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FleetBroadband - ready for launch

Inmarsat's next generation FleetBroadband service will be launched on November 19, offering 432 kbps IP connections, dedicated streaming, simultaneous voice and data, and completely new pricing options. *Digital Ship* spoke to Inmarsat to find out all you need to know about FleetBroadband

This month Inmarsat will launch its highly anticipated next generation satellite communications service FleetBroadband, which promises huge improvements in functionality and bandwidth as well as a completely new approach to pricing that will allow customers to purchase the service in a host of different ways, signallling a major departure from the company's traditional demand-assigned tariff structure.

A maritime extension of Inmarsat's existing BGAN (Broadband Global Area Network) high-speed land mobile service, FleetBroadband will use the same satellite constellation currently in use by that system. Consisting of Inmarsat's two most sophisticated satellites ever produced, the I-4s, this network will offer bandwidth speeds of up 432 kbps to the deep sea merchant market.

Piers Cunningham, head of maritime business with Inmarsat, believes that this service will represent a major step forward for the maritime market.

The world has moved on since the launch of Fleet in 2002 - Piers Cunningham, Inmarsat

"On the 19th of November we will launch FleetBroadband, and that's been made possible by a number of things," he told us. "Fundamentally the most important parts are the BGAN platform, which has been operating for over two years commercially in the land sector, and also the utilisation of the Inmarsat 4 (I-4) satellite constellation to its full capacity and extent."

"Since 2002 (when Inmarsat Fleet was launched), has the world moved on in terms of its requirements? Of course it has, and I think things in the maritime world are evolving too, but the majority of the world's fleets are still relying on batch and compress technology."

"However, there is a very real demand to move solidly into the IP (internet protocol) era. Not necessarily on November 19th, but over the next year, two years, or five years, and the rate at which people will adopt the IP services will be influenced by so many factors."

"It's not just that people can go out and buy this new terminal, it's about how their backbone, their background application structure, works on their vessels and ashore. Are they ready to embrace the IP era, are they happy with what they've got, is it limiting their operations, or do they want to do more?"

Inmarsat is prepared for this new service to grow slowly, and expects that the industry will take its time in judging where the benefits are to be

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ABC

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found in ramping up to a higher degree of bandwidth.

"If they're happy with their Fleet 77, they work well, they're not costing the earth to run or maintain - do they need FleetBroadband?" said Mr Cunningham. "This is the emotive subject, and we've always had this, in the 90s or since 2000 when we launched new services."

"From my perspective there's always a period of 'bedding in' to the market, so Inmarsat will come out with a new service, we will have tested it to destruction, but we know that the industry will look at this new solution placed on a moving platform many hundreds of kilometres from shore where they are relying on it, and they will talk."

"In the coffee rooms and the meeting rooms people will say 'you've got a FleetBroadband, how's it going?'. We're pretty sure they'll say 'it's working well'."

Mr Cunningham continued: "You'll get the bullish early adopters, who'll take it on because it's the newest, latest and greatest, then you'll get the middle tranche who'll wait and see the reports back from the early adopters."

"And then you'll get the later adopters, maybe two years from now, three years from now, when their Inmarsat-Bs are starting to get a bit tired and they're looking to upgrade - would you then go out, two or three years after the launch of a new service, and buy an older service? Some may, but most won't buy a VHS video recorder now when they know a DVD or hard disk recorder will work 100 times better."

"The same emotive discussions go on with us. Our expectations for FleetBroadband are tempered against what we already know, there's not going to be a landslide overnight to FleetBroadband. That doesn't happen, and we'd be foolish to think that would be the case."

"What we will see is a phased take up, where over the next eighteen months to two years FleetBroadband will ramp up in its acceptance in the market, and then we will start to see Fleet come off the boil as people adopt new technology over existing technology. When we're talking four years from now, hopefully we'll say FleetBroadband is the de facto standard fit in the deep sea world."

Competition

Competition in the satellite communications market has grown at a massive rate in the last few years, with a number of VSAT (very small aperture terminal) service providers coming to the table with offers of unlimited, fixed fee, high-bandwidth systems, or other variations on the same theme.

This greater level of movement in the market, as well as a number of internal changes within the company since Inmarsat was privatised eight years ago, have been some of the driving forces behind Inmarsat's push to introduce its next generation systems, said Chris Insall, manager, maritime products at Inmarsat.

"There has been quite a large amount of development on the technology side of things, and that was most definitely aided by the dynamic structure of Inmarsat having been privatised in 1999, but also being part of a new dynamic market which included competitors," he told us.

"There's no other way of doing it, you have to embrace the competition. We've said that we welcome the competition, and actually this is quite true, it's not just something we say. The advent of Iridium into maritime services after 2000, subsequent VSAT competition and also Connexion by Boeing has spurred on new product development, and new commercial developments as well."

The launch of the third Inmarsat I-4 satellite in 2008 will bring global coverage for FleetBroadband

Connexion by Boeing in particular proved to be a very interesting addition to the market before its demise in 2006. Backed by the considerable weight of the Boeing corporation this was a company that had the muscle to compete with Inmarsat at the corporate level, though the product did not prove to be as successful as the company might have hoped.

"Connexion by Boeing did surprise us with the certainty that was attached to it, given the restrictions of Ku-band," said Mr Insall. "From our side, in maritime, the surprise was that they were so sure about being able to offer the coverage, because with the nature of Ku-band coverage you are bringing together such a range of different spot beams around the world."

"Doing that without the benefit of a single coordinating company, like we can with our own satellites, was always going to be a huge challenge. We were surprised it was presented as so black-and-white, by such a major company as Boeing."

"What was very particular about the Boeing proposition was that it claimed to cover more than 90 per cent of shipping routes worldwide. Doing that, in particular in the Pacific Ocean, was a major challenge, and this is one of the great advantages that we bring with the global coverage."

"It's difficult to speculate (about why it didn't work), it may have been because they were so large it was difficult for them to bring the focus that was required. It is quite a small world in this industry."

While global coverage is one of Inmarsat's most fundamental claims about the advantage its service has over the competition, FleetBroadband, when launched, will only have coverage of two thirds of the Earth via the Atlantic Ocean Region and Indian Ocean Region I-4 satellites.

Full global coverage will not be achieved until the launch of the third and final I-4 satellite in March / April 2008 to cover the Pacific Ocean Region. However, Inmarsat believes that there is a lot to be gained from launching the service as it now stands, for the company itself and for prospective users.

"We will be able to benefit in a kind of 'rolling development' way from actual usage, there are many vessels out there with different requirements, and we understand that some of those vessels will be interested in waiting until the global service is available, but others do not have that requirement," said Mr Insall.

"It makes a lot of sense for us to still ensure that we can benefit from the experience prior to the launch (of the third satellite). Also, from a commercial angle, it does take several months for the industry to get acquainted with the service."

"We are essentially delivering an IP service, and although we can deliver the pipe it takes a while for the applications to really come through. It's just like in the terrestrial industry where it has taken people a while to develop awareness of their applications, it's only now that people are looking at things like videoconferencing or Skype at a popular level. That's been available for many years, but now you have things like high bandwidth and WiFi at home or at work and the applications that go with that."

High-speed options

One of the marked differences that Inmarsat sees in pitching this service against the offerings of its VSAT competitors is in the way the user pays for the extra bandwidth they use. While VSAT may, in most cases, entail a fixed fee for unlimited use of the available bandwidth, FleetBroadband will mean having a high-speed pipe on the vessel that only incurs costs when in use.

This could be a way of creating interest from vessels that do not have a current requirement for high-bandwidth connectivity, but would like to investigate the possibilities of improving operations through the use of more advanced applications without having to pay up-front for the capability to do so.

"The difference is, with VSAT, you would have to make a major investment up front," said Mr Insall. "If you've made that major investment then often there's no marginal cost to access larger amounts of data."

"In the case of FleetBroadband, it's entirely flexible and there are new pricing packages, so if you have the volume you

have the choice of accessing high data rate services. It will give you the same sort of benefits (as VSAT) but give you the flexibility that if you don't want to access those services then you don't get charged for them."

Mr Cunningham added: "It comes with a whole host of functionality, but you don't pay for it unless you use it. So, for example, you can do what we call 'provisioning' of services."

"To start off maybe you just want voice, standard IP, and ISDN on your FleetBroadband 500, but every now and again you might like to do a video link emergency response drill, maybe once every six months. You can provision 128kbps streaming just for that occurrence, the functionality is all built in and there to be taken advantage of, but you don't have to immediately."

Mr Cunningham sees FleetBroadband working as a bridge between existing services and the sophisticated applications of the future, allowing users to continue to use the technology they are familiar with while testing out new ways of doing business.

"I think that's important in how we conceptualised the FleetBroadband 500 with an ISDN channel - it's because in the world today over 90 per cent of our customers are using dial-up batched and compressed technology," he said.

"We realise that their applications backbone is not going to change overnight, so they can adopt FleetBroadband, the latest equipment working on the latest constellation, and still use their application types, but have the assurance that they've got a very powerful standard IP background there that can take them seamlessly into the IP era when they're ready."

Pricing

The increased power available from the latest constellation of satellites will allow Inmarsat to offer its airtime to distribution partners at its cheapest ever rates. This should meant that even users who continue to send and receive the same amount of data and voice calls over FleetBroadband as they would have done with a Fleet terminal or Inmarsat-B will see a direct benefit in those costs savings alone, even without taking advantage of the higher speeds available.

"If you're using Fleet today, the move from Inmarsat-A to Fleet, from analogue to digital, was quite marked in terms of the savings that could be had and the functionality," Mr Cunningham told us. "The same factor applies to FleetBroadband."

"Although the differential compared to going from analogue to digital technology won't be the same when going from Fleet to FleetBroadband, there's no doubt that the utilisation of the IP services on FleetBroadband, the tariffing structures, and the other elements we've built in will be highly competitive."

"Depending on your method of operation it could bring you cost savings going forward over Fleet, although we hope it's a tool that, rather than cost savings, allows people to drive more value from the equipment and do more with it."

Competition from Iridium, VSAT and Connexion by Boeing spurred on new product development - Chris Insall, Inmarsat

The key point here is in the installation of the capability to use high-speed services, rather than paying a monthly fee for bandwidth that might not be necessary for an organisation's specific functions.

Once the installation is finished, on a like-for-like basis FleetBroadband should be a cheaper monthly cost than its predecessors, with built in functionality that can be accessed should the need arise.

"It is a way of, to the best of anyone's ability, future proofing your path up to making more extensive use of more sophisticated applications," Mr Cunningham said. "The capability comes as part of the rations, basically the technology is a quantum leap in terms of what has gone before. In terms of like for like tariffing you're certainly not paying more for it - it really is faster, smaller, cheaper."

"Hypothetically, if you contract for a VSAT, you're buying always-on bandwidth, but half the time you probably won't be utilising it, so you're paying for a pipe you're not utilising. The most important thing to remember is that normally there are substantial contractual durations to that, so you are fitting, in effect, proprietary equipment on to your vessel that's contracted for three years."

"Then at the end of that time you have an antenna that possibly could be re-used with another provider, a below decks unit that could possibly be used - but there is no substitute for a standard, type-approved global service like FleetBroadband. This is just fundamentally run on a SIM card, so should you wish there is the ability to literally change provider by swapping out that SIM."

Pricing plans for FleetBroadband have also changed fundamentally from the traditional Inmarsat pay-per-use model employed for its previous services. High and low use structured plans, with bundled packages and contracted allowances, should offer new options to the customer as to how they wish to purchase their airtime.

"The price packages create a greater degree of flexibility for the user, and a greater degree of cost control," said Mr Cunningham. "It's still not 'all you can eat', but ultimately you can be sitting now at your office looking at the web interface from the distribution partners, and see real-time traffic and billing information for your fleet in front of you."

"It's no longer the case where you have to have a delay of a month or three months before you get the invoice back. It gives you more control of your revenue flows but also gives us a greater level of comfort with respect to traffic moving away from Inmarsat."

He continued: "There are mechanisms in place so you can make an accurate assessment of which plan or package suits you best for your current and future growth needs, without jumping into a contractual relationship and buying bandwidth you actually don't need. A function of that is looking at how it stacks up as a total solution cost against VSAT."

"But there are so many intangibles that you can't really put into a spreadsheet, that's why we've always said that when you make a decision you have to look beyond the headline, per-megabit price."

Global standard

Going forward, Inmarsat will hope that FleetBroadband can emulate the success of its Fleet services, with the 10,000th Fleet77 terminal recently having been activated, and approximately 15 Fleet units being activated on a daily basis.

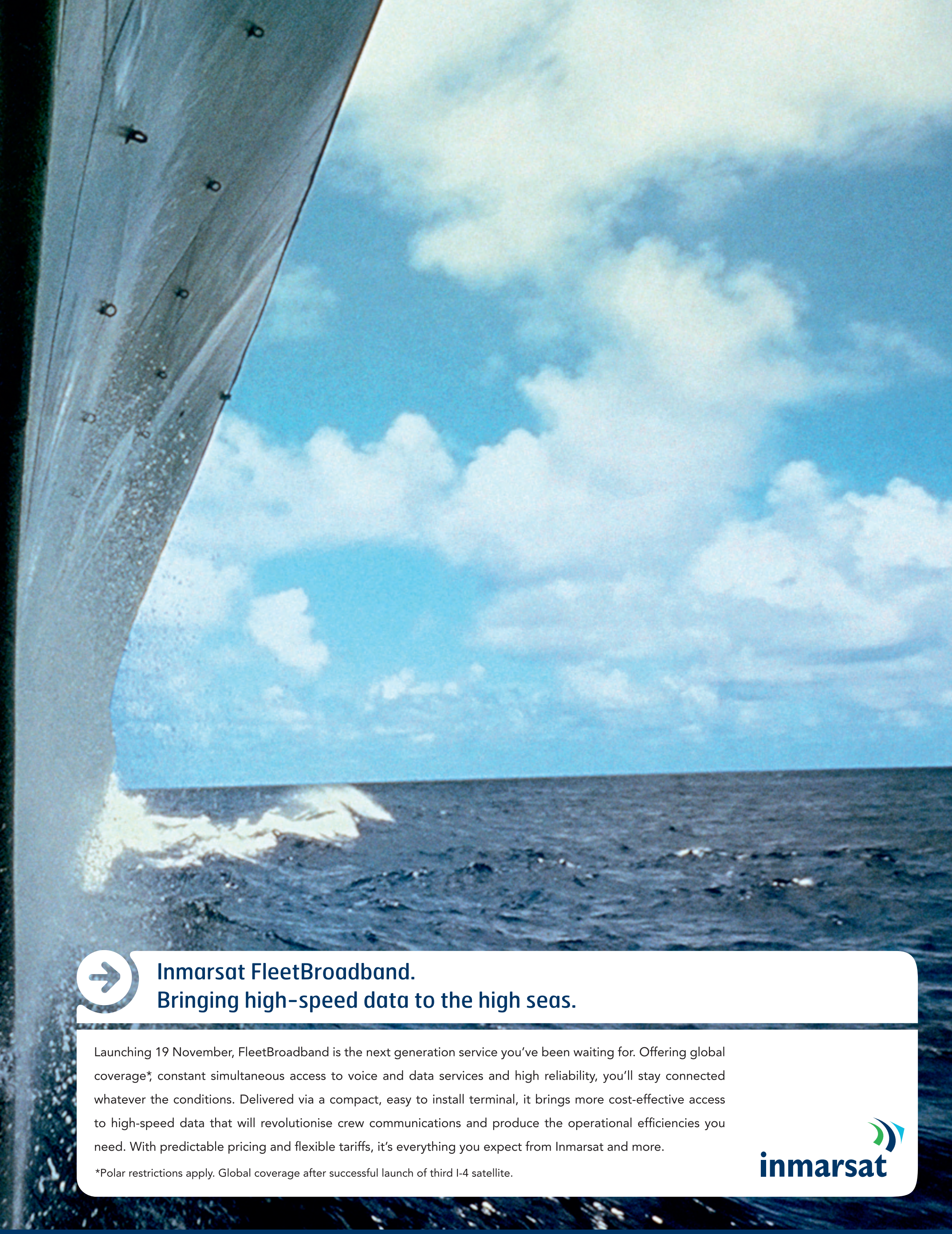
With competition from VSAT providers hotting up, the launch of this new service could represent a major crossroads in the future of the maritime satellite communications market.

"The idea is that we want to provide something that can be used to a known standard, on a global basis, through an established and respected distribution network," said Mr Cunningham. "We've met all of those requirements. When you buy a FleetBroadband terminal, you know what you're getting in terms of functionality, and quality of service."

"Why should a shipowner have to worry about adopting a piece of proprietary equipment that will lock him into a network or a provider where he's potentially not sure of the coverage? Vessels change routes, but spot beams don't, and a lot of providers of alternative technologies, especially VSAT, put together quasi-global coverage, but it's never normally from one network. It's cobbled together from two, three, even four separate providers."

"Imagine if you had to deal with four separate Inmarsats, and there was a middleman in between cobbling together the coverage map? How could that middleman ever have the assurance that that coverage wouldn't change overnight? They're not in control of their constellation. At least here we can show you the coverage, show you the 228 intermeshed spot beam configurations - they're not going to change. I think that's a pretty compelling proposition." DS

For the full details on different aspects of Inmarsat's new service, see Digital Ship's special reports: FleetBroadband - Speed and Capabilities on page 8, and FleetBroadband - Pricing Plans on page 12



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*Polar restrictions apply. Global coverage after successful launch of third I-4 satellite.

inmarsat

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Thrane & Thrane FleetBroadband ready to order

www.thrane.com

Thrane & Thrane has announced that its SAILOR series of satcom terminals for use with Inmarsat's next-generation FleetBroadband system are now available for order.

The terminals come in two sizes, SAILOR 250 and 500, and are expected to be type approved in the middle of November. The antennas will be released to the market directly after approval is confirmed.

The SAILOR 500 system will be able to provide connection speeds of up to 432 kbps with ISDN capability, approximately seven times faster than current generation Fleet77 systems. It utilises an antenna smaller than the mid-range Fleet55, with a diameter of less than 60cm, weighing just 16 kg.

SAILOR 250 FleetBroadband offers data speeds up to 284 kbps with an antenna that's smaller than today's Fleet33 system. The diameter of the equipment is less than 30 cm and weighs in at just 5 kg.

Inmarsat satellite phones from Stratos

www.stratosglobal.com

Stratos has confirmed that it is to make Inmarsat's new Satellite Phone Services commercially available later this month. The services are available in mobile, fixed-land and fixed-maritime packages, and offer high-quality voice (2.4 kbps) connectivity via small, affordable equipment.

The product that will be marketed to the shipping industry, the FleetPhone, is a fixed maritime terminal that offers voice services only (rather than the voice and data capabilities of the other handsets).

Global coverage for the FleetPhone will be dependent on the launch of the third Inmarsat I-4 satellite, currently scheduled for March / April 2008. This satellite will cover the Pacific Ocean Region (POR) and will also complete global coverage for the new FleetBroadband satellite communications system.

SeaMobile NOAA VSAT contract

www.seamobile.com

SeaMobile Enterprises reports that it has signed a new three-year contract with the National Oceanographic and Atmospheric Administration (NOAA) to provide global VSAT satellite services to the entire fleet of ships operated by the Administration.

SeaMobile has also been agreed to perform the integration, installation, operations and maintenance of a 3.7m VSAT terminal system for the new NOAA ship, Okeanos Explorer. NOAA is an agency of the US Department of Commerce, and conducts environmental research and serves as the country's primary source of information on weather data, forecasts, warnings and climate change.

The contract will also include the provision of voice and data access to up to 21 ships in the NOAA fleet using SeaMobile's DirectNet service, a fully managed maritime telecommunications service enabling the extension of NOAA's network from all its terrestrial locations to the fleet.

DirectNet enables broadband connectivity between the ships and the NOAA headquarters so that environmental scientists can interact in real-time with ships at sea. NOAA will have the ability to conduct voice calls, large data transfers and video conferencing simultaneously while operating in the northern Alaska, Pacific and Atlantic Ocean regions.

SeaMobile had previously provided service to nine NOAA ships on a month-to-month basis. The new contract covers all ships under a long-term commitment.

IMO publishes GMDSS handbook

The International Maritime Organisation (IMO) has issued a complete revision of its comprehensive handbook on the global maritime distress and safety system (GMDSS), the GMDSS Manual. The intent of the new GMDSS Manual (formerly the GMDSS Handbook) is to provide, in a single publication, a thorough explanation of the principles on which the GMDSS is based.

This will include examination of radiocommunication requirements and recommendations for its implementation, operational performance standards and technical specifications to be met by GMDSS equipment, and the procedures for and method of operation of the various radio services which form the GMDSS and the Master Plan for the GMDSS.

The Manual is intended for use by ship personnel, shore operators, trainers, administrations, regulators and anyone else concerned with ship communication.

Topics include - Development and concepts of the GMDSS; Components of the GMDSS carriage requirements and operational procedures; Excerpts from the relevant SOLAS regulations; Supporting resolutions and circulars; IMO performance standards and related ITU-R recommendations giving technical details of radio equipment; NAVTEX Manual, International SafetyNet Manual and Joint IMO/IHO/WMO Manual on Maritime Safety Information; Current GMDSS Master Plan, giving details of coastal infrastructure and services provided by Member Administrations; Extracts from the ITU-R Radio Regulations giving the radio regulatory background.

The Manual is available from authorised distributors of IMO publications and via IMO's Online Bookshop.

New 60cm VSAT antenna from Sea Tel

www.seatel.com

Sea Tel reports that its new 2406 Ku Band Tx/Rx 60 cm VSAT antenna has been confirmed as compliant with US FCC resolutions.

The company says that the small, 24-inch dish can operate with more than 70 per cent efficiency across the transmit and receive bands, and is suitable for file and image transferring, video conferencing, e-mail, Virtual Private Networks (VPNs) and database backup.

Based on Sea Tel's proprietary 3 axis stabilization technology, the 2406 is an unlimited azimuth system with +/- 25 degrees of roll and +/- 15 degrees of pitch while maintaining a pointing accuracy of +/- 0.2 degrees at all times.

Sea Tel's new 60cm VSAT antenna - now FCC compliant

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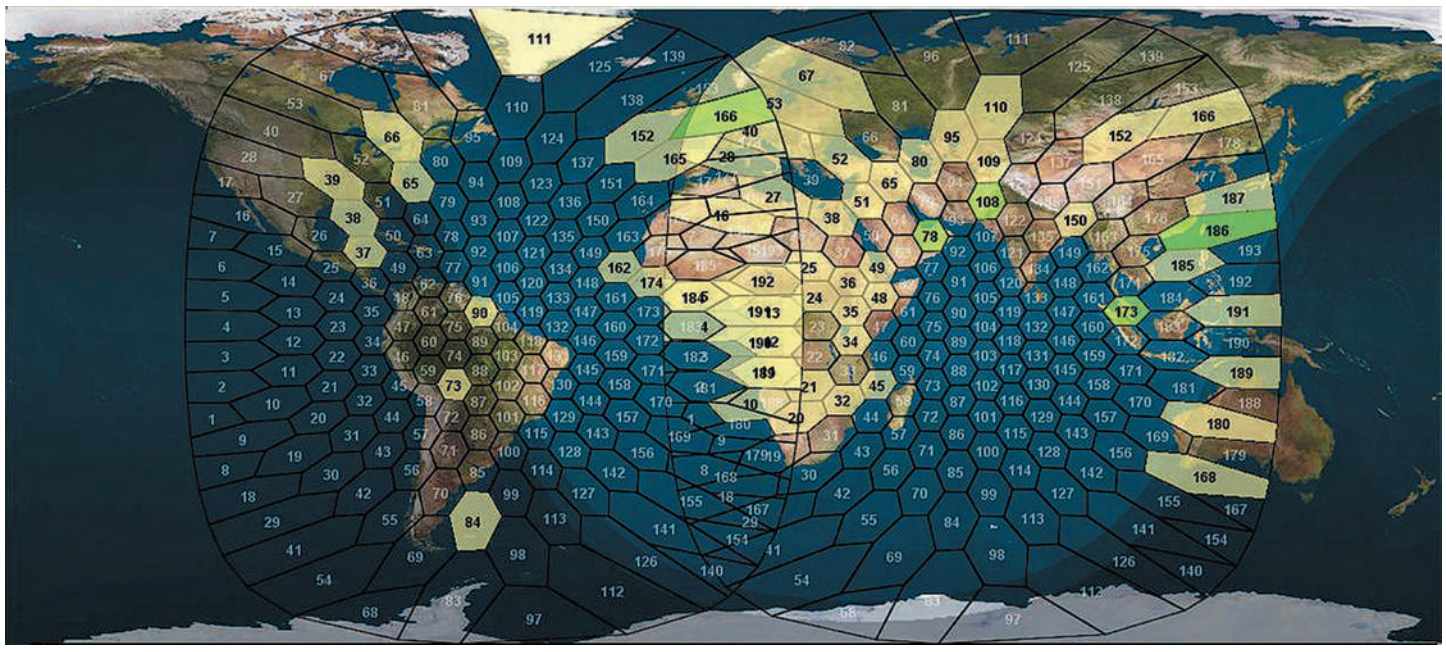
FleetBroadband - Speed and Capabilities

Speeds up to 432 kbps, dedicated streaming, simultaneous voice and data, applications over IP - FleetBroadband boasts a range of functionality vastly different to Inmarsat's previous market offerings. But what will this really mean for the shipowner? *Digital Ship* spoke to the satellite provider to find out



The two existing I-4 satellites can offer broadband capability to the Atlantic and Indian Ocean regions, via 228 intermeshed spot beams

Inmarsat's FleetBroadband system represents a huge leap in technology and potential for the company's satellite communications network, offering bandwidth speeds of up to 432 kbps over standard IP (internet protocol) connections to the deep sea merchant market, compared with the 128 kbps maximum capability of the existing Inmarsat Fleet range.

For the first time over Inmarsat vessels can send and receive voice and data traffic simultaneously, and run background business applications while also taking advantage of dedicated streaming connections up to 256 kbps. IP connectivity will open up new applications to Inmarsat vessels that were unavailable using the previous MPDS (Mobile Packet Data Services) technology.

Quite simply, this is a completely new departure for the company in terms of speed and functionality, and Sandro Delucia, maritime market manager at Inmarsat, is excited about the prospect of terrestrial capabilities being transferred to the maritime sector.

"FleetBroadband is an IP communications device, an IP 'plug in the wall' service," he told us. "In terms of integration it's a gateway, a router that provides services for ISDN, standard IP, streaming IP, dedicated IP connections, SMS, and voice."

"Basically this is like plugging in an ADSL connection at home, in the sense that you have voice and simultaneous multiple IP connections."

FleetBroadband is available as two different terminal options - the FleetBroadband 500 (FB 500), a 15 to 20kg antenna offering speeds up to 432 kbps, with ISDN capability, and the FleetBroadband 250 (FB 250), a 4 to 8kg dome with speeds up to 284 kbps, but without ISDN.

The Thrane & Thrane FB 500 can deliver 432 kbps over a 55 cm antenna (with FB 250 in background)

FB 500 is approximately 55cm in diameter compared with approximately 25cm for FB 250, and both options offer dedicated streaming channels in 32, 64, and 128 kbps, while FB 500 has a further 256 kbps channel.

These dedicated streaming channels can run independently while the standard IP service is running in the background, meaning that a host of applications can be running simultaneously.

"In terms of what you're going to be able to do with that it will change altogether compared to what went before," said Mr Delucia.

"Essentially we've taken a core network, similar to a general 3G mobile phone provider network, and taken out the normal transmitters and added a satellite link across there with terminals that have SIM cards fitted to them, pretty much like the same SIM cards you'll find in a mobile phone."

"Does it support the same kind of protocols you'd use on your home connection or office network? Well, yes - it supports TCP, UDP, SMTP, POP 3, HTTP, all of the protocols you use generally for e-mail, web browsing and the standard protocols used out there on the internet. In addition to that you preserve all of the legacy stuff, we can run single channel ISDN across the FB 500."

"It covers all types of IP addresses, static, dynamic, public, private, and this has implications in terms of some applications that might require assigned IP addresses, like a dedicated VoIP phone."

Proven network

The FleetBroadband system will run across the existing Inmarsat BGAN (Broadband Global Area Network) land mobile satellite network, essentially operating as a maritime version of that current terrestrial service.

This brings the benefit of introducing a new product running on a system that has been in full commercial operation since 2005, lead-up time that is useful to ensure the system has all of the kinks ironed out before ocean going vessels entrust their communications to the network in the middle of the Atlantic.

"It has the same infrastructure as BGAN, the antenna and aspects of the core modular technology are the only difference, though very similar," Mr Delucia explained.

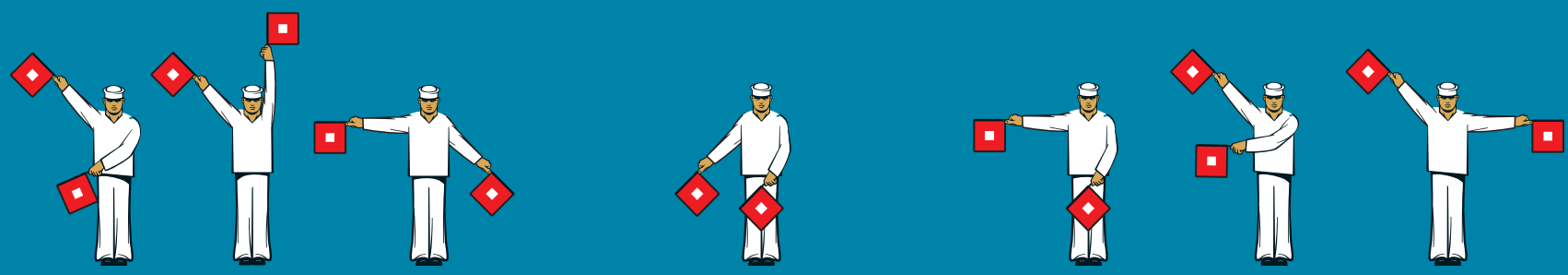
"It is intrinsically marinised BGAN. And we have two years of running it, supporting it, tweaking it, refining it, making it better and better."

"This is being upgraded for FleetBroadband (from BGAN) to deal with spot beam handover, with three satellite access stations to be implemented in 2008 that will mean worldwide coverage."

FleetBroadband will not be a global service until after the first quarter of next year, after Inmarsat launches the third and final I-4 satellite it has developed to run the service.

That satellite, scheduled for launch in March 2008, will cover the Pacific Ocean Region, joining the existing I-4s covering the Atlantic and Indian Ocean Regions. The initial launch of FleetBroadband will offer services within the coverage areas of those two satellites only.

GMDSS (Global Maritime Distress and Safety System) is not currently supported by FleetBroadband, though Inmarsat has said that the BGAN service and technology platform (including FleetBroadband) may become relevant to the provision of GMDSS in the future, and that it is actively considering what changes would be required to Fleet Broadband should a deci-



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sion be taken in future to include these safety services.

"For GMDSS, there's a little bit of a difference," said Mr Delucia. "There's the coverage at the moment, but also the way we orientate the land earth stations, we're not using the model that we have for Fleet. With Fleet you have back-up land earth stations all the way around the world, and also back-up satellites, so you can go from I-4 to I-3, from I-3 to I-2, for an emergency call. So it's a little bit different."

"The infrastructure is different in that we've gone from a LESO (Land Earth Station Operator) model to an Inmarsat model, where we have our own satellite access stations, though the LESOs are still needed for GMDSS, so they will still be around for quite a while."

Operational improvements

The extended technological capabilities of FleetBroadband open up a range of new applications to users of the service that would have been impossible, or at least very difficult, using existing Inmarsat systems.

"Firstly, you have high streaming capabilities, so that would lend itself to things like high quality video conferencing, video surveillance, all in real time," Mr Delucia told us. "That's something we could do up to 64 kbps on an ISDN link quite adequately, but if you wanted higher quality that's something we couldn't do before to that degree."

"That's probably not an everyday thing, but just with the standard IP you're going to be able to do things a lot faster, and free up that IP capability for other applications that may be working in the background. It's less contentious because it's dealing with the work faster."

The additional power available from the satellites also means that, on a data volume basis, it will be cheaper to send information over FleetBroadband than with the existing Inmarsat offerings.

"The price is cheaper for standard IP per megabyte than over, say, Inmarsat-B or Fleet, it's the cheapest we've ever had," said Mr Delucia. "The I-4 satellites, as a whole end-to-end solution, are much more efficient, with more advanced technology. From that point of view it is more cost effective to push data across this type of connection."

"Even if you're just sending an e-mail or browsing the internet, operationally, as well as in terms of cost, you'll be at an advantage using FleetBroadband."

"Also, doing things in less time, there may be operational implications to that. Doing a server back-up, or sending large amounts of information back to shore, these are things you'll be able to do a lot faster. Essentially it will be cheaper and operationally more efficient than before."

Another cost saving aspect of the technology is the standardised nature of the below deck units (BDU) that come with the FleetBroadband terminals, which carry standard equipment input slots and can be connected with existing Inmarsat cabling.

"An important point is the interfaces, and these are not proprietary," said Mr Delucia.

"(The JRC FB 250 below deck unit) has a standard RJ-11 connector, two RJ-45 connectors, and one for ISDN. You can buy equipment from your local computer store that will plug into these, these are commercial off the shelf interfaces and no specialised equipment is needed to be plugged in to make it work."

"I could plug an Ethernet cable from my laptop into the FB terminal and treat it like my home connection. Effectively it's an IP gateway, with voice capability."

Mr Delucia continued: "A coaxial cable running from the antenna connects into the below deck unit, add your power supply, plug in your commercial off the shelf telephone or your computer through USB, and you're up and running. Or, if your connections are still dependent on the legacy Inmarsat functions, you can just plug into the ISDN port and dial in to an ISDN network. So you've got the existing and evolved, and the new."

"You don't need new cabling, you can use the existing cabling, it's exactly the same, you don't need to remove it. Just remove the BDU and plug the new one in, in the case of JRC."

Vessels with a JRC Fleet 33 already installed can upgrade to FleetBroadband just by replacing the below deck equipment

The below deck unit has non-proprietary inputs where you can plug in equipment purchased in the local electronics store

"Then you just have to install the antenna, which is a case of placing it on a mount and making sure it's positioned correctly relative to other devices that may be onboard the ship. The advantage with installation of the FB antennas is that they're very much smaller than some other systems, you can carry it on board, they're incredibly light."

Inmarsat and its distribution partners are also developing specialised software based user interfaces to allow those on board to have more complete control over the FleetBroadband system's functionality, and to make configuration of the unit as easy as possible.

"We're developing a software interface called Launch Pad for FleetBroadband, which is something we've done for land mobile," explained Mr Delucia. "It's a Java application that simply has buttons and menus where you can easily enable and disable services, and control the FB terminal."

"Thrane & Thrane and JRC are also developing their own web interfaces. They will work similar to if you have a home router, where you can put the IP address of the router into a web browser, and you can access the router. In a similar way you can access the FB terminal by going into your browser and putting in the default IP address. That way you can configure virtually everything on the terminal."

He continued: "The web interface and Launch Pad, what they do is send commands back and forth to make the terminal do things. Those commands can be implemented into software, so you can run those scripts and control the terminal from third party devices."

"You could also have software with the codes built in to run things automatically. So that's another way of interfacing, directly through those commands. Those commands are accessible, if anyone needs those commands to build into their software they can do that."

Voice and Fax

While the new system may have extended capabilities for IP connections and more advanced applications, basic voice and fax services have not been forgotten, with the voice services in particular benefiting from the improved technology the equipment provides.

"This is the most advanced voice telephony that we've ever created, it's something that's been running very successfully on land BGAN and is now tried and tested," said Mr Delucia.

"We utilise only a 4 kbps channel, which means we can bring down the price of a telephone call, yet it is probably a notch up in terms of quality above the existing services using 4.8 kbps and in some cases even more. This means we can offer voice at the cheapest price ever, which is great for crew calling, for example."

"Your terminal will also have a range of telephone numbers that you can use, you'll have a principle number for your main voice channel and you can provision an additional three numbers for your ISDN services," he added.

"They could be used to route different devices, for example one number could be for an ISDN phone, one for a fax machine, and the other number could be for another ISDN device on the network. You just need to be registered on the network and are not incurring any costs at that stage, then someone can dial your specific fax number and send you a fax."

"FB 500 will support all of your fax capabilities on a 64 kbps ISDN channel, it will cover all of the MPDS, all of the ISDN, and a lot more. There's an old fax service using a 9.6 kbps connection which was charged at a certain rate, that's something you cannot do across FleetBroadband.

And it doesn't support telex, but maybe there are other ways of doing these things with the system if you really wanted, which would also have cost savings if you followed the right path."

While older technologies like fax may not push the FleetBroadband unit to the limit of its capabilities, using the new network to perform these tasks will still save money for the user on airtime rates alone.

"It is substantially cheaper, it's less than 50 per cent the cost of MPDS and in some cases there are up to 80 per cent savings, depending on the package," said Mr Delucia. "It also has a much lower latency than MPDS, so you would be able to introduce certain applications that you couldn't use before that need low latency."

"The streaming channels are good for applications where you are sending information over and back constantly, in real time, so things like VoIP or videoconferencing."

"With the standard IP connection, you only pay for the number of bytes sent and received, regardless of the connection speed you might be experiencing on your laptop or desktop. Guaranteed streaming is charged by the second."

Availability and upgrade

Inmarsat has confirmed that manufacturers Japan Radio Company (JRC), Thrane & Thrane, and Furuno will be the suppliers of the FleetBroadband equipment following its launch. Of these three, only JRC and Thrane & Thrane will have antennas and equipment available for sale on the first official day of the service, with Furuno set to release its FB 250 system in early 2009.

Thrane & Thrane will be making its 16 kg FB 500 antenna and BDU available from November 19, with its FB 250 system to follow in Q1 2008. Conversely, JRC will open its service with the 7.4kg FB 250 and BDU available on the November launch date, followed by the FB 500 in Q2 2008.

One of the most useful aspects of the new equipment for existing Inmarsat customers will be the ability to re-use part of the communications system in place from those legacy service when upgrading to FleetBroadband.

JRC, in particular, has confirmed that users with an existing F33 installed on board need only replace the below deck unit to upgrade to the FB 250 - keeping the same antenna and same cabling that is already installed on the vessel. This is not possible with the Thrane & Thrane FB 500, though the cabling can be re-used in both cases.

"The existing mounting for Mini-M and Fleet 33 will be compatible with the new radomes, there's a compatibility there," said Mr Delucia.

"The JRC F33s came out a little bit later on in the game (than the Thrane & Thrane Fleet series), and in their spec they implemented the ability to actually move on to FleetBroadband in the future, whereas the Thrane & Thrane terminals were brought in over a longer period of time and were there earlier on. So they didn't have the spec to potentially do that, and need a full kit replacement, though you can use the same coaxial cable."

Inmarsat is hoping that this mix of improved speeds, cheaper airtime, and easy installation will be a compelling proposition for companies in the deep sea merchant sector. The next step will be to see if the market agrees. DS

FleetBroadband - Pricing Plans

Inmarsat's new FleetBroadband service will introduce a host of pricing options that will mark a new departure for companies in how they pay for Inmarsat services. With a range of packages available, the company has also created a software tool to calculate the most cost effective arrangement for any particular customer, which can be displayed as a hard dollar figure. *Digital Ship* examines the pricing options for FleetBroadband

With its new FleetBroadband service Inmarsat is set to launch a new range of pricing options radically different to the standard 'pay-per-megabyte' plans associated with its previous communications systems, incorporating bundled packages and shared fleet allowances that will allow shipping companies to contract their satellite services in new and varied ways.

Inmarsat has also constructed a software tool that it will be making available to its distribution partners that can calculate the most effective monthly package for any particular company's voice and data usage, which will also demonstrate the monthly cost of that usage for comparison with legacy Inmarsat services or with competitors' offerings.

"We have a thing called the 'total cost of ownership' model which is basically a sales and consultation tool covering the hard costs and benefits of purchasing FleetBroadband," said David Jennings, senior analyst, maritime, with Inmarsat.

"We did this kind of thing when we launched the original land BGAN (Broadband Global Area Network) model, and it was quite successful. FleetBroadband, while in the maritime environment, we've moved away from simple demand-assigned pricing."

The computer model takes into account all of the costs associated with purchasing the system, such as installation and downtime, and factors these into the calculations of whether this would be a positive investment for your company. It is purely a financial tool, and only considers the monetary benefits of the system.

"Buying any kind of maritime terminal is a capital investment decision, particularly if you've got an existing unit," said Mr Jennings. "If people ask 'why should I buy FleetBroadband, what are the benefits?' - this tool is about calculating the 'hard' benefits, basically in cash."

"People selling FleetBroadband or any Inmarsat service will often point out a lot of the 'soft' benefits, like global coverage, reliability, global support, all of those value for money things that you get. They're not covered by this model, but this is the basic starting point."

Mr Jennings believes that displaying a hard figure based on the return that a company would be likely to achieve from installing the system will have a major bearing on management discussions as to the wisdom of opting for a high-speed communications system.

"For a ship manager, for example, this could be a useful way to say to an owner 'I'd like to install FleetBroadband', the shipowner will say 'why?', and the ship manager can show how it will make a financial return," he said. "The ship manager then may get other benefits as well, particularly if it helps him run his business more efficiently."

'We have moved on to new pricing plans, with packages and threshold discounts' - David Jennings, Inmarsat

"This model tells you what is the optimum airtime price plan, and by doing that can justify the capital expenditure for the chosen FleetBroadband service. If you can define your existing costs you can take the traffic behind those costs, apply FleetBroadband pricing tariffs, find the optimum one, and work out the payback on your capital expenditure."

Pricing Plans

The computer model that Inmarsat has created is also useful to find the optimum package for the customer from the new pricing plans the company has introduced. These include a number of new options somewhat similar to many domestic mobile phone contracts, where you pay a certain amount for a bundle of voice minutes and SMS, with additional charges should you exceed your allowance.

"FleetBroadband pricing is rather different to the standard demand-assigned pricing," said Mr Jennings.

"For individual ships we have something called 'threshold discounts'. It's like demand-assigned, but a bit different. Basically, you will get no discount at the beginning, but if you get to a certain threshold of revenue you will get a discount on all additional airtime."

"It will work in tiers, from this revenue to this revenue you get no discount, then a discount on the next tier up to a certain revenue, then an extra discount in the third tier above that."

Along with improved discounts for greater usage volumes, Inmarsat is also introducing discounts up-front to companies who contract to use a particular volume of voice and data services - essentially offering better deals to customers that will contract for a certain minimum spend each month.

"If the customer says 'actually I'm happy to make a fixed commitment for a fixed amount of revenue', then they can have the discount straight away, from day one," said Mr Jennings.

"This will be in the form of paying a subscription and getting a revenue allowance which is bigger than what's paid in the subscription. All the traffic that's used is then used to burn that allowance."

Mr Jennings added: "It's similar to a mobile phone scheme where you might pay £20 per month up front but get £100 worth of value to spend against text or voice or GPRS. Instead of being in minutes and megabytes it's done in money, so we have to attach a monetary value to the traffic in order to burn the commitment."

"Once you use up that committed amount you start paying incrementally for any extra traffic, like demand-assigned. But if you have a lot of extra traffic you would tend to go up on to the next discount plan."

Inmarsat will also, for the first time, be allowing shipping companies to share these purchased allowances between vessels in a fleet, another initiative it hopes will allow the industry to use its communications more effectively.

"There are a series of plans, and the discounts you get depend on how many ships you have in your fleet and how much traffic you have - the bigger commitment you want to make, the bigger the discount you get," said Mr Jennings.

"You're also then able to share the allowance across the entire fleet of ships. If you've got a ship that goes into drydock you can then pass its allowance you've bought to another ship in the fleet."

"The customer will make that commitment to the distribution partner, and the distribution partner will make the commitment to us. What this will do is encourage the distribution partners to contract for an entire fleet, moving away from demand-assigned where the commitment to the customer is just the price but not the volume. Here you're committing to ships, with the volume as well."

Inmarsat believes that extending these options to the customers will allow the industry to have a greater level of flexibility in controlling costs than was possible with the existing services. The company will no doubt hope to pitch this point as a counter to VSAT (very small aperture terminal) service providers, who point to the predictability of a fixed monthly fee as a major selling point.

Computer modelling

The computer models that Inmarsat has created should make decisions about purchasing a FleetBroadband system a little more clear-cut, as it deals in hard figures concerning communications usage at that particular company, and can point exactly to where cost savings might be possible through the use of the next generation technology.

"To begin with you have to make some basic choices, like what are your capital investment criteria, what terminal you want to purchase, a number of things like that," Mr Jennings explained.

"You would also add in whether you're going to delay the ship with the installation, and that's an important comparison to make when you are perhaps in a situation where you are competing against VSAT. In some installations that may delay the ship, and that has a cost."

"Then you get on to the traffic," he continued. "There are three ways of estimating your traffic."

"For most situations in the merchant market you are probably talking about ships that have existing Inmarsat systems, and possibly one or two other services. So you'll have mixed fleets of ships, ships with Fleet, ships with Inmarsat-B, ships with Mini-M. What we have to do is look at what kind of traffic they have."

"With this tool, you have one column for each type of installation, you can say how many ships you've got and say what is the average monthly traffic by service for these types of ships."

"If you've got voice traffic from another mobile satellite service you can put that in, you can also say you've got Mini-M, or Inmarsat-B or whatever with voice, fax and data, MPDS, ISDN - having put all that traffic in it will work out the traffic for the average traffic, by service, by ship. If you add in your existing retail pricing it will tell you what your current costs are."

All of the information about communications usage is then filtered by the computer model into bundles of voice and data that can be applied to the different capabilities of the FleetBroadband system.

"The model can take all this and turn it into some basic traffic - voice, fax and data in terms of megabytes," said Mr Jennings.

"Then we look at how much that's going to grow over the number of years of this capital investment decision. Your voice traffic might grow a little bit, your fax traffic definitely will decline, your data will grow, so moving forward you can estimate what that traffic will look like."

"Then it has to split that traffic over the basic FleetBroadband services, so you can decide what kind of services you want. There are three different voice services, and about six data services - ISDN, standard IP, and streaming IP at four different speeds."

"So we have the number of ships by type, the average monthly traffic by service, the existing service retail prices, maintenance costs, growth rates, and the split among the FleetBroadband services."

Should the user be unclear about exact usage figures in terms of megabytes and minutes there are other options for calculation of monthly costs based on ship operations patterns.

"Another way is to look at the activities you do," Mr Jennings said. "You look at the number of ships in the fleet and activities like business calls, social calls, how many faxes you send, and a whole list of things you might do that use data, like business e-mail, crew e-mail, shipmanagement data, and so on."

"You then look at the average size of each action, maybe a business voice call is three minutes, for example, and how many you do. This tool sums it all up and calculates the traffic. Then you apply the growth factors, and what the FleetBroadband service splits would be. This way would probably be more for people who don't have an existing Inmarsat service, but have an idea of what they want."

Monthly spend

Once the computer model has calculated a communications usage pattern it can then move on to calculating the hard dollar values that will show whether or not FleetBroadband will be able to make a substantial difference to the company's communications costs.

"Having put in what you want to buy and how much traffic you have and how much your current services cost, the model then calculates the cost for every single FleetBroadband pricing plan for that traffic and for the number of ships you have," Mr Jennings told us. "This will tell you what the lowest cost plan is for your specific needs."

"You'll get an 'at-a-glance' comparison of all of the price plans - there's a standard plan (which is just demand assigned), an entry plan, a mid-plan and a high-plan. These are basically the packages available based on different levels of commitment."

"Then you'll get a detailed recommendation and breakdown of the costs and it will suggest what one of the SCAPs (Shared Corporate Allowance Packages) you might need, though there are a number of single ship plans as well to go with it."

Mr Jennings believes that the detailed nature of this explanation of the costs will give companies a firm basis for any decision to move to FleetBroadband.

"It will tell you exactly what you're buying, in terms of the components of the purchase, how many ships are covered by those components, and give you the total," he said.

"It will tell you if the traffic you've got will fully use the allowance or not, and then give you a breakdown of your costs, your subscription, and the additional costs if you exceed that or choose not to have a subscription. After that it will tell you what your total monthly cost is."

"The tool will also show you the package that was 'runner-up'. The next one might be a bit more in terms of cost, but maybe it will give more in terms of flexibility, so it will show a little more about that."

The FleetBroadband computer pricing model will now be provided to Inmarsat's distribution partners, where potential customers can request an analysis of what their own costs might be if they move to the service after the November 19 launch.

"This tool has gone to the distribution partners, because it's a retail model only," said Mr Jennings. "It's up to them to decide how they want to use it." DS

VSAT - the always-on alternative

While Inmarsat's FleetBroadband launch may be grabbing the headlines at the moment, maritime VSAT (very small aperture terminal) providers have been steadily increasing their customer base in the last few years, and are working on innovations of their own. CapRock, MTN and KVH gave us some of their views on the future of VSAT

The market for maritime VSAT (very small aperture terminal) services, offering always-on high-speed communications for fixed monthly fees, has been growing steadily in the last few years, and current providers are confident that increasing data needs in land-based industries will continue to be mirrored in the maritime community, fuelling the need for higher and higher bandwidth.

There may be 100,000 Inmarsat customers, but about 10,000 might be ready for VSAT - Pal Jensen, CapRock

One area that has seen huge growth in the use of VSAT has been Scandinavia. Pal Jensen, as a representative of Telenor and now as VP sales, maritime division, at CapRock, has overseen hundreds of installations in the region, and shared his views on how the Scandinavian experience might shed some light on possible growth around the world.

"VSAT technology has been around for a long time, so it is well proven," he told us. "The first C-band systems were available from the beginning of the 1980s, and the first Ku-band was available in the mid-80s."

"The unique features of VSAT have allowed it to grow from where it started from, moving into more and more user friendly technological solutions."

Even though this technology had been available for some time, it was around the year 2000 that Mr Jensen began to see a significant growth in the use of VSAT systems by Scandinavian vessels.

"When I was moving into this business about that time, I sat down and started to count how many vessels are equipped with VSAT, and saw around 500 or 600 vessels in 2000," he said.

"It could have been more or could have been less, but it was around that figure. Those installations at that time were very much focused around the energy, offshore and cruise / ferry markets, almost all of them. That's natural, they had a high requirement for communications, and they had the money to pay for it."

"In Scandinavia around 2000 something else started to happen, a lot of other market segments related to the energy sector, they saw this new technology and wanted to take part in it. In Norway in particular there are a lot of companies serving the oil and gas people, so they needed the same technology to be able to get business. So they moved slowly into VSAT."

"By 2002 or 2003, for example, most shuttle tankers, small vessels with limited operations and limited crew, they were equipped with VSAT."

One misconception that Mr Jensen had noticed was in the impression of VSAT as purely having value as a high-speed solution.

"When people talk about VSAT as just being 'big bandwidth' and so on - that's not really the case," he told use. "To be able to install this on the shuttle tankers we, the vendors, had to scale down the product, and also the price. The customers had to move up from what they were paying, and at one point in time it clicked and everybody was equipped in Norway in that sector."

"They started using a 19.2 kbps solution - bandwidth wasn't really the driver, it was the functionality, it needed to be always-on and they wanted a fixed price. And that's what they got. So around that time it had got to the point where about 800 or 900 vessels were equipped with VSAT systems."

VSAT growth

The growth in the energy-related maritime market did not go unnoticed, and, as the laws of economics will suggest, attracted a new breed of suppliers into the market to join them.

"Something else happened where we got some help - the requirements of the end users started growing and growing," said Mr Jensen. "But you also had new companies moving in from various directions."

"One was Broadband Maritime, they opened up the market in a very good way. Unfortunately they are gone now, but there was a lot of talking. Their prices were totally wrong, but still they opened up the doors."

"Then from the other angle you have a company like Connexion by Boeing coming in with their philosophy, which again made a lot of noise and created a lot of expectant customers. A lot of people wanted to try this technology. That gave us a lot of help. Unfortunately they're gone as well, but there are other companies there to pick up the pieces."

The result of these changes in supply and demand was an increased interest in VSAT systems away from the purely energy-supply markets.

"At that point in time, around 2004 and 2005, I started to see commercial shipping in Scandinavia really moving into VSAT," Mr Jensen said. "And I'm talking about fleets, not one vessel here or there, I'm talking about commercial shipping fleets."

"When we started to sell this in 2000, we barely mentioned the crew morale part of this, that was not very interesting for the Scandinavian companies at the time. But a year ago that became number one. When people think about why they should choose VSAT, that is the number one reason is: 'how do I get crews and how do I get the right crews, because I need to be competitive'. To be competitive to get the crews you need to provide internet, provide e-mail, and so on."

"In 2007 now, looking at the same place, I'm looking at now more than 3,000 vessels, equipped with, and dependent on, VSAT solutions. That's how it happened in Scandinavia, but that's what I'm seeing is happening around Europe, that's what's happening in the US right now. I'm a little bit uncertain about the Far East, but that's a whole new market to look at, to see what's going to happen."

Fixed fees

Mr Jensen, like many VSAT providers, sees the fixed monthly fee offered by most of the solutions as a key driver in the increasing acceptance of this technology.

"What are the real market drivers for VSAT?" he asked. "Money. I think a lot is based on the predictability of fixed communication costs."

"They'll know exactly what they are going to pay for a certain communications solution, and that's it. No surprises, no different invoices from last month that are double or triple. That's the main driver for every fleet I talk to."

"Also, the telephony tariffs for the crews have got to be competitive. To be competitive it has to be close to the terrestrial price, I'm talking 10 to 25 cents. These are the main drivers for VSAT. This is what the fleets are screaming for."

These drivers are not the same for every company, and Mr Jensen does not believe that VSAT and Inmarsat's FleetBroadband will be directly compet-

'Multi-regional Ku-band is replacing C-band' - Brent Horwitz, MTN

ing services. Rather, he expects certain users with specific needs will be the core market that might find a VSAT solution more attractive.

"There are a lot of maritime Inmarsat customers out there, maybe up to 100,000," he said. "I would say that 100,000 wouldn't be ready to go for VSAT. But I would say it's the upper layer, the first 10,000 might be ready to investigate this. The rest, for various reasons, I don't think will be VSAT customers."

"Connexion by Boeing had one great idea, Ku-band is the right stuff if you can provide it, but you can't. It's a given that you have to compromise a little if you want to use Ku-band. But if you could use Ku-band it's better for all kinds of reasons, cost, licensing, weight, height - everything really, Ku-band is smaller and cheaper with the same functionality."

"Unfortunately Connexion broke their neck because they wanted to give global Ku-band, and you'll never have global Ku-band. You can get close to it, you can have 80 or 90 per cent plus coverage, and if that is good enough my recommendation would be Ku-band. But there are companies who will say 'forget it, I need global for my business'."

In this same vein, regional Ku-band has been the installation of choice for the VSAT users that Mr Jensen has dealt with during his time in the market.

"In my experience before it was approximately 60 per cent Ku-band installations and 40 per cent C-band," he said. "But where it will go from here, who knows?"

"I would go for Ku-band, but if people require 100 per cent coverage they will have to have C-band. Ku-Band has been the majority, but that could change as the market changes."

Brent Horwitz, MTN

Brent Horwitz, vice president sales MTN (Marine Telecommunications Network), has had the opposite experience in the VSAT providers role, supplying mainly global C-band systems to the maritime market.

"About two-thirds of our ships are C-band and about one third are Ku-band, of about 320," he told us.

"Three C-band beams cover the entire globe, and that typically requires a 2.4m antenna, whereas the Ku-band are more regional in nature with limited coverage. The concept with Ku-band is that many of us are trying to patch together a number of Ku-band beams to come up with coverage that's not fully global but to cover the main areas of the shipping routes and offshore activities."

Mr Horwitz believes that there are a number of pros and cons to be considered with VSAT, or with any satellite communications system, and that examining these factors in relation to your own business should be an important part of the process in choosing a provider.

"In terms of performance, in general the C-band is going to work extremely well, across our fleet I'd say we have a 98 or 99 per cent uptime," he said. "The only time you really have problems with C-band is in certain ports where the C-band frequency is close to the terrestrial microwave frequency, and sometimes those signals get jumbled a little bit."

"Then there can be physical blockages, particularly in extreme northerly or southerly latitudes because all of the satellites are at the equator, from fjords or ship superstructure. The additional downside

of the Ku-band is that you suffer from rain fade in extreme weather conditions. Those of you that have Ku-band systems have probably experienced this."

"There is also a latency of about 600 milliseconds, the time it takes at the speed of light to send the signal from the ship up to the satellite and then back down to the Earth."

Mr Horwitz, like almost all VSAT providers, also points to fixed monthly costs as the initial driver for VSAT systems, though he has seen companies take the system and really expand their operations once these capabilities are available.

"When people say 'why VSAT?' I suppose the key thing is the always on, always available service that has unlimited use for a fixed cost as opposed to a variable cost," he said. "The commonly seen 'pay by the megabit' costs are gone."

"That means you don't have to have a minimalist approach to communications, where every time you use the service you do so as sparingly as possible. That's what we see, when you're paying for an unlimited service they are using it in an unlimited way."

"We keep hearing about living in the twenty-first century where internet access is really part of life. Just like on land these are the same requirements we're finding at sea, operational network efficiencies to extend LANs onboard the vessels, new IT initiatives. And with crew retention and welfare people are expending a lot of energy on these things."

"Then there are all the other applications that are required, remote monitoring, distance learning, tracking, reporting, all those kinds of things," he added.

Crew welfare

With unlimited bandwidth and a fixed monthly rate that's not going to increase with usage, VSAT does offer the opportunity to share the use of the vessel's communications system with the crews through the provision of low cost crew calling and e-mail services.

"One of the benefits we've found from the services we offer to the cruise industry is that we've been able to take up these applications and drop them elsewhere," Mr Horwitz told us.

"For example, we have about 100,000 crew members across our fleet, who are using our crew calling service that enables them to make calls at extremely reasonable rates, particularly compared to an Inmarsat-type service where maybe an off-peak call might be $1.00 per minute, we can do calls around $0.25 per minute."

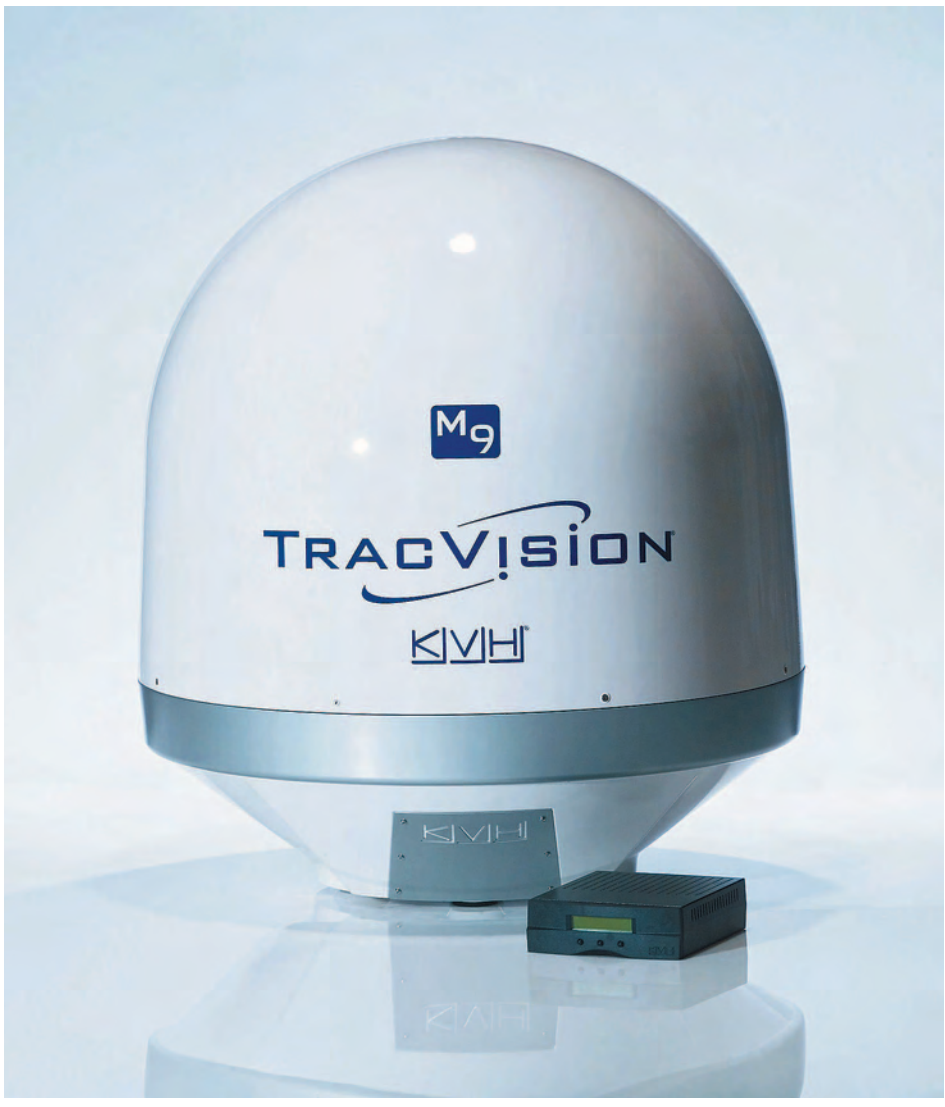
"There are also turn-key internet café and WiFi applications where we provide the multi-session billing engine, we provide a calling card or virtual PIN solution. It's also on a logically separated network so there's no chance of any types of recreational internet use affecting the IT resources of the company."

"We do internet services for crew that usually cost about $0.10 per minute. It was suggested to offer it for free, and we tested that, but it turned out that too much of the bandwidth was being used for recreational use, getting away from the real reason for the VSAT which is for operational efficiencies. The $0.10 seems to be low enough where people are able to use it, but not so low that they're going to use it all day long."

One of the new services MTN is aiming to offer to its VSAT customers which it hopes will add an additional element into the decision making process is in the provision of onboard television services for crew entertainment.

"One place I would see VSAT heading in terms of the crew welfare is in television programming," said Mr Horwitz. "For the commercial market we want to have three live and fifteen store and forward channels available, probably from about 2008."

"Then there's cellular services, we already have about 135 vessels, mainly cruise and ferry, using these GSM services, and it really has helped to blur the line between the ship and the shore."



The 60cm KVH VSAT antenna weighs only 27kg, compared with over 100kg for a 1m dish

Ku-band coverage

While MTN has mostly installed global C-band services for its customers up to this point, Mr Horwitz believes that Ku-band will become the VSAT service of choice in the future.

"We're starting to see that the multi-regional Ku-band is replacing C-band, largely due to the cost of the antenna and the size of the equipment," he said.

"Also, as a benefit of Connexion by Boeing going out of business, they did have a lot of maritime footprints and those have become available for sale for other companies to buy, who've been able to pick up the remnants of what was left of their network."

"Smaller Ku-band antennas are starting to be used, there are even companies out there that are offering a 60cm antenna. Up to about 2003 or 2004 all that was available was a 1.2m antenna. I think the trend is probably a 1m antenna now, which is less in cost but still, through some technical innovations, gives the same performance standards."

The smaller size of the antenna will also help Ku-band VSAT compete more easily with services like Inmarsat's FleetBroadband, said Mr Horwitz.

"I think in some cases VSAT is now being seen as a fixed price alternative to Inmarsat, and the visibility of companies like Connexion by Boeing and Broadband Maritime has really put VSAT on the map," he explained.

"In general the C-band antenna is a 2.4m antenna and weighs around 500kg or 600kg, and as a result of that it may require some special metal works to reinforce the deck. Because of the size and the weight it can't be easily accommodated on all ships. The Ku-band antenna, by contrast, is a 1m reflector, about 115kg, and is much smaller. In terms of functionality it's exactly the same."

"I believe in taking a more modest approach of starting small and growing over time, an evolution not a revolution. Start off at 64 kbps or 128 kbps and see how that goes. Then increasing the bandwidth can be done just by a keystroke."

Mads Ebbesen, KVH

VSAT provider KVH is also confident that smaller sized VSAT antennas will prove to be a hit with the deep-sea merchant market, and has developed a new antenna which is significantly smaller than the traditional 1m antenna that has mostly been seen in the Ku-band sector.

"We've created the smallest VSAT solution on the market today, with a new mini-VSAT broadband service," explained Mads Ebbesen, area sales manager Asia, KVH. "It's a fully integrated maritime communications system and service, and has a rugged design, based on the 100,000 antennas we have in the field today."

'We are working hard to secure 70 to 90 per cent global coverage' - Mads Ebbesen, KVH

"We decided to make smaller and more affordable hardware, and the antenna we came up with is actually 85 per cent smaller by volume and 75 per cent lighter than the traditional 1 metre VSAT terminals that are the trend today. This makes it significantly easier to install and use."

"It's only 27kg, making installation very easy compared to the 1 metre antennas that are over 100kg. It gives you more flexibility in mounting, and there's not a lot of room on the ships today. No need for a crane or any structural reinforcement, it's a two man job for just one day and you're ready to go."

"Everything you need is built inside the antenna, gyro, GPS, and so on, so it works on its own and is able to find a satellite when you need it. The hardware price is Euro 27,995 for the complete package to allow you to have broadband at sea."

KVH is offering the service with fixed price tariffs that vary according to different speeds. Always-on fixed price access is $995 per month for 128 kbps up and down connectivity, and this increases incrementally for improved bandwidth up to $4995 per month for 512 kbps up and 2Mb down.

"We call this new service the 'mini-VSAT' broadband service, which we offer together with SES Americom, and ViaSat who do the modem," said Mr Ebbesen. "It delivers flexible rate plans to meet every customer's needs, commercial or leisure."

"There are fixed rate plans and per megabyte plans, thought the per-megabyte plans are more for the leisure market where yacht owners who may not use their yachts all the time wouldn't want to buy a fixed price plan."

Expanding coverage

The biggest challenge facing KVH at present with this mini-VSAT system is the provision of coverage for its users. At present

the company only offers the service to vessels travelling in the Americas, the Caribbean, the North Atlantic and Europe, though it is confident that this will be expanded.

"It's a Ku-band system, so it still has the challenges about coverage that exist for Ku-band today," said Mr Ebbesen.

"This is the tricky part for us right now. We have coverage in North and South America, the North Atlantic route and in Europe. Together with SES and ViaSat we are working hard to secure the 70 to 90 per cent near global coverage that is really needed for commercial shipping. I can't promise any firm dates right now, but hopefully by the end of the year we'll have a firm grasp of the extended coverage."

"The problem with the coverage is getting the land Earth stations on the ground to work together with the antenna. It's up to SES and ViaSat now to create the infrastructure where it's needed. I'm hoping in 2008 we might get to the coverage we need, right now we don't have the coverage for the shipping lanes."

"I'm hoping in 2008 we might get to the coverage we need"

- Mads Ebbesen, KVH

The multi-regional Ku-band offering has been one that has been promised by a number of providers, including Connexion by Boeing, without having really taken off as a viable solution. However, Mr Ebbesen believes that the current VSAT providers have learned valuable lessons from the experiences of some of these unsuccessful forays into the market.

"You see it in other areas, sometimes it takes two or three tries to get a technology moving," he said. "But if the first guy that develops it uses a billion dollars he will need to generate a lot of revenue to survive."

"They break their neck and the next guy comes along and buys it for a billion dollars, he needs to generate revenues that aren't possible yet. But altogether they make a marketing effort that brings the technology to the market, so the market gets more and more ready. Now we're here to pick up the pieces, but obviously we're not the only ones using the Connexion by Boeing pieces."

Mr Ebbesen is also confident that the sophisticated technology used to run the service will convince any doubters who suggest that such a small antenna will be able to perform as well as its larger predecessors.

"It's tricky, obviously every time you come up with a new technology you have some explaining to do," he said. "It's really up to the CDMA technology and the modem we put in it, which actually allows you to be a little bit less accurate in the pointing of the antenna."

"That's why we can make it 60cm in size instead of 1.2m. It's not going to interfere with satellites that are next to the one you're trying to hit, because the burst of communication is not as hard on adjacent satellites." DS

Maritime GSM - crew calling's next wave

With crew shortages becoming an increasingly uncomfortable issue for the merchant maritime industry to deal with, many technology providers are promoting improved crew communications services to shipping companies as the incentive they need to offer to make sure that the best officers and ratings choose them as a favoured employer. *Digital Ship* spoke to GSM providers Blue Ocean Wireless and MCP about this growing market

Communications for deep sea ocean vessels is a complicated business. Fibre optic cables with seemingly limitless bandwidth capabilities offer endless options to allow people around the world to communicate cheaply, in real time, and it is now the norm for most of us to depend heavily on low-cost connectivity in both our working and personal lives.

However, the power of fibre optics might as well be confined to the pages of a sci-fi novel for the crewman sitting on a bunk in the accommodation quarters of a container vessel. If you happen to be thousands of miles from home in the middle of the Pacific Ocean you must instead rely on the vessel's satellite communication system as your conduit to the outside world.

While crew communications via satellite has traditionally been an expensive business, possibly dependent on the generosity of the vessel's master, a number of maritime technology companies are hoping to offer new alternatives to the industry to allow seafarers access to some of the communications services we enjoy on land.

Among them is Blue Ocean Wireless (BOW), an Irish maritime GSM company headed up by former Inmarsat aviation and maritime manager Robert Johnson. Mr Johnson feels that the dearth of communications options available to crews, as evidenced by the latest Inmarsat market research, are a poor reflection on the industry.

"What have you been doing out there? For the last five years Inmarsat's been telling you that for crew welfare, crew retention, you need to get out there and make life easier for them - but there's only 19 per cent of you actually (providing dedicated crew calling terminals). That's disgraceful," he said

"But I think we're all to blame, there are shipowners out there who still don't even know about Super Quiet Time. This probably reflects on me, it wasn't so long ago that I was at Inmarsat and thought we'd actually got that message out there - but obviously not well enough. We've got to be radical to change this."

Mr Johnson's company is currently offering GSM solutions for merchant vessels that run over the Inmarsat network, the only current on board mobile provider that does not run over VSAT (very small aperture terminal).

"Blue Ocean Wireless is the first operator, due to the Inmarsat network, that can offer you a global service within the deep-sea merchant sector," he said.

"You don't have to be a cruise ship, you don't have to be a specialised vessel where you've got some very sophisticated communications equipment - not that I'm saying Inmarsat is not sophisticated! But it does provide effective communications at a price that is palatable, and we use that means of communication."

"These are globally terminated voice and text services, connected without using permanent satellite bandwidth - that's very important to keep the costs down. Inmarsat has trialled this for more than 14 months, they've got the wrinkles out, and it's now gone commercially live. It's tested, it's trialled, it works, and it's now being installed."

BOW has recently finalised a number of key partnership agreements that it believes have completed the missing pieces in the puzzle to make this solution a really attractive maritime offering.

"To make this a reality you need a total partnership," said Mr Johnson. "Not only do you need Inmarsat to carry the traffic, you also need somebody who will partner with you as a GSM operator - and that's SMART, the GSM operator out of the Philippines. And just coincidentally, 40 per cent of seafarers come from the Philippines, so we consider it to be a match made in heaven."

"We've been pretty quiet in the market place in the last few months as we put all the pieces together. But I think now we're got some of the 'best in class' - we've got Inmarsat, we've got Stratos for the airtime provision, and now we've got SMART as our global GSM partner. The other partner, who provides the link to the satellite, is JRC."

You can upgrade the F33s we supply with your GSM system to FleetBroadband by just switching the below deck unit - Robert Johnson, Blue Ocean Wireless

Stand alone system

The BOW system operates over two JRC F33 satellite antennas, with picocells approximately the size of a domestic smoke detector placed around the ship to create the virtual GSM network.

"Why do you need two F33s? At the moment it's running over the Inmarsat I-3 satellites, so it's single channel. One for signalling, one for communicating. And support is included for the duration of the contract - fit it and forget it," said Mr Johnson.

"When FleetBroadband is available, the manufacturer has guaranteed that those units onboard are quickly and easily upgraded to FleetBroadband 250, just take the below deck unit out and put the new below deck unit in, and that's it. You're up and running with two FleetBroadband 250s on your ship."

"Just think about that and what it brings to you as a benefit. If you actually invest in this, what you're actually looking at is the billions of dollars that's been invested into the 3G network, all of those applications that are coming down the line you're going to get on your GSM phone, transferred across into the maritime environment."

The GSM network onboard the vessel will operate as a stand-alone system, and is not connected to the vessel's main operational satellite communications.

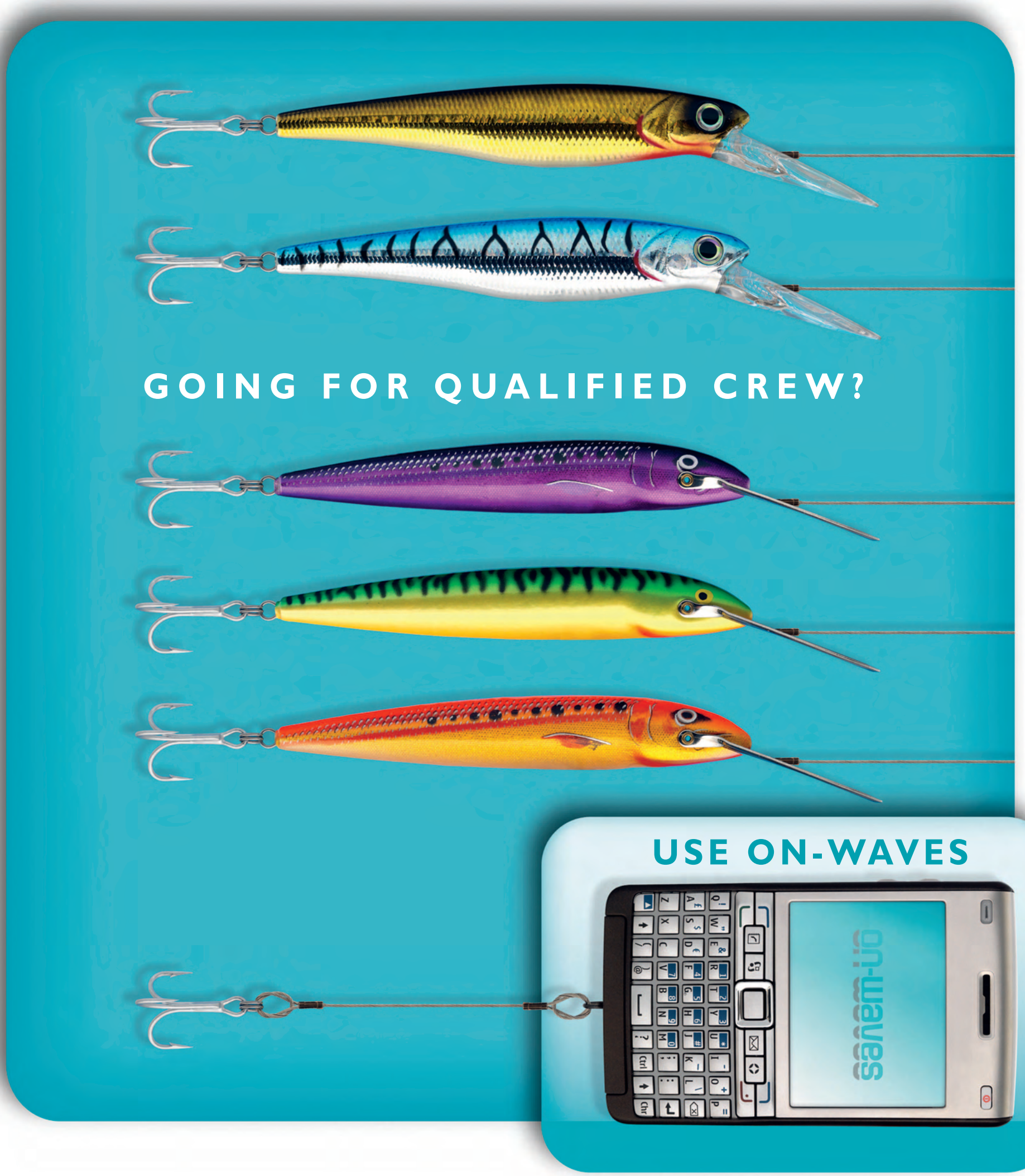
"Why don't we connect it to the current commercial equipment fitted to the ship? Because it goes wrong," said Mr Johnson.

"Experience has told us that if you connect it to the commercial equipment, if you get a change of crew or a particularly pedantic master, he might go and unplug it, and it won't work in the mid-Pacific Ocean."

"We then send an engineer to the next port and find it's unplugged. So we went for stand alone, pre-configured, pre-tested

"There are 1.2 million seafarers out there, on at least 40,000 merchant ships - 88 per cent use a mobile phone"

- Robert Johnson, CEO, Blue Ocean Wireless



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equipment on board, and you won't have to worry that anyone will touch it or interfere with the day to day commercial traffic."

Mr Johnson feels that the reductions in satellite airtime prices that follow from improvements in communications, like Inmarsat's new FleetBroadband service, are eliminating cost as an excuse not to improve crew calling services.

"Why is this the right time? Because only 19 per cent of you are providing a crew calling solution," he said. "Just looking at general mobile trends globally, the key message here is that year on year growth just keeps on going. It's the fastest growing industry ever to hit the world."

"Why shouldn't seafarers experience the benefit of that type of growth. If we can possibly give it to them on the ship, why shouldn't we? Then there's the shortage of seafarers we're going to see in the next ten years. Give them the quality of life, give them what they want, and you'll get them coming back."

"There are 1.2 million seafarers out there on at least 40,000 merchant ships. 88 per cent of the crew members use a mobile phone."

"GSM can bring communications direct to the right person, saving you time and cost," Mr Johnsons continued. "The master, the chief engineer, and anybody who's got this system enabled, somebody can send him an SMS but he just happens to be on a ship."

"Because he's within the global GSM network it goes straight to his phone. He can then send an SMS back, and it's in real time. You and I today just accept it as the norm, but when you actually sail away for 8 months it's no longer the norm."

He added: "Of course, all of this is a waste of time if you can't do the billing, so we have a billing system that works over the web, it's robust as it's been inherited, and then added to, from our partnership with SMART. The shipowner doesn't have to worry that the billing is adding to the daily burden of the administration of the vessel."

"They put my SIM card in, the Blue Ocean Wireless SIM, and they know they'll get a globally terminated rate and know the price they're going to be charged."

Regulations

Mr Johnson is careful to point out that BOW has carefully considered the regulatory issues that can arise with GSM roaming networks, as well as the safety aspects of using electronic equipment on board certain types of vessels.

With the below deck equipment and 'smoke detector' sized picocells connected to the communications system, the GSM network is ready for operation

"Within the software, under the ITU regulations, it's got a world map built in and has GPS, and when it comes within three miles of land it turns off," he told us. "It has to."

"It used to be twelve miles, but we negotiated with them and got it down to three. It automatically turns off, so you haven't got to rely on the master to turn it off."

"Also, on the issue of the mobile phones being intrinsically safe, I talked to one shipowner who has 70 tankers and who wanted this system, and I said 'what about when you're tank cleaning, or when you're loading?'."

"He said 'we will just apply the same rules that we use for smoking or using the toaster, or cooking with an open flame in the galley - you can't use it'. You actually have to make that decision. And with that said, there haven't been any accidents to date caused by phones, and I don't think there will be."

The system is also currently limited to one GSM phone call, send or receive, at a time, though this is about to improve.

"Right now it's one cell phone at a time," Mr Johnson said. "When you're talking to me there can only be one call."

"But from the trials, even when you're giving the service for free, the length of a call is just over three minutes. And if you've got 20 people on a ship, they work, they eat, they relax a bit, they go to sleep. The actual number of people available to make calls is fairly limited. But if you get a busy tone, you know very quickly it's going to come free."

"The good news is that Inmarsat is going to give us four channels when they give us FleetBroadband, so you'll be able to have four calls. So that will take away the perceived limitation of having just one channel."

Mr Johnson believes that the industry needs to act and embrace innovation in technology, to make sure that crews can reap the benefits of improvements in maritime communications.

"It has to be radical, it's got to be different, or otherwise only 19 per cent of shipowners will take it up," he said. "Then in 5 years time, 81 per cent of them will wish they had. It's what your crew are asking for."

Tom Sekkelsten, MCP

MCP (Maritime Communication Partners) offers a differing maritime GSM solution, which runs over high-speed VSAT connections and offers users the opportunity to roam on the vessel GSM network using their own mobile phones, with their own phone numbers. Usage is then billed on the user's home account in the same way that any international roaming charges would appear.

Tom Sekkelsten, chief marketing officer senior vice president, MCP, believes that merchant maritime GSM is a market that is ready to expand, but feels that the industry should carefully examine the offerings of potential partners before proceeding with this technology.

"Moving in to the GSM era, it's not always as straightforward as it sounds sometimes," he told us. "I think there's a question to be raised - are all wireless networks created equal? I think the answer to that is 'no'."

"There are significant differences, and at this early stage for merchant marine it's important that you ask the right questions when you are determining what type of service you are employing on your ship."

MCP is fully owned by Norwegian telecom company Telenor, and Mr Sekkelsten believes that it is the telecoms providers that play a key role in ensuring the dependability of a maritime GSM offering.

"We are a fully-licensed maritime telecoms provider," he said. "An operator, in the telecoms world, is something that you have to have a licence to be."

"You're not an operator just because you are marketing or selling a GSM service, in the mobile industry there always has to be a licensed operator in the background that complies with regulatory issues, reporting to government, all of these things that have to be in place for the company to work."

"We have that all in-house, there's no other entity that we are leaning on for these things, or borrowing or leasing in any way, shape or form, so we own our

own roaming. Roaming is an issue, it's important and needs to be considered."

The issue of roaming can be more complicated than it may first appear, with separate agreements required for different types of services, such as GPRS or prepaid roaming, that differ from those for standard voice.

"Roaming is something you obtain as a bilateral agreement between mobile operators to make your phone actually work in each other's networks," Mr Sekkelsten explained.

"It has to be obtained on different types of documents, there's one for the GSM and texting, there's a separate one for GPRS, and there's a separate one for CAMEL (Customised Application of Mobile Enhanced Logic), which is used for roaming for prepay mobile phones."

"This is something that can be confusing for people, when you have a speech service that works but your Blackberry doesn't work, or prepaid people can't use their phone on the network. This is because there are different agreements needed for all of the different services to work."

"This is a relatively big task in the background that needs to be completed, and I'd say this is where most providers of this type of service will run into problems. It's easy for everyone to give out their own SIM cards, but if someone like a contractor comes onboard your ship and you'd like him to use his own cell phone so you won't get his phone bills on your ship he can't use it unless that provider roams into the network."

Liability

The issue of regulation of cell phone networks is another area that Mr Sekkelsten feels should be carefully considered by shipowners considering a GSM solution onboard. He speculates that even unintentional misuse of the service could lead to the shipowner having to deal with questions from the authorities.

"You can get into trouble with governments, and that's not a good thing," he told us.

"If I'm a telecom operator on board your ship and I'm in breach of any regulations, obviously I have to take the heat for that, but first of all they're going to see what ship it's coming from and the shipowner's going to get in trouble before I get in trouble. That's why we're careful not to get our clients in trouble."

Mr Sekkelsten also noted that MCP is expecting to release some new services tailored for the deep sea commercial market towards the end of 2007, though would not elaborate on the details. However, he did hint that the company may also be able to offer a GSM over Inmarsat service, similar to Blue Ocean Wireless.

"For the merchant marine market keep an eye out for some interesting information in the fourth quarter of this year," he said. "Currently we have the system working with VSAT, and that can be any VSAT supplier, we're independent."

"Towards the end of the year we'll be looking at interfacing our system with FleetBroadband and those types of services, and also scaling down the system so it would fit merchant marine purposes, cost-wise and so forth."

"I can't reveal too much at this point, there'll be more later, but the experience that we have from passenger ships telecom wise will be the same when you move those technologies over on merchant marine." DS

ABS-NS tanker vetting module in testing

www.abs-ns.com

ABS Nautical Systems reports that it is to begin industry beta-testing of a new tanker vetting module by the end of this year, with the expectation that it will be commercially available in 2008. The new module is being developed with input and guidance from Overseas Shipholding Group (OSG), an existing ABS Nautical Systems client.

ABS-NS says it believes this to be the first module of a fully integrated fleet management software system that will have been developed in concert with industry that specifically addresses the vetting function to which all tanker and tanker operators are subject.

Chris Flanagan, OSG Vice President, said "One of OSG's key operating concerns is the tanker vetting process. It requires a software solution that recognizes that one size does not fit all. The NS 5 approach gives the needed flexibility to companies to customise their fields."

The new vetting module is being developed with the aim of helping tanker operators improve the timeliness and accuracy of their responses to observations that are made during a vetting inspection as well as supporting improved use of data to encourage better preparation in advance of future vettings.

The new software is being developed with the flexibility to load protocol for a number of different vetting processes, including the OCIMF SIRE standards and the CDI (chemical ship) standards. The system will also link with the ABS' new NS 5 Root Cause Analysis module so that owners will be able to more easily investigate underlying causes of any problems that may be identified by the vetting process.

Videotel LNG CBT for SIGGTO

www.videotel.co.uk

Videotel Marine International has released a computer-based training (CBT) course for deck and engineering officers serving on LNG tankers to work towards compliance with the competence standards of the Society of International Gas Tanker & Terminal Operators (SIGTTO).

The course is designed for self-study and for use at sea, although it can be undertaken ashore. Training progress is recorded and a Videotel Course Completion Certificate is available to users upon successful course completion.

The program includes training modules in: Fundamental knowledge and understanding; Equipment; Support systems; Standard operations; Non-standard and emergency operations; and Commercial considerations.

Available on CD-ROM, the program contains text with optional English language voiceover, still photographs, video clips and animations. Videotel says that it will also shortly provide the course via its website, www.videoteltraining.com.

Earn SIGTTO certification at sea with Videotel's latest CBT

Fortune signs SeaWorld Management contract

www.frtntech.com

Fortune Technologies has announced that it has signed a contract with SeaWorld Management and Trading Inc for the supply of Microsoft Dynamics Nav - Fortune Maritime Add On Solution to its entire fleet.

The project includes the delivery of the Microsoft Dynamics Nav - Fortune Maritime Add On Solution, and will include services to complete database conversion, customisation, installation and training on the new system.

Fortune says that the project has already begun and that it expects the new system to be implemented within 9 or 10 months.

London shipbroking firm **Gibson's** has installed an integrated shipbroking software system by **Trigonal** to upgrade their messaging and shipbroking systems. The software is integrated to the Danaos Management Consultants' Info@Gate messaging solution used by Gibson, and has been implemented throughout Gibson's tanker, gas, dry cargo, sale and purchase and research departments.

S & I Systems of Singapore has agreed with **Autoship Systems Corporation** to join the Autoship Dealer Network, distributing Autoship's CAD/CAM software product line in the Asia Pacific Region. S&I will also offer Autoship's Stowage Planning System in the market.

www.trigonal.co.uk
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Knowledge management at Wallem

With better IT and faster communications comes an increasing amount of data that companies need to deal with. However, without context data can often be meaningless. *Digital Ship* spoke to Patrick Slesinger, CIO at Wallem, about his company's approach to knowledge management

Modern technology in the shipping industry, be it high-speed satellite communications, improved automation in software systems, or multi-functional navigational equipment, is creating sophisticated IT networks that can lead to huge benefits for companies able to harness their capabilities.

This increasing level of sophistication is creating vast amounts of data about the operational life of today's organisations. But data alone is useless, and can even possibly be detrimental to a maritime organisation that does not capture the context that can turn the raw data into usable information.

Patrick Slesinger, CIO and director of the Wallem Group, believes that good data and knowledge management is a fundamental requirement for anyone thinking about adopting new technologies in the shipping sector.

"Context and metadata - this might sound like consultant-speak, but these two items are very important to enable you to go from cost to value," he told us.

"Data basically has cost - there is the cost of collection, there's the cost of storage, and there's the cost of reporting it."

"However, it's often information with no context. If I show you, in an Excel spreadsheet, a line that's got dates, and a six-digit number, and then it's got a dollar value, you might be able to work out it's a line from a sales invoice, or a purchase order, or something. But it's without context. It is not process aware because it is abstracted from that process. Managing this is data management."

"Knowledge, however, has value, and can be used for business process enhancement because you're basically making tacit information, the things that people know but don't necessarily speak, explicit and committed to paper, and then it becomes available to other people. This process is knowledge management."

Mr Slesinger sees the progress from data to knowledge as a process that should be relatively easy, but that can be often overlooked in practice.

"How do we go from data to knowledge? We need to establish a context, the context of the data. To be able to do that we need to gain a fundamental understanding of the business process that it's coming from or is part of," he said.

"This sounds very simple, and in theory it is, but unfortunately people tend to forget it. I'll give you a very simple real-world example: if I was to show you a share price, and give you two figures, six months apart, for a stock, and one is two-thirds of the other, the natural thought would be that the price had actually dropped by a third."

"If I give you the contextual information that they did a share split in between, now you can actually see that the value went up. This is why the context of data, and the metadata being kept with the data, is important, or you can't re-evaluate it."

Data is not worthless in and of itself, but has far more limited scope for application than the knowledge that can come with it.

"Pure data is useful for one-off transactions, one-off reporting, one-off use," said Mr Slesinger. "If you want knowledge it has to be able to survive for a decent period of time, six months, a year, or whatever else it may be. Without the context and without the metadata travelling with that data it is impossible."

"In the performance of a vessel this can include so many small items, like the environmental context, the weather, fuel emissions, cargo. How many reporting systems today actually take any of these into account? Very, very few, they're abstracted."

"We're actually dealing with data, and the data is just something like the number of tonnes per mile on that particular voyage on that given day. You can't actually re-use it or put it into anything else, because it can't be put into context."

'Data has cost. Knowledge, however, has value' - Patrick Slesinger, Wallem

Data issues

Mr Slesinger believes that each company has to take responsibility for its data and the capture of the context that surrounds it. The capabilities are there, what is required is the will and commitment to make this a priority.

"You have the ability to deal with the data issues, the 'what, where, when, why and who'," he told us. "The only thing that's missing is 'how', because you have plenty of vendors who will tell you the 'hows'."

"You have to decide - are we going to take exceptions? Are we going to take

trend information? Are we going to be looking at disparate systems or integrated systems? Are we going to do some analysis on board? Are we going to collect all of this information together and try and put it into some form of context and send it ashore? How does the data overlap? How do we ensure that we don't end up with redundant data or, worse, conflicting redundant data? These are things that need to be looked at."

"Know why you're collecting it, the cost versus the benefit, and the context. Know how it's going to be used, again, the context and the metadata requirements. If you're going to hold all of this data for a period of time, understand the business processes, understand the business analysis requirements, and make sure that you also capture the metadata that goes along with it."

"These are things that are near impossible to recreate after the event, because memories fade. If you go back and try and do analysis on data without context you're going to get spurious results."

Mr Slesinger sees this clear demarcation of the types of data the company requires, and of the contextual data that must necessarily accompany it, as one of the foundation stones of the whole knowledge management system.

"What are we actually trying to achieve with things like PMS, and other amounts of data that we bring back on an hourly basis, by minute or whatever else?" he said.

"Is it life cycle management, is it performance? These things need context, and they need the metadata. It needs to come back as knowledge, and be kept as knowledge, rather than abstract data."

"If you want to share a body of knowledge across your fleet, like best practices let's say, you need to know how those data sets vary from collection point to collection point. You can take the same information now, this second, across the fleet, 100, 200 vessels - unless I know what type of engine is on board each of those vessels the data is meaningless."

"We need to make sure that the body of knowledge fits together, that we keep the context. We need to understand what it is we're trying to achieve by the data collection itself."

This issue becomes even more complex for shipmanagers who may be taking on or handing over vessels to different owners, Mr Slesinger added.

"The issue with data management becomes far more complex when you start to hand over vessels," he said. "When (a shipowner) sells a vessel, what amount of data are you actually going to pass over? The minimum required. If it's not in the agreement it ain't going to happen. That is the world that we live in."

"If we sold the vessel, are we actually going to keep the data about the voyages for a vessel we no longer own? We may want to for corporate planning purposes and so on, but are we going to pass it on to the buyer of that vessel? Most probably not. But we still need to maintain the context. We need to make sure that the metadata and contextual data are captured before we sell the vessel, and before the superintendent disappears and whatever else."

"[Context and metadata] are near impossible to recreate after the event, because memories fade. If you go back and try and do analysis on data without context you're going to get spurious results."

- Patrick Slesinger, CIO and director of the Wallem Group

Planned Maintenance Systems

To put the discussion of data itself into its own 'context', Mr Slesinger cited the use of Planned Maintenance Systems (PMS) as a good example of where a huge influx of data may not necessarily lead to an increase in knowledge.

PMS can create data about a huge number of different aspects of a ship's operations, but that data will only be useful if collected in a manner that brings meaning to the facts and figures in your spreadsheets.

"Everyone understands Planned Maintenance Systems," Mr Slesinger said.

"Planned Maintenance is known by various names - some chief engineers in the eighties might have called it 'Planned Mutilation'. It's also known as Preventive Maintenance, or simply Predictive Maintenance."

"Whatever it is, there are constantly maintenance instructions - 'I want you to do maintenance', or 'I don't want you to do maintenance', for whatever the commercial reasons might be. Wear and tear instructions - 'take it to its maximum life', or 'take this window of opportunity to do some preventive, predictive maintenance'."

While these kind of decisions are being taken on a continuous basis by companies across the globe, Mr Slesinger feels that perhaps too narrow a view is being taken of what the full possible benefits of the system might actually be, and that with more consideration these benefits could be extended.

"Why are we doing Planned Maintenance?" he asked. "Is it because of regulation, ISM and TMSA? Is it to extend the running hours? To reduce the cost?"

"If we look at the context for planned maintenance systems, there has to be a commercial context, and there has to be an environmental context when looking at the performance of the vessel."

"If we have a figure about the performance of the vessel, whether it be tonnes of fuel per mile or whatever else, it means nothing without context. The commercial context could be performance instructions: 'there's no cargo, steam slowly' or 'I have cargo waiting, steam hard, I don't care about bunker costs'."

"If you're not actually capturing that with the vessel performance information you're going to be misled by that performance data."

Data by satellite

The 'how' issue involved in the collection of data is being dealt with by a number of different satellite communications providers in the shipping sector, with services like high-speed VSAT (very small aperture terminal) or Inmarsat's new FleetBroadband extending the options available to companies that want to push megabytes of information back to their offices.

While Mr Slesinger believes that the availability of improving technology in the maritime communications market is positive for the industry, this technology should be used to fulfil the requirements that you have already established rather than breeding a culture where unnecessary data transmission becomes acceptable.

"The 'how' of sending it across, in 1994 or 1995 it was resolved, this is when vessel e-mail systems became available," he said.

"The 'where', do we take it all ashore, or take exceptions ashore? That's going to depend on what management resources you have, but just taking it all ashore for the sake of taking it all ashore is not necessarily a good idea."

"Do you actually need it everywhere? As soon as you actually get the data in multiple places you've got to keep this all synchronised. When you spot an error in your data, you've got to make sure that all of these other areas that you've now replicated the information to are also updated."

The availability of constant connectivity, with 'real-time' information, may sound like a benefit to the business, but Mr Slesinger cautions that the benefits will only accrue if you can clearly indicate how this capability will create value for the organisation.

"We've all been through VSAT, and they've said 'now everything's real-time'," he said. "Why do we need real-time? How many offices operate 24x7, I mean real 'follow the sun' processing where they hand off financial transactions around the

world, in shipping?"

"Very few, if any. The only ones you could probably find would be the container lines. The rest of the world, basically they will centralise a function, accounts receivable, accounts payable, whatever else it may be, in one locale. So we have real-time data coming ashore to sit there for twelve hours while the guy's asleep, or so it can be processed at month's end."

"Does this really make sense? I suggest not. You need to decide upon the re-use of that data, the transportation of data itself is of no value whatsoever. When it's going to be used and how it's going to be used is down to the business cycle. "

"This is where we're starting to look at the context of the data. 'It's for quarterly reporting' - then put it on a CD, put it with the ship's mail at the next port. The simple fact is, people become overly concerned about where the data should be and when, and totally forget about the reasons why. Why does the data need to be where it has to be, at a given time?"

While IT vendors might have a long list of the benefits that a certain technology might be able to bring to your business, Mr Slesinger urges shipping companies to do a thorough examination of their own needs themselves, to make sure this system will bring value.

"There's a lot of promise in bringing all of this data ashore, you'll hear how you can dump megabytes per hour into your shore based system, but I would suggest that you need to know why you're doing it - not just because you can," he said.

"You need to establish a long term plan, and not a 'tick the box' exercise, in any systems that you are purchasing. Be vary wary of how these systems and data transport mechanisms are actually sold to your company."

"You need to establish and maintain the context, you need to know what you are going to do and what you're not going to do with the data, and you need to make sure that the data is only used within context. A lot of analysts or IT people will say 'I haven't got that data, but I've got something close to it' and will produce a nice graph, and people will start to re-use information outside of context. Misinformation is basically the result."

Legal issues

While collecting data that cannot be used as knowledge may seem like merely an unfortunate waste of resources, Mr Slesinger warns that there may be more sinister consequences for companies that maintain a poor data and knowledge management regime.

"There are legal issues involved in this, there is a concept called 'latent data liability'," he explained.

"Hindsight is 20/20, we all agree. We could all make better decisions if we could look back a few years and say 'if I'd only known'. The trouble is, you're holding on to data, and a lot of people and IT departments collect data for the sake of collecting data, to explain away the terabytes of disk space that they purchased in the last budget round. And it sits there because it might be of use at a later date, and it doesn't really cost anything to keep it, does it?"

"But there's a slight problem. Let's say there's a vessel incident, and everyone turns round and says 'we did our best, there were no indicators, could have happened to anyone'."

"Then in discovery the charterer goes through your terabytes of data and sees a trend, and says 'if this company had been analysing the data that they have been collecting in real-time, they would have seen this particular trend and could have stopped the loss. Because the information was available and wasn't used, this surely was negligence'."

Mr Slesinger sees this as another example of why a clear and precise data and knowledge management system is a necessity in any modern organisation.

"Within the data that you store over a long period of time could be time bombs, if it's not properly analysed," he said.

"You can get around that by having a data storage policy and having a data analysis policy which is very public. Then if they come back in and say they found a trend, you can say 'yes, at that time we explicitly did not check for XYZ trend'."

Mr Slesinger is also concerned about the consequences that a greater level of real-time information might have in terms of abdication of responsibility. With shore-based offices able to configure the latest IT systems to keep them constantly updated about the state of the vessel and the equipment onboard, he wonders if this might reduce the level of responsibility of those on board charged with caring for the ship in the first instance.

"With planned maintenance systems, a lot of the chief engineers believe that the actual chief engineer for the vessel is the superintendent sitting ashore," Mr Slesinger said.

"They can say 'Why should I bother looking at the information in the PMS onboard when I know the superintendent is going to have a look as well? I'm safe, I don't need to worry about it, there's somebody else checking it'. More importantly, it's his boss, so if something goes wrong 'he didn't spot it and I didn't spot it, I'm in the same boat as my boss, I'm safe'."

"If you actually think about it, if you were a chief engineer and you were in a fully automated engine control room, with the superintendent sitting over your shoulder every single day, where's your job satisfaction? You have to involve people, and if you take them out of the loop you're not involving them."

The possible reduction in personal responsibility for maintenance of the vessel can become even more significant in situations where there may be communications outages, and onboard personnel that have become reliant on having shoreside assistance are left to deal with problems without that guidance.

"When we start putting more data collection equipment aboard vessels, we start collecting a lot more information," Mr Slesinger continued.

"This means it's another piece of kit to be maintained, another piece of kit to be

trained upon. We have multiple kit across the fleet from different manufacturers, depending on when the vessel was purchased, and there becomes a loss of tactical experience and analysis."

"You take all of this data ashore, and you turn round to the chief and say 'you don't need to look at temperatures, we've got computers on shore doing that, in real-time' because of VSAT or whatever technology you use."

"What happens when that link goes down, and you are reliant upon technology, whether it be GPS and people not able to use a sextant, or the engine room abdicating responsibility for trend analysis and performance management of the engine to a piece of software which happens to reside ashore? It's dangerous I would suggest."

Best practice

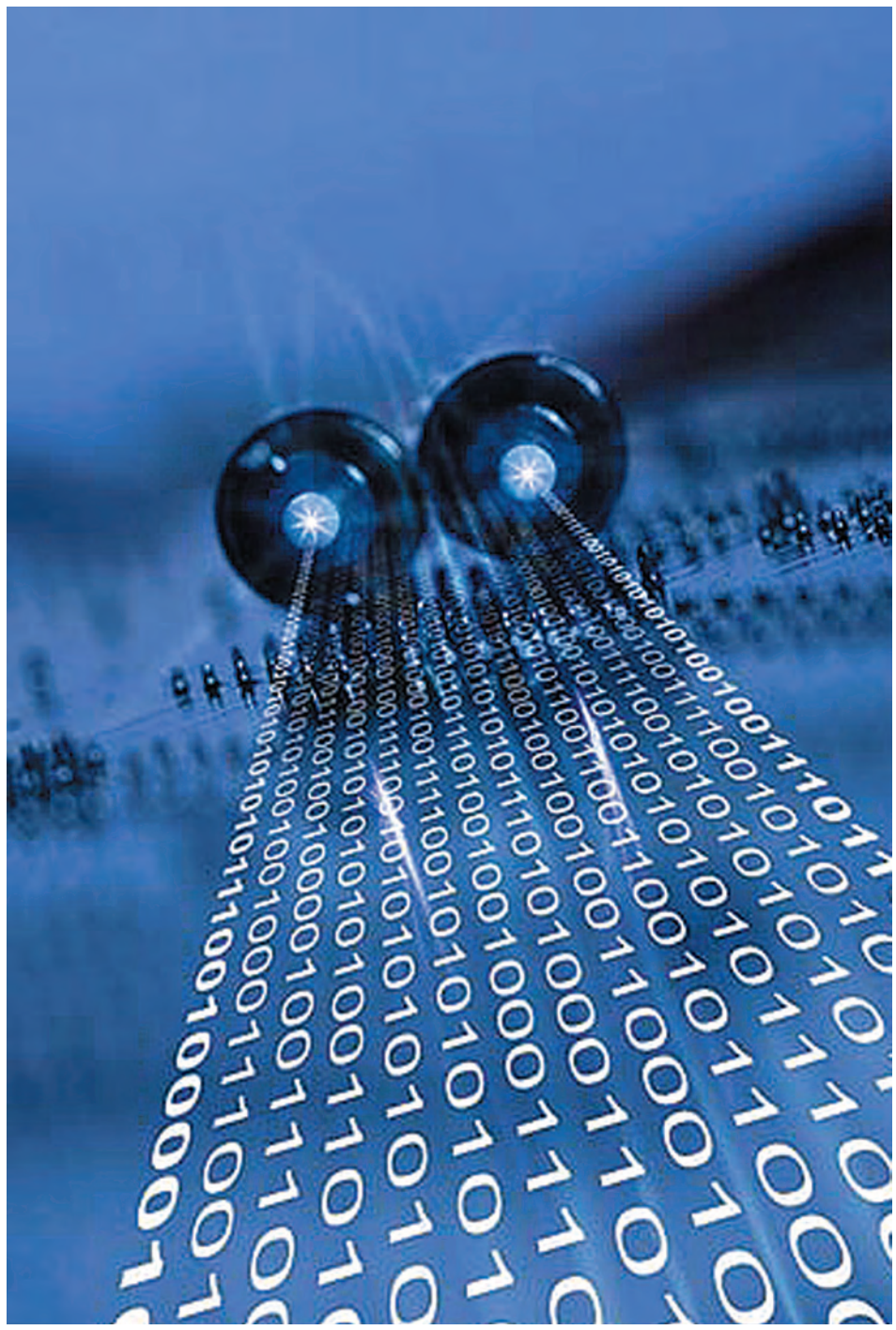
Mr Slesinger suggests that there are a number of positive steps that a shipping company can take to improve its data and knowledge management, that need not be particularly complicated but are based mainly on commitment and better internal communication.

"Start with the process, and get a fundamental understanding of the process and what it's trying to achieve," he said. "As you define the data collection points you can actually build your own metadata anyway, because you know that it was taken at this point within the process."

"It's up to the process owners, you can go to a third party to help you, but it's the process owner who's in the best position to turn around and say 'this is what I believe we will need in 5 years time, this is the trend'."

He added: "Work with the vendors. A lot of people bemoan vendors for XYZ - what we have to remember is that vendors only produce what we've asked them to produce. If we've turned around and said 'we want this function, that function', that's what they've written into their software."

"They are able to talk to a large number of operators because they want to sell to a large customer base, so they can put together a de facto best practice for processes, so that's basically what they will write into the software. You need to talk to the vendors and ask them where their data model is going and what type of information they're collecting."



Data without context will not produce the knowledge that you need for your business processes

"There's a lot of information being generated on the vessel, and some would say it's going to waste. Look at VDRs, how much data is captured by VDRs? How much of that are we bringing ashore, how much of that are we keeping? How much should we be keeping?"

Crew calling

With the attention being generated by upcoming introduction of Inmarsat's FleetBroadband service helping to increase the focus on the provision of better crew communications services, Mr Slesinger also spoke about how his company has seen it's crew calling services evolve, and some of the improvements in the industry that have helped to drive that.

"With the vendors, pre-consolidation the LESOs were quite fragmented, and the pre-paid calling card solutions were pre-paid, in the sense that there wasn't distribution and then activation afterwards," he told us.

"We've had vendors coming to us and saying 'let's put pre-paid cards on all the vessels' and we thought it was a great idea - and then they said 'write us a check for half a million dollars'. And we said 'no'!"

"Then the solutions moved forward to being able to distribute blank cards, which are basically an account number, and then have first call activation and have it linked into the billing system. Since then we've moved on to Stratos CrewConnect, which has virtual cards."

Mr Slesinger feels that the market is becoming more conducive to allowing shipping companies to provide better services for crews, though there are still some obstacles to be overcome.

"I think the biggest issue used to be that the crew members in the past, going back to the nineties, were enabled to select their own LESO (land earth station operator)," he said.

"If you have Indian crew in the Indian Ocean they want to use an Indian company. (That Indian company) then used to send us our bills, handwritten, six months after the event. Trying to get crew calling cards out in that situation is not going to happen."

Mr Slesinger added: "There was this feeling with the crew that somehow the company was making money out of them, or wanted to make money out of them, by dictating that they used a certain LESO. There was a negativity, 'why, with my dollar, should the company tell me which LESO to use?'. Then they'd sit with the tariff tables, somehow they'd get hold of the Inmarsat tables with Super Off-Peak time, and they wanted to use it."

"I think those are primarily the reasons why the market has struggled, but now with the system that Wallem has implemented with Stratos, everyone is very, very happy. It's been implemented since November last year and it's now second nature for them to top up the cards."

Mr Slesinger amusingly remarked that with further consolidation the last big obstacles to the crew calling cards system might eventually be removed.

"There still is not a prepaid card which covers all the LESOs," he said, "though the way we are going we're going to end up with one LESO and maybe by default we'll end up with one crew calling card!" DS

ERP for shipping

While looking for an ERP system that would integrate software applications from different parts of its organisation, Varun Shipping found that the major players, such as SAP and Oracle, did not cater for the needs of the shipping industry. So the company decided to develop a maritime specific ERP system by itself. *Digital Ship* spoke to S A Amudan, Varun Shipping Company

Varun Shipping Company, an LPG, crude oil and petroleum carrier with a fleet of 20 vessels, is currently in the final stages of implementing an ERP (Enterprise Resource Planning) software system across its organisation, which it has constructed in-house through the development of software interfaces linking the different programs in use at the company.

While the company is now pleased with the results of its efforts, putting the system together has been a difficult and time consuming task, says S A Amudan, senior general manager- systems, personnel and administration, Varun Shipping Company.

"Shipboard technology has made a tremendous amount of progress, and communications technology will further reduce the distance between ship and shore," he told us.

"But ERP is like the glue that binds the different applications, processes and computer systems for a large organisation. Different divisions will tend to have their own systems, and ERP is the thing that helps it all work together for the organisation."

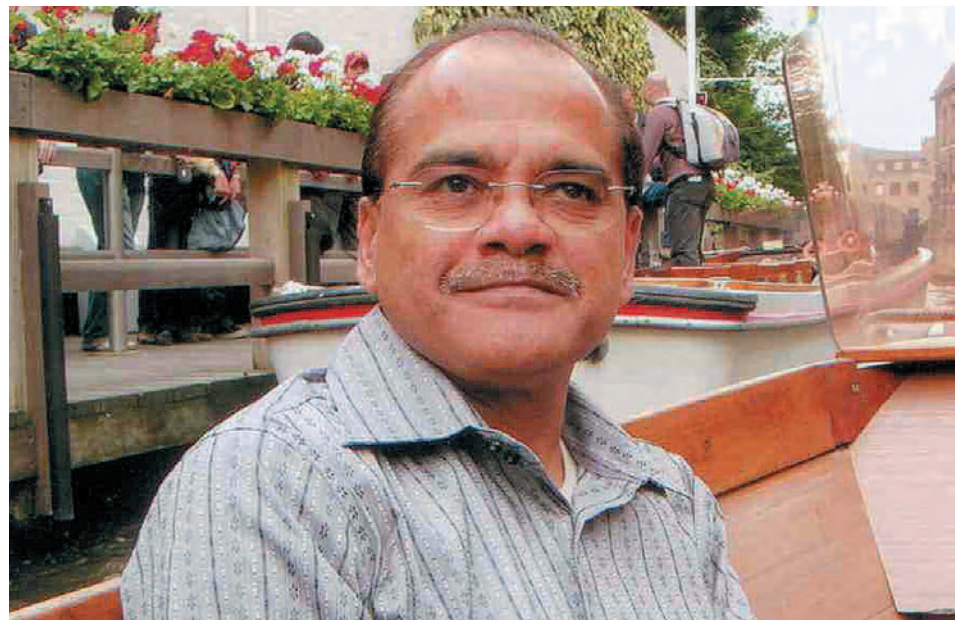
Developing a common platform for a host of non-integrated systems involves a large commitment on behalf of the company, but also requires securing the goodwill of the users, which can be an even greater challenge.

"Today it's not like when you were switching over from a manual system to a computerised system, those days are gone, but even changing from one software to another software is a tremendous amount of change," said Mr Amudan.

"You need to sell the software to your internal customers, that was really the biggest challenge for us. Training becomes a very important part of this. We say the implementation costs are very high, and training is also included, if you buy an ERP system training the users doesn't just happen in one stroke."

"And training costs have become very high for software. First you do the training of the basic functions, and after the user achieves a comfort level you can move on to other features, add-ons, reporting, and so on."

"If you look at SAP and all of these people, they will tell you that the product cost is much, much less than the implementation cost. For us, we spent about ten times the product cost implementing the software."



'ERP is like the glue that binds the different applications, processes and computer systems' - S A Amudan, Varun Shipping Company

Implementation process

Mr Amudan is keen to point out that his experiences have shown that there is no one set method that can be used as a blanket blueprint for how to implement a software system at a shipping company. Even the smallest differences between two organisations can completely alter the software set-up that would be required.

"Managing the implementation process was the biggest challenge," he said. "You can buy software in a package now, but the methodology for implementation will vary from organisation to organisation."

"The most important things are things like finalising your goals for the project, being aware of your limitations, and creating a good implementation plan that you can track its progress. You also need to make sure you have good communication with all functional and technical heads. But if even a small part of this is missed out the whole thing will come to a grinding halt."

"Formation of the implementation team plays a very important role in that, and assigning responsibilities to people. Having people with the right attitude in the team, that they push the software for the users, so people know that this is also part of their job to use the software. That can be very difficult."

Dealing with the changes that arise within organisa-

tions after a large scale process realignment is a task that can vex even the most experienced of managers, and Mr Amudan believes that good communication is an essential tool in preventing change becoming crisis.

"You have to know what the limitations are and communicate them to everybody," he said. "It's better to be frank and tell people 'it can do this, but it can't do this'. We need to explain the complete stream of the system and say that 'the extra steps you are doing here might seem like a bad idea, but you are getting a benefit somewhere else'."

"You have to let people know that software does not always lead to a tangible reduction in human involvement. It's not right to say 'you have 10 people, once you use the software you will need only 3 of them'. Human involvement is very important, he's the one who's thinking about putting in the data."

As part of the change management process Mr Amudan suggests periodical updates on the project's progress as an aid to remind people that this important work is still going on and that they need to stay involved.

"People can get so involved in implementing the system that the user doesn't see anything of it for quite some time," he said.

"Six months down the road they are still working on the process and by the time you can produce some tangible results the user is not interested. We need to have some short term milestones, reports to show that something is moving."

"My people always ask me 'the amount of work we have put in, why doesn't management appreciate our efforts?'. It's because they haven't seen any differences, you have been working for eight months writing interfaces and he hasn't seen anything."

"The whole process of implementation and integration is complex and challenging because there is no ERP available that can take into account all of our requirements, and that we can use all over the world, like Oracle or SAP."

Software problems

The shipping industry creates unique problems when it comes to finding software solutions, with rules, regulations and technical challenges that do not exist in most land-based industries. Mr Amudan accepts that this creates a difficult environment for software vendors, but hopes that ERP solutions may become more readily available in the future.

"There are so many rules, regulations and laws that it is so difficult for any software manufacturer to put in all those things," he said.

"We pay 22 different types of taxes. How do you expect any software to incorporate all of those? And financial accounting, country to country they have different methods, so it's difficult to find ERP packages that cover financial accounting."

"Oracle, SAP, they have development centres, and when there are any changes they customise their package and give it to the users. We don't really see the same thing in the shipping industry. If we look at Oracle or SAP, they mainly cater to manufacturing industries, but they haven't even attempted to modify the same package to cater to the shipping industry."

Mr Amudan continued: "The big problem we have at the moment is that at present no shipping ERP system is available that provides end-to-end solutions for non-liner shipping companies. There are softwares available, but they don't cater to all the functions."

"In communications technology we have come on in leaps and bounds, but in software we are lacking quite a bit. And if the data is not ready there is no point in communicating even if I can."

Improving standardisation is one area where Mr Amudan thinks that an industry-wide effort could be made, whether in the processes to be employed or the formats in which the applications are created.

"There's no point re-inventing the wheel," he said. "Some of the organisations have to take the initiative and standardise their formats, across the world. Come up with a package which every vessel has to use, that's in a standard format that everyone can use."

"If we can do that imagine the amount of money that can be saved by shipping companies. Today everybody is buying software and integrating, spending money and time which can be saved."

"I don't blame the vendors per se, the vendors will change if the industry changes. Because of the requirements of so very many they are not able to come up standards yet. A company doing purchasing software can not give me an ERP that will work with the accounting software."

He continued: "One of the most pressing concerns when migrating to a new system is transferring all of the data from the old system. When you acquire a new ship this is the problem that shipping companies and IT people are facing. The data might be in different formats and you need to take it out, it's a huge problem. Operators can end up doing data entry for months."

"I think some of the shipping authorities should come forward and make some standard recommendations, that when you buy a ship or sell a ship, these are the things you must transfer to the next owner, otherwise we are just wasting time transferring data here and there."

Mr Amudan also believes that an opportunity might exist in the market for the major land-based ERP providers to tailor their solutions to the maritime industry.

"One of the things I always used to wonder, SAP and Oracle are well established - a vessel is like a floating factory, why doesn't the shipping industry as a whole go to them and ask them to incorporate the needs of the shipping industry," he said.

"I know it's a small industry, and that's probably why they haven't come in yet, but if you look at the amount of money being spent by the shipping industry on IT it's something to think about."

"The shipping industry lacks an ERP solution, and something has to be done."

In-house development

With a shipping-specific ERP software system seemingly lacking, Varun Shipping decided to build its own system, purchasing software that would meet its requirements in different sectors of the company and then building its own interfaces to connect them all together.

"Specialised software is available to cater to the specialised business needs of the operation's commercial functions," Mr Amudan told us.

"So we decided to procure these specialised software and integrate them with the financial accounting software. We bought a system from Sun Systems, an ERP. The software was marketed by Deloitte, they understand the language of the accountants and they implemented it."

He continued: "We bought AMOS business suite from SpecTec, the first company in Asia to implement it across the fleet, and are using the IMOS package for chartering operations from Veson. This is not ERP, they were marketing it together but they are different companies. No interfaces."

"We sat down and wrote about 100 interfaces between this system and that system, and connected AMOS and IMOS, and our other in-house systems with the Sun financial accounting system. We've done about 80 per cent of all of the integration now across all of the organisation's systems. Our IT people are tired of creating interfaces."

"But as a result of this combination of software, we have created an integrated IT environment to streamline our system, thereby improving our business processing capabilities."

The effort involved in getting to this point has been a huge challenge for the company. However, Mr Amudan has been impressed by the flexibility of the non-maritime specific software from Sun Systems that has become the foundation of the whole ERP chain.

"I'd say the biggest advantage that Sun Systems had was the interface they provided was nothing but common controls, Excel spreadsheets," he said. "Anything you wanted to integrate, you put it in a column and rows format and it can go seamlessly."

"The best part of the Sun system is their Vision tools, which allows you to generate any report you want from the information. But even with that, people have to learn how to use these tools. Like I said about training, if complete training was given to all the people then after some time it will really start working."

"The Sun system is quite user friendly, and the implementation duration was short. We've restructured some of our process to fit with the system, because ultimately all of the processes have to lead into your financial accounting system anyway. This has helped us to achieve our objective of capturing detailed information of every transaction and extracting MIS reports based on them."

While maritime specific ERP may not be available as a package for the time being, Mr Amudan says that, with some effort, it is possible to achieve the results you want.

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ShipServ and MTS - working together

This summer Thome Shipmanagement became the first company to integrate the two leading maritime e-procurement platforms, ShipServ and Marine Transaction Services (MTS), into a single ShipNet installation. So far the company has been pleased with the results, said Ivan Blazina, purchasing manager at Thome

Electronic procurement systems have been slowly gaining acceptance in the shipping industry in the last few years, with the hard work and development on behalf of the software vendors turning into an increasing number of contracts from companies keen to explore the possible benefits.

Millions of transactions are now taking place on these platforms on a yearly basis, with growth continuing on an exponential basis.

Thome Shipmanagement is one of those companies that has invested in e-commerce to try and improve efficiency in its purchasing function. However, Thome holds the unique distinction of being the only known operator that has integrated both of the leading providers in the electronic purchasing market, ShipServ and Marine Transaction Services (MTS), into its maritime software package.

Ivan Blazina, purchasing manager at Thome, explained how these systems have made the company's processes run smoother and more effectively.

"In September it was 2 years since we started using ShipServ, and our experience has been mainly positive," he told us. "As you could expect with every IT project there are some small hiccups, but nothing big. We can say we are celebrating two years of successful cooperation."

"Then we took on board another trading platform, MTS, in April this year. The second trading platform, it's not so important why we decided to install it, but more interesting is why we decided to keep it. There are three reasons: firstly commercial reasons, then to have experience using both systems and see what they can do for us, and lastly to keep our options open."

Thome has integrated the two trading platforms with its maritime software systems, to try and make the entire process as efficient as possible.

"We started using the AMOS Preventive Maintenance system in 1995," said Mr Blazina.

"We manage almost 100 ships, and AMOS is applied to about 75 per cent of the vessels. It's not on all of them, as shipmanagers we don't have full control so it can be difficult in that respect. We've also been using ShipNet since about 2000, using the purchasing and accounting modules, which is connected to AMOS so they can talk to each other."

"As far as I know, we are the only company today in the world that is using the two trading platforms linked to a single ShipNet installation. Doing that was a big challenge. MTS came onboard just before a summer holiday, so of course some people went missing which made life a bit more difficult! But through the efforts of MTS and our own network systems people we've overcome most of the problems. Both systems are now running today successfully."

Technology benefits

Mr Blazina believes that the technology available through these software systems have made a huge difference to the way that Thome conducts its business.

"I think we take too many things for granted, and people often forget about how we came to this point," he said. "Today we just enjoy all of this technology, and it was not too long ago that requisitions were actually going from the ship via telex or even just by mail. You can imagine all of the work that was repeated all of the time using paper."

"I guess there were a few good things with that, in that we were more careful and were planning much better, because we knew that the next chance to send our requisition might be a few days away. We were more careful what we put on paper."

"But a huge amount of man hours and paper and resources were basically forced to be wasted until the technology came around. The big turning point was the communications."

Mr Blazina feels that improved communication systems, offering more reasonably priced airtime rates, have completely changed the IT landscape of the shipping industry.

'We are the only company today in the world that is using the two trading platforms linked to a single ShipNet installation' - Ivan Blazina, Thome Shipmanagement

"Communications and IT gave us a chance to apply three basic principles," he said. "The first was having a single point of data entry, meaning that one piece of information is entered by only one party, to save time in retyping and re-entering the same piece of information."

"The second is data exchange and sharing, the amount that people can use the information to learn things has increased beyond comparison, we have direct access to all of this data."

"The third is data management, we can manipulate it in any way we like and we can get some results out of it. This is done by using various platforms, software, but most importantly communication - without communications all of this would not be possible."

Co-operation

While Thome has been pleased with the success of its two e-purchasing software packages so far, Mr Blazina does feel that the maritime industry needs to address certain issues to improve the capabilities of systems working in tandem with one another.

"This unique experiment confirmed one thing - that there is still not enough cooperation between software and service providers," he told us. "It is my feeling that, instead of cooperation sometimes we have a tendency towards domination, and I don't think this is good for anybody. It is better to have more players in the market."

"I would say that almost everything we need is available today, but not quite everything. What is missing? Better cooperation between all of the parties. We need results to come faster. We need conventions, and have to agree upon standards and protocols."

Mr Blazina pointed to the example that has been set in other industries, where online purchasing systems account for massive amounts of trad-

ing between businesses and consumers across the world.

"Think of when you're buying plane tickets online, and look at all of the air carriers today, and how many airports," he said.

"It's quite amazing that whenever you buy the ticket it seems that everyone else in the chain knows what they need to know. This industry somehow found a way to work together. In the shipping business this seems to be, unfortunately, different."

"We are still like small islands. Ok, integration today is much better than before, but I think there's still a lot to be done."

There is still integration work left to be completed at Thome itself, despite the efforts it has already made to get all of its systems running together.

"Some of the information is still not integrated in ShipNet, and this is what we want, to have everything in one place," said Mr Blazina.

"This is not a solution that we are happy with, we want to have all of the relevant information in one place, eventually replicated and synchronised where it's needed. I think this is just a matter of protocols, and these protocols must be open, non-exclusive and available for everybody."

Co-operation

While Thome is already using two e-purchasing systems, Mr Blazina would still like to see further sharing of protocols so that in the future it will no longer be necessary to build interfaces just to let different software packages run together.

"Procurement, it's not rocket science, but it's not so easy either," he said. "Agreement is important for very simple reasons. Without supplies practically all of the human activities would cease. And very often we are talking about some very serious numbers."

"It's also important because of the consequences affecting everything else. What makes it challenging is the volume, the size - the size of the market, the number of participants, the number of goods on offer, logistics. The task we have in front of us is fairly simple, but huge. To do it efficiently we need to use good strategies and apply every technology available."

"Our strategy is to buy from the fewest suppliers possible, with the fewest steps in between, and with automation of every step that can be automated - that is our philosophy."

Mr Blazina believes that this automation can be achieved through co-operation, and doesn't necessarily have to be a situation of one company dominating over all others, which he feels could have a detrimental effect.

"It's a bit like Microsoft and Apple - I think Apple keeps Microsoft honest," he said.

"I think all of us are probably heading in the same direction, we are looking towards direct ordering. We still have steps, such as receiving quotations and so on, there are still steps which might be actually avoided in the future. Our direction is towards contracting the prices, full and complete differentiation of the forwarding part, and having consumer feedback stored in the system."

"We would like to have a system to help us have everything in one place where it can be monitored in real time, and be controlled from where we can also make decisions to have better and more efficient purchasing." DS

Building a reporting database at Fleet Management

Since its foundation in 1996, shipmanagement company Fleet Management has evolved an integrated information database that generates vast amounts of information, which can then be shared amongst all of the vessels in the fleet to spread best practices and improve operations. Fleet Management's Capt Mayank Mishra told us how the system works

When shipmanagement company Fleet Management began trading more than 10 years ago, information and communication technologies were mere shadows of the sophisticated systems available to maritime companies today.

However, even at that time the company knew that a successful operation would be dependent on having some of the best systems available, to help the business to maintain its competitiveness.

With the advent of newer and greater technologies, constantly improving on these systems is a task that persists to this day, says Capt Mayank Mishra, Fleet Management.

"Back in 1996 when the company started we realised we'd need a comprehensive IT system, an IT backbone," he told us. "This is important not just to the shipowner, but more importantly for managing the crew."

"The most important thing is to have a common interface between the ship and shore. So we came up with something called PARID, which is a Planning And Reporting Information Database."

"We have an offline computer system onboard the ship which is linked to the offices, which we have in many parts of the world. The important thing was that everyone, every person who works at Fleet Management, was required to work on the same platform and the same database."

Constructing an all-encompassing database that could provide information to people involved in all aspects of company operations created wide ranging operational benefits.

"What do the shipowners expect? They would like to know how their ships are doing, they want transparency - what's happening to their fleet, and how well the ships are maintained," said Capt Mishra. "They want Key Performance Indicators, which indicate how well the vessel is run."

"The end users of the vessel, they want to know how well the vessel has been doing at inspections, how well the ship has been audited. The oil companies want to know about the quality of crew you are using on the ship, and that's not something very minor, it's extremely important. Ships have been known to be rejected by oil majors simply because the crew wasn't good enough. These data are extremely, extremely crucial for the business."

"Then what do we want? We want to know how to use our IT network to make our operations more efficient, and more user friendly. For our business, with about 180 vessels and each having 23 or 24 crew, we create an extremely large amount of information, and we need a comprehensive IT platform to analyse it."

Analysis

The IT system that Fleet Management has developed now creates masses of information for the company on a continuous basis, including 300,000 technical reports, 150,000 individual components, 75,000 crew appraisals, and 8,000 inspection reports per year, as well as many others.

The company has since extended its capabilities to include a business intelligence (BI) system, to help it manage all of the reports being generated and use that knowledge to improve operations.

'Data reported in the wrong format is discarded' - Capt Mayank Mishra, Fleet Management

"Our solution included the implementation of business intelligence systems that allow us to use the accumulated data from 180 ships to improve the operation of each individual ship," said Capt Mishra. "All this is possible through our web-based interface."

"If some kind of incident happens on a ship, you want to quickly transmit the information to every ship, every captain should know that, every chief engineer should know that."

KPIs (key performance indicators) are one example of BI that Capt Mishra points to as a useful tool, though KPIs may not be the best indication of the reality of every situation.

"KPIs are the first stage of business intelligence, they can tell you how you're performing according to certain parameters - but what are the typical KPIs for a shipmanagement company, for a company like us?" he said.

"Lost Time Injuries, PSC Detentions, Pollution Incidents, Machinery Break downs, Overdue PMS Items, Cargo claims - this information is crucial for a business like ours. These are the basic KPIs that we want to get up close and look at, and really affect our operations."

"However, the problem with KPIs is that they're too generic. They're just a basic indication of what might be going wrong, of problems that have happened but maybe not problems which will arise in the future."

One area where the benefits of the reporting system were quite quickly evident was in the company's planned maintenance system, Capt Mishra told us.

"(Having access to such a wide range of information allows) you to improve the planned maintenance system," he said.

"Say certain machinery on a ship has broken down, and you realise that your policy of oiling it maybe every 1,000 hours did not prevent that, and you review it, change it to 600 hours. The change of requirement from 1,000 hours to 600 hours is immediately sent out to every ship in the fleet, with an e-mail alert to let them know."

"We have four IT personnel who are basically given the charge of looking after the IT system. Then we have 15 people who are only working on the planned maintenance system, but that's the most complex part in it, as every ship has different parts that need to be renewed at different times and so on."

"Analysis is done every three months, we call it a management review. That's when we look at it and see how we have performed during the year. At the end of the year we do our annual review, and that's where we broadly specify our KPIs looking ahead."

"Looking back gives us an idea of what we need to do going ahead to meet these KPIs, and then every three months we are monitoring to see how we are performing against those KPIs."

Implementation

The implementation of Fleet Management's database and BI system required the assembly of a sophisticated network that could integrate data from different parts of the company.

"We first put together a dedicated team for building the application, and defined a single integrated data source," Capt Mishra explained. "It was important that everyone involved in Fleet Management operations had to be working on the same platform and same database."

"The important thing is that we had all of this information, and people were reporting it from various sources, but we needed to put it together in one common base that was then accessible to everyone. What you cannot measure you cannot control - that was the philosophy."

"We also had to make sure it would be accessible for the end-users, so we set up a team of a QMS superintendent, a technical superintendent and an IT developer, who worked together to spread best practice on using the software. The superintendents were a specific department that is not too concerned about the constraints of the system, their focus is only on the quality and safety issues. These guys worked together with the best guys in software."

The key message that was repeated throughout the implementation process was the need to have all of the systems working together, allowing information to flow from one place to another.

"Having a fully integrated system is the way to go, that is what we realised in 1996," said Capt Mishra. "It took us about four years to develop this system, but the principle behind doing it and achieving our goal was to avoid having a wide spread of applications, or even worse, Excel."

"The reports were coming in various forms, fax, Excel sheets, and so on - we needed to have that reporting platform. You want every ship to report in one format that is easy to understand and easy to work on. Our system picks up the data, and if they're not reported in the correct format they're just discarded."

Even after the four years taken to develop the system initially, Capt Mishra points out that it will never really be 'complete', with changes always necessary to keep up with the changing demands of the industry.

"The system is still under development, I won't say that it has completely evolved because there have been challenges all the time, new innovations, new reporting - how do you comply with that?" he said.

"The intention was to develop something that caters to the need of an ever changing environment that the ships are operating in, and our system is fully flexible. We are hoping to make changes as and when it requires. If the changes can make the system more effective, we're all for it."

The implementation of this company-wide information system has also included the introduction of a training system that would help Fleet Management crew members to learn from some of the knowledge that had been acquired on other vessels and then passed into the centralised system.

"We introduced what we call a Training On Land and At Sea (TOLAS) system," explained Capt Mishra. "We have our training centre who are constantly making training videos and visiting on ships."

"All of the video training is made by our own simulator, though we also subscribe to other training institutes. But when we find that something is really important and useful, then we put it on the TOLAS system."

"Training courses on the shipboard on-line training system can then be recommended to the ships as the result of an appraisal or because of an incident on another ship. Then the video is accessible to the captain, and if he wants to give specific training to his crew, all he needs to do is call everybody, play the TOLAS subject, and he can give them on-line training delivered on the ship." DS

McMurdo reports that it is to supply an order worth $800,000 for C1 S-VDR (Simplified Voyage Data Recorder) float free capsules to marine electronics systems supplier **ComAS**, for integration into the ComAS Blue Ocean S-VDR systems. Several months of collaboration between the two companies has resulted in obtaining type approval for the fully integrated ComAS S-VDR system, which is now ready for the shipping market.

ConAS has placed an $800,000 order for C1 S-VDR systems from McMurdo

The **UK Hydrographic Office** says that its Admiralty ENC and ECDIS services have now expanded to include over 6,500 ENC cells, with a further 1,000 cells scheduled to be added by the end of the year. New cells are fed into the ENC and ECDIS services available to customers through the UKHO worldwide distribution network, details of which can be found at www.ukho.gov.uk/amd/howtobuy.asp.

SAM Electronics has acquired APSS S.r.l. of Italy, a specialist integrator of automation systems and manufacturer of control components to the Italian market. Based in Diano d'Alba, APSS customers include high-end Italian shipyards producing cruiseliners, ferries and chemical carriers.

Ewan Porteous, age 23, of the University of Loughborough in the UK has been named as the 2007 winner of the **Lloyd's Register Educational Trust Award** for the Best Maritime Technology Student, for his research project on 'Wave-Like Propulsion of Small Marine Craft'. The Award was judged by the Institute of Marine Engineering, Science & Technology (IMarEST), the Royal Institution of Naval Architects (RINA) and the Lloyd's Register Educational Trust.

Kongsberg's new Norwegian training centre, in Bekkajordet, Horten

Kongsberg Maritime has opened a new training facility at its Bekkajordet, Horten, Norway site, featuring two new classrooms and one specialised training room which have been established to meet demand for customer and employee training. This facility joins other training centres in Aberdeen, UK, Busan, South Korea, Houston, US, Kongsberg, Norway, Manilla, Philippines, Macae, Brazil, and Singapore and the UAE.

Andreas Lesch has been appointed managing director of **ACR Electronics Europe** (formerly Nauticast), based in Vienna, Austria. In his previous position as Chief Technology Officer at ACR Europe, Lesch led development of the ACR Nauticast Class A AIS system. ACR has also recently added Doug Wiklund to its European sales team, as sales manager.

www.ukho.gov.uk
www.sam-electronics.de
www.setawards.org
www.acrelectronics.com
www.kongsberg.com
www.mcmurdo.co.uk

Wärtsilä introduces fuel-saving engine

www.wartsila.com

Wärtsilä has introduced a new, '-D' version of its RT-flex50 low-speed marine engine type with a higher power rating and lower fuel consumption compared with the existing '-B' version.

The maximum continuous power output of the RT-flex50 has been raised by 5.1 per cent from 1660 to 1745 kW/cylinder (2260 to 2375 bhp/cylinder) in the '-D' version at the same running speed of 124 rpm. Thus, with five to eight cylinders inline, the RT-flex50 in the '-D' version covers a power range of 6100-13,960 kW (8300-19,000 bhp) at 99-124 rpm.

At the same time the brake specific fuel consumptions (BSFC) have been reduced by 2 g/kWh. Thus at the maximum continuous rating R1, the full-load BSFC has been reduced from 171 to 169 g/kWh. This fuel saving is made possible by employing the latest, higher-efficiency turbochargers in the "-D" version.

Wärtsilä says that the flexibility provided by the layout field for engine power and speed can be used to save money on fuel. For example, if a '-D' engine is derated to the same cylinder power output as the '-B' version, then the BSFC at full load is reduced by 4.5 g/kWh compared with the '-B' version.

For a typical bulk carrier with a six-cylinder RT-flex50 engine this can translate into annual savings of $76,000 when operating for 6000 running hours a year with heavy fuel oil costing $300 per tonne. The company says that even greater savings are possible if the engine is derated to a lower running speed (rpm) at the derated power to gain the benefits of a better propulsion efficiency.

The RT-flex50 incorporates the latest electronically-controlled common-rail technology for fuel injection and valve actuation. The new technology provides great flexibility in engine setting, bringing benefits in lower fuel consumption, lower minimum running speeds, smokeless operation at all running speeds, and better control of other exhaust emissions.

The first of these new engines entered service in January 2006 and by the end of August 2007, a total of 157 engines aggregating 1604 MW (2,180,900 bhp) were delivered or on order.

Engines have been ordered for newbuildings contracted for owners in various countries including China, Greece, Scandinavia, Germany, India, Japan and the Netherlands. They comprise 38 seven- and 119 six-cylinder engines, the newbuildings being mainly 50,000 to 80,000 dwt bulk carriers and 37,000 to 60,000 dwt product tankers, together with a number of feeder container ships, car carriers and LPG carriers.

C-Map changes name to Jeppesen

www.c-map.no

C-Map Norway has officially changed its name to Jeppesen Norway, having been acquired by US-based Jeppesen in early 2007.

The company will continue to market chart products and services with the C-Map brand name, as it feels that the brand has an already developed relationship with the maritime industry that it wishes to maintain. Jeppesen Norway will be the main office for the worldwide commercial marine activities, doing business as Jeppesen Marine Norway.

"The name-change expresses our shared commitment to develop the marine industry's best navigational solutions," said Tor Svanes, managing director commercial navigation, Jeppesen Marine.

The company has also released a new chart catalogue which it says has been designed to assist in the process of ordering and managing electronic charts for the end user. The improvements have come about as a result of a study of end users' experiences conducted in co-operation with key stakeholders.

"As a major distributor of ENCs [electronic navigational charts], we have a great source of user feedback," said Jeppesen Marine marketing manager Willy Zeiler. "We discovered that planning the needed chart portfolio and ordering the correct ENCs were obstacles for end-users, so we were determined to do something about it."

"First, Jeppesen Marine's new Dynamic Licensing concept is under implementation in most of the ECDIS systems delivered by our OEMs. Dynamic Licensing allows the navigator to obtain necessary charts, updates and licenses in seconds without a pre-ordering process. Costs are controlled via preset budgets and spending limits - in essence, this is 'pay as you go'."

Tor Svanes, managing director commercial navigation, Jeppesen Marine

US ID card scheme up and running

On October 16th port workers and others at the port of Wilmington, Delaware, became the first workers in the US to enrol in the Department of Homeland Security's (DHS) Transportation Worker Identification Credential (TWIC) programme.

The programme aims to ensure that any individual who has unescorted access to secure areas of port facilities and vessels has received a thorough background check and is not a security threat.

The US Transportation Security Administration (TSA) and the US Coast Guard has also announced the names of the next 11 ports where enrolment will begin in November, publishing an updated port site list with additional enrolment locations, and a revised final rule that lowered the credential fee to $132.50.

"These developments reflect progress toward the implementation of this important port security measure," said TSA Administrator Kip Hawley.

"TWIC is one of the world's most advanced interoperable biometric systems and has a lot of moving pieces. We are now seeing those pieces come together."

Workers will be able to pre-enrol for their TWIC cards on the TSA website, at https://twicprogram.tsa.dhs.gov/TWICWebApp.

Pre-enrolling online speeds up the process by allowing workers to provide biographic information and schedule a time to complete the application process in person. This eliminates waiting at enrolment centres and reduces the time it takes to enrol each individual.

The revised TWIC rule, posted to the Federal Register on September 28, made a few minor changes to the program. One that will impact every applicant is reducing the fee for obtaining a standard TWIC by nearly $5, which will now cost $132.50.

The credential is valid for five years and the fee is below the federal government's original estimate. The fee includes the cost of the threat assessment, program management, card production and issuance.

Workers with current, comparable background checks, including a hazardous materials endorsement on a commercial driver's license, Merchant Mariner's Document or Free and Secure Trade (FAST) credential, will pay a discounted fee of $105.25.

The ports that will begin enrolling in November are Corpus Christi, Texas, in early November, Baton Rouge, Louisiana; Beaumont, Texas; Honolulu, Hawaii; Oakland, California; and Tacoma, Washington in mid-November, and Chicago/Calumet, Illinois; Houston, Texas; Port Arthur, Texas; Providence, Rhode Island; and Savannah, Georgia in late November.

The order of ports is based on a variety of factors including risk, geographic location, size and contractor resources. TSA says that specific dates for these ports will be released soon, along with information on other major ports.

Magnetic float switch from Emerson

www.emersonprocess.com

Emerson Process Management has produced a new Mobrey magnetic float switch, which it says is the first float switch to combine ATEX and marine approvals in one standard product. The new marine hazardous area float switch is flameproof and is available for both submersible and hose-proof duties.

Emerson says the technology is ideal for high or low level alarm and pump control duty in marine tanks in the most arduous and demanding of environments.

The switch comes with aluminium bronze wet-side housing as standard, with a range of float and switch combinations available. It can either be horizontally or vertically mounted into the tank for hose-proof duties or horizontally mounted directly inside the tank for submersible duties.

The new marine hazardous area float switch is ATEX certified for use in Zone 1 areas with group IIC gases. It is available in versions sealed to IP68 (submersible) and IP66 (hose-proof), and is approved Lloyds, DNV, ABS, BV, RINA and RM.

Emerson's new magnetic float switch can be used to control certain onboard alarms

New service from Primar

www.primar.org

The Norwegian Hydrographic Service (NHS), operator of the Primar electronic navigational chart (ENC) service, has launched a new set of Business to Business services which it says will assist in integrating distributors' business systems directly with the Primar ENC service.

The B2B interface has been tested over the past year in cooperation with Datema in the Netherlands, the first Primar distributor to fully implement the new service.

The secure interface is designed to support online customer and vessel registration and management, facilitating online quotations, ENC ordering, and the delivery of cell permits.

Primar says that the results of the pilot project demonstrated that by reducing manual effort and simplifying the ordering process it is possible to achieve a 90 per cent reduction in time and resources required for each ENC order.

The new service also enables distributors to integrate the sales transactions process involving their customers with the ordering processes from Primar, creating a single service system controlled by the distributor.

Datema, the first to implement the service, has also integrated its Chart Planner software with its back-office computer systems which, in turn, integrate with Primar - allowing the end-user to order ENC-permits directly.

The new service from Datema is called ENC-Online and will be introduced at the Europort exhibition in November 2007.

Willem Amels, the director of Datema, said: "With the new ENC-online service we allow the generation of short-validity permits (3 months). This can even be done on a per-voyage basis, thus only activating what the ship needs. Because we have automated the complete process, the requested permits are sent back in a matter of seconds".

COM DEV to develop space-based AIS

www.comdevintl.com

COM DEV International, a manufacturer of space hardware subsystems, have announced that the company has secured a space flight opportunity to demonstrate an advanced AIS data detection capability from space.

COM DEV has developed satellite payload technology to solve the traditional challenges associated with space-based collection of AIS (Automatic Identification System) data, and is committed to commercialising it following a series of planned tests.

"Space-based collection of AIS data offers tremendous cost and performance advantages over existing methods of monitoring marine traffic," said John Keating, CEO of COM DEV.

"After more than two years of work we have developed a very promising solution that is ready to be validated under real world conditions. The potential market for this technology is significant, and we believe we are well positioned to become world leaders."

AIS data is currently collected primarily from other ships and land-based receivers with a range of approximately 50 nautical miles. COM DEV says that a reliable satellite-based collection system would eliminate the 50-mile limitation as well as the need to build large numbers of ground stations along the world's coastlines.

Existing AIS transmissions can be received from space, but the company says that the primary technical barrier to a space-based system has been "de-colliding" the cacophony of signals received simultaneously from hundreds or even thousands of vessels in a satellite field of view.

COM DEV has developed a proprietary de-collision process that is capable of separating the multitude of AIS signals into useful information. The satellite payloads, which would fly in low-earth orbit, would make immediate use of over US $300 million of AIS equipment already installed by the global shipping industry, and would include an onboard encryption system to maintain data security.

COM DEV is conducting a number of tests to validate its AIS technology, beginning with an aircraft trial in November 2007. The next stage will involve a prototype test in orbit aboard a nanosatellite currently under construction at the University of Toronto's Institute for Aerospace Studies Space Flight Laboratory (UTIAS/SFL) targeted for launch in the second quarter of 2008. The final test will utilise a dedicated microsatellite capable of demonstrating the full commercial viability of the technology.

The Canadian Department of National Defence (DND), Project Polar Epsilon, has signed a small contract with COM DEV to obtain data which it will use to evaluate the results of the trials to assess the suitability of the advanced AIS system for operational requirements. Polar Epsilon is a DND capital project to exploit space-based capabilities in support of Canadian Arctic and marine surveillance, and is especially interested in the potential for space-based AIS technology to assist with its objective of monitoring shipping traffic in the Canadian Arctic.

COM DEV hopes that over 40 AIS payloads could be in orbit by 2015.

Primar and UKHO - what next after NAV 53

IMO's NAV 53 meetings in July decided that ENC coverage was not yet sufficient to properly consider a carriage requirement for ECDIS. *Digital Ship* asked the United Kingdom Hydrographic Office (UKHO), and the Norwegian Hydrographic Service with Primar Stavanger, for their views on the sub-committee's decision

Despite proposals from Denmark, Finland, Norway, Sweden and Japan, with supporting evidence from Russia and Det Norske Veritas (DNV), to make the carriage of ECDIS (electronic chart display information systems) a mandatory requirement, the IMO's NAV 53 subcommittee meeting has decided to defer any such decision until next year's NAV 54, at the earliest.

'Lack of coverage' of ENCs (electronic navigational charts) was cited as one of the main reasons behind this decision - however, what would constitute an adequate level of coverage in this instance was not clearly outlined. If today's coverage is inadequate, what target should the Hydrographic Offices be aiming for?

We asked the United Kingdom Hydrographic Office (UKHO) and Primar Stavanger, with the Norwegian Hydrographic Service, for their views on the decision, and how this issue might develop in the future.

Capt Sach Sharma, Primar Stavanger/ NHS

The maritime safety committee (MSC) had mandated NAV 53 and NAV 54 to study and analyse the issue of ECDIS implementation and make appropriate recommendations.

In the absence of a clear consensus the chairman of the NAV 53 committee wisely decided to defer the issue until the NAV 54 meeting and made a recommendation to prepare additional documentation in support of the proposal.

At NAV 53 there was a clear majority in favour of ECDIS implementation based on two different proposals from the Nordic countries and Japan.

The Japanese proposal recommended less stringent requirements with regard to tonnage limits than the Nordic proposal. On the other hand, there were some interventions expressing concerns mainly over ENC coverage, adequacy of ECDIS training facilities, and the cost factor.

A few flag states, mainly the flags of convenience, even went to the extent of raising questions over the capabilities of ECDIS and the need to switch from analogue to electronic charts. Clearly, these concerns were based on flawed assumptions and plain disbelief.

Owing to lack of consensus on the issue the chairman of the committee encouraged further analysis and documentation to address the concerns in a constructive manner. In the end it was concluded that a clear picture of ENC coverage status should be presented to NAV-54 in a manner that is convincing and easy to understand.

Thus, NAV-53 has paved the way for further analysis and provided a roadmap for NAV 54 meeting. There is every reason to believe that the NAV 54 session would be able to recommend a solution based on a compromise between the Nordic and the Japanese proposals.

The issues

There is a perception that sufficient ENC coverage is not available at present and therefore an IMO mandate on ECDIS would result in a safety mismatch.

The main purpose of an ECDIS mandate is to realise the full potential of ECDIS to reduce the risk of collision and grounding. These risks exist more in coastal waters owing to greater traffic congestion and less sea room to manoeuvre than in open seas.

According to the DNV report (see Digital Ship June / July 07), by 2010 there will be sufficient ENC coverage in the coastal waters along the main traffic routes to justify ECDIS implementation.

Furthermore, considering the risk reduction capability of ECDIS it remains an effective navigational tool even with the present ENC coverage which is evident from the statistics on grounding frequency reduction presented in the DNV report.

It is noteworthy that a grounding frequency reduction of 11 per cent is achievable even on a route with just 28 per cent ENC coverage. Thus there would be no safety mismatch if IMO mandates ECDIS carriage, as in any case ECDIS enhances safety of life and environment.

Another misconception is that the ben-

efits of ECDIS apply only to new tonnage and for older vessels it would merely add to the trading cost.

The safety benefits of ECDIS are as applicable to older vessels belonging to smaller companies with less financial resources as to modern fleets owned by leading-edge companies. There is no compelling evidence in existence today that suggests that the consequences of collision or grounding are less catastrophic in case of older vessels.

Nevertheless, the recommendations made by both the Nordic countries, as well as the Japanese proposal, take into the account the age factor and make due allowance for older vessels that will be taken out of service within five years from the ECDIS implementation date.

There has been a certain amount of variance in the interpretation and application of IHO (International Hydrographic Organisation) standards when it comes to ENC production in different nations. These issues are being addressed by different IHO committees on a continuous basis.

However, this fact should be viewed in light of enormity of the task of achieving standardisation and harmonisation of ENC production, and the significant progress made so far.

This is where the concept and the role of the RENCs assumes great importance as without their coordinated efforts it wouldn't have been possible to achieve the degree of standardisation that we witness in the electronic chart world today. It also goes to prove that the estimates made in the 1990s about quick establishment of global ENC coverage were nothing but misconceptions based on false optimism than realistic goals.

Costs

Any cost comparison between paper charts and ENCs is bound to be inaccurate unless the underlying assumptions are clearly stated and well understood. It is pointless to compare the total cost of a world folio of paper charts with that of ENCs simply because it is not necessary even for a tramp vessel to subscribe to all the ENCs at all times.

It is important to be aware of the possibilities when using ENCs for navigation. Since all the ENCs are available on board on the base CDs it is just a matter of obtaining the permit files for the required ENCs if the vessel is required to call a new port.

Using three month subscriptions it is possible to minimize the ENC costs by means of prudent chart folio management. This may not be possible with paper charts where one has to plan the anticipated voyage requirements well in advance. Add to this uncertainty the cost of updating paper charts in terms of manual efforts and amount of time, and a more realistic picture of cost comparison begins to emerge.

One must not forget that even paper charts need to be replaced at regular intervals depending on the frequency of new editions. Moreover, the manual process of updating charts is tedious and leaves scope for errors, not to mention deliberate omissions in some cases.

For vessels equipped with broadband connections it is possible to obtain online updates which further simplifies the chart updating process and improves safety by eliminating the time lag of several weeks normally experienced between receiving the updates for paper charts and actually applying them.

The ENC distribution service operated by Primar, which is one of the two RENCs (Regional Electronic Navigation Centre) in existence today, has a worldwide network of over 50 distributors and provides a one-stop shop solution to mariners all over the world. All ENCs and updates in the database are made available 24x7 by means of a sophisticated, user friendly, and fully automated ordering and delivery system.

Issues regarding licensing arrangements have to do mainly with two issues - flexibility of choosing desired coverage and the flexibility of subscription period. The distribution model of Primar addresses both these issues.

It allows end users the freedom to choose individual cells as opposed to pre-defined folios offered by other distribution models. It also offers flexibility by way of 3 and 6 months subscription periods, in addition to the standard 12 months subscription.

Some distributors have also designed innovative dynamic licensing systems based on three months subscription periods.

Training

The task of assessing the ECDIS training capacity has been assigned to the STCW committee which is working within the same time frame as the NAV subcommittee.

Apparently a number of maritime educational institutes have already implemented the IMO model course and have provided ECDIS training to a significant number of seafarers.

Ultimately, it is the responsibility of the IMO to ensure a reasonable phase-in plan so that a sufficient number of seafarers receive the requisite training by the time ECDIS is fully implemented.

What needs to be done prior NAV 54? IHO, HOs, and the RENCs need to address the following issues and prepare appropriate documentation to present a convincing and easy-to-understand picture to NAV 54:

- More specific information on the ECDIS concept, with efficient, cost effective ENC services for 24x7 availability of ENCs to mariners
- Clear evidence of steadily improving ENC coverage and the availability of adequate ENC coverage by the proposed date of ECDIS implementation
- Relevant statistics to demonstrate the growth of the ENC subscriber base and the fact that a substantial percentage of the SOLAS fleet is already using ECDIS and ENCs even before the IMO mandate
- Clarification on the nature and magnitude of issues related to ENC consistency
- An assessment of ENC costs taking into account all relevant factors in order to establish that ENCs don't compare unfavourably with paper charts on this count
- Establish beyond doubt that the push for implementing ECDIS is based on human factors and not technology driven. This task is mainly for the national maritime administrations, possibly with some input from the IHO and HOs.

Vaughan Nail, Capt Defence Requirements, UKHO

The ECDIS carriage compliance debate at NAV 53 was wide ranging and informative. A compelling case for mandation was made by the Nordic countries, drawing from the evidence of the recent DNV report, which emphasized the significant growth in ENC coverage on several major shipping routes.

Japan tabled a further variation, which was also supportive of mandation. In general, those nations which had perhaps seen the greatest benefits from ECDIS use provided support for mandation to varying degrees.

There was an expectation that ECDIS would prove to be cost-effective, accurate and lighten the workload of the mariner on the bridge, leading to less fatigue. The Russian Federation in particular updated the sub-committee on a recent study that had demonstrated, through monitoring stress factors on the bridge, the merits of ECDIS in pilotage waters.

However, there were strong counter arguments and most of the largest flag registries fell into this camp. The benefits of ECDIS were not, in general, a point of contention, but some delegations were of the opinion that, by making the carriage of ECDIS mandatory, the IMO was, in effect, banning the use of paper charts on many ships.

Taking into account the problems of developing countries when introducing new legislation and the unanswered question of exactly which organisation would provide ENCs for those areas off the main trade routes, this could cause significant problems if not carefully handled.

Many nations raised concerns about training and other human element issues. Of the contributors to the debate over half, including all the large flag registries, stood firmly against mandation altogether, or at least were of the opinion that a decision on a carriage requirement for ECDIS would be premature at this stage. The International Chamber of Shipping observer supported this view.

A number of delegations expressed a degree of scepticism about establishing a mandation timetable for ECDIS, before completion of a high percentage of global ENC coverage.

It will be important, before NAV 54, for the IHO Member States to provide further evidence of progress, in a readily comprehensible format, to meet this problem head-on.

There is general agreement in the hydrographic community that the issues of coverage, cost and consistency need to be addressed further in order to encourage more widespread ENC usage, but equal precedence must also be given to improving the efficiency of the supply chain, including easing the onboard burden of folio management, including licensing and updating.

UKHO is committed to improvement of all these facets, working closely with the other IHO member states. The challenge will be overcome when all levels of the shipping industry want ECDIS onboard their vessels - at this point mandation will be almost a non-event. DS

Europort Maritime - Preview

The Europort Maritime exhibition in Rotterdam, held every two years, is one of Europe's biggest maritime events. The 2007 show, taking place in the Ahoy exhibition centre between November 6 and 10, will feature a host of the best and brightest maritime technology providers. *Digital Ship* spoke to some of them, to see what they can offer visitors to the event

C2SAT

C2SAT, a producer of stabilised satellite antenna systems for vessels requiring satellite broadband communication, will showcase its latest VSAT antenna at its Europort stand.

The recently introduced 4-axes VSAT is able to carry reflector sizes up to 2.4 m at all frequency bands. When in motion the system achieves 0.1 dB satellite tracking accuracy, comparable to a terrestrial satellite antenna.

C2SAT says the improved technology can ensure that ships get the bandwidth they pay for even during harsh conditions and heavy seas. Visitors can see the antenna in action live at stand 812, Hall 1C.

JRC

Japan Radio Company (JRC), presenting with Alphatron, will display its communication and navigation products at Europort.

Examine JRC's FleetBroadband equipment at stand 376

One set of new releases are the JHS-770S and JHS-780D series VHF, set to replace the previous JHS-32 model. It is available as semi-duplex or full duplex, and features a separate transceiver and compact controller.

Built-in Class A DSC, Ch 70 watch keeping and 120 seconds of digital recording are also standard features, as is a unique direct calling function by way of the AIS.

In conjunction with the November launch of the Inmarsat FleetBroadband service, JRC will also introduce the FB250 satellite communication terminal for use with the service.

Existing JRC Fleet 33 customers can utilise a dedicated upgrade path whereby they need only to replace the main unit rather than installing a completely new system.

Visitors can find JRC at stand 376, hall 3.

Lloyd's Register

Lloyd's Register EMEA (Europe, Middle East and Africa) showcases environmental technology at Europort Maritime this November, at stand number 353.

Lloyd's Register has entered into an agreement with NanoNord to develop FOBAS Onboard with Lab-On-A-Ship, an in-line fuel and lube oil quality analysis and monitoring system for onboard management of fuels and lubes with real-time notification during bunkering treatment and consumption, which it says can lead to savings of up to 20 per cent in cylinder lube oil consumption.

Lloyd's Register will also be presenting its Green Passport service, which maintains a record of materials onboard a vessel which may be hazardous to human health or to the environment. Copies of the Lloyd's Register Concise Guide to the Green Passport will be available on the stand, as well as a new guide which assesses the technological developments in ballast water treatment.

PC Maritime

PC Maritime's Navmaster ECDIS system will be featured at Europort this year on the stand of German company, Veinland GmbH.

Veinland develops software and manufactures and markets electronic hardware for the maritime and industrial markets. The company offers products such as serial converters, NMEA splitters and expanders, RGB distributors, touch screen displays, and loading computers.

Through collaboration involving both Veinland and PC Maritime's UK agent, Lilley & Gillie, the Navmaster ECDIS received type approval from Germanischer Lloyd earlier this year, in addition to DNV Approval secured in 2006.

Veinland's marketing of Navmaster at Europort this year will be fully supported by Lilley & Gillie, whose Technical Sales Manager, Mike Howes, will be on the stand. Both PC Maritime and Lilley & Gillie are part of the Liverpool-based Charente Group.

Radio Holland

Radio Holland will be presenting at Europort Maritime at stand number 1220, in hall number 1 of the Ahoy exhibition centre.

Radio Holland says that its exhibition stand this year will be focussed on complete bridge systems. There will be no separate standalone equipment on the stand, with all equipment instead built into four integrated bridges.

Displays will include an inland shipping console, an innovative workboat bridge, a complete deep-sea integrated bridge and a bridge designed specifically for the fishing industry.

Radio Holland will also exhibit its new VSAT broadband service, CONNECTOR by Radio Holland, at the event, as well as its fixed installation packages for the Danelec (S)VDR, for which the company is the exclusive global dealer.

Transas

At Europort 2007 Transas will presents its latest developments in marine electronics, including a new generation of onboard systems, the 4000 series of Navi-Sailor ECDIS, Navi-Radar and Navi-Conning.

Anders Rydlinger, sales and marketing director, Transas, commented: "Our cutting-edge research will help the industry to make the most informed decisions to provide better maritime safety."

"Using available technology in an innovative and across-the-board manner will not only save the time and money of our customers, but provide better information to the whole industry."

See Transas' latest navigation technology at stand 312

Transas invites visitors to stand 312 to explore its full range of marine navigation technology.

UKHO

Two new electronic charting services developed by the UK Hydrographic Office (UKHO) will be unveiled at the Europort Maritime exhibition.

The first of these is an improved updating method for Electronic Navigational Charts (ENC). The UKHO's ENC service is being improved to allow users to update their charts with the latest data remotely - which means they will have access to up-to-the-minute chart information over the internet at any time and won't need to wait for CD-ROM updates.

Alongside this, the UKHO will be demonstrating a new web service that gives shore- based personnel operating within the merchant marine environment the ability to view up-to-date charts on-line.

For more details about the new services attendees are invited to visit stand 334 where UKHO staff will be happy to give a full demonstration. DS

ECDIS Carriage Requirements - the end of paper charts?

Next year's IMO NAV 54 meeting will pick up where NAV 53 left off, and once again consider proposals for mandatory ECDIS. However, would such a mandate preclude the use of paper charts if ECDIS is available? Dr Andy Norris examines the possible repercussions of an ECDIS carriage requirement

It has been widely reported that IMO has extended the discussions on proposed ECDIS carriage requirements to next year. In the intervening period there will be increased interest as to what the implications will be if they are adopted.

Under the present SOLAS regulations, ECDIS is noted as an option that 'may be accepted as meeting the chart carriage requirements'. It will be interesting to see how this will be rewritten. Will it preclude the use of paper charts in normal circumstances, except when there is a fault in the ECDIS or if ENCs are not available? Or can an ECDIS just be fitted but remain unused?

However, it seems that most bridge staff would welcome its availability, providing there was good coverage of ENCs and that they could rely on the equipment. Formal Safety Assessments submitted to IMO have shown the effectiveness of ECDIS.

It seems most likely that ECDIS carriage requirements will be phased in, initially covering only ships over 10,000 gt from about 2012. These larger vessels normally have room for additional equipment on the bridge and the fitting of one or even two ECDIS is unlikely to pose space problems.

As the size goes down, finding suitable available space can become an issue. An ECDIS needs to be able to a display a chart area at least 270 mm square - not including the space for navigational data and menus. This means that ECDIS screen sizes are at least 17 inches diagonal.

An ECDIS should ideally be mounted close to the normal conning position and adjacent to a main radar display. Fitting a sole ECDIS on or adjacent to the chart table is normally a poor option for normal use.

Many ships already carry a non-approved electronic chart system or plotter. If this is in a prime position, it is likely that the ECDIS should be positioned in its place, with the original equipment being repositioned, if still needed.

Backup

It is an IMO requirement that facilities are provided to enable a safe take-over of the ECDIS functions in order to ensure that an ECDIS failure does not result in a critical situation. Also, means need to be provided for safe navigation for the remaining part of the voyage.

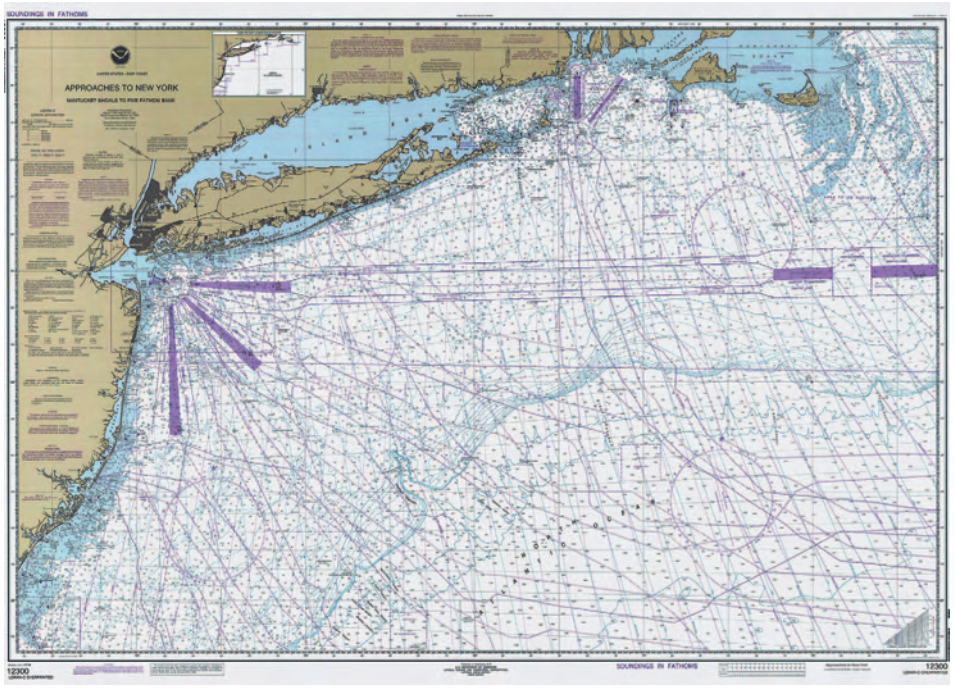
Backup facilities can range from a second ECDIS to the use of paper charts. The former is a good solution but it is expensive - depending on specification, an ECDIS currently sells for about £10,000.

The use of paper charts as a backup is superficially attractive but it suffers problems in practice, such as in meeting the important requirement by IMO of the need for a safe takeover in the event of a failure.

This implies that an up-to-date paper chart, of suitable scale to ensure that an ECDIS failure does not result in a critical situation, must be on the chart table at all times. Ship's position, with time labels, must be plotted at appropriate intervals.

The planned route and any route options need to have been pre-plotted, together with any other relevant planning information. This implies that much of the work associated with the use of paper charts still has to be carried out, including chart corrections.

What folio of paper charts should be used as a back up? In the IMO ECDIS performance standards it is stated 'relevant information of the hydrographic and geographic environment which are necessary for safe navigation' are required for backup.



Paper charts do not appear to be a good back-up solution for ECDIS. Photo courtesy NOAA

Surely, this is the basis for selecting folios when paper charts are used without ECDIS. Does this mean that the backup folio is the same size as existing paper chart folios? If so, there are significant cost implications.

Paper charts do not appear to be a good backup solution. Even when the ECDIS is operating normally, they distract the OOW because of the necessary extra work involved, as well as imposing an ongoing cost burden.

Electronic backup

The ideal backup is a second ECDIS, if it is affordable and space is available. It can normally be positioned on or close to the existing chart table. In normal circumstances it can then be used as the planning workstation.

If both primary and backup systems are identical it eases usage by operators and also reduces any possible problems in electronic data exchange between the two systems.

Licences for ENC data cover its use on the ship and there is no extra cost in having chart data installed on two ECDIS. The cost of the additional equipment, however, will discourage many ship operators to want to fit such an optimum configuration.

The problems with the potential cost of this solution were foreseen by IMO and a less expensive option for electronic back-up has been loosely defined within the IMO ECDIS performance standards - Resolution MSC 232(82).

It needs to have route planning and route monitoring facilities. It should be capable of displaying at least the information equivalent to the 'Standard' display of ECDIS. Also, it must be able to keep a record of the ship's actual track, including positions and corresponding time.

Although it does not specify that ENCs must be used in the backup, it is difficult to imagine that anything other is permissible, as the information has to be issued officially and colours and symbols must be in accordance with the requirements of ECDIS.

The required chart display area is only 250 mm square (or 250 mm diameter), enabling slightly smaller screens to be used than required for ECDIS. This will help in finding suitable space.

It is clear that the backup must be able to work reliably in the same environmental conditions as an ECDIS. It also needs to be ensured that it will not interfere with any other bridge equipment and that it can be connected safely and effectively to the primary ECDIS to enable data transfer, particularly of route planning information.

This implies that the backup must conform to the relevant marine requirements that are supported by IMO and defined in IEC 60945 (environmental) and IEC 61162 (data interfaces). It must also be able to be connected to the emergency power supply of the vessel.

Practical back up systems

It is quite possible that manufacturers will make a dual ECDIS configuration more affordable.

A significant proportion of the price of an ECDIS covers the 'one-off costs' for software and hardware development and for type approval. If a dual system is supplied there are opportunities for discount.

In particular, some manufacturers may offer a lower cost backup version, which has the same look and feel as the primary ECDIS but offers reduced functionality, such that it only meets the requirements of a backup system.

An attractive option could be that the backup system could be converted to function as a complete ECDIS simply by removing an easily accessible 'dongle' from the failed primary machine and inserting it into the backup.

Other options will become common. Equipment can be based on relatively standard PC hardware, even a ruggedised laptop, provided it meets the IMO/IEC environmental and compatibility requirements for bridge equipment. The prices could be much lower than a second ECDIS.

It should also be recognised that new chart radars, using ENC data, have been designed to be suitable as an ECDIS back-up, simultaneously fulfilling the carriage requirements for radar and therefore becoming a cost effective and space-saving option.

Innovative ideas for ECDIS backup, integrated with other marine equipment, are also becoming available.

In comparison with electronic backup, paper charts are a poor substitute, which will result in their faster demise than many people expect.

Operators of smaller ships are likely to react to the benefits of ECDIS in advance of legislation, further diminishing the use of paper charts. 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

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