an accident.

Financial considerations are not, however, the only factors that determine whether ECDIS will be a suitable technology for every vessel.

"Presumably very few today will object to the findings, and to the reasoning behind introducing ECDIS," said Mr Klepsvik. "The main issue is to develop and build on these findings - and ENC coverage is the biggest issue involved in that."

"There are always some people that disagree how things should go forward, but presumably nobody will disagree with the analysis that ECDIS will be a good thing."

Improving ENC coverage

It also seems that ENC coverage continues to be the major stumbling block preventing a universal endorsement of mandatory ECDIS - and that the issue has become a 'chicken and egg' debate over whether an IMO mandate should be the driver for increasing ENC production, or if increased coverage is needed before such a regulatory move can happen.

"The value and safety benefits are recognised, but the coverage is essential," said Mr Klepsvik.

"Information has to be prepared by the international Hydrographic community, they have to be able to say that by the time it becomes mandatory there will be full coverage on all of the substantial routes."

"When ECDIS becomes mandatory and is fully used you have to have the ENCs in place, or there's a safety risk. We need to identify where there are the biggest needs, and what are the critical routes. ENC coverage has seen a significant increase. It's been a very positive development, and will be a big part of any moves to make ECDIS a carriage requirement."

The International Hydrographic Organisation (IHO) will play an important role in preparing this information and reporting back to NAV 53. IHO has undertaken to establish a world-wide chart catalogue that will give the maritime community an instant overview of available official charts as well as the ENC coverage around the world.

It would seem that the Hydrographic Offices have, at least, been moving in the right direction. ENC coverage has increased considerably over the last 12 months, and the rate of increase has also been on the rise, though even at these rates worldwide coverage is a very long way off. Mr Klepsvik believes that an IMO decision could be the catalyst to really drive this technology.

"The Hydrographic community is influenced by the decision makers, this (a proposed mandatory carriage requirement) would be a really strong signal to the international Hydrographic Organisation and the Hydrographic Offices, and it needs to come from the IMO," he said. "That way you'll put pressure on the producers to increase their coverage."

MSC 2008

The plans are in place to allow moves to a mandatory carriage requirement to happen, but it will require hard work from many quarters to turn potential into a solid agreement.

"Consideration of regulations to require vessels to carry ECDIS are already on the agenda for NAV 53, and will be for NAV 54," said Mr Klepsvik. The sub-committee on navigation has asked member governments to submit suitable proposals for consideration at the NAV 53 session in July 2007.

"NAV will have two sessions to get it right and formulate the proposals, then it will go to MSC in 2008 where all the formalities will be taken care of."

Mr Klepsvik hopes that that 2008 meeting will be the time when ECDIS is finally given full IMO backing as a mandatory piece of equipment, with a timetable set down for implementation and installation of the technology.

"I think that 2010, or 2011 will be the earliest I think it could happen," said Mr Klepsvik. "With a decision in 2008 there would have to be a few years left to introduce ECDIS on to the vessels, starting with newbuilds." DS

An in-depth examination of DNV's formal safety assessment into the use of ECDIS discussed at NAV 52 was made by Rune Holst Johnsen, Primar Stavanger, during a presentation at the Digital Ship Oslo 2006 conference. The original presentation can be downloaded at www.thedigitalship.com

Sperry's next generation bridge

Sperry Marine, will launch its latest line of marine navigation technology at this year's SMM exhibition, the flagship product being a multi-functional workstation combining the functions of radar, chart radar, and ECDIS in one unit with a single display. *Digital Ship* looks at the potential benefits

SPERRY MARINE is hoping to introduce an improved level of flexibility to bridge operations with its new line of navigation technology, and sees the next generation of mariners having an unprecedented level of access to situational information, anywhere onboard the vessel.

"We're looking at systems that adapt to the officer," said Frank Soccoli, director of marketing for the company.

"The mobile device is the repeater of the future. In the future, we will still have bridge systems of course, but we'll also have mobile devices that will be an extension to the bridge."

Mr Soccoli pointed to the proliferation of mobile phones today that incorporate myriad different functions, like cameras, MP3 players, and internet browsers as an example of the potential improvements that can be made to portable devices.

"Look at mobile devices today, they're multi-functional, they have about six different functions other than as a cell phone," he told us. "And these multi-functional devices are cheaper today than the single function cell phone was when it was introduced. You pay less for the technology than you did you 20 years ago and get more benefit."

Mobile data

Sperry has already begun introducing mobile information systems on a small scale for some customers.

"We put it on a series of small container ships, they have mobile data tablets," said Jan Hansen, director of worldwide customer development and system sales for integrated bridge systems with Sperry Marine.

"It's used for docking data, though the captain can go on the bridge wing with it if he wants to."

"We believe it will be more or less a standard fit going forward. With a wireless network on the ship, the captain can keep an eye on what's happening on the bridge at all times with mobile devices."

Sperry's integrated system allows data from separate sources to be overlaid on one screen

Mr Hansen said that wireless problems in the metal environment of a vessel have been overcome.

"We have the same problems on a ship that we have everywhere with wireless," he said. "But that technology is now available. IEC bridge requirements is where we are focussing now."

Multi-function workstation

The company's first step in the evolution of this process has been the development of a single integrated unit called the TotalWatch, which can operate as a radar, a chart radar, or an ECDIS (electronic chart display and information system), or can combine disparate functions of each and display them simultaneously on a single screen.

"This is a multi-function workstation," said Mr Soccoli. "Some people are radar-centric, some are ECDIS-centric. But even the radar-centric guy will say 'it'd be nice to see some ECDIS targets on my display', and the same with the ECDIS guy."

"We see this taking over other sensors and bringing them in to multi-functional workstations. We say let the watch officer decide what he sees, you can arrange information the way you want to see it."

"With computers today you can overload the mariner with information. Do we give the mariner a choice of information and then see what they want? We think so."

"The person's function on the bridge is to read, analyse and react. Currently he's constantly moving back and forth."

The mariner can select the types of information he wants to be displayed to correlate with the particular circumstances at the time. Sperry thinks that this can have benefits for safety as well as convenience.

"8 or 9 ECDIS layers are considered as important for safe navigation," said Mr Hansen. "I think that something like a full ECDIS with radar and full ARPA display would be great."

"I believe that this will be the future standard display. These are the main areas for safe navigation. It's not only us, IMO and everybody are trying to make it safer, giving the right information to people at the right time."

"We can't deviate from minimum IMO specification (2 radars, ECDIS backup etc). But there's no reason why 4 stations can't be multifunctional. It's being discussed."

One of the main advantages Sperry sees in the system is that it eliminates the need for a navigator to move between different workstations on the bridge for the information he requires, with navigational information from three sources available from a single terminal.

This could be particularly advantageous in an area with little room for manoeuvre, where decisions need to be made quickly with the best information available.

Mr Soccoli pointed out that a situation where information was only available on separate machines would be unthinkable in most businesses.

"In the office today it's unheard of to have one terminal for word processing, one terminal for Excel, and so on," he said. "You pay a premium for all this functionality, but it does save you time."

A panel of basic functions used by the seafarer will also be included, programmable to the specific demands of that person. The panel has a USB port so that information can be downloaded and transported to another panel, on the ship or on any other vessel with the system.

Easy upgrades

The TotalWatch system is part of a group of VisionMaster FT navigation products being produced by the company, all based on a common hardware and software platform to allow the functions to be more easily integrated.

If a shipowner was to buy a radar system, for example, from this group it could then be upgraded to chart radar or ECDIS at a later stage if required, without any new hardware installation necessary.

"The core is a common software base," explained Mr Soccoli. "We wrap PC-based hardware around that. Being PC-based also means that it cuts down on the support costs. It also has an open architecture so people can develop for it easily. You can add a chart function to your radar at a much smaller cost than getting an ECDIS."

"With the old technology you couldn't turn an ECDIS into a radar, because it had different hardware. Today you can upgrade one system into another. The software is king here, it's really one product with different modes. Before you had different products with different modes."

Broadband services

Sperry sees the next big step in these systems coming hand-in-hand with increased levels of high-speed connectivity on vessels, with better flows of communication and information.

This will, in turn, allow for a greater

The VisionMaster FT bridge has ECDIS, radar, and chart radar functions in one unit, where all of the data can be integrated

range of services to be offered to the shipowner, creating more value from the use of the onboard systems.

"In 5 to 10 years we believe that ships will be online 24/7," said Mr Soccoli. "Services will be the driving force that will help people to manage their businesses better. We see a difference in the future, with a gateway system, connecting the ship to the shore with broadband capability."

"Like a HD-ready television, our system is value added services-ready. We have a host of value added services, and broadband will make these services more functional."

The services currently planned to be offered include e-chart services, remote diagnostics and weather routing, with Sperry looking to move away from being a purely manufacturing company into a service-based company as the technology develops.

"We plan that people will be able to send CCTV and ECDIS pictures in to the network, that can be checked on the web from anywhere," said Mr Soccoli. "Portal technology is an area where we can really provide value to the shipowner."

"We will have a 'gateway' server onboard - where you can connect to broadband. Then you can start building links to automation, cargo management, VDR, bridge, shipboard mobile devices, administration networks, and so on. We will be unveiling our ServiceNet portal at SMM."

"We believe remote monitoring (of the bridge equipment) and diagnostics will be a solution we can offer to our customers," Mr Soccoli continued.

"We will focus on this area over the next 5 years. General Motors spends $5bn a year on warranty, it's seriously considering putting all of its cars online for the first year to monitor things like tyre pressure and hopefully prevent accidents."

"We are also developing a 'Bridgelink' internet portal - which will allow the office to see where ships are, get additional information. Maybe it could also include screenshots and diagnostics. It's like when an aeroplane comes to an airport, it connects to a phone line and downloads the diagnostics."

Back-up options

A further advantage Sperry thinks shipowners might be able to take advantage of with this system is having redundancy back-up for multiple navigation functions built in to one single unit.

This could prove useful for those considering installing ECDIS on their vessels. Under the present regulations, if a ship is using ECDIS and has a second ECDIS as back-up, a malfunction in one would mean that the vessel could not undertake another voyage until both are operational.

However, a multi-functional system could conceivably act as a back-up in this regard, allowing the ship to continue as planned until repairs were more convenient. Essentially, having three such systems on the bridge could be seen as having two back-up units for each of its three functions.

"In the future maybe you will have 3 or 4 deckstanding TotalWatch systems, giving you full redundancy," said Mr Soccoli. "TotalWatch can work as a redundancy for multiple systems."

Confirmed installations

Royal Caribbean has purchased this system for upcoming newbuilds.

"Royal Caribbean's next Freedom-class vessel will have this system," Mr Hansen told us.

"First deliveries of the system will be made as of next month. Each watch mode is type approved for itself, and the ECDIS is to be fully approved by the end of 2006."

"We haven't defined the pricing, but it will be in the same range as the BridgeMaster that we have today," he added. DS

Compass of the Future: Gyro, FOG or GPS

In the last few years research and development have produced new technologies for determining the heading on ships. Can they replace the conventional gyro compass? Captain Andreas Lentfer, sales director, Raytheon Anschütz, looks at the possibilities

THE WORLD'S entire commercial fleet has one thing in common today: ships steer, almost without exception, according to a gyro compass.

Even a hundred years after its invention, the gyro compass is still part of the standard equipment. Its need for regular maintenance is a disadvantage, however; the high-precision bearings of the precision gyro are subject to wear and must be replaced after several years of operation. Reason enough for the manufacturer to seek alternatives.

When the so-called Fibre-Optic Gyro (FOG) came on the market in the middle of the nineties, the maritime world at first had great hopes for the new technology, which operates without mechanically moving parts.

High accuracy and low prices were expected as well as maintenance-free, more economical operation which would render the regular replacement of gyrospheres required by conventional gyro compasses unnecessary.

After a few years, however, it became evident that the purchase price of the fibre-optic compass was in no way lower than that of a gyro compass; in fact, it was more than three times as high.

Aside from the very costly manufacturing process, the material costs in particular for photoconductors were a burden, since their prices did not fall as drastically as expected. For an FOG-compass several kilometres of photoconductors are needed.

Exact maintenance costs for this type of equipment are also unclear, since most of the equipment has been in operation for only a few years. Experts estimate the average life span of a fibre optic compass sensor at about ten years. Then a complete overhaul by the manufacturer is necessary including an extensive calibration, which cannot be carried out on board but only at the factory.

Altogether this is a procedure which is more difficult and considerably more expensive than the replacement of a conventional gyro compass sphere.

As far as accuracy is concerned, the fibre-optic compass is even clearly inferior to the traditional gyro compass. FOGs achieve a dynamic accuracy of 0.7 degrees and thus fulfil the minimum requirements of the IMO, but they are not a technical improvement in this regard. Conventional gyro compasses had already achieved an accuracy of 0.4 degree in the 70's.

This is also the reason why the fibre optic compass has hardly been used on commercial vessels at all. Eight years after the introduction of this technology, less than five per cent of all ship newbuildings in the world are outfitted with FOGs.

GPS compass

After the introduction of the FOG, development did not stand still and in 2002 something entirely new came on the market: the so-called "GPS compass".

It is possible today to determine the heading of a ship with the help of two GPS antennas. The two antennas are mounted on a bar and measure the phase relationship of the satellite signals received. From the difference between the measurements the heading is calculated. Additional acceleration sensors and speed sensors support the heading calculation.

Depending on the quality of the signal processing, the arrangement of the antennas and the calculator algorithms, heading accuracies of better than one degree can be achieved. This lies within the IMO accuracy requirements.

GPS sounds as if it should offer reasonable purchase costs and freedom from maintenance, both qualities which had been desired from the FOG. Today there are actually GPS compasses which cost only half as much as a gyro compass, or less. An attractive alternative, then?

In principle, yes. If only there were no reliability considerations. In using a satellite compass one first accepts the fact that the course of a ship is no longer determined by an autonomous sensor on board, but is now dependent on external systems and their reliability.

Again and again there are reports of intentional and unintentional interruptions in GPS satellite operations and corresponding consequences for users. As yet there is no alternative of equal quality to the satellite system of the USA which could provide more reliability. The USA continues to reserve the right to cut off selected individual areas from use during times of crisis.

Only a second, additional satellite system which is independent of GPS would reduce this risk. Once hopes were pinned on the Russian GLONASS system; for some years there has also been the European project GALILEO.

Theoretically the Russian system is available worldwide, but the highest accuracy is achieved only over Russia, because the operators have no control over earth stations in the West. Thus worldwide use is not in sight at present. GALILEO, on the other hand, is intended for use all over the world, but as things stand now it will not be ready for operation until 2012.

If in the future so-called hybrid receivers could make use of two satellite systems which were independent of each other, there would be real redundancy and thus the necessary reliability. Unless, of course, the operators in the USA and in Russia should want to interfere with or shut out each other for strategic reasons in times of crisis; that too would be technically feasible.

After over one hundred years, the compass is still standard equipment for modern vessels

Jamming

The possibility that unknown third parties as well might interfere with the GPS reception concerns the US authorities in particular and has moved more and more into the foreground recently. This process is called "Jamming".

With very little technical effort, small portable interfering transmitters can be built with which the GPS reception in a radius of over 100 kilometres can be rendered ineffective. Due to their low emission power, it is difficult to locate these microwave-jammers.

Potential causes of interference therefore need not be on board themselves, but could work from land or even lie at sea at a safe distance from the coast. Up to now this danger was considered slight, for who would be interested in creating such disturbances?

An equally great although quite everyday risk is always present on board: interferences caused by the ship itself. Shadows and reflections from masts, smokestack and deckhouses influence the GPS heading as well as irradiation from other transmitting antennas. The extremely weak microwave signals of the GPS process are almost swallowed up in the general noise of the atmosphere and are very hard to filter out.

Only if the antenna is mounted optimally without sources of interference on board can a reliable GPS heading be determined. An S-band radar, for example, can cause interference, since it operates at exactly double the frequency (3.050 GHz) of GPS signals.

Ideally the antenna of a GPS compass should always be located at the highest point, a demand which is made by the antenna manufacturers of almost all radio and communication systems. This is hardly possible.

The limited space on the upper deck and the constantly increasing number of antennas are an ever-worsening headache for shipyard engineers and customer service technicians alike. The result is more or less satisfactory compromises.

For normal radios and even position receivers such disturbances might perhaps be acceptable; a few minutes without the ship's GPS position could possibly be accepted by the nautical officer.

The heading, however, is a different matter - disturbances or deviations are fatal here, because they take immediate effect. Autopilots react to every change in the compass course and always set off an immediate turn of the ship. Therefore the GPS compass is not acceptable as the main heading source for navigation. For this reason the outfitting regulations according to SOLAS and IMO do not approve this technology for use in large ships.

If the developments in the various compass technologies are compared with each other, the conclusion is in general that autonomous procedures on board still offer the greatest reliability. Satellite courses are no more accurate, and they bring considerable risks endemic to the system as well.

Gyro compass developments

In the meantime, gyro compass research has not remained stationary. Like the diesel motor, gyro technology has been continually refined - "quick settling" and "automatic error correction" are standard today, and parts subject to mechanical wear have been largely replaced with robust long-lived electronics and optical transmission technology.

The conventional gyro compass is the most accurate source of the ship's heading - Captain Andreas Lentfer

The lifetime of the mechanical precision gyro has been further improved, and instead of requiring the former annual overhauls, modern gyro compasses need no maintenance for at least three years.

Ship newbuildings today have one or two gyro compasses, with the possibility to switch over to the magnetic compass which is still obligatory. The user selects the desired heading sensor at the touch of a button; the equipment automatically allows for the corresponding correction values for speed error, deviation and variation. All indicators always show the true north heading and show in addition from which compass the heading was taken.

A fibre-optic compass could also be integrated into the system, but due to the disadvantages discussed above, FOGs play almost no role nowadays. The GPS compass is of more interest. If a GPS course is desired in addition to the gyro course and magnetic course, a GPS compass can be integrated into the system and then there are three sensors to choose from.

The GPS compass however is only as "reserve"; the gyro compass remains the first, most reliable and most accurate source of the ship's heading.

DS

Using New Technology Radar

Dr Andy Norris continues his series on New Technology Radar and how it can be a sensible investment for shipowners

The concept of NT radar has been introduced to improve detection performance.

Existing radars do not meet the detection requirements of mariners under all encountered conditions.

On conventional radars critical targets can readily disappear into clutter or, more dangerously, not appear at all. In adverse conditions the poor radar visibility of targets such as leisure craft, small fishing vessels and non racon bearing navigation marks is of constant concern to the navigating officer.

The Master of a large container ship emailed just recently, "Our problem is (and always will be) detection of small wooden vessels in restricted visibility, especially in Asia".

NT radar technology has the potential ability to give this Master what he needs but does not think is possible.

The next few years will be an exiting time as manufacturers get to grip with the new possibilities.

Such radars, suitably integrated with AIS display features, are capable of meeting the real requirements of users and should contribute significantly to safety.

Shipping companies may also be influenced by the potential reductions in cost of ownership.

Why we need NT radar

The growing integration of radar data with information from other sensors and also from databases, such as digital charts, needs increasing levels of integrity in the radar.

NT radar fits in with the evolution in marine navigation currently being defined by IMO and IALA, known as ´eNavigation.´

NT radar can supply this. It has an inherent ability to improve the detection of targets in clutter by using the frequency data (Doppler) in the returned signal.

The potential capabilities of NT radar can be increasingly exploited as techniques evolve, giving an almost unlimited performance upgrade path into the future.

Ironically, the advent of AIS for small vessels (AIS Class B) increases the need to have better ship radars.

Some incautious users of Class B systems will inevitably consider that their AIS will make them always highly visible to ships. For this reason they may use less caution than is currently the practice when in the presence of ships in adverse conditions.

If such users do not notice a failure of their own Class B, it will be solely up to the ship's radar - in conditions of poor visibility - to detect such craft. A well-designed NT radar should be up to this.

Although NT radars will give the opera-

tor the ability to optimise manually the displayed image, automatic processes may well be superior to the capability of most users because of the potential sophistication and power of its processing system.

Experienced navigators of today take pride in their ability to optimise the radar. However, many young navigators, brought up on the preciseness of computer technology, are expecting that optimum performance should always be maintained automatically.

In principle, if this is possible it is no bad thing, as it increases the time that the navigator has for improving total situational awareness, rather than concentrating on adjusting the radar.

NT radar therefore has the potential capability to increase situational awareness in addition to that obtained by its improved detection capability.

Improved reliability

The implementation of NT radar relies on the affordable availability of sophisticated microwave technology and formidable processing power.

Perhaps unexpectedly, these should lead to greater reliability in the equipment, enhancing safety and reducing cost of ownership.

This happens for a number of reasons. The very high levels of integration needed reduce the number of individual components; much analogue circuitry, prone to noise and drifting effects, is replaced by reliable digital technology; and no high voltages need be used, significantly reducing the chances of component breakdown and interference effects.

Better detection

The Doppler processing capability of NT radar and the extra reliability are not the only advantages.

For instance, the move from fixed frequency magnetrons to flexible solid-state transmitters allows additional benefits to be gained by the use of frequency diversity techniques.

Frequency diversity means that the radar utilises a transmit signal on two or more different frequencies. This gives an improved detection capability as there is a much greater statistical probability that the target will be visible, particularly in clutter.

It is relatively straightforward to make a solid-state radar transmit consecutive pulses at different frequencies or even transmit two (or more) signals at different frequencies, simultaneously. The frequencies have to be quite far apart for best results but there is ample range within a single radar band.

High performance magnetron-based radars, mainly used in military systems, have obtained the benefits of frequency diversity by using two separate transmitters. However, this is an expensive option for the commercial marine market, compared to that potentially available from the use of NT radar.

Tracking and detecting

Other military inspired techniques can also perhaps be used for NT radar, making use of the affordable processing power becoming available.

For instance, an interesting concept is known as 'track-before-detect'. - despite its name, the tracking and detection processes are carried out simultaneously.

Current marine radars first detect the presence of a target (a blip on the radar display) and then, in effect, use standard algorithms to track the movement of the blip across the display.

For ´track-before-detect´ systems the simultaneous tracking capability helps the basic detection process.

Knowing where a target is likely to be, assists detection.

This technique has the potential ability to detect and track moving targets in very high levels of clutter that would be otherwise impossible using conventional techniques.

Operating NT radar

So what about using NT radar - will there be any differences from conventional systems?

In principle, quite different controls could be made available but for the foreseeable future IMO requirements will still insist that the familiar gain, rain and sea clutter controls are provided.

Also, similar processing options selectable on existing radars, such as scan-to-scan correlation, are likely to be also available.

Signal waveforms, such as pulse length and pulse repetition frequency, will change appropriately as the operator switches the displayed range, similarly to most existing radars. There may be less need to have any operator overrides on these settings.

It is possible that some NT radars may always transmit a signal waveform that ensures optimum performance at all ranges, whatever the current maximum range selected for display by the operator.

This, in particular, allows a number of integrated navigation multifunction displays to show the optimum radar picture, whatever the user-set range on each display.

The controls selecting radar display options, for example maximum range, have no reason to differ from existing modern radars. Also, the control of tracking functions should remain similar.

In general, it is unlikely that there will be a proliferation of additional controls.

Avoiding radio interference

Potentially interfering signals from nearby conventional radars will not affect a well-designed NT radar.

However, an NT radar operating on the same frequency as a conventional radar is likely to cause non-suppressible interference to the conventional radar because the standard methods of interference rejection are generally unsuitable for NT radar signals.

For this reason, NT radars with incompatible transmissions should never transmit on the same frequency as a within-range conventional radar.

Therefore, designers of such NT radars need to provide means to ensure that interfering transmissions are not made.

Rejecting radar interference between NT radars will also have to be carefully thought out by the radar designer. The radar operator may be provided with a control that is able to eliminate any observed interference.

Although such a control should be simple to operate it may in fact perform a variety of complex actions, such as changing transmission frequency, pulse repetition frequency and pulse compression waveforms. This detail would not need to be apparent to the user.

It may be possible to provide automatic processes that properly look after all interference aspects, without operator intervention. DS

Dr Andy Norris has been well-known in the maritime navigation industry for a number of years. He has spent much of his time managing high-tech navigation companies but now he is working on broader issues within the navigational world, providing both technical and business consultancy to the industry, governmental bodies and maritime organizations. Email: apnorris@globalnet.co.uk

Making the most of AIS

Andy Norris gives his suggestions on how the industry can benefit further from AIS

IN PRINCIPLE, the mandatory fitting of AIS on SOLAS vessels has been a major step towards the improvement of safety.

There is no doubt that an AIS that has been properly installed, is regularly checked by bridge staff and is used in accordance with the guidance in the Model Course has the capability to increase the safety of navigation.

But in practice, many of the benefits are still to be properly realised.

Two factors contribute to this.

Firstly, many of the benefits are only obtained when AIS data is properly integrated with the display of radar. Relatively few ships currently have this capability, although all new radars fitted after 1 July 2008 must be capable of displaying AIS data.

Secondly, many navigation officers remain sceptical about AIS, because of the many personally experienced instances when AIS has given demonstrably incorrect data.

Although such instances are generally considered to be decreasing, AIS data does remain tainted. The resultant scepticism detracts from the perceived worth of AIS.

AIS display

The AIS Minimum Keyboard and Display (MKD) facility that most ships have fitted provides only a basic capability for using AIS data.

Normally, an MKD has a simple polar display that crudely shows the positions of surrounding vessels.

Textual facilities provide a list of all vessels, showing range and bearing, normally ordered by range to ownship. The full set of AIS data concerning a particular vessel can be shown on demand.

On such systems it is difficult to visually correlate the received information with that on the radar display.

AIS on radar

When AIS targets can be shown on the radar, this visual correlation becomes straightforward.

The correlation process, whether performed visually or semi-automatically by the equipment, is known by IMO as target association.

Extra care needs to be taken in assessing the significance of targets that are unassociated or poorly associated to the navigation safety of ownship.

Poorly associated targets will have significant differences in position, course or speed.

If radar data is received with no apparent association it is likely that the target does not have an AIS or that AIS is fitted but is not operational. It could also mean that a gross AIS error is preventing association.

When AIS data is received without an associated radar target it could be for the following reasons:

The radar target is obscured by clutter or lies behind a large target (including, for instance, a headland); the radar is poorly set up; or the position of the AIS target is erroneously transmitted.

However, provided the AIS and radar of ownship have been properly set up there is generally good correlation on most AIS fitted targets, permitting an easy decision on target association.

Good correlation provides extra confidence on the integrity of the electronically derived navigational parameters of a target, greatly reducing the possibility that positional and velocity data are significantly in error.

Furthermore, it is often not realised that for correlated targets the AIS derived data will normally be more accurate than radar data, although there can be exceptions, particularly when the local GNSS positional accuracy is poor.

If a target is changing course, the radar tracked data is likely to be compromised in accuracy. In comparison, the AIS data will have less latency (time delay) and its heading and rate of turn information can be expected to remain accurate during the turn.

Conversely, for a target with constant velocity, a fixed AIS offset in position or course compared to the radar-observed data, is likely to indicate that the target's AIS data is in error.

If the AIS data on all targets has a fixed offset then the setup of ownship equipment, including its radar, is suspect.

AIS better than radar?

A straw poll I made indicated that most users of AIS would not agree that it is likely to be more accurate than radar.

This is for a number of good reasons.

Firstly, as mentioned earlier, users have been disillusioned by the preponderance of targets with gross AIS errors.

Secondly, the majority of users cannot easily make an accurate comparison because their AIS data is confined to being displayed on an MKD. Only gross errors are apparent and therefore good correlation is difficult to assess.

Thirdly, mariners have a healthy scepticism of new technology. They understand radar and know when to rely on it; AIS is a relatively unknown quantity and, quite rightly, should be treated cautiously until more experience is obtained.

Fixing AIS errors

AIS errors, on ownship or target, can normally be categorised as being due to one of the following: inadequate installation of equipment; equipment malfunction; or poor user operation.

The inadequate installation of AIS has been covered several times in the past but it continues to cause problems.

A particular issue is the innumerable instances of gross heading errors. These are normally caused by poorly thought-out interconnections to heading sensors, especially when digital interfaces have had to be retrofitted to the sensor.

Problems typically arise because many installations require a fixed heading offset to be entered. Bridge staff can remain unaware of this.

Also, the offset can be lost when power to the AIS or the heading sensor is interrupted and therefore needs to be re-entered.

Errors, both in transmission and reception of data, can be caused by inappropriate AIS antenna positioning or by the use of incorrect RF cables, resulting in low quality signals on transmit and receive. Although corrupt data will not be displayed it reduces the effective range of operation.

Static data and voyage related data are broadcast relatively infrequently compared to the dynamic data of the ship, making them more prone to be incorrectly received on systems with a faulty antenna or RF cable.

This can cause the target name to become unknown and be replaced by its MMSI number - a common experience for users.

In these cases the dynamic data, such as position, is also being corrupted. Sufficient uncorrupted data is often being received, allowing its display but compromising its update rate.

Equipment malfunctions also cause transmission and reception problems.

These can be exacerbated by inadequate training of bridge staff, such that onboard failures are not recognised and therefore not corrected.

The UK Maritime and Coastguard Agency recently highlighted in a Marine Information Notice (MIN 243) a failure mechanism where, on some equipment, static data items can revert back to default values under fault conditions (www.mcga.gov.uk).

As well as other problems, it can cause two or more ships to transmit with the same MMSI. This confuses AIS equipment within range of these systems, causing erratic effects, including data appearing to swap between targets.

Good AIS practise

Proper user-checking of AIS on a daily basis would quickly detect such malfunctions and prevent faulty data being continuously transmitted.

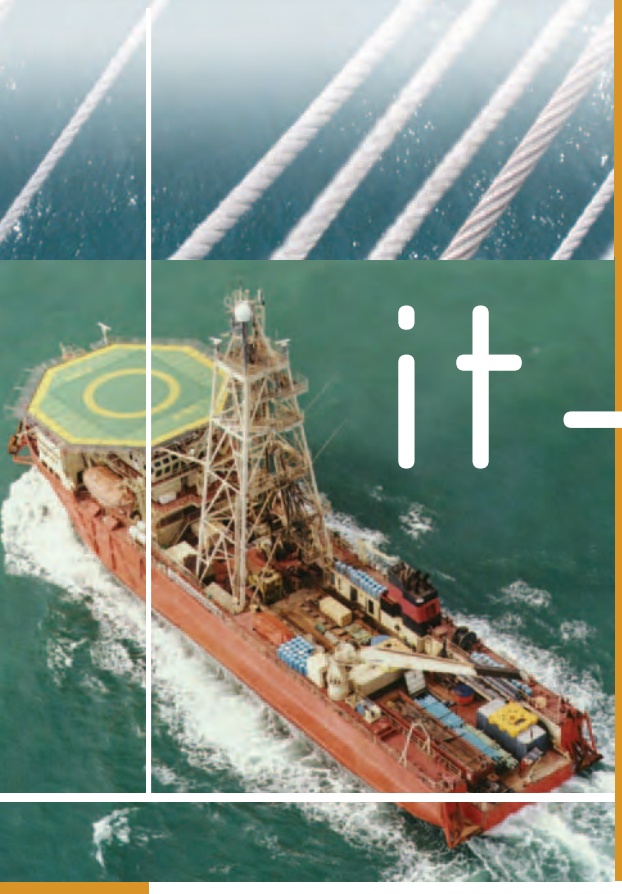
Proper user checks also help to ensure that the equipment is always configured with accurate static and voyage related data.

Many mariners find that the destination port of targets can give a good indication of the ship's likely intentions in busy traffic areas close to ports. This prior knowledge can be useful to help to avoid a close quarters situation developing.

However, voyage related data is prone to being not properly updated, and should be used with care.

In July IMO published Model Course 1.34 on Automatic Identification Systems. This not only details how such a course should be organised but also includes a large section on a description of AIS and its proper use at sea (www.imo.org).

The use of AIS on MKD equipment and when integrated with radar is explained. It highlights that collision avoidance decisions should not be made solely on AIS received data but explains the significance of associated data - with a warning of possible instances of false association. DS



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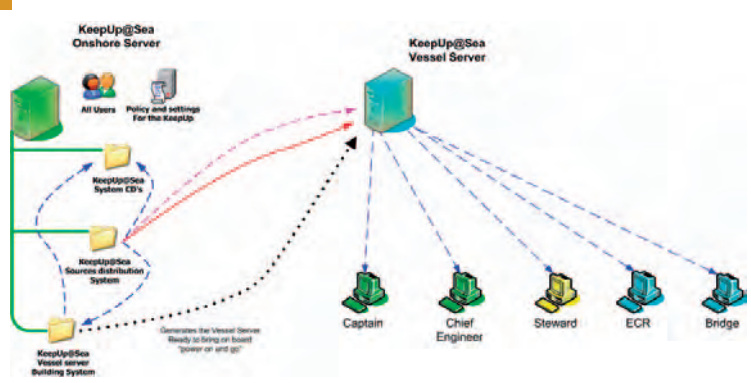

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