Digital Ship
September 2011
www.thedigitalship.com

EADS acquires Vizada in $1bn takeover

EADS Astrium, part of the giant EADS Group, is to buy satcom services provider Vizada for almost $1 billion – a deal which brings a major new player, with considerable resources, into the maritime market

EADS Astrium has entered into an agreement to acquire Vizada from Apax France, a French private equity fund and Vizada's majority shareholder, for $960 million.

Vizada's forecasted revenues for 2011 are $660 million, with $95 million EBITDA, from more than 200,000 users worldwide.

The acquisition is subject to customary regulatory approvals.

EADS has pointed to growing demand for maritime services as one driver for the deal, describing the market as "a perfect cornerstone for Astrium to develop its commercial satellite communications business."

"This acquisition marks a further step towards the realisation of EADS' strategy to balance platforms with services, develop business in North America and diversify its workforce," said EADS chief strategy and marketing officer Marwan Lahoud.

"This is clearly an accretive transaction for EADS shareholders and will generate significant synergies."

Astrium Services offers Telecom Services, Secure Satcom Systems, and Geo-Information Services, with Vizada to become a fourth business line within Astrium Services providing a range of fixed, handheld and mobile solutions.

EADS Astrium is part of the EADS Group, a major force in aerospace, defence and related services.

In 2010, the Group – which also comprises Airbus, Cassidian and Eurocopter in addition to Astrium – generated revenues of €45.8 billion and employed a workforce of nearly 122,000.

The Group reportedly has a net cash surplus of approximately €11 billion, and has recently spent €2.75 billion buying out BAE System's 20 per cent stake in Airbus.

Apax

The sale of Vizada marks the end of an interesting foray into the maritime satellite communications market by Apax Partners.

The company originally purchased France Telecom Mobile Satellite Communications, the satcoms arm of France Telecom, for €60 million (approximately $75 million at the time) in July 2006, and followed that with an agreement to acquire Telenor Satellite Services for a further $400 million at the end of the same year.

This immediately created one of the world's largest satellite communications service providers (which would soon be rebranded as Vizada), but more significantly it also meant that Apax was in control of what was, effectively, the second largest distributor of Inmarsat services, behind Stratos.

'This (deal) will generate significant synergies' – Marwan Lahoud, EADS

According to Inmarsat's yearly results at the time of the acquisitions, Stratos had a market share of 46 per cent of Inmarsat business, with Telenor Satellite Services (TSS) and France Telecom Mobile Satellite Communications (FTMSC) holding a combined 38.1 per cent.

Speculation at the time pointed to a further Apax bid for Stratos itself, which, if such a bid had been made and been successful, would have

continued on page 2

IN THIS ISSUE

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continued from page 1

creted a company with control of an enormous 84 per cent of the Inmarsat market – and put the company in an extremely strong negotiating position when it came to purchasing satellite airtime.

Perhaps mindful of this, in early 2007 Inmarsat announced that it had agreed to provide $250 million in financing to Canadian investment company Communications Investment Partners (CIP), to fund a deal to purchase Stratos.

In return for this loan Inmarsat was granted the option to acquire 100 per cent of Stratos, an option it subsequently exercised in 2009.

This move immediately removed the threat of Apax taking control of a large majority of the market share for Inmarsat business, that would have significantly shifted the power dynamic in the wholesaler/distributor relationship.

However, a further important consequence was that, for the first time, Inmarsat was in direct control of part of its distribution channel – something which has had a major effect on the current maritime satcoms market.

This has been demonstrated by Inmarsat's recent moves to introduce its Global Xpress upgrade product, XpressLink, via what it called its "direct distribution" channel – Stratos and recent acquisition Ship Equip.

At the time of writing, no further non-Inmarsat owned distributors have been named as partners in providing this service.

Vizada responded to this by launching a similar competitive product, without an inclusive Ka-band upgrade but with a shorter contract length that would allow customers to switch to Global Xpress when it is launched, should they so wish (see *Digital Ship* August 2011 issue, page 1).

As such it would seem that the slightly unusual situation of competition between Inmarsat and its own distribution channel will play a major role in maritime satcom pricing in the near future.

These changes in the satcom distribution channel are perhaps an inevitable conclusion of the way that the technology used to provide Inmarsat services has evolved over the last decade.

FTMSC and TSS, as well as Stratos, were originally part of a large group of separate companies known as 'land earth station operators', which owned the land earth stations that communicated with Inmarsat satellites.

However, with the launch of the Inmarsat-4 generation of satellites, used to run the FleetBroadband network, Inmarsat began to operate its own land earth stations, which somewhat weakened the commercial and strategic strength of the distribution partners.

With Inmarsat's contracts with its distribution partners, in their current form, expiring in 2014, it will be interesting to see how these various strategic acquisitions and product launches affect the next stage of evolution in the maritime satcom sales channel.

Financials

The approximately $960 million purchase price for Vizada represents a significant return for Apax on its initial $475 million investment in creating the company.

Based on the $660 million forecast for 2011 revenues for Vizada, the purchase price represents approximately 145 per cent of that figure.

EADS Astrium was selected by Inmarsat as the prime contractor for the Alphasat I-XL satellite, planned for delivery at the end of 2012

In contrast, Telenor Satellite Services (TSS) was bought by Apax for 106 per cent of annual revenues, while France Telecom Mobile Satellite Communications (FTMSC) was valued at only 38 per cent of revenues.

TSS revenues for 2005, the most recent results prior to that original takeover, were $376.9 million, with FTMSC recording revenues of $201 million for the same period, a total of $577.9 million.

Compared with this figure Vizada's $660 million forecast would therefore represent an increase in revenues of approximately 15 per cent over the course of Apax's involvement in the company.

As already mentioned, EADS has huge cash reserves and has been involved in a number of acquisition moves over the last twelve months. Adding Vizada to the Group's stable will help the business to diversify, to some extent, into the services sector.

Some analysts have said that this will help the company to move away from any over-reliance on military revenues, as governments look to cut spending with the weakening of the global economy.

It has also been suggested that the fact that most Vizada billing is done in dollars will help the company to reduce its US currency risk, given that most of EADS' costs are in Euro.

Future plans

EADS' plans for the Vizada business in the future are not yet entirely clear at this stage, with little having so far been said by those involved while they await full completion of the deal.

However, it seems safe to assume that the company has not spent close to $1 billion without having a plan in place to make a significant return.

So what can EADS, and in particular the Astrium business unit which Vizada will become part of, offer to expand the profit making potential of Vizada?

Astrium is certainly one of the world's biggest satellite manufacturers, and was, in fact, responsible for the construction of the three Inmarsat-4 satellites that act as the backbone of the FleetBroadband network.

In addition to this, the company was also selected by Inmarsat as the prime contractor for the Alphasat I-XL satellite, planned for delivery at the end of 2012 and intended to augment the existing Inmarsat-4 L-band network.

Astrium also has experience constructing Ka-band satellites – KA-SAT, delivered to Eutelsat, was launched successfully at the end of 2010, though this satellite is not being used to provide maritime services.

As such, the company could potentially design and construct its own constellation of satellites, be they Ka-band or L-band, if it should so wish, which could then deliver services for sale to the end-user market by its Vizada division.

Coming at a time when speculation is growing about whether Inmarsat may take direct control of its own distribution channel, such a move by Astrium would represent an even longer chain of control – from design and construction of the satellite right down to billing for crew e-mail traffic on commercial ships.

It would also mean that the margin that a company like Inmarsat has to pay to a satellite construction firm like Astrium, or Boeing in the case of the Global Xpress project, would be eliminated from the development of the satellite network should it be completed 'in-house'.

In essence, Vizada would have access to a satellite network provided by Astrium at 'cost price', rather than the 'cost + profit' amount that a satellite operator like Inmarsat or Eutelsat would have to pay.

While the 'cost price' of the satellites would no doubt be substantial, with all other things being equal removing the additional profit margin cost that would usually be demanded by the satellite construction firm for the delivery of its service would certainly allow a satcom provider to be more competitive on pricing to the end-user.

Of course, creating such an operation and managing such a complex distribution channel would presumably create a number of additional difficulties, so whether EADS Astrium would consider such a move remains to be seen. Certainly, any such intentions could only be discussed after the Vizada deal is fully completed.

However, one thing is sure – a powerful new player, with huge financial clout, has entered the maritime satcom market. Whatever its next move, it is bound to have a significant impact on vessel communications. DS

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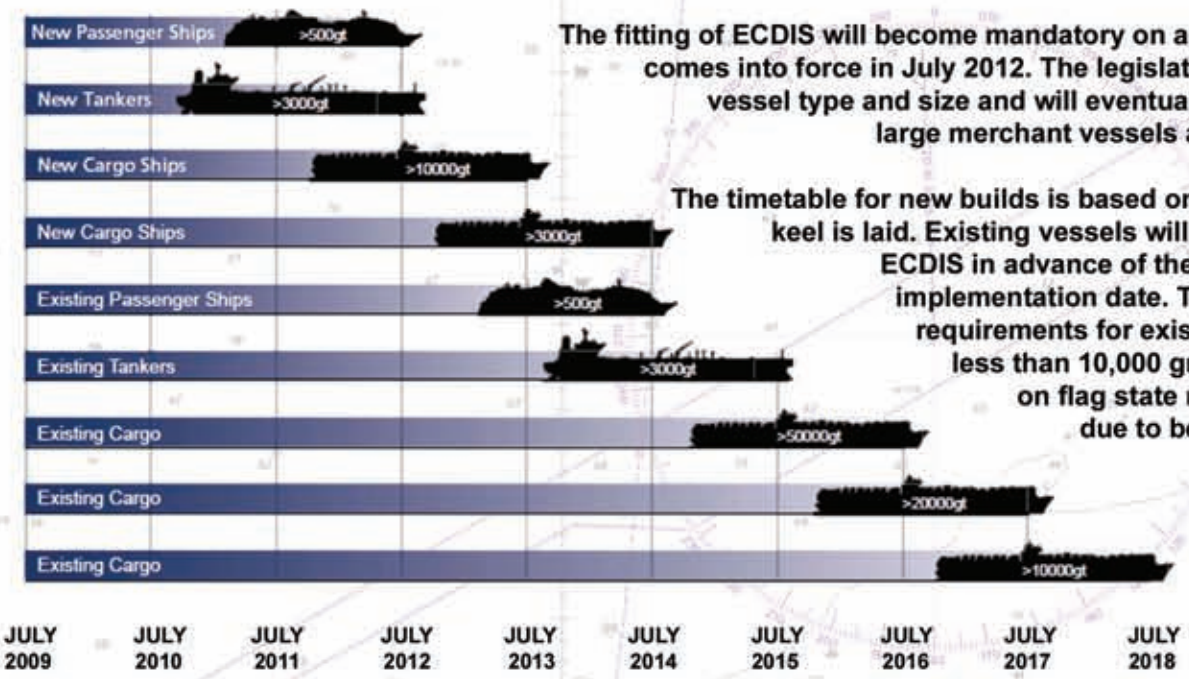

The fitting of ECDIS will become mandatory on a rolling timetable that comes into force in July 2012. The legislation will be phased by vessel type and size and will eventually apply to almost all large merchant vessels and passenger ships.

The timetable for new builds is based on the date the vessels keel is laid. Existing vessels will be required to install ECDIS in advance of the first survey after the implementation date. There are currently no requirements for existing cargo vessels of less than 10,000 gross tons. Depending on flag state requirements vessels due to be taken out of service within 2 years of the implementation date maybe exempt.

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Marlink and Vizada introduce FleetPhone packages

www.marlink.com

Marlink has announced a new offer under which the company will provide customers who use its Inmarsat FleetPhone service with a free terminal, while parent company Vizada has unveiled a range of new services for the handset.

The Marlink FleetPhone offer is open to all one year subscribers of the prepaid Vizada Universal Card.

Marlink's deal includes a free crew handset and call blocker, which restricts crew to prepaid traffic, and customers can choose between two different terminals, which are both free of charge.

Marlink offers free terminals to subscribers of the prepaid Vizada Universal Card

The first of these, the Oceana 400, enables the use of five standard phones or integration into a PBX system.

The larger Oceana 800 features integrated Bluetooth, a GPS receiver, tracking and instant message reporting via SMS, and the 505 emergency calling feature.

Vizada, meanwhile, has announced its intention to provide e-mail and data transfer capabilities to users of Inmarsat's new maritime handset.

The company says that its various communications services, such as SkyFile Mail and Satellite Direct, will be able to be applied to the unit (as well as the Universal Card).

Vizada's version of FleetPhone will also be offered with a crew calling promotion package.

Voice services, voicemail, text and e-mail messaging will all be possible over the FleetPhone, while a supplemental voice line can be included to allow the captain to have a dedicated private communications line while the crew maintains their own lines for personal or professional calling.

PBX integration will mean that calling between the different phones located on a ship will be supported.

Vizada says that it has already received pre-orders for the system from service providers who wish to supply the unit to their maritime customers.

Globalstar receives seven new satellites

www.globalstar.com

Globalstar has announced the receipt of seven second-generation satellites from manufacturer Thales Alenia Space, which have been shipped to a pre-launch preparation facility at the Baikonur Cosmodrome in Kazakhstan.

Six of the spacecraft will undergo preparations and testing for an October launch executed by Arianespace, who use the Soyuz launch vehicle, which has successfully launched Globalstar satellites on ten occasions.

The delivered satellites will be part of the third scheduled launch of Globalstar's second-generation satellites.

"With this milestone delivery of satellites, Globalstar continues to proceed, on schedule, with preparations for our third second-generation satellite launch expected in early October," says Tony Navarra, president, global operations Globalstar.

"With a total of eight satellites now in Baikonur, we have also started preparations for our fourth satellite launch which is now expected to take place prior to the end of the year."

Inmarsat launches IsatData Pro

www.inmarsat.com
www.skywave.com

Inmarsat and SkyWave Mobile Communications have jointly announced the launch of IsatData Pro, a low data rate machine-to-machine (M2M) service for managing and communicating with remote assets.

IsatData Pro offers up to 10,000 bytes sent to and up to 6,400 bytes sent from the device, transmitting a 100-byte message in less than 15 seconds, or a 1,000-byte message in 45 seconds.

The solution uses SkyWave all-weather data terminals, including integrated GPS as well as digital and analogue ports for connecting sensors to relay data such as fuel levels, engine temperature and speed.

"The M2M market is set to continue its rapid growth globally, but it is currently under-served by services that cannot match the increasing data demands," says Drew Brandy, director of land services at Inmarsat.

"By supporting a significant increase in the size of M2M messages, IsatData Pro will provide better visibility of business operations, allow for risks to be managed more effectively, and deliver enhanced efficiencies."

Marlink VSAT for Simon Møkster Shipping

www.marlink.com
www.mokster.no

Marlink has announced the renewal of its VSAT contract with Norwegian offshore vessel operator Simon Møkster Shipping, for a further five years.

Simon Møkster Shipping operates primarily in the North Sea within the areas of platform supply, anchor handling, sub sea, Ro-Ro cargo and emergency services. The company has worked with Marlink for over ten years.

Under the agreement, Marlink will continue the provision of its Sealink VSAT services aboard 18 existing vessels. Additionally, the company has agreed to supply the service to five new vessels scheduled for construction in 2011 and 2012.

"Flexibility and quality of services is an important factor for us as we require satellite communications to facilitate an extensive range of business critical applications," says Gunnar Løtveit, IT/data supervisor for Simon Møkster Shipping.

"Marlink, including its support team at Eik teleport, is able to ensure outstanding control of its services, offering us the flexibility and reliability we need to operate effectively."

In other news, Marlink has also donated a package of Sealink VSAT system hardware to the Norwegian maritime training vessel MS Gann, which provides training programmes to prepare school leavers for a career at sea.

Marlink's VSAT services will provide MS Gann with up to four voice channels and always-on bandwidth to support a range of applications, enabling students and teachers to stay in touch via the web-based learning system 'It's learning'.

In addition, the services will allow students to stay in touch with family and friends while away at sea.

"People working in the global maritime sector now rely heavily upon connectivity for a range of applications, from everyday e-mail and voice calling to more advanced and technical functions such as transfer of critical data to offices ashore," said Jostein Vik, electrician and teacher aboard the MS Gann.

"It is also essential for us to offer crews the provision of reliable satellite communications aboard our vessel, to enable students gain valuable true-to-life experience, which is vital to the success of the programme."

Simon Møkster Shipping chose Marlink for a further five years

Globalstar CEO Peter Dalton has retired, with executive chairman and former CEO Jay Monroe resuming his operational role as CEO on an interim basis. Mr Dalton will remain as a special advisor to the interim CEO to assist with transition issues until September 2011. Mr Dalton is also retiring as a member of Globalstar's board of directors.

Globalstar Europe has also announced that it has signed an authorised distribution agreement with **Sailornet S.R.L.**, a provider of satellite communications services in Italy. Sailornet will act as a national distributor for Globalstar's suite of duplex products to the Italian mainland via its re-seller channel.

One Horizon Group has appointed Helen Stalker as director of marketing. Ms Stalker was previously commercial director of global satellite phone services, director of marketing strategy and communications and BGAN marketing manager for **Inmarsat**. Earlier in her career, she held positions with **Orange, Ionica, Gartner Group** and **NCR**.

www.globalstar.com
www.onehorizongroup.com

Iridium second-quarter results

www.iridium.com

Iridium has reported its financial results for the second quarter and reaffirmed its growth outlook for the full-year 2011.

The company has specified a growth of 25 per cent year-over-year in total billable subscribers and attributes this to the strength in machine-to-machine (M2M) data, handheld voice, as well as Netted Iridium and Iridium OpenPort customers.

Iridium's net income for the second quarter of 2011 was $11.7 million, as compared to $3.2 million for the second quarter of 2010.

The company reported second-quarter total revenue of $95.9 million, which grew 14 per cent compared to the comparable period of 2010.

"Connectivity is one of the single biggest driving forces in our daily lives," says Matt Desch, CEO Iridium.

"Our vision, with the world's furthest reaching network, is to connect people, assets and organisations all over the world in the ways they expect to be connected."

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Asian Navy C-band order for Orbit

www.orbit-cs.com

VSAT antenna manufacturer Orbit Communication Systems has announced a contract with an unnamed Asian Navy to provide its OrBand (AL-7107) maritime C-band VSAT system.

The OrBand antenna features a 2.7m radome, which Orbit says requires less deck space and is 30 per cent lighter than many other similar VSAT systems.

This antenna is being marketed at commercial maritime customers as well as military users.

"This is another major order for our recently launched OrBand system and serves as a confirmation of the ground-breaking performance and value of the system," said Yosi Albagli, president, satellite communications at ORBIT.

"OrBand's compact footprint and light weight were instrumental in securing the deal, as it allowed the deployment of global C-band VSAT to a wider range of vessels, including smaller ships which could not fit any of the larger industry-standard systems."

"From commercial cargo ships and navies that need global coverage and fast installation times, to oil and gas support vessels that struggle to fit the larger C-band systems, OrBand offers an innovative solution for maritime customers that require high-performance VSAT systems with a small footprint."

The antenna supports extended C-band and extended Ku-band frequencies, as well as multiple RF feeds. Automatic beam switching (ABS) is also possible through the use of the standard OpenAMIP protocol.

The company says that the units can be shipped for installation as a single, fully assembled and tested unit in a standard 20 foot container.

Orbit's OrBand antenna and radome is being provided to an Asian navy

Project to explore transparency in broadband services

www.outsource-it.nl

Broadband@Sea has announced plans to improve transparency in maritime broadband service pricing by launching a project that will compare the merits of various services from different providers.

The project is to be executed by Outsource-IT Management, a partner in the Broadband@Sea platform.

Broadband@Sea was initiated by Holland Marine Equipment Association (HME) in 2007, and comprises of shipowners, shipping companies and various maritime suppliers, including satellite communications providers.

In 2008 Broadband@Sea published a similar comparison of maritime broadband costs, however the platform now intends to update this with an overview of the continuously changing prices for maritime broadband, whilst taking into account various aspects of the communication link between ship and shore.

The study will include Inmarsat, Iridium, VSAT and hybrid broadband solutions and contain comparisons on coverage, upload and download speed, monthly fees, contention ratios, terminal dimensions and other aspects affecting the price/quality ratio of maritime broadband.

The new comparison results will be presented in Q4 of this year.

Stratos adds Port-IT antivirus to AmosConnect

www.stratosglobal.com
www.port-it.nl

Stratos Global is to integrate the Port-IT Antivirus system, from Dutch maritime IT provider Port-IT, into its AmosConnect product portfolio, where it will form the basis of Stratos' AmosConnect Anti-Virus solution.

This new version of AmosConnect Anti-Virus will be used to protect IT networks from the threat of virus infection, and it is hoped that the creation of a combined service will reduce the amount of data traffic sent over satellite in managing these processes, minimising airtime costs.

The Port-IT Antivirus service operates on clustered server systems and uses custom antivirus updates from ESET NOD32, with vessel-based license management and administration via an online portal.

"Through several successful customer trials, the Port-IT Antivirus has proven to be a reliable service that can help ensure a secure onboard IT infrastructure. It is a valuable complement to our AmosConnect product portfolio," said Ian Canning, VP global product marketing at Stratos.

"For years, Port-IT has been an important contributor to our AmosConnect platform. This agreement will help us continue to benefit from their contribution in the coming years."

SES completes FBB installation for BP

www.ses-marine.com

Ships Electronic Services (SES), a maritime communication and navigation electronics provider, has announced the completion of a contract with BP Shipping. Under the agreement SES has supplied 25 ships with Thrane and Thrane's FleetBroadband 250 systems.

The installations were completed on schedule taking place all over the world during short-term docking for engine room upgrades at short notice.

"We have worked with SES as our supplier for many systems, including the FleetBroadband upgrades for a number of years. We believe this to be an economical solution with technical back-up and after sales service," says Bob Ball, electrical superintendent BP Shipping.

"We are delighted that BP Shipping has once again chosen SES as their leading supplier of communication equipment," adds Colin Anderson, a Director of SES.

"Both in the past and recently with the upgrade to the Thrane and Thrane FleetBroadband systems, we have provided continual technical support for the entire BP fleet. This recent contract proves that SES's reputation for excellent customer service and cost effective solutions continues to stand."

BP's British Cormorant is carrying a Thrane and Thrane FleetBroadband 250 by SES

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We don't need VSAT

Progressing satellite communication technology and continuously growing demand for data have made VSAT an appealing option for some. However, many companies still believe that their data usage does not justify the investment. Swen Kleinau and Frank Schoone of Buss Data GmbH, part of organisation Reederei Buss, a German shipping company, told *Digital Ship* why they don't need VSAT

Leer-based organisation Reederei Buss, managing a fleet of nearly 90 vessels, is in the process of implementing a major change in its satellite communication systems. Over half of the company's fleet has been equipped with FleetBroadband so far, and the roll-out is continuing.

The shipping company has been advised in this process by its in-house maritime software and hardware solutions company, Buss Data, which, as organisation Reederei Buss' outsourced IT department, has become a valuable partner.

Buss Data's deliberations on a new satellite communication solution started with the impending construction of a number of new vessels in 2008/2009, which organisation Reederei Buss decided to equip with a modern satellite communication system that would satisfy the company's demand for data traffic.

In addition to the newbuilds, the existing fleet, having previously employed Inmarsat Mini-M as well as Fleet 77 systems onboard its vessels, was to implement the new technology in a roll-out starting in early 2011. Swen Kleinau, IT manager, Buss Data, recalls the thoughts at the outset of the implementation.

"Satellite based communication is the most important medium for shipping companies nowadays and the charterer demands round-the-clock availability of communication technology," he says. "This is why we decided to make a major investment into a comprehensive modernisation of our systems."

"We are building a lot of new vessels and didn't want to install an outdated Fleet 77 preliminarily and for a lot of money. Instead we wanted to settle for the newest technology straight away."

"Whilst the newbuilds were supplied with FleetBroadband, I had a look at the rest of the fleet last year. An assessment of the communication requirements of our fleet showed me that we had very high communications costs with our solutions, Mini-M and especially with Fleet 77. In addition we found out that we had extremely high costs of repair for the Fleet 77 systems, mainly because we had to send out a lot of technicians."

"We notice that a lot of shipping companies don't take this approach," says Mr Kleinau. "Not every company employs a specialist, like Buss Data, who monitors the satellite communications market and the newest developments and who is able to advise on this."

A new satcom is needed

When organisation Reederei Buss decided to deploy a new satellite communication technology on its entire fleet, cost calculations played an important role, but it was Buss Data's technical considerations that tipped the scales.

Buss Data had experienced certain recurring difficulties with organisation Reederei Buss' prior communication technology. Mr Kleinau notes that the Fleet 77 system especially was so prone to problems that Buss Data had to stock spare parts in the office.

The bulky spare parts had to be consigned by a special carrier, which was time consuming and costly, and technicians had to be sent out to the vessels in order to install them wherever the problem occurred.

"More often than not, by the time one spare part had been dispatched the next one had broken so that we didn't have enough spare parts to send. Also, the spare parts had to be sent from the office because in most cases there were none available locally," recalls Mr Kleinau.

"Our key consideration was that there was a new technology available that would promote the company's business and that would provide less repair costs," he adds. "Besides, the benefit of better crew retention played into choosing a new communication solution as well."

Frank Schoone and Swen Kleinau run tests and train staff on their office FleetBroadband

FleetBroadband vs VSAT

Buss Data draws on 15 years of experience in optimising communication processes and systems in the shipping industry.

This expertise and the company's focus on improving its operational efficiency has resulted in a customised communication strategy for the shipping company that encompasses tailor-made software, strict crew training and planned maintenance. It is the implementation of this strategy across the entire fleet, in combination with the new technology that has enabled Buss Data to minimise its communication costs.

Prior to deciding on the new satellite communications solution, Buss Data projected its communication traffic demand for the coming five years. The comprehensive comparison contained the estimated traffic demand as well as pricing structures, coverage areas, technical specifications and available service networks for the different solutions.

The traffic requirements are based on the company's usage policy. Buss Data's communication strategy encompasses a number of methods and technologies to minimise the traffic amount, which has been estimated to average 50 MB per vessel per month. On this scale Buss Data determined that a FleetBroadband solution is more economical than a VSAT package.

Additional factors in favour of FleetBroadband were the fact that organisation Reederei Buss vessels require global coverage, which VSAT does not offer, and Buss Data's conviction that the VSAT technology would be less sturdy with its larger antenna and amount of technology inside. Technical problems were not expected with the deployment of FleetBroadband.

"The FleetBroadband in our office provides spare parts, which we can send out to our vessels if this is the quickest way of replacing a faulty part," comments Mr Kleinau.

"In an emergency we can pick up the spare part and fly over to where it is needed and plug it straight in. This plug-and-play is extremely economic," adds Mr Schoone.

"Another advantage with FleetBroadband is that the dimensions are significantly smaller. To send out other systems we would have to use bulky luggage, which needs to be dispatched separately. That costs a lot of time, whereas in case of an emergency the FleetBroadband antenna can be treated as hand luggage."

"We also foresee problems in finding VSAT qualified technicians to maintain the equipment and be at hand if there is trouble. These problems do not occur with FleetBroadband."

Mr Schoone further stresses the importance of service availability for the company as a main factor in its decision-making process.

"When we buy hardware we do not primarily focus on the price but we look at the service coverage. That's the critical point," he says. "What use is cheap hardware for us if there is no service? If we have to send out a technician just once, we have lost the benefit of buying cheap."

"Nowadays, the pressure is so high – if satellite communication is missing, it simply has to be fixed in the next port. There are no ifs or buts."

DIY FleetBroadband installation

Buss Data has devised a strategy for the parent shipping company, organisation Reederei Buss, that keeps communication costs at 0.5 per cent of the vessel's budget.

In order to economise on expenses Buss Data introduced a number of measures, ranging from tailor-made manuals for a crew-conducted FleetBroadband installation, carefully planned maintenance and particular crew training, to the use of efficient bespoke software.

"When we look at other shipping companies, especially if we take over vessels, we see that our communication costs are very low in comparison. Other shipping companies invest 3-4 times more than us for standard communications," says Mr Kleinau.

"They don't do more than us but there are a number of factors which drive their costs, such as the wrong email program, incorrect settings, and insufficient training of the staff using the different communication equipment."

Buss Data's strategy on minimal communication costs covers every stage of the process, and the economisation starts as early as the installation of the FleetBroadband system. Mr Kleinau explains how he studied the ins and outs of the new technology.

"When we received the first newly built vessel we had a close look at the FleetBroadband installation to see how it worked and how it had to be set up, and

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A FleetBroadband installed in the office helped Buss Data to develop a DIY manual for the deployment

we had a very comprehensive introduction from our FleetBroadband supplier, Imtech Marine," he says.

"This was important to us since FleetBroadband was a completely new technology and we wanted to deploy our vessels in the best way possible. Further we wanted to minimise the risk of hidden costs. We even placed a FleetBroadband into our office so we could run tests on it, for example with new software. This also allows for FleetBroadband training in our office."

In addition to learning as much as possible about the deployed systems, Buss Data developed a DIY strategy of implementing the technology using thoroughly instructed crew, without a technician having to be present onboard.

The technology department created a detailed and foolproof set up manual, which is sent out to the vessel together with the FleetBroadband equipment. The manual contains a picture-by-picture explanation of every single step, including how to plug in the antenna cable, how to attach the shrink hose or how to configure the FleetBroadband.

"The set up is made so easy for the crew," explains Mr Kleinau. "Our unique four-page manual reads like a storybook. We have covered all eventualities and answered all questions."

"In addition, we set up 24-hour support hotlines for IT and hardware questions during this period, so that any problem can be solved immediately."

The equipment is preconfigured in the office before it is sent out to the vessel. The settings cannot afterwards be changed, thus security breaches during the installation have not been an issue for Buss Data.

Mr Schoone illustrates how the crew puts the system together. "The actual installation is very straightforward," he says. "We have constructed a base adapter made from stainless steel. This ensures that the crew onboard has no 'hotwork', no drilling or welding to do."

"The old Fleet 77 is uninstalled and the adapter simply screwed onto the old base. Then the new FleetBroadband antenna is screwed into the adapter. There is basically not much that can go wrong."

Buss Data's experience with this DIY method has been entirely positive and no problems have been encountered during the ongoing roll-out so far. The company has found the crew very supportive as they are eager to avail themselves of the new technology.

The complete set up of a new FleetBroadband system is thus done within one working day without any additional costs other than the delay in port.

Hardware management

Once the new equipment has been deployed Buss Data employs further methods to minimise the communication costs. One example is a planned maintenance scheme, which includes a hardware management system that contains the entire fleet's technology specifications.

This has been developed by Buss Data and is utilised through Navicom, the technician service department for bridge equipment at Buss Data, managed by Mr Schoone.

The bespoke system allows the company to track the life cycle of its hardware, such as computer, gyro, radar and satellite communication systems. All new devices are entered into the software with information covering the date of their initial operation, the guarantee, the battery life, fixed check-up dates and an expected life-span.

"One click makes all the hardware deployed on the entire fleet visible, including its history, executed repairs, service records, maintenance periods, expiry dates for warranties, battery life and much more. This data allows for an unparalleled overview," says Mr Kleinau.

A specific time frame is set for each component. Once the 'use-by' date is reached the hardware is exchanged. This routine replacement, even of fully functional devices, has been devised to largely prevent repair costs.

Buss Data has found, from experience, that most components are thus exchanged before they break and before the maintenance costs exceed the rest value of the equipment.

If difficulties occur and repairs become necessary, Buss Data has developed a strategy for keeping repair costs to a minimum, whereby the crew has been instructed to email a detailed description of the fault to the office together with a request for technical assistance.

Buss Data says that more than half of the repair requests from the vessels are

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successfully dealt with via email. Often, the support finds that a problem stems from a simple cause such as a loose screw or connection, and is easily fixed.

Buss Data is saving on repair costs by sending out spare parts to the vessels and through a careful selection of, and good communication with, the crew.

"When a vessel reports a problem that can be fixed by sending out a spare part, I quickly write an instruction for the crew and send it off," says Mr Kleinau. "This solves the problem in most cases and is still much cheaper than having to pay for a technician to go."

"Another reason why we do not usually need to send out a technician or even use remote control is the fact that organisation Reederei Buss is able to rely on very skilled and profoundly trained crew. We have never had to fly anywhere because of a computer problem. We have always been able to solve these by maintaining sound communication."

"As a shipping company you have the choice to hire cheap, basically trained crew from some manning agency. Organisation Reederei Buss has decided to focus on experienced and well trained crew and a lot of the seafarers on our vessels have been with the company for many years. We trust them implicitly."

Tweaking the software, coaching the crew

Another way for Buss Data to further economise on costs is to minimise its operational traffic using software specifically configured to meet its particular requirements.

The company utilises the Vizada SkyFile email client, which compresses all emails. Buss Data's main provider, Vizada, has also set up a size restriction according to the company's specifications. If an email exceeds this an error message instantly notifies the user.

"Our email software features a function that changes the information of an email to only plain text when it is sent to vessels. In addition, the size of outgoing attachments is visible to the user, thus enabling him to minimise it," says Mr Kleinau.

In addition, the onboard computers are configured to prevent the download of regular automatic software updates, like chart updates or the company's own software products. Instead the installation is adjourned until the ship reaches the next port, to where a CD with the update is dispatched.

Ultimately, Buss Data sets much store by carefully instructing and coaching its employees. Staff onboard as well as in the office are trained in the use of the new communication equipment. This essentially focuses on priming the employees' understanding of marine communication systems, including their costs and limitations.

"The internet generation has grown up knowing quasi limitless connection availability and speed and is not used to thinking twice," says Mr Kleinau. "Crew starting to work now don't know that an MB can easily cost $10 USD."

"At Buss Data we train and instruct both our office staff on shore and the crew onboard to handle communication conservatively. That includes a careful review of the content sent."

The installation of FleetBroadband has reduced costs to a third of what they were with the prior system

"We train our staff to check before sending a document that the vessel has not already received the information, or if attachments can be reduced in size, for example, by using our own pdf shrinker. We make sure our staff know not to use high resolutions when sending images."

"The internet is a hot potato. One has to think thoroughly about the benefits of allowing internet access and take all related security issues into the equation," says Mr Kleinau.

Costs reduced to 30 per cent

Buss Data's decision to embark on a FleetBroadband implementation fleetwide was predominantly based on the company's goal to minimise communication costs. Even though the implementation has not yet been concluded, Buss Data has already assured a gratifying result.

"By introducing FleetBroadband we have been able to reduce our already comparatively low communication costs to a third of what they were with the prior system. This makes the FleetBroadband implementation very economical," says Mr Kleinau.

"In addition, we have not had a single incident with the FleetBroadband necessitating repair expenses. The introduction of FleetBroadband onto our vessels has already paid off through the savings on repair costs."

Apart from the cost reduction, the integration of FleetBroadband has had a tangible impact on operations.

The amount of data traffic has increased, with Buss Data's average traffic being less than 50 MB per vessel per month before the exchange of communication systems, increasing to around 50 MB on average today.

The company attributes this increase in data traffic to the improved bandwidth, as well as the fact that the crew can send more data and that the charterers make more use of the better communication possibilities.

In addition, organisation Reederei Buss vessels enjoy a wider variety of software under the new technology which also increases the amount of data transferred. The software developed by Buss Data, such as OrderStar, RouteStar, MaintStar, ClaimStar, requires regular data transfers.

However, the programmes have been designed to send only data classified as important. In addition, pictures are automatically reduced to the smallest possible size containing all information.

Even though remote maintenance has been made more feasible through the introduction of FleetBroadband, Buss Data has not replaced its previous way of solving technical problems.

"Over the last 15 years we have mainly done service by email, where other shipping companies would have flown a technician to the vessel, and have very good experience with it. In about 95 per cent of the cases we get the problem fixed via email," says Mr Kleinau.

"In the remaining cases of software failures we use a tool called Teamviewer, which allows us to have direct access to the PC onboard from the office. Teamviewer only transmits what is shown on the monitor, no other data, and is therefore very efficient. And we make sure that whatever we have to do to fix the computer uses a minimum of transferred data, e.g. small update files."

"Remote access via FleetBroadband is still more economical than flying out to the vessel. Of course we have to assess how important the problem is and if it can be resolved using emails. If not, it is useful to have this kind of monitoring tool at hand too," adds Mr Kleinau.

The implementation of FleetBroadband has also had positive implications for organisation Reederei Buss' crew.

Mr Kleinau reports that "our seafarers are happy that we have introduced a new satellite communication system that provides them with cheaper airtime rates on their prepaid cards and better communication, and they appreciate that we do this even in times of economic crisis."

Future plans

However successful the roll-out of the FleetBroadband system has proved, Buss Data has not ceased planning ahead.

Although the new solution is hoped to last for a minimum of two to three years, the company is giving consideration to evolving technologies, such as the recently announced Inmarsat Global Xpress.

"We will monitor the market and our activity closely over the next few years and then decide if an additional VSAT or a different new solution has to be deployed on the vessels," explains Mr Kleinau.

"Whether Buss Data will consider Global Express or not will depend on Inmarsat's politics. We will think about it only if our communication costs reach the critical limit. As long as communication costs do not drop to $ 1/ MB we will monitor our attitude towards communication closely."

With the strictly efficient cost minimisation system Buss Data and organisation Reederei Buss are employing, it seems unlikely that the company will have to reconsider its choice of satellite communication soon. However, ongoing progress in technology and the present competitive environment in satellite communication solutions may entice the Leer-based company to think again.

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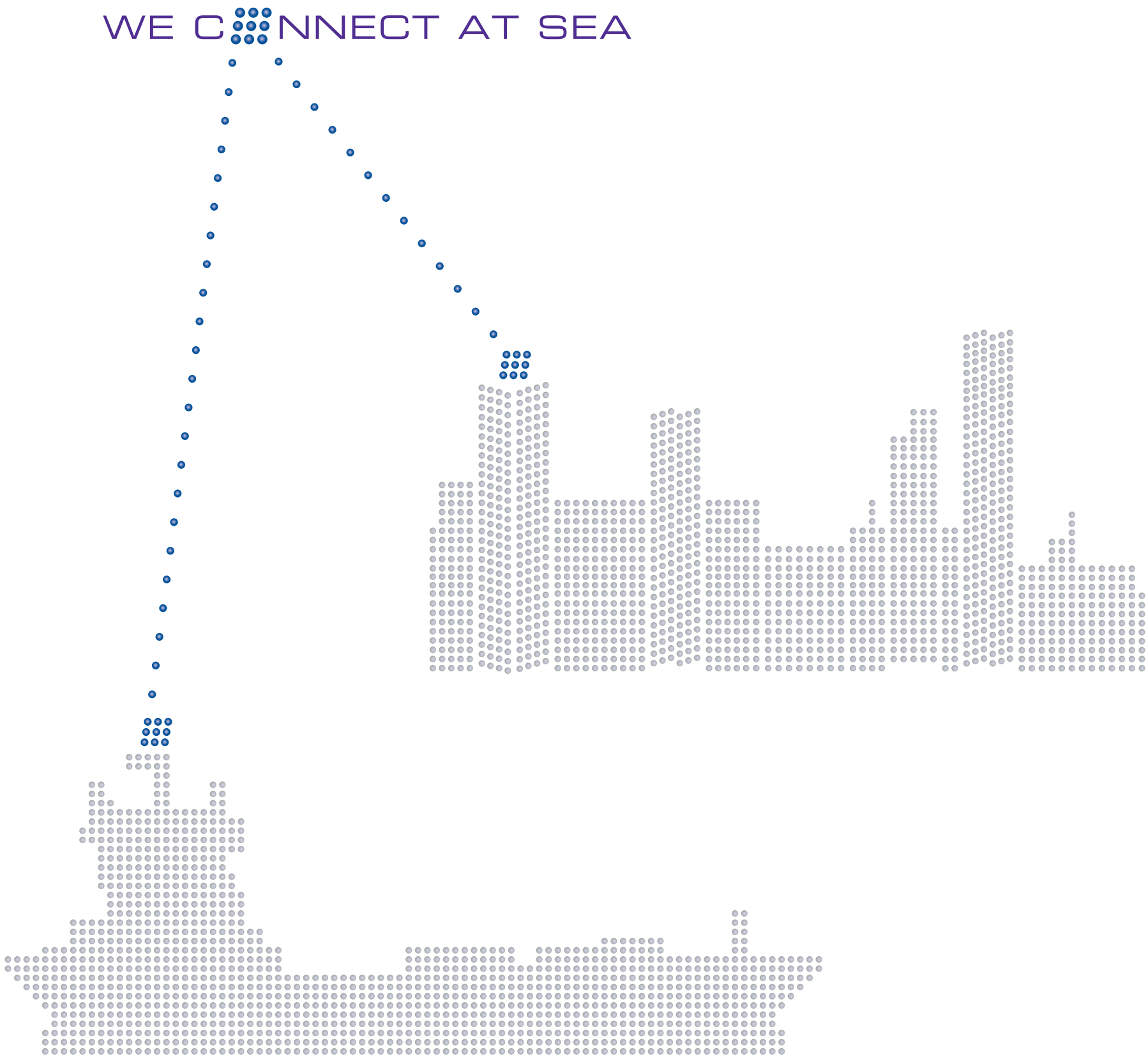

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Fleetwide FleetBroadband for Harren & Partner

Harren & Partner's deployment of FleetBroadband across its fleet is nearing completion. The roll-out, encompassing the company's fleet of 57 vessels, has delivered a number of benefits as well as throwing up a few new challenges. Caspar Graf von Spee, company director, has told *Digital Ship* about his experience with the new technology

German shipping company, Harren & Partner, realised towards the end of 2008 that its shipboard communications system was in need of replacement and decided to execute a fleetwide upgrade, introducing FleetBroadband to replace its existing Inmarsat services.

So far around 40 FleetBroadband systems have been deployed onboard the company's vessels. The remaining ships will be continuing the exchange of their systems on a one-by-one basis.

The Bremen-based company started its roll-out by substituting the fleet's existing technology, Inmarsat Mini-M and Inmarsat-B systems, for the new satcoms. In a final step Harren & Partner has now also started disposing of its remaining Fleet 77 systems.

Choosing a new satcom

The driving factor in Harren & Partner's decision on which satellite communication technology to employ was the costs. Caspar Graf von Spee, director, Harren & Partner, recalls how data transfer efficiency, in particular, affected the company's ultimate choice.

"We had a look into our communication costs with regards to the data traffic and we found out that it amounts to more than 80 per cent," he says. "And it turned out that the old systems and the slow speed traffic was really driving the costs high. Therefore we decided to exchange the systems for a new technology."

Having assessed the overall demand and its monthly communication volume, Harren & Partner proceeded to look into different FleetBroadband and VSAT options. There were two main reasons why the company chose FleetBroadband over VSAT.

"VSAT is the most cost efficient system when you have a lot of traffic," he says. "Harren & Partner does not use communications technology to the extent where a VSAT would be needed. We have estimated that at present our vessels have a traffic amount of around 30 - 40MB per month on average."

"Another reason for choosing FleetBroadband over VSAT was the way our vessels are operating. We don't know where the vessel will be tomorrow. FleetBroadband, as opposed to VSAT, operates worldwide. The coverage on VSAT systems is a bit troubled and less reliable."

Harren & Partner calculated that, with the estimated amount of traffic, a FleetBroadband system would be the most cost efficient solution. However, those calculations have proven to be too conservative as the throughput is already exceeding estimations before the roll-out has even been completed.

"It was realistic during that time," says Mr von Spee. "We found we had an average traffic of 20 MB per vessel per month and took into account that it will rise a bit, which it did. Now that we are implementing FleetBroadband, however, we already have an average traffic of 50 MB per vessel per month."

The company has identified two reasons for the unexpectedly steep increase. One is that the FleetBroadband system facilitates the throughput of a much higher data volume, and the other is that the implementation of the new satcom solution has generated a change in how the vessels are being operated.

"With the implementation of the new systems, the crew has adjusted its behaviour towards satellite communication. We just don't think about whether to send a certificate or not, we just send it," explains Mr von Spee.

Surprisingly, crew retention, often mentioned as a major driver in satcom upgrades, has not played a role in Harren & Partner's decision, as Mr von Spee explains.

"The crew had the possibility to use the email systems before and they have got the possibility now," he says. "The difference is that, with FleetBroadband, we have free email now. The system we employ, called crew mail, is free of charge for them."

"It's difficult to measure the effect on the crew if you provide a free email system as opposed to a prepaid one. I appreciate having this availability but I cannot say if this results in more people coming back."

Overall, Harren & Partner has not seen, in its experience, that providing communication options plays a significant role in crew retention, and believes that the difference between the varied satcom solutions is barely relevant to the crew.

Benefits and challenges of a new satcom solution

So far, Harren & Partner has been happy with the results of the implementation. The expected expense reduction has been realised and the company has been able to minimise its communication costs from around $40-50 per MB using the Inmarsat-B system to around $10 per MB using FleetBroadband.

With the new system, an average of 50 MB is transferred per vessel per month. To what extent this is crew generated is, according to Mr von Spee, difficult to gauge. He is however not concerned about the possible increase in private use.

"We do not monitor the costs for the chat cards that the crew uses privately to use the telephone," he says. "With regards to data traffic, email use etc, it is probably less than 10 per cent of the overall traffic that is used for private purposes. We do not analyse that."

"I appreciate that this easy communication possibility is available for the crew and that they can contact their families and loved ones at home."

Another significant difference is seen in the improved connection speed. Mr von Spee says that with the old systems Harren & Partner paid for connections that never reached the promised speed, whereas under FleetBroadband the company pays significantly less and avails itself of a faster and more reliable connection.

With the new communication technology and the higher throughput Harren & Partner deemed it wise to put certain control systems in place to ensure that usage did not get out of control and result in unexpected bills.

The first step was to control the operational traffic. In order to prevent an unnecessarily high volume of data traffic all automatic software updates were disabled. In addition, Harren & Partner installed an antivirus system as well as a firewall. A further control provision was implemented which restricted the accessible ports.

The company also agreed with its provider to implement a notification system which would signal when a certain amount of traffic had been reached within a set time frame. This enabled Harren & Partner to review the traffic, assess what had caused the excess costs and take appropriate measures.

Harren & Partner has further started to instruct its shore side staff and shipboard crew to use the new communication systems carefully. The officers are trained to improve their awareness of the technolo-

FleetBroadband has delivered a higher connection speed and a cost efficient communication solution for Harren & Partner

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'Now we are implementing FleetBroadband we already have average traffic of 50 MB per vessel per month' – Caspar Graf von Spee

gy, and measures such as the use of compressors are recommended to keep the traffic down.

For additional cost control on the crew side, the crew mail solution was restricted to text messages. Moreover, the system would not accept attachments.

"We do not see this as a disadvantage since there is not really much that the crew would want to send apart from what they can write down. The main thing is that the crew is always able to communicate," explains Mr von Spee.

"These measures lead to sufficient cost control. Communication is there to serve the operation."

Having achieved a very satisfactory result overall, the implementation of the FleetBroadband has nonetheless caused a few difficulties. Mr von Spee elaborates on the challenges during the deployment.

"The installation downtime caused a problem, as did security issues with regards to network security risks," he says.

"We had to deal with these problems, especially since the systems were not designed to work together without explanation and training. The computers are predesigned to look for updates every now and again. If an internet connection on a vessel is used, it is a costly experience."

"Another challenge was to introduce the crew to the use of FleetBroadband and instruct them to employ the new systems accordingly. We underestimated the difficulties of training the crew in the use of the new satcom."

Using the new technology

Higher connection speeds and a cost efficient communications solution were the targets for Harren & Partner in the decision to install a FleetBroadband system. These have been successfully achieved.

However, the company has moved beyond its initial plans and set up a virtual private network (VPN) connecting the office in Bremen and the company's fleet of vessels.

The decision to establish a VPN was predominantly based on the potential to support the fleet from the office rather than having to send a technician onboard, which had previously been the only way to resolve technical problems. This had proved to be not only time consuming but also costly.

Difficulties arising from the implementation of the FleetBroadband system, as well as all other IT related problems, are now initially assessed through the VPN before any measures are taken. For Harren & Partner the VPN has thus proved to be a very useful addition.

"We wanted to be able to handle problems remotely by having a look at the system and seeing if we could fix the problem instead of sending someone out. Normally these systems are stable but there are various small changes that can be affected accidentally by the crew," says Mr von Spee.

"Ashore we often can't imagine how annoying it can be to be left alone with a malfunctioning system and there is nobody within 3,000 miles able to help. And the crew is not really trained for communication systems. It's not their job. They are users."

Technological progress and the recent announcement of Inmarsat's Global Xpress Ka-band service (available from 2013) suggest an even broader range of communication options via satellite in the future.

Harren & Partner, enjoying the benefits of its improved satcom solution, is also taking the possibility of moving on to Global Xpress into consideration. However, the company has very decided views on the topic.

"It's a cost decision and it all depends on our needs. We have different categories of communication on various vessels and some vessels are very intensively communicating due to their operational functions' needs," says Mr von Spee.

"For those vessels we would consider implementing a different technology depending on the individual needs. But we will monitor the technology as it develops as well as our own needs in terms of traffic."

Having successfully gathered first-hand experience of implementing FleetBroadband, Harren & Partner has valuable advice for shipping companies looking into a new satcom solution.

The company has found that the most basic, and simultaneously most important, first step is to assess all of the many relevant variables and make careful calculations before reaching a decision.

Besides the acquisition costs for the technology, says Mr von Spee, a company should assess the possibility of support from shore, the service network available, and of course the operating costs. The system should further be sourced from not only one supplier but from many, in order to ensure a variety of choice.

Whether FleetBroadband proves to be a long lasting choice for Harren & Partner remains to be seen. Unexpectedly steep growth in traffic, as well as the expected improvements in technologies and pricing structures, could be cause for a re-think. However, for the time being the German company has made a choice which it can strongly recommend. DS

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Moving to FleetBroadband – is it worth it?

With satellite communication costs continuing to fall, utilising the additional efficiencies possible with the latest technology can mean that upgrading from a previous generation of satcom system can have a significant effect on monthly expenditure. *Roger Adamson, Stark Moore Macmillan,* examines the possible return on investment for Inmarsat customers considering an upgrade

Service	Voice Per minute	% Saving using FleetBroadband	Data Per Mbyte	% Saving using FleetBroadband
Inmarsat-B	$1.45	54%	$22.68	60%
Inmarsat Fleet F55/F77	$1.15	43%	$17.60	47%

During 2011 Inmarsat initiatives to drive the cost of FleetBroadband voice calls to $0.55/minute have led to significant changes in Inmarsat FleetBroadband pricing.

Market prices of standard, non-discounted, voice rates have correspondingly fallen by more than 40 per cent from greater than $1.10/minute to around $0.66/minute.

Coupled with this has been a less dramatic, but steady, decline in the price of standard IP data during the first half of 2011.

It is estimated that there are currently circa 8,000 maritime Inmarsat-B terminals still in operation worldwide. Given a merchant fleet of a little over 40,000 vessels this means that 1 in 5 vessels operating today may be equipped with an Inmarsat-B system.

It is further estimated that there are more than 12,000 Inmarsat Fleet terminals also in operation within the world's merchant fleets.

Both systems provide voice and data solutions which are slower and more expensive than Inmarsat FleetBroadband. Ship operators with Inmarsat-B or Inmarsat Fleet terminals can realise very significant savings by switching from these legacy systems to FleetBroadband.

Additionally, FleetBroadband also provides access to enhanced data services unavailable on these legacy systems.

With the new pricing levels typical Inmarsat-B users with a 40:60 split of voice and data traffic, and spending $1,500 per vessel per month, can now expect to see monthly cost savings increase from 39 per cent to 57 per cent when switching to FleetBroadband.

Higher savings are still seen with higher levels of data utilisation but this is no longer as pronounced. Correspondingly lower savings will be achieved with higher levels of voice traffic but these lower savings are only of the order of a few per cent.

An average user can now expect return on investment (ROI) in less than 11 months when installing a FleetBroadband FB250 system, down from 15 months prior to price changes.

Typical Inmarsat Fleet users with a 40:60 split of voice and data traffic and spending $1,500 per vessel per month can expect to see cost savings rise from 25 per cent to 45 per cent. As with Inmarsat-B higher levels of data utilisation will realise higher savings.

An average user can expect to see a ROI in the order of 13 months when implementing a FleetBroadband FB250 system, down from 24 months prior to price changes.

The above savings and payback periods are calculated using FleetBroadband standard airtime rates, with no contract commitment. Greater savings still can be achieved when using FleetBroadband in conjunction with monthly data bundles, Shared Corporate Allowance Plans (SCAP) or entering into a hardware and airtime purchase deal.

The following article provides comprehensive data on the savings that can be made when switching to FleetBroadband across a range of monthly vessels' expenditure and splits of voice and data traffic. In order to use this information to examine your own company's situation, you will need to know:

- approximately how much your vessel spends per month on using its Inmarsat-B or Fleet terminal and;
- the approximate percentage split between voice and data traffic

Using the tables and charts provided here you will be able to calculate how much you can save on your monthly airtime bill and also the payback period when installing a replacement FleetBroadband FB250 unit.

Comparison of different systems

There are in the region of 8,000 Inmarsat-B systems still in operation in the commercial maritime sector. Such systems are now approaching the end of their operational life and ship operators should be considering replacing them.

Upgrading these terminals to FleetBroadband will provide ship operators with far greater operational efficiencies through access to more and faster data services and applications.

Typical usage patterns also show that significant cost savings can be realised by upgrading to FleetBroadband. Inmarsat Fleet F55 and F77 users can also realise significant cost savings from faster and cheaper data services offered by FleetBroadband.

Research undertaken by H2OSatellite shows that typical monthly vessel satellite communications expenditure equates to approximately $1,100. Vessels fitted with Inmarsat-B show an average monthly spend in the region of $1,500, whilst FleetBroadband equipped vessels have an average monthly expenditure just below $1,000.

In cases where vessels are transferring similar amounts of data and voice the savings are accounted for by the differential in price of the services used.

Typical prices and percentage savings gained by moving from Inmarsat-B and Inmarsat Fleet to FleetBroadband can be seen in the table above.

Inmarsat-B

To demonstrate the savings that can be realised using FleetBroadband in place of Inmarsat-B, we will take the example of a typical vessel spending $1,500 per month on its Inmarsat-B communications.

We will assume that the vessel is spending 60 per cent of this amount on data traffic and 40 per cent on voice traffic.

As can be seen from Table 1 (below) this equates to a monthly utilisation of 40 megabytes of data and just over 400 minutes of voice. Calculating the cost per megabyte using Inmarsat-B is done by first ascertaining the time needed to transfer 1 megabyte of data.

This meant taking the theoretical maximum throughput of a 9.6 kbps link (72 Kbytes/minute), adding an overhead of 10 per cent to cover handshake time etc. and then dividing that throughput figure (65.5 Kbytes/minute) into 1 megabyte.

This gives a figure of 15.63 minutes to transfer 1 megabyte of data at a cost of $22.67. In our example the vessel spends $900 on data traffic equating to just under 40 megabytes.

Table 2 (below) highlights the corresponding cost of the same usage pattern

		Inmarsat-B Monthly Data & Voice Usage					
		$1,000		$1,500		$2,000	
Data	Voice	MB	Mins	MB	Mins	MB	Mins
0%	100%	0	690	0	1034	0	1379
10%	90%	4	621	7	931	9	1241
20%	80%	9	552	13	828	18	1103
30%	70%	13	483	20	724	26	966
40%	60%	18	414	26	621	35	828
50%	50%	22	345	33	517	44	690
60%	40%	26	276	40	414	53	552
70%	30%	31	207	46	310	62	414
80%	20%	35	138	53	207	71	276
90%	10%	40	69	60	103	79	138
100%	0%	44	0	66	0	88	0

Table 1.

		Monthy Expenditure Using Inmarsat-B			
Data	Voice	$1,000	$1,500	$2,000	FleetBroadband Equivalent Cost
0%	100%	$455	$683	$910	
10%	90%	$451	$676	$901	
20%	80%	$446	$669	$893	
30%	70%	$442	$663	$884	
40%	60%	$437	$656	$875	
50%	50%	$433	$650	$866	
60%	40%	$429	$643	$857	
70%	30%	$424	$636	$848	
80%	20%	$420	$630	$839	
90%	10%	$415	$623	$831	
100%	0%	$411	$616	$822	

Table 2.

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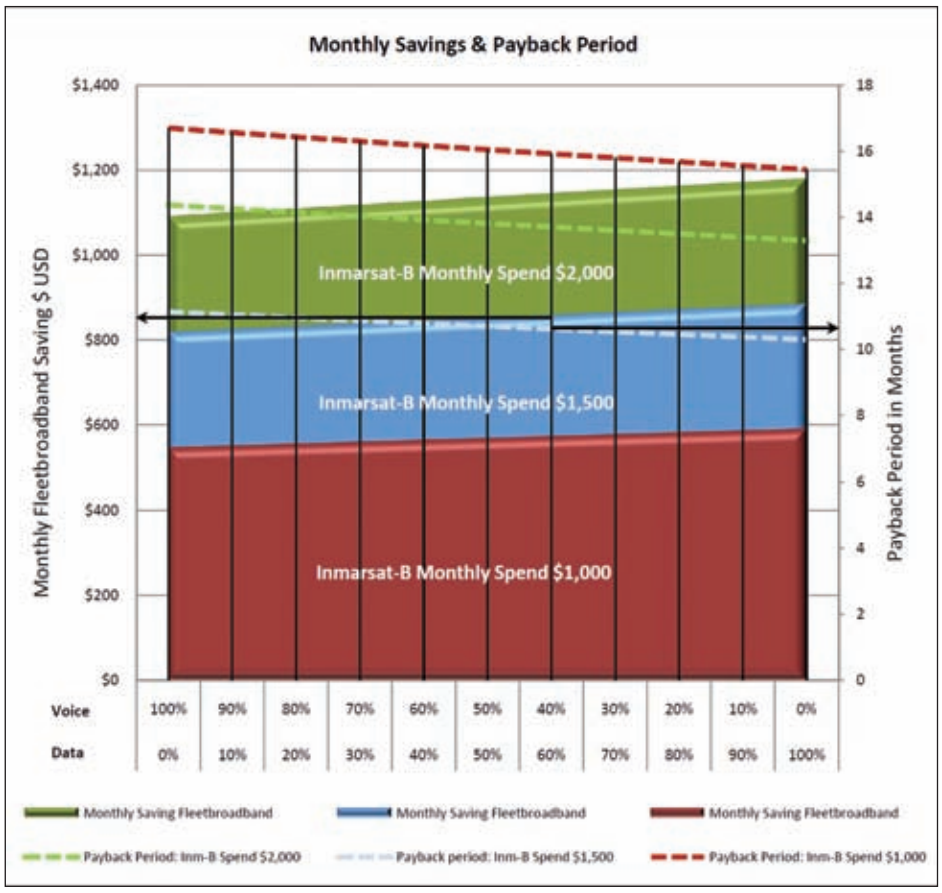

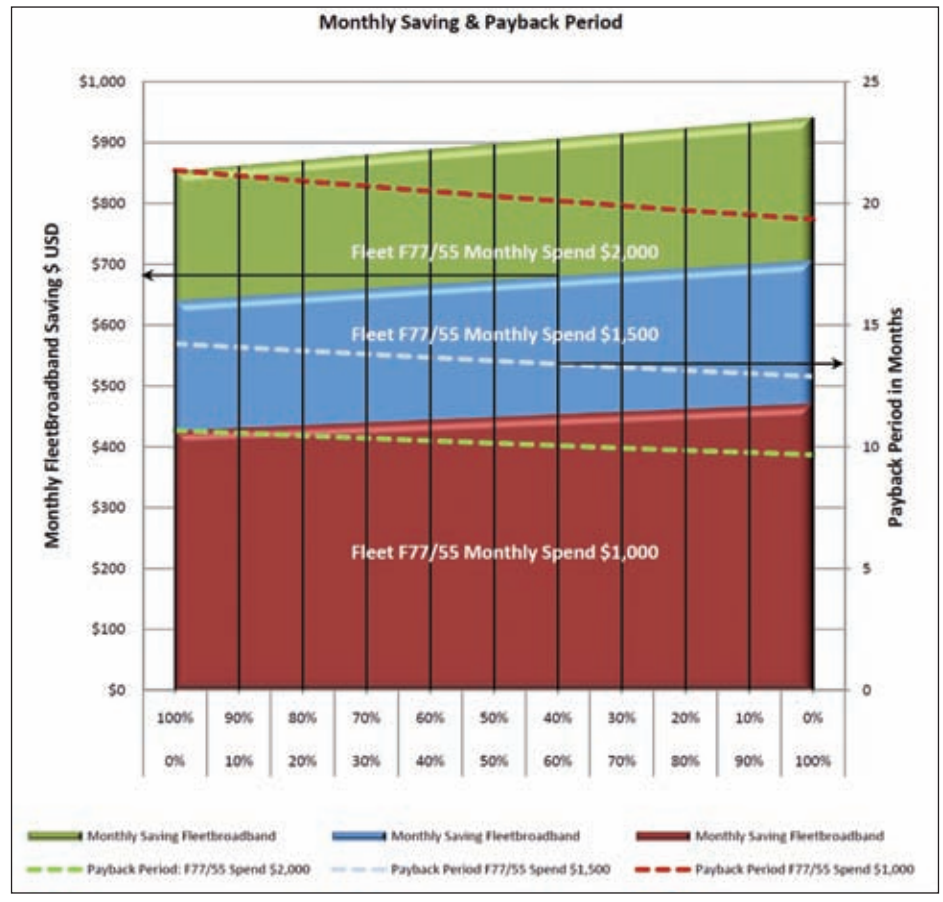

with FleetBroadband. A saving of $857 / month ($1,500 - $643) or 57 per cent can be realised under this scenario.

The graph above (left) shows the monthly savings that can be made by switching from Inmarsat-B to FleetBroadband at monthly Inmarsat-B expenditures of $1,000, $1,500, and $2,000. The graph additionally provides the payback period resulting from upgrading to FleetBroadband FB250 across the corresponding expenditure ranges.

In order to use this graph first ascertain your Inmarsat-B expenditure and the split of this expenditure between voice and data.

Use the left hand primary vertical axis to read off the monthly saving that can be gained by switching to FleetBroadband. Use the right hand secondary vertical axis, the voice/data split, and the dashed lines to ascertain the payback period for a FB250.

Continuing our example above, the monthly communication saving is just over $850 ($857) and the payback period just under 11 months.

The payback period is based upon a JRC 25 FB250 with a typical retail price of $7,600 plus $1,500 for the onboard installation – in total $9,100.

The example given here provides only three Inmarsat-B monthly expenditure ranges, however a more detailed examination of a range of monthly expenditure bands from $500-$2,000, in increments of $100, is shown in the 'Comparison Tables – Inmarsat-B' (see next page).

For each of the expenditure bands from $500 to $2,000 we have calculated a saving of between 54 per cent and 59 per cent.

Based on these figures we would see payback periods ranging from 33 months ($500 per month, using 70-100 per cent voice) down to 8 months ($1,900 per month, 50 per cent split on voice and data).

All calculations have been made using standard, non-discounted, FleetBroadband rates. Further savings can be realised from data bundle plans, Shared Corporate Allowance Plans (SCAP) or lease purchasing equipment and airtime.

Fleet F77/F55

To demonstrate the savings that can be realised using FleetBroadband in place of Inmarsat Fleet (F77 or F55), we will again take as an example a typical vessel spending $1,500 per month on its Inmarsat Fleet communications.

We will also repeat our assumption that the vessel is spending 60 per cent of this amount on data traffic and 40 per cent on voice traffic.

As can be seen from Table 4 (below) this equates to a monthly utilisation of 47 megabytes of data and just over 522 minutes of voice. The cost per megabyte for Inmarsat Fleet using MPDS (Mobile Packet Data Service) is calculated by multiplying the per megabit charge by eight.

Given an average figure of $2.20 per megabit for Inmarsat Fleet MPDS the per megabyte charge is $17.60.

Table 5 (below) highlights the corresponding cost of the same usage pattern with FleetBroadband. A saving of $679 per month ($1,500 - $821) or 45 per cent can be realised under this scenario.

The graph above (right) shows the monthly savings that can be made by switching from Fleet F77/F55 to FleetBroadband at monthly Fleet F77/F55 expenditures of $1,000, $1,500, and $2,000.

The graph additionally provides the payback period resulting from upgrading to FleetBroadband FB250 across the corresponding expenditure ranges.

To read this graph first ascertain your Fleet F77/F55 expenditure and the split of this expenditure between voice and data.

Again, use the left hand primary vertical axis to read off the monthly saving that can be gained by switching to FleetBroadband. Now use the right hand secondary vertical axis, the voice/data split, and the dashed lines to ascertain the payback period for a FB250.

Continuing our example above the monthly communication saving is just under $700 ($679) and the payback period is 13 months.

The payback period is similarly based upon a JRC 25 FB250 with a typical retail price of $7,600 plus $1,500 for the onboard installation – in total $9,100.

The example given here provides only three Inmarsat Fleet monthly expenditure ranges, however a more detailed examination of a range of monthly expenditure bands from $500-$2,000, in increments of $100, is shown in the 'Comparison Tables – Inmarsat Fleet' (see next page).

For each of the expenditure bands from $500 to $2,000 we have calculated a saving of between 43 per cent and 47 per cent.

Based on these figures we would see payback periods ranging from 43 months ($500 per month, using 100 per cent voice and no data) down to 10 months ($1,900 per month, 70 per cent data usage).

All calculations have been made using standard, non-discounted, FleetBroadband rates. Further savings can be realised from data bundle plans, Shared Corporate Allowance Plans (SCAP) or lease purchasing equipment and airtime.

		Inmarsat Fleet F77/55 Monthly Data & Voice Usage					
		$1,000		$1,500		$2,000	
Data	Voice	MB	Mins	MB	Mins	MB	Mins
0%	100%	0	870	0	1304	0	1739
10%	90%	6	783	9	1174	11	1565
20%	80%	11	696	17	1043	23	1391
30%	70%	17	609	26	913	34	1217
40%	60%	23	522	34	783	45	1043
50%	50%	28	435	43	652	57	870
60%	40%	34	348	51	522	68	696
70%	30%	40	261	60	391	80	522
80%	20%	45	174	68	261	91	348
90%	10%	51	87	77	130	102	174
100%	0%	57	0	85	0	114	0

Table 4

		Monthly Expenditure Using Inmarsat Fleet F77/55			
Data	Voice	$1,000	$1,500	$2,000	FleetBroadband Equivalent Cost
0%	100%	$574	$861	$1,148	
10%	90%	$569	$854	$1,139	
20%	80%	$565	$848	$1,130	
30%	70%	$561	$841	$1,121	
40%	60%	$556	$834	$1,112	
50%	50%	$552	$828	$1,103	
60%	40%	$547	$821	$1,095	
70%	30%	$543	$814	$1,086	
80%	20%	$538	$808	$1,077	
90%	10%	$534	$801	$1,068	
100%	0%	$530	$794	$1,059	

Table 5

Conclusions

From examining these figures it is clear to see that, in the majority of cases, FleetBroadband offers a more cost-effective option for vessel communications than legacy Inmarsat systems.

Even at the most basic level included in this analysis, spending $500 per month using only voice services on Inmarsat-B, a company would still stand to save $272 every month by switching to the more modern FleetBroadband technology.

In such a situation the biggest issue is the upfront investment required to move to the new system, but the returns seem to be swift – again, based on a $500 per month spend on an Inmarsat-B system, the user would make a return within three years.

Higher-level users could expect to see payback from their investment even sooner than that.

For a company that has $10,000 available to invest in a satcom upgrade we believe that this would represent a strong incentive to move to the latest technology. DS

This article has been adapted from a whitepaper commissioned by satcom service provider H2OSatellite, and produced by maritime marketing agency Stark Moore Macmillan. All Inmarsat pricing information has been provided by H2OSatellite. www.h2osatellite.com, www.starkmooremacmillan.com.

Inmarsat-B Monthly Data & Voice Usage

		$500		$600		$700		$800		$900		$1,000		$1,100		$1,200		$1,300		$1,400		$1,500		$1,600		$1,700		$1,800		$1,900		$2,000	
Data	Voice	MB	Mins	MB	Mins	MB	Mins	MB	Mins	MB	Mins	MB	Mins	MB	Mins	MB	Mins	MB	Mins	MB	Mins	MB	Mins	MB	Mins	MB	Mins	MB	Mins	MB	Mins	MB	Mins
0%	100%	0	345	0	414	0	483	0	552	0	621	0	690	0	759	0	828	0	897	0	966	0	1034	0	1103	0	1172	0	1241	0	1310	0	1379
10%	90%	2	310	3	372	3	434	4	497	4	559	4	621	5	683	5	745	6	807	6	869	7	931	7	993	7	1055	8	1117	8	1179	9	1241
20%	80%	4	276	5	331	6	386	7	441	8	497	9	552	10	607	11	662	11	717	12	772	13	828	14	883	15	938	16	993	17	1048	18	1103
30%	70%	7	241	8	290	9	338	11	386	12	434	13	483	15	531	16	579	17	628	19	676	20	724	21	772	22	821	24	869	25	917	26	966
40%	60%	9	207	11	248	12	290	14	331	16	372	18	414	19	455	21	497	23	538	25	579	26	621	28	662	30	703	32	745	34	786	35	828
50%	50%	11	172	13	207	15	241	18	276	20	310	22	345	24	379	26	414	29	448	31	483	33	517	35	552	37	586	40	621	42	655	44	690
60%	40%	13	138	16	166	19	193	21	221	24	248	26	276	29	303	32	331	34	359	37	386	40	414	42	441	45	469	48	497	50	524	53	552
70%	30%	15	103	19	124	22	145	25	166	28	186	31	207	34	228	37	248	40	269	43	290	46	310	49	331	52	352	56	372	59	393	62	414
80%	20%	18	69	21	83	25	97	28	110	32	124	35	138	39	152	42	166	46	179	49	193	53	207	56	221	60	234	63	248	67	262	71	276
90%	10%	20	34	24	41	28	48	32	55	36	62	40	69	44	76	48	83	52	90	56	97	60	103	63	110	67	117	71	124	75	131	79	138
100%	0%	22	0	26	0	31	0	35	0	40	0	44	0	48	0	53	0	57	0	62	0	66	0	71	0	75	0	79	0	84	0	88	0

Monthly Expenditure Using Inmarsat-B

Data	Voice	$500	$600	$700	$800	$900	$1,000	$1,100	$1,200	$1,300	$1,400	$1,500	$1,600	$1,700	$1,800	$1,900	$2,000
0%	100%	$228	$273	$319	$364	$410	$455	$501	$546	$592	$637	$683	$728	$774	$819	$865	$910
10%	90%	$225	$270	$316	$361	$406	$451	$496	$541	$586	$631	$676	$721	$766	$811	$856	$901
20%	80%	$223	$268	$312	$357	$402	$446	$491	$536	$580	$625	$669	$714	$759	$803	$848	$893
30%	70%	$221	$265	$309	$354	$398	$442	$486	$530	$574	$619	$663	$707	$751	$795	$840	$884
40%	60%	$219	$262	$306	$350	$394	$437	$481	$525	$569	$612	$656	$700	$744	$787	$831	$875
50%	50%	$217	$260	$303	$346	$390	$433	$476	$520	$563	$606	$650	$693	$736	$779	$823	$866
60%	40%	$214	$257	$300	$343	$386	$429	$471	$514	$557	$600	$643	$686	$729	$771	$814	$857
70%	30%	$212	$254	$297	$339	$382	$424	$467	$509	$551	$594	$636	$679	$721	$763	$806	$848
80%	20%	$210	$252	$294	$336	$378	$420	$462	$504	$546	$588	$630	$672	$714	$755	$797	$839
90%	10%	$208	$249	$291	$332	$374	$415	$457	$498	$540	$581	$623	$664	$706	$748	$789	$831
100%	0%	$205	$247	$288	$329	$370	$411	$452	$493	$534	$575	$616	$657	$698	$740	$781	$822

FleetBroadband Equivalent Cost

Inmarsat Fleet F77/55 Monthly Data & Voice Utilisation

		$500		$600		$700		$800		$900		$1,000		$1,100		$1,200		$1,300		$1,400		$1,500		$1,600		$1,700		$1,800		$1,900		$2,000	
Data	Voice	MB	Mins	MB	Mins	MB	Mins	MB	Mins	MB	Mins	MB	Mins	MB	Mins	MB	Mins	MB	Mins	MB	Mins	MB	Mins	MB	Mins	MB	Mins	MB	Mins	MB	Mins	MB	Mins
0%	100%	0	435	0	522	0	609	0	696	0	783	0	870	0	957	0	1043	0	1130	0	1217	0	1304	0	1391	0	1478	0	1565	0	1652	0	1739
10%	90%	3	391	3	470	4	548	5	626	5	704	6	783	6	861	7	939	7	1017	8	1096	9	1174	9	1252	10	1330	10	1409	11	1487	11	1565
20%	80%	6	348	7	417	8	487	9	557	10	626	11	696	13	765	14	835	15	904	16	974	17	1043	18	1113	19	1183	20	1252	22	1322	23	1391
30%	70%	9	304	10	365	12	426	14	487	15	548	17	609	19	670	20	730	22	791	24	852	26	913	27	974	29	1035	31	1096	32	1157	34	1217
40%	60%	11	261	14	313	16	365	18	417	20	470	23	522	25	574	27	626	30	678	32	730	34	783	36	835	39	887	41	939	43	991	45	1043
50%	50%	14	217	17	261	20	304	23	348	26	391	28	435	31	478	34	522	37	565	40	609	43	652	45	696	48	739	51	783	54	826	57	870
60%	40%	17	174	20	209	24	243	27	278	31	313	34	348	38	383	41	417	44	452	48	487	51	522	55	557	58	591	61	626	65	661	68	696
70%	30%	20	130	24	157	28	183	32	209	36	235	40	261	44	287	48	313	52	339	56	365	60	391	64	417	68	443	72	470	76	496	80	522
80%	20%	23	87	27	104	32	122	36	139	41	157	45	174	50	191	55	209	59	226	64	243	68	261	73	278	77	296	82	313	86	330	91	348
90%	10%	26	43	31	52	36	61	41	70	46	78	51	87	56	96	61	104	66	113	72	122	77	130	82	139	87	148	92	157	97	165	102	174
100%	0%	28	0	34	0	40	0	45	0	51	0	57	0	63	0	68	0	74	0	80	0	85	0	91	0	97	0	102	0	108	0	114	0

Monthly Expenditure Using Inmarsat-B

Data	Voice	$500	$600	$700	$800	$900	$1,000	$1,100	$1,200	$1,300	$1,400	$1,500	$1,600	$1,700	$1,800	$1,900	$2,000
0%	100%	$287	$344	$402	$459	$517	$574	$631	$689	$746	$803	$861	$918	$976	$1,033	$1,090	$1,148
10%	90%	$285	$342	$399	$456	$513	$569	$626	$683	$740	$797	$854	$911	$968	$1,025	$1,082	$1,139
20%	80%	$283	$339	$396	$452	$509	$565	$622	$678	$735	$791	$848	$904	$961	$1,017	$1,074	$1,130
30%	70%	$280	$336	$392	$448	$505	$561	$617	$673	$729	$785	$841	$897	$953	$1,009	$1,065	$1,121
40%	60%	$278	$334	$389	$445	$501	$556	$612	$667	$723	$779	$834	$890	$945	$1,001	$1,057	$1,112
50%	50%	$276	$331	$386	$441	$497	$552	$607	$662	$717	$772	$828	$883	$938	$993	$1,048	$1,103
60%	40%	$274	$328	$383	$438	$493	$547	$602	$657	$711	$766	$821	$876	$930	$985	$1,040	$1,095
70%	30%	$271	$326	$380	$434	$489	$543	$597	$651	$706	$760	$814	$869	$923	$977	$1,031	$1,086
80%	20%	$269	$323	$377	$431	$485	$538	$592	$646	$700	$754	$808	$861	$915	$969	$1,023	$1,077
90%	10%	$267	$320	$374	$427	$481	$534	$587	$641	$694	$748	$801	$854	$908	$961	$1,015	$1,068
100%	0%	$265	$318	$371	$424	$477	$530	$583	$635	$688	$741	$794	$847	$900	$953	$1,006	$1,059

FleetBroadband Equivalent Cost

Global Xpress development continues

Inmarsat has reached agreement with a launch provider to carry its new Ka-band satellites into orbit, and confirmed the first customers for Global Xpress via its 'upgrade path' package XpressLink

Inmarsat has signed a contract with International Launch Services (ILS) for the launch of the three Inmarsat-5 satellites that will provide the network for its Ka-band Global Xpress system, and agreed the first new contracts for its XpressLink Ku-to-Ka-band upgrade service.

The satellite launches, scheduled for 2013-14, will use the ILS Proton launch vehicle from the Baikonur Cosmodrome in Kazakhstan. The three 702HP Ka-band satellites are currently being built by Boeing.

Inmarsat is investing an estimated $1.2 billion in the Global Xpress programme, which includes launch costs.

ILS was also the launch partner for the successful launch of Inmarsat's most recent satellite, the third Inmarsat-4 used to provide the FleetBroadband network, from Baikonur in August 2008.

"Selecting a launch services provider is a critical part of realising our Global Xpress vision," said Andrew Sukawaty, chairman and CEO of Inmarsat.

"Our agreement with ILS shows that we are well on track with our aggressive programme for Global Xpress, with service planned to start in 2013. We have partnered with ILS and Khrunichev for previous launches, and look forward to a successful campaign for Inmarsat-5."

XpressLink

Inmarsat has also announced, through its Ship Equip subsidiary, that it has agreed contracts with two shipowners for the delivery of 28 XpressLink systems, the new flat-fee service launched by Inmarsat in July offering combined Ku-band/FleetBroadband connectivity for $2,999 per month.

The two independent shipowners have not been named, though Ship Equip told Digital Ship that one is located in the Asia region and one in the EMEA region.

"XpressLink has been enthusiastically embraced by the market, and customers have been quick to respond," said Ship Equip CSO, Gilles Gillesen.

The Boeing-built Inmarsat-5 satellites will be launched by ILS

"The cost/benefit have reached a very attractive level and we are very glad customers now see the benefits in this solution."

Inmarsat launched XpressLink as a bridge to its Ka-band Global Xpress service.

XpressLink offers a managed service of VSAT from Ship Equip bundled with FleetBroadband that provides 512 kbps/512 kbps bandwidth (to and from the ship), with a minimum guaranteed data rate of 128 kbps. All Ku-band and L-band traffic is included in the monthly fee.

Customers who sign up to XpressLink will also receive a free upgrade to the Ka-band service when it is launched.

Generally this will involve the use of a new Sea Tel 1m Ku-band antenna when installing the XpressLink service, with this antenna scheduled to be available in early 2012, that can be upgraded to Ka-band through the replacement of some internal components.

However, in the case of the 28 systems to be supplied by Ship Equip under these new deals the company says that deliveries will commence before this antenna is available, in which case it will supply one of its current products which also includes FBB failover from Ship Equip VSAT for a fixed fee.

These installations will then be upgraded to XpressLink at a later time at no extra cost to the customer.

"This service brings communication speeds for maritime users a long step towards speeds that are common for land based offices, and should open up a new way of thinking about communication," said Mr Gillesen.

"I think now is a good time to act for shipowners who have been awaiting these developments in maritime communications."

Financials

The announcement of these agreements was also joined by the publication of Inmarsat's interim financial results for the first six months of 2011, which has seen a modest revenue increase of 0.3 per cent on maritime services compared with the first six months of 2010 ($178.2 million compared with $177.7 million).

These results show a continuing shift away from voice services and into data, with voice revenue declining by 4.1 per cent compared with 2010 while data revenue increased by 1.9 per cent.

At $131.3 million, data services revenue is more than three times that achieved from voice services, at $46.9 million.

In a statement Inmarsat said that revenues have been adversely impacted by customer migration to FleetBroadband, where pricing is typically lower than the older services being replaced.

5,607 FleetBroadband terminals were installed during the first half of 2011, of which 2,727 were activated in the second quarter.

Voice to e-mail substitution and, to a lesser extent, competition from alternative providers were also cited as having contributed to lower than expected revenue growth in 2011.

According to the company's statement; "Our analysis of customers who have migrated to FleetBroadband shows consistently that average data usage per ship is increasing in response to the capability of the faster service. Usage growth will gradually offset the revenue impact of service migration, while the number of ships yet to migrate is rapidly falling."

"While we remain confident in the longer term prospects for our maritime business, we now expect the impact of migration to last longer than previously anticipated and this will have an effect on maritime results for the remainder of the year and possibly the early part of 2012."

Inmarsat also notes that its recently introduced package-based pricing plans have been targeted at improving maritime revenue growth, and claims that these have proven effective in retaining business at risk from alternative service providers.

"In the short period since we began offering such plans, we have won orders from ship operators for over 150 vessels to be upgraded to FleetBroadband combined with a pricing plan," the company said.

"In almost all circumstances, these plans will result in significantly higher revenue per ship for Inmarsat, but much of the revenue benefit of these upgrades will only be realised in future periods."

Reaction to this news in financial circles was not positive, with Inmarsat's share price dipping dramatically after word of these results reached the markets. Several agencies reported that the published revenues were less than had been expected by analysts, causing Inmarsat stock to dip dramatically.

Closing at 488.90p on August 3rd, the evening before the announcement, the shares dropped to a low of 366.40p on August 4th before beginning to recover.

The share price then stabilised to trade between approximately 440p and 450p during the second half of the month, before picking up again to pass 485p at the beginning of September, recovering almost all of its lost value. DS

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Port Wi-Fi and WiMAX - Implications for seafarer welfare

In a report commissioned by the International Committee on Seafarers' Welfare, *Dr Olivia Swift, Greenwich Maritime Institute*, examines the availability of wireless web access in world ports, and some of the implications for the global population of seafarers – as well as the maritime industry as a whole

Communicating with home is of paramount importance to seafarers and their welfare.

Being able to stay in touch with family and friends can have a significant positive effect on seafarers' mental wellbeing while they are away from their loved ones for several months at a time, often working in small crews with limited shore leave.

In countries such as the Philippines, from where more than 330,000 seafarers originate, anxieties about perceived social costs of labour migration are widespread among politicians, scholars and the public at large. Correspondingly, the Philippine state and communication companies promote improvements in communication technology as benefiting the Filipino family, as well as the wider society and nation.

It follows that, beyond the Philippines, similar levels of optimism surround communication technology and its potential to lessen the social costs of separation among migrants' families, including those of seafarers.

At present, seafarers' access to the internet and phones aboard ship is both limited and expensive.

In E. Kahveci's 2007 report, Port-based Welfare Services for Seafarers, for the Seafarers International Research Centre at Cardiff University, he cites just 16 per cent of seafarers having access to e-mails onboard, even though seven out of ten seafarers felt access to e-mail to be important.

40 per cent of officers had access to e-mail, compared to just 3 per cent of ratings, although this access was usually restricted to work usage. Those who were able to access e-mail for personal use were often limited in the length and number of e-mails they could send and some had to pay to send and/or receive e-mails.

A lack of privacy in the use of e-mail was also a common complaint, as was the fact that access to e-mail for personal use was often dependent upon the goodwill of the captain.

Given the limited availability of e-mail at sea, Mr Kahveci reports seafarers using satellite phones as their main method of communicating with home, which are expensive, followed by personal mobiles (primarily for texting) when in range of a signal.

Shore communications

If able to go ashore while in port, seafarers can take advantage of varying communication facilities in seafarer centres.

While some centres only provide phone cards for use in the nearest public phone box, others are equipped with computers linked to the internet, or with Wi-Fi signals to which seafarers can connect using their own wireless-enabled devices.

It is not clear what percentage of seafarers sail with personal laptops; one welfare worker interviewed during this research in the Port of Antwerp, Jorg Pfautsch, estimated almost all officers to have laptops, compared to 20-30 per cent of ratings – although he and others considered this number to be rising.

A new development affecting seafarers is mobile WiMAX, a wireless network

technology that differs significantly from Wi-Fi in the way in which it operates – Wi-Fi typically offers a maximum range of 50m indoors and 100m outdoors while WiMAX provides wireless reception over greater distances.

A small minority of welfare organisations have begun to take mobile WiMAX technology on ship visits so that crew can connect to the internet via their personal computers without having to come ashore.

While there is potential for growth in the number of welfare workers taking mobile WiMAX onto ships in this way, the numbers of seafarers benefiting from the technology would remain modest.

In contrast, WiMAX or Wi-Fi that covers the entire area of a port, including its waters in which ships are harboured, has the potential to reach many more seafarers, enabling them to connect to the internet and communicate with friends and family via e-mail, social networking sites and applications such as Skype.

As well as offering vast improvements to the lives of existing seafarers and their families, this technology would also make seafaring a more appealing career choice among younger generations for whom internet access is embedded within day-to-day life.

It follows that improving seafarers' access to the internet is critical in addressing the global shortage of officers.

Study

The research conducted for this International Committee on Seafarers' Welfare report combined an online survey of port authorities with semi-structured interviews with a selection of individuals, mostly representatives from port authorities and welfare organisations.

The survey asked respondents whether their ports had (or had plans for) a port-wide wireless network, whether seafarers could access it and at what cost.

Where ports lacked port-wide wireless networks the survey questioned respondents about their reasons for not having such technology. In cases where ports had port-wide wireless networks but seafarers were unable to access them, the survey investigated reasons for this lack of access.

Interview and survey comments showed several port authorities to support the principle of allowing seafarers access to the internet via port-wide wireless systems.

Comments included these from two port authorities – "It would be very positive for seafarers if they could have access to Wi-Fi in our ports", and "The seafarers can use the internet at the seamen's mission. It would of course be good if they could use also the Wi-Fi when they are onboard. We have to look at that."

Despite these enthusiastic examples, the interview data suggests port-wide wireless networks to be rare.

Of ports responding to the survey, 32 per cent had port-wide Wi-Fi and 10 per cent had port-wide WiMAX. 26 per cent of those ports with neither reported having plans for this technology in the future.

Of those ports with port-wide wireless networks, 58 per cent allowed seafarers access to the networks, of which 38 per cent gave seafarers access for free.

Although these figures reflect relatively low numbers of ports, they offer encouraging signs that some ports are furthering seafarers' welfare by allowing them access to this technology.

Taken in conjunction with the interview data, the survey data informs this report's discussion of the benefits and issues surrounding port-wide Wi-Fi and WiMAX in relation to seafarer welfare. It is hoped that the report will equip the wider industry to then take this discussion forward.

Supply and demand

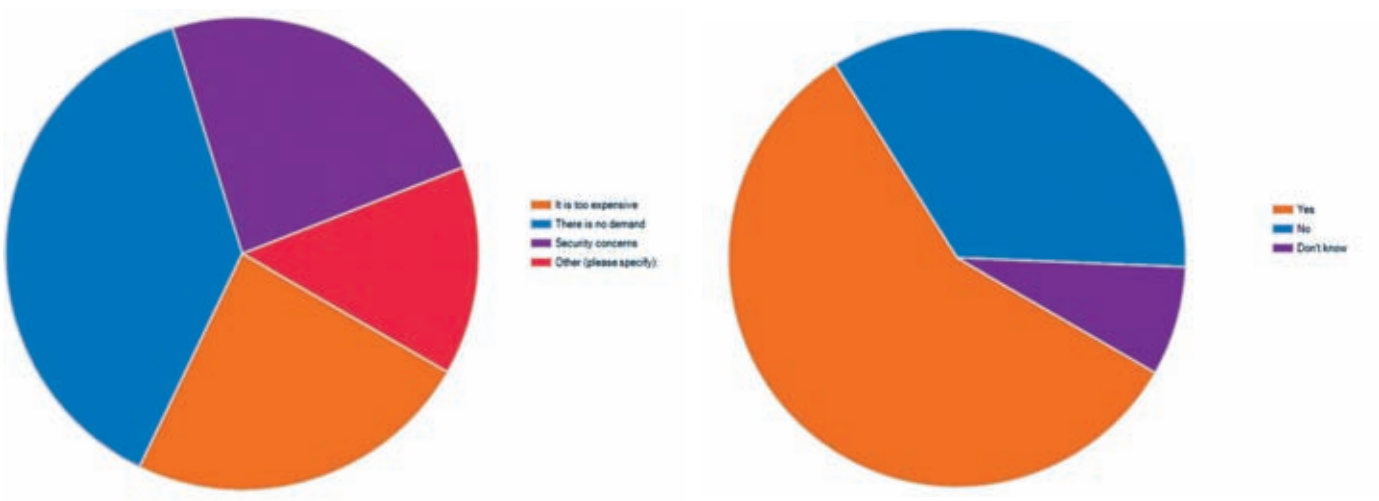
The main reason respondents gave for not having port-wide Wi-Fi or WiMAX was a lack of demand.

"We are not against it," said an IT manager at Associated British Ports, "it's just never come up."

These comments relate to a second main reason respondents offered for lacking port-wide network technology – "it is too expensive."

Several port authorities interviewed were unable to justify the cost of establishing port-wide Wi-Fi or WiMAX since they could not see how such an initiative would deliver revenue in return. Consequently, these respondents felt a port-wide wireless network would only result if sufficient demands were made of ports.

To quote from an employee at the British Port of Felixstowe: "We have over 800 acres here; the cost of establishing a network would be colossal. We prefer to keep our frequencies for business use; providing a port-wide network for seafarers' use would have to be forced upon us. I've not heard of British ports offering such a thing."



ICSW survey results – What are the main reasons against implementing port-wide Wi-Fi and/or WiMAX? (left); and Can seafarers use the port-wide Wi-Fi and/or WiMAX to use the internet? (right)

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The following comments from port officials in various countries indicate others' concerns about expense.

According to Lourens Visser, head of information division, Port of Rotterdam, Netherlands: "We have a vast area here in Rotterdam with a number of propagation issues: buildings, large ships and mountains of coal and ore, etc. To have port-wide Wi-Fi would be a vast investment with doubtful added value. I doubt it would bring equivalent increase in traffic; it's not a strong business case."

The IT manager at the Port of Tilbury, UK, said that: "We would need revenue on the back of it [port-wide Wi-Fi/MAX]; we have to think of the bottom line. We were approached by a company in London interested in providing a network service to the public in the port but it turned out to not be worth their while, given the limited number of potential subscribers."

Mark Brennan, IS manager at the Port of Taranaki, New Zealand, also noted that: "There would be a minimal cost involved in setting it [a port-wide wireless network] up. With potentially more capital and ongoing maintenance costs (to address the management of traffic and content to non-port traffic), we would need approval of senior management, as it is definitely not driven by core business requirements."

Concerns about the cost of port-wide wireless networks are justified.

The Port of Rotterdam estimated that a port-wide Wi-Fi network would cost in the region of €10m (although this estimate may have decreased in the two years since it was obtained by the port).

In New Zealand, the Ports of Auckland's partial Wi-Fi network cost NZD$0.5m and port-wide Wi-Fi in the Russian Port of Vladivostok cost USD$30,000.

The cost of installing and operating a port-wide wireless network varies between ports and is largely influenced by a port's area and topography, which partially determine the extent of wiring and number of antennas required, and by the type of wireless technology involved.

Inevitably, installing and operating a port-wide wireless network is a considerable investment and includes the cost of infrastructure, building permits for antennas, relevant software and maintenance costs.

However, it is worth noting that port-wide wireless technology does not lack potential for generating revenue, even if it is modest in comparison to the cost of network installation.

For the Port of Antwerp, Belgium, providing port-wide Wi-Fi at no cost to all port users, including seafarers, is a marketing device that helps the port compete as a public company.

As such, the port's Wi-Fi is expected to increase the port's overall profits, although its success in doing so is presumably difficult to measure.

In more tangible terms, the research survey suggested ten ports to be charging seafarers and possibly other users for access to their wireless networks.

In the Port of Vladivostok seafarers have been able to connect to the internet via port-wide Wi-Fi operated by Port Telecom Co Ltd since 2005.

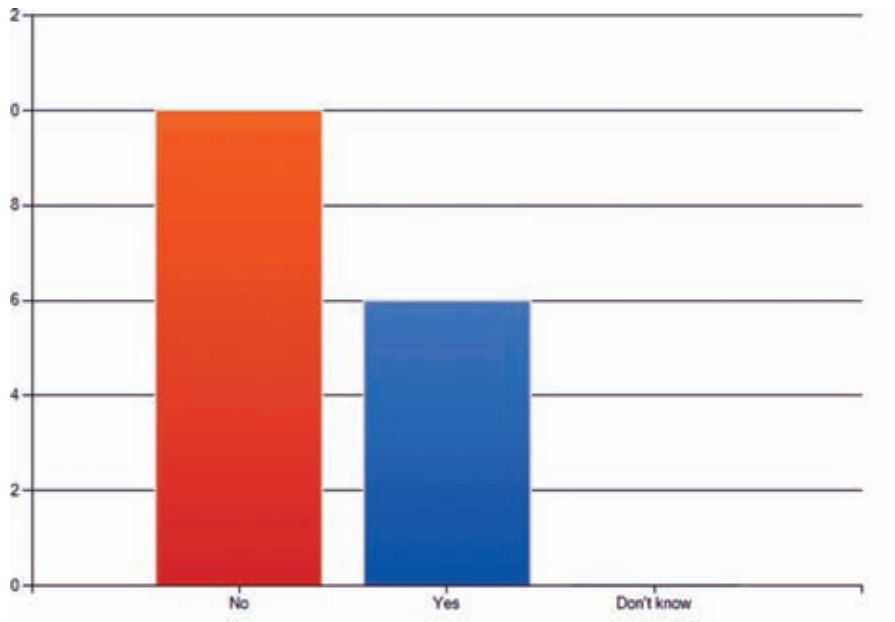
To date, seafarers have required a log-in and password from a Port Telecom office in order to use the system (and it is therefore unclear how many seafarers are able to use the system), but the company has imminent plans for seafarers to be able to both pay for and access this information via SMS on their mobile phones.

In Singapore, seafarers and other users will pay to use the port-wide WiMAX after the system's trial is completed, while Pieter Bakker of the Ports of Auckland speculated that were the port to offer port-wide Wi-Fi, it "would need to install software and receive payment for internet access."

Cor Oudendijk of the Port of Amsterdam, Netherlands, suggested a further way in which a port-wide wireless network can contribute to the bottom line of ports – by reducing the fees ports pay to port agents.

Security

The third main reason respondents cited for not providing port-wide Wi-Fi or WiMAX was security concerns: fears that a port-wide network would compromise the secure handling of ship and port information systems.



The ICSW survey showed that, at the majority of ports that responded, internet access was not free for seafarers

Comments from various ports included: "The only issue keeping us from doing this [installing port-wide Wi-Fi/MAX] is security"; "It's not a good idea to have Wi-Fi or WiMAX in port area for security reasons"; and "Security reasons do not allow non-employee access to the network."

Security concerns were also the most common reason for those ports with partial or port-wide wireless networks to not allow seafarers access to it.

Two examples from New Zealand provide further insights.

According to Pieter Bakker at Ports of Auckland: "At this stage we have an infrastructure that can only host those security checked to be on our network."

"The Ports of Auckland have had port-wide Wi-Fi for almost a decade, which is used to facilitate communication between container handling equipment (CHE) and host systems."

"Since the system has suffered interference from other Wi-Fi networks from nearby apartments, as well as attacks on the system that prevent access, we do not provide access to non-port workers for fear of attack from hackers in nearby apartments wanting to use the network for free, which would compromise the core purpose of the Wi-Fi: CHE connectivity."

Mark Brennan, IS manager at the Port of Taranaki, also notes that: "We have partial Wi-Fi coverage, for internal port company use in areas where wired infrastructure is not available."

"Were we to open this out to users outside of the port company, there would be potential for internet access abuse, such as downloading illegal content, which would potentially fall back on the port as the provider of service and could lead to a loss of the port's internet access."

The security concerns expressed in the comments above are twofold – concerns about the security of port and ship information systems and, secondly, that ports would be held responsible for any downloading of illegal material via the wireless network they provide.

In most national jurisdictions, if not all, Wi-Fi providers are not responsible for any illegal downloading by their customers, although employers can be liable for illegal downloading by employees.

Port authorities therefore need to be clear about the nature of their relationship to the potentially multiple categories of people using their wireless networks as well as the legislation applicable to these relationships in cases of illegal downloading.

The Port of Antwerp, where port-wide Wi-Fi has been operating for over two years, provides an example of a port that has secured its wireless network by taking its own precautionary measures.

The success of the port at doing so implies other ports could achieve similar levels of security by taking the same or equivalent steps.

"Security is definitely a concern with Wi-Fi networks," said Johan Deleu, Port of Antwerp.

"There are two reasons why it is not a problem in our setup. Firstly, our infrastructure allows us to make 'virtual networks' that are not connected at all to the company network; the only 'way out' is directly to the internet. Even for the internet access itself, we have a completely separate connection with an independent service provider. The company internet connection is not used by the Wi-Fi users."

"The second reason why security is not a problem is that, for our own ships, connection to the corporate network is not only encrypted on Wi-Fi, but also uses end-to-end IPSEC VPN tunnels (a special security protocol). During 2011 security will be enhanced even further by authenticating every individual PC that wants corporate network access."

In the port of Singapore the WiMAX signal is provided by a telecommunications commercial partner for use by individuals, such as seafarers, and also by businesses and other organisations operating in the port area.

Users are responsible for securing information, via security software on individuals' devices and security protocols such as VPN tunnels in the case of businesses (as used by the Port of Antwerp).

Threat to welfare organisations

Another concern research participants voiced about port-wide wireless technology was that it posed a threat to seafarer centres, either because the technology discourages seafarers from using centres or because centres' welfare workers sell seafarers fewer phone cards.

The following comment from Jon Moore, Northport, New Zealand, is illustrative of participants' fears.

"The port fully sponsors the seaman's mission where access to the internet is provided," he said.

"Whilst we have not dismissed Wi-Fi throughout the port, I am concerned that it would stop seafarers from venturing ashore. This would then give cause for the mission to close its doors and we already struggle for support from the seafarers."

Given the inevitability of technology's continuous development, a small minority of port welfare organisations are responding to port-wide network technology not as a threat but as an opportunity to better meet the welfare needs of seafarers, particularly since limited shore leave means seafarers are often not able to make use of seafarer centre facilities in the first place.

In the port of Kandla, India, welfare workers have begun taking mobile WiMAX with them on ship visits which enables crew to connect to the internet using their laptops.

Although Kandla is an isolated case study, Mission to Seafarers, which has seafarer centres in 119 ports around the world, is a year into their review of existing wireless technology with a view to equipping their centres with WiMAX.

"We are very keen that seafarers unable to come ashore to the seafarer centres are still able to communicate with their families," explained the Mission's Ken Peters.

The Mission is investigating what infrastructure and technology is required, the cost of purchasing and installing such equipment, and whether individual centres would be able to bear the costs alone.

According to Mr Peters, the Mission foresees using a log-in system that would allow access to the internet for a limited period (akin to the existing Wi-Fi system in seafarers' centres), thereby allowing the Mission to charge appropriately for the service in order to compensate for the expected decline in revenue from the sale

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of phone cards to seafarers.

The Kandla and Mission to Seafarers examples highlight some of the ways in which concerns about the threat of new technology to welfare organisations' viability can be addressed.

These, along with the main advantages of port-wide Wi-Fi and WiMAX to the operations of welfare organisations, are listed below:

i) Shore leave. Port-wide Wi-Fi and WiMAX address some of the problems linked to seafarers being unable to come ashore by allowing them to connect to the internet aboard ship.

ii) Adding value to ship visits. In cases where welfare workers take mobile WiMAX aboard ships, or when they provide information and/or hardware enabling seafarers to connect to wireless networks, they add value to ship visiting beyond the core service of providing pastoral care.

iii) Port-wide Wi-Fi and WiMAX need not deter seafarers from coming ashore. Anecdotal evidence from welfare workers in ports with port-wide Wi-Fi or WiMAX does not suggest this technology to be deterring seafarers from coming ashore.

For example, Jorg Pfautsch of the German Seamen's Mission in Antwerp remarked that: "Plenty of seafarers visit the seamen's club each day to use the club's Wi-Fi. Off the ship is more relaxed and they have time to phone home, surf the internet and read the news online."

iv) Port-wide Wi-Fi and WiMAX need not affect welfare organisations' revenue from the sale of phone cards. Again anecdotally, welfare workers in ports with port-wide Wi-Fi or WiMAX did not report a decline in sales of phone cards.

To quote Mr Pfautsch of the German Seamen's Mission in Antwerp once more: "In terms of whether the Wi-Fi encroaches on our revenue from selling phone cards, I would say no, not yet – we have still enough phone-card customers."

Some welfare organisations working in locations with port-wide Wi-Fi or WiMAX have been able to sell international phone cards that seafarers use in other ports, as has been the case in Kandla where the Seafarer Welfare Association has started selling these cards alongside investing in mobile WiMAX technology.

In Antwerp, the German Seamen's Mission is looking to sell prepaid internet SIM cards to seafarers for use in other ports. These cards use 3G technology to provide internet access via mobile phones.

"We are receiving increasing numbers of requests from seafarers for prepaid internet SIM cards," said Mr Pfautsch.

"Since the market for these cards is still small in Belgium, we are not yet able to offer a suitable product at present but we hope this will change by the end of the year. I have in mind a prepaid internet SIM card for selling in the region of USD$5-7 with unlimited data download valid for 1-2 days. In time, such a card may replace phone cards."

In summary, unless port-wide Wi-Fi and WiMAX become commonplace, welfare organisations look able to continue raising revenue from a range of evolving products, in order to meet the communication needs of seafarers in the ports beyond those that are Wi-Fi or WiMAX enabled.

v) The significance of existing revenue from the sale of phone cards is questionable. In the port of Kandla, concerns that port-wide WiMAX would threaten the welfare organisation's revenue from the sale of phone cards have proved misplaced, not least because such revenue is minimal.

As Joseph Chacko, of the Kandla Seafarer Welfare Association, notes: "….there is not much revenue in selling the card as we sell at very low cost to the seafarers. The people most affected by the WiMAX are the petty traders renting USB internet sticks to seafarers at prices as high as USD$20 per 24 hours of use."

vi) Port-wide WiFi and WiMAX provide their own potential for revenue generation. By using a system in which seafarers pay for log-in details that expire after a set period of time, welfare organisations would be able to raise revenue, as suggested earlier by Ken Peters of the Mission to Seafarers.

Given the appeal to seafarers of being able to access the internet aboard ship, revenue raised in this way has the potential to amount to more than that currently earned from the sale of phone cards.

Usage of existing networks

In ports such as Antwerp and Singapore, port-wide wireless networks offer seafarers the opportunity to communicate with home via the internet at no cost, without having to go ashore. This marks a significant improvement in seafarer welfare.

It is worth noting however that seafarers appear to differ in the ease with which they use the networks, with some not using them at all. This may be the result of seafarers still becoming familiar with the systems that are still in their infancy.

Jorg Pfautsch of the German Seamen's Mission in Antwerp reported that for seafarers who use computers relatively frequently connecting is straightforward, while for others it is more difficult.

Welfare workers are instrumental in providing seafarers with information they need to connect to the network, along with port agents.

Mr Pfautsch also noted, as did the port, that the strength of the signal varies according to "…the ship's proximity to the Wi-Fi antennas, the seafarer's computer hardware and his location on the ship, with the bridge deck offering the strongest signal. Often cargo handling and cranes interrupt the signal. Few seafarers are using additional antennas to boost the signal."

In the case of Singapore, feedback was mixed regarding the extent to which seafarers are using the port's WiMAX network.

One seafarer remarked that his colleagues who had recently passed through Singapore reported that 'all was fine' with the network. In contrast, comments from welfare workers and shipping companies suggest many seafarers not to be using the WiMAX network at all.

According to Christian Schmidt of the German Seamen's Mission: "Most of our ratings are using our centres or going ashore. Some seafarers, who come frequently to Singapore, use a [3G] dongle provided by a company called Starhub, which allows pay-per-day usage at an affordable rate."

"Some port agents also provide dongles for the crew, such as APL in the Brani terminal [of Singapore]. In these cases, seafarers also pay by the day and then return the dongle to the port worker."

Leonard Harbottle of BW Shipping supported the impression that seafarers are not fully benefiting from the port's WiMAX.

"It is my understanding that that it [the WiMAX] really only benefits vessels berthed alongside and within the container port," he said.

"We also believe that there are some technical IT issues – it is not a simple case of hooking up your laptop to a system at no cost. We also believe that there is a limit on its [the WiMAX's] range; this is one of the reasons we are not using it."

"Our fleet, which primarily comprises tankers, rarely visits the port of Singapore but transits the straits on an almost daily basis and we also do a lot of bunkering, storing and crew changes within and beyond Singapore port waters. Our entire tanker fleet will have a VSAT [satellite] broadband system by the year's end, which crew can use for free."

Another BW employee reported similar sentiments, saying: "From what I gathered from a few of our seamen and port colleagues, none of our seafarers have used the WiMAX while in Singapore or at any Wi-Fi enabled ports, due to inconvenience and a limited number of users at one time per vessel."

"Normally the system works using a dongle that the port agents provide free of charge to the master; one dongle per vessel. This limits the usage to one laptop, which is usually controlled by the master."

Although anecdotal, the comments above suggest seafarers to not be benefiting fully from existing port-wide Wi-Fi and WiMAX systems due to a number of reasons that include:

i) Issues with the range and uneven signal strength of wireless networks. This is known to be a problem with Wi-Fi in particular. While the Port of Antwerp is eager to address these limitations as part of its improvement work, it is important that similar measures are factored into the maintenance programmes of other port-wide Wi-Fi networks.

ii) Issues of access to the hardware required for connecting to wireless networks. There are two components to this point: firstly, seafarers without personal laptops are reliant upon limited access to ship computers to communicate with home using port-wide wireless networks.

Secondly, WiMAX networks appear to require additional hardware in the form of a dongle, modem or antenna in order for seafarers to connect their computers to the internet via the WiMAX network.

In Singapore, port agents are reported to provide every ship visiting the port with a dongle for connecting to the port's WiMAX. It seems that without additional hardware, seafarers remain reliant upon limited access to the internet via one computer controlled by the ship's captain.

It is unclear to what extent other seafarers in the port are able to access the hardware necessary to connect their laptops to the WiMAX internet and where responsibility falls for providing this hardware.

Wireless expansion

The wider problem of improving seafarer access to the internet lies in the limited number of ports with port-wide wireless networks. Although such systems are not without potential for generating revenue, the cost of their installation remains a major deterrent to their proliferation.

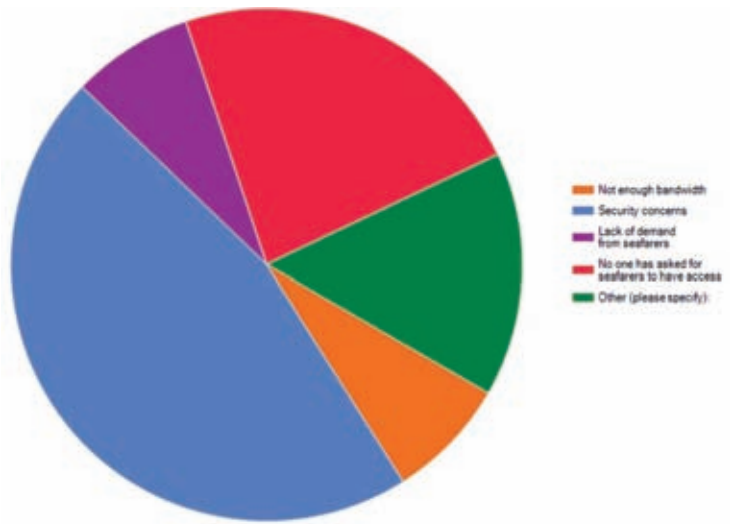
In ports with an existing degree of wireless infrastructure, such as Amsterdam, the cost of developing a network through which seafarers can use the internet is significantly lower than that of developing such a network from scratch.

However, doing so requires both ports' concerns about the security of their information to be addressed (using measures such as those taken by the Port of Antwerp, outlined above), as well as the willingness of ports to incorporate the needs of seafarers into their technology strategies.

This sentiment is also shared by some other ports, including Rotterdam.

"We were supposed to be involved in a WiMAX trial along with parts of the emergency services and local government, but the company that was going to provide the signal no longer owned the frequency so now we are looking for a new solution," said Lourens Visser, head of information division, Port of Rotterdam.

"At present, we use 3G to communicate with our vessels and next year we are changing the mobile signal supplier. There are concerns about the quality of the signal from the new provider and it might be that WiMAX provides a back-up system, or indeed the primary means of communi-



ICSW survey result - Why are seafarers prevented from accessing existing port-wide Wi-Fi and WiMAX?

cation with the potential of also allowing seafarers access to the internet."

"I could certainly see how WiMAX could play a marketing role for the port and how we could combine the welfare of seafarers with our own commercial interests. We charge port fees so need to give services in return."

The situation Mr Visser outlined raises a further obstacle to the spread of WiMAX technology in ports – the need for a commercial partner licensed to supply the WiMAX frequency in the port area.

In the Port of Kandla, welfare worker Joseph Chacko describes the need to keep abreast of new products that would enable seafarers' access to the internet aboard to continue, should the WiMAX signal no longer be available.

"The engineer from the current WiMAX provider assured me that they will continue to offer WiMAX," he said.

"Meanwhile I have found new technology: a new 3G router, DIR-457 by D Link, which costs around INR10,000 (which may come down in price in a few months) and a 3G card which is currently provided by BSNL and MTNL [Indian internet service providers] and will be launched by other providers all over India."

"You insert this 3G card into the router and then carry the same in your pocket onto any ship. Once switched on, the device turns the mess room into a Wi-Fi zone, allowing approximately 16 laptops to be connected to the internet."

Mr Chacko demonstrates the engagement with changing technology that is necessary for seafarers to be able to communicate with their families via the internet aboard ship.

Existing and emerging technology, including Wi-Fi, WiMAX, 3G and 4G, offer varying advantages and disadvantages. Given the differences between ports, the solutions for enabling seafarer access to the internet will vary between ports.

What seems likely to assist ports in reaching solutions suited to their specific needs and characteristics is increased communication between ports, including welfare organisations working within them, regarding developments in technology and experiences of using these technologies.

This report is intended to begin such a dialogue.

Conclusions and recommendations

Increasing seafarers' access to the internet promises to both improve seafarers' welfare and improve recruitment and retention rates across the industry facing a global shortage of skilled workers.

While this research has shown port-wide wireless technology to have considerable potential to help increase seafarers' access to the internet aboard ship, it has also highlighted a range of issues needing to be resolved in order that their potential be realised.

At present, only a minority of ports appear to have port-wide wireless networks via which seafarers can access the internet aboard ships.

Most commonly, ports without this technology cited a lack of demand, followed by concerns about the costs associated with the technology, and security risks surrounding it, as the main reasons for neither having installed it nor having plans to do so in the future.

In ports where a port-wide wireless network exists but seafarers are not able to access it, the main reason offered for seafarers' lack of access was, again, concerns about the security of port and ship information systems.

Among other concerns that research participants expressed was a fear that port-wide wireless technology threatens the viability of seafarer centres, either because the technology discourages seafarers from using centres or because centres' welfare workers sell seafarers fewer phone cards.

Overall, the research found a number of practical impediments to the proliferation of port-wide wireless technology and seafarers' access to it, as well as a 'bottom-line' culture among ports in which the needs of seafarers, while not disregarded, were peripheral to port operations and planning.

Drawing on the discussion of these and other issues in the previous sections, the following recommendations offer a range of measures to help address respondents' concerns and increase seafarers' ability to communicate with friends and family while away from home:

i) In ports with existing port-wide wireless networks, many of the respondents' concerns have been confronted and at least partially resolved.

It is recommended that communication be increased between ports in order to promote the sharing of knowledge, experiences and concerns about port-wide wireless and other technology benefiting seafarer welfare, possibly administered by an umbrella organisation such as the International Association of Ports and Harbours.

This would help ports address concerns about the security of port-wide wireless networks, help them source wireless infrastructure at competitive rates, provide clarity about the law regarding ports' liability for any illegal downloading by network users, and provide alternative solutions should a WiMAX signal provider no longer operate or when new and improved technology becomes available.

Increased communication between port authorities would create a culture of 'best practice' among ports in relation to seafarer welfare as well as assisting them in meeting their own information and communication system needs in as efficient a way as possible.

ii) As well as increasing communications between port authorities, it is recommended that port authorities work more closely with port welfare organisations in order to better use available technology to meet both the welfare of seafarers and commercial interests of the port as a shared concern.

Additionally, welfare workers appear well placed to provide seafarers with the information and assistance they require when connecting to existing port-wide wireless networks.

There needs to be clarity about which organisation(s) should bear the cost of port-wide wireless networks as well as benefit from any revenue they generate.

iii) Following the examples of the Kandla Seafarer Welfare Organisation and Mission to Seafarers, welfare organisations are encouraged to see port-wide wireless networks as an opportunity to better meet the needs of seafarers rather than as a threat to seafarer centres and welfare organisations' revenue from phone-card sales.

It is recommended that welfare organisations keep abreast of developments in communication products and other sources of revenue that could replace and/or add to the revenue currently generated from the sale of phone cards.

iv) Although the cost of port-wide wireless technology will be prohibitively high for some port authorities to bear, ports with an existing degree of wireless infrastructure are urged to explore expanding this infrastructure and opening it up to seafarers.

It is recommended that the industry consider an incentive scheme by which ports looking to provide seafarers access to port-wide wireless networks at little or no cost might receive assistance with meeting the cost of doing so.

v) Shipping companies and their relevant membership organisations might consider advocating increased port-wide Wi-Fi and WiMAX, which benefit their crews and provide a cheaper means of communicating for business purposes than satellite technology.

vi) In ports with existing port-wide wireless networks, there needs to be clarity about which organisation(s) is/are responsible for ensuring seafarers have access to any hardware needed to connect to these systems.

This hardware includes dongles, modems and/or antennas in the case of WiMAX, and also laptops for those seafarers without their own.

Failure to do so means seafarers being reliant upon accessing the system via only one computer, to which the ship's captain determines access.

vii) It is recommended that ports with existing port-wide wireless networks continue to be alert to (or solicit) feedback about their networks' performance and carry out regular improvements and upgrades to their systems.

It is also important that where seafarers are required to pay to use networks, the cost is kept low.

viii) Given the limited range of port-wide wireless networks, whether based on Wi-Fi or WiMAX technology, it is recommended that owners and other parties continue to look at ways of improving seafarers' access to the internet beyond port waters. DS

This article has been adapted from the original report 'Developments in New Technology & Implications for Seafarers' Welfare – Seafarers' access to Wi-Fi and WiMAX in ports', commissioned by the International Committee on Seafarers' Welfare and authored by Dr Olivia Swift, research associate, Greenwich Maritime Institute.

The original report, including all references, diagrams and further analysis of specific port facilities, is available for download at: http://bit.ly/icswwifi_1

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Reederei Claus-Peter Offen implements voyage support software

www.gl-maritime-software.com

Reederei Claus-Peter Offen has completed the installation of GL Maritime Software's GL SeaScout 2.0 navigational decision-making support system on the 14,000 TEU newbuilding MSC SAVONA.

GL SeaScout, formerly known as the Shipboard Routing Assistance System (SRA), is an integrated onboard software that provides ships' officers with decision-making support, with computations incorporating seaway measurements, wave and weather forecasts, cargo data and other signals.

The software informs a ship's officers how the ship is responding to current conditions, and displays alarms and warnings for risk of extreme motions, including rolling, slamming and bending moment, and allows the officers to simulate different speeds and courses.

GL says that this will assist officers in then choosing a speed and course that is optimised for the individual ship's hull, with respect to the prevailing seaway and loading conditions of the ship.

Onboard the MSC SAVONA the software will interface with a radar-based wave measurement system and will have access to weather forecast and navigational data via the ship's network. A GL SeaScout workstation is built into the bridge console for ease of access.

"Generally GL SeaScout, as a system, works very well, giving good assistance with checking the vessel's work against heavy sea," said Captain Piotr Kruszewski, commander of the MSC SAVONA on her last voyage.

"It was found helpful with planning the vessel's speed in areas of heavy weather. From my side I have to emphasise that the software is simple and user-friendly, which I appreciate very much (we do not need too sophisticated items which require special training, and it is not time consuming in handling). The manual is written in a simple and understandable way."

This GL SeaScout installation will also contribute to a 'Springing & Whipping' Joint Development Project being run by GL and the Korean shipyard DSME, which aims to permanently record environmental conditions.

The objective of this long term measurement campaign is to collect data for GL's ongoing rule development, with the information also to be used by FutureShip, a GL company, for validation of numerical simulation methods with respect to whipping and springing phenomena.

GL SeaScout 2.0 installed on the bridge of container vessel MSC SAVONA

CrewInspector for Oceanwide

www.crewinspector.com
www.oceanwidecrew.com

Latvian online crew management system provider, CrewInspector.com, has announced the signing of an agreement with the Dutch crew manning agency, Oceanwide Crew, to provide its proprietary crew management system.

Under the contract CrewInspector will manage a full database migration of 20,000 seafarer applications and related information such as certificates and seagoing service to ensure a smooth transition to the new crew management platform.

Additionally, the solution includes a recruitment tool with an automated functionality to register new vacancies, to allocate seafarers to Oceanwide Crew clients and vessel owners directly from the system.

CrewInspector will also develop an expense controlling/ invoicing tool and integrate this into the company's payroll programme.

"The Netherlands historically are known as a very important link within the maritime industry maintaining high standards on crew management as well," says Andy Lipsberg co-owner of CrewInspector.

"Meeting customer expectations in such a demanding market strengthens confidence in the viability of our business model and the software we market."

Norbulk installs planned maintenance system

www.marinesoftware.co.uk

Marine Software has completed the delivery of its MPM - Marine Planned Maintenance software system to Glasgow-based shipping company Norbulk Shipping, for use on its new built 33,500 dwt bulk carrier Seastar Endurance.

This is the ninth such system delivered to Norbulk in the past 12 months, with the Seastar Endurance joining the vessels Seastar Empress (35,000 dwt), Ocean Reef (52,485 dwt), Blackfin (43,246 dwt), Blackbird (43,246 dwt), St Gregory (31,800 dwt), St Andrew (31,800 dwt), St Peter (31,800 dwt) and St George (31,800 dwt).

Norbulk also commissioned Marine Software to construct full planned maintenance databases for the nine vessels, incorporating all vessel main machinery and statutory items to provide a fully working scheduled system on delivery.

Database setup costs were reduced by the fact that the vessels comprised two sets of sisters, with the Seastar Endurance carrying many machinery items common to Seastar Empress.

In other news, Marine Software has also recently supplied the MPM system to Imtech Marine & Offshore B.V., for installation on two Naval client vessels.

Each vessel MPM system was also delivered with a commissioned interface to automatically update machinery running hours from the Imtech monitoring system for main propulsion and power generation control systems.

This contract also included two separate MPM user training courses at Imtech's Rotterdam Offices, where PC based system training was conducted for approximately 20 Naval personnel.

Norbulk's Seastar Endurance will join the Empress in using the MPM planned maintenance system by Marine Software

STCW information site launched

https://portal.emsa.europa.eu/web/stcw

EMSA's STCW Information System (STCW-IS), a web-based information system designed to provide information on both national maritime administrations and maritime education and training (MET) institutions, has been made available on the internet for public consultation.

With the STCW-IS, the user can find relevant information on: EU maritime administrations; EU maritime education, training and certification systems; EU maritime education and training institutions; EU approved programmes and courses; and career progression schemes available in EU Member States.

EMSA (the European Maritime Safety Agency) says that future planned developments will also allow the system to produce and publish reliable numerical and statistical data on EU and non-EU seafarers certified by EU Member States.

Working in cooperation with participating countries (EU Member States and also non-EU countries providing seafarers to work on board EU flagged vessels) the system compiles information on a range of related topics.

These include lists of the parties to the STCW Convention that are recognised by each country, contact information for all entities involved in the implementation of the STCW Convention in each country, and the type of training facilities made available for maritime education and training at approved institutions.

The system can be accessed at https://portal.emsa.europa.eu/web/stcw.

SpecTec's AMOS growing in China

www.spectec.net

SpecTec has announced that it has successfully completed the implementation of AMOS on 40 ships for the Taiwan-based Yang Ming Marine Transport Corporation, and has also agreed a separate deal to supply the software system to China Offshore Oil Engineering Corporation (COOEC).

Under the agreement with Yang Ming, SpecTec will supplement the completed 40-ship installation project by installing its solution on a further 11 ships in 2011, while the remainder of the 89-ship fleet will be equipped in 2012.

According to SpecTec, Yang Ming's IT department made a big contribution in offering ideas and development on how to link AMOS with other internal software, such as its internal Ships Positioning System.

Giampiero Soncini, SpecTec Group CEO, notes that this contract is indicative of the company's commitment to expanding its operations in Asia.

"We have increased our local support staff in all offices, especially in Shanghai where we translate software and documentation in the Chinese language," he said.

"We develop databases in Chinese. We are setting support staff in Taiwan and Korea."

"We have firmly established ourselves in this area since 2005, much earlier if we think of the Hong Kong office, and we intend to continue our growth in Asia."

China Offshore Oil Engineering Corporation (COOEC) will also deploy SpecTec's AMOS solution following the recent agreement of a new contract.

COOEC is the largest offshore engineering and construction company in China, offering integrated services and maintenance for oil and gas exploration and production projects.

Under the contract SpecTec's AMOS Maintenance and Procurement (M&P) modules will be supplied to six offshore support vessels, two pipelay vessels and one crane barge.

AMOS M&P will be used to integrate the management of maintenance work and costs, stock control and purchasing onboard the vessels.

Yang Ming Marine has started installing AMOS on its 89-vessel fleet

Q88.com integrated with Veson's IMOS

www.veson.com
www.q88.com

Veson Nautical and Heidenreich Innovations, owner of Q88.com, have announced the completion of a project to integrate Veson Nautical's IMOS (Integrated Maritime Operations System), with Q88.com's vessel questionnaire system.

With this integration in place, users can eliminate double entry in using the systems, automate manual processes, and make information for new vessels instantly available to improve the efficiency of the internal vetting and pre-fixture processes.

"Getting ships vetted in a timely manner is crucial in today's volatile market," said Fritz Heidenreich, president of Q88.

"We are very excited to help charterers streamline the vetting process."

John Veson, president of Veson Nautical, also commented that "the integration between IMOS and Q88 makes it easy for charterers to move quickly from the gathering of information to the execution of business. We're pleased to continue delivering value to our clients through this partnership."

AVEVA joins OpenHCM Consortium

www.aveva.com
www.openhcmstandard.sourceforge.net

Engineering software provider, AVEVA, has announced that it is joining the OpenHCM (Hull Conditioning Monitoring) Consortium, an initiative to increase ship safety though transparent electronic processing of assessment data for the in-service operation of ships and offshore platforms.

The OpenHCM Consortium is developing a neutral exchange standard to support the exchange of thickness measurements data for ships in service. The project aims at improving the efficiency of the measurement process onboard ships already in service through a fully electronic process.

The main users are shipyards, owners, classification societies and thickness measurement companies and the system allows them to exchange files and visualise data as 3D models.

"AVEVA fully support the use of the 3D design model downstream in lifecycle activities and will actively participate in the development of the OpenHCM standard," says David Thomson, solution strategy manager, AVEVA.

"Based on this standard, we are developing export functionality from AVEVA design applications, and the ability to read and visualise the condition data within our AVEVA NET information management system."

"AVEVA's unique ability to idealise and filter the production model ensures that our customers' IP will be protected. Using AVEVA, the information needed for further lifecycle activities can be safely handed over to ship operators and class societies without compromising security."

New CBT tackles accidents in enclosed spaces

www.videotel.co.uk

Videotel Marine International, in partnership with Mines Rescue Marine, has launched a new computer based training series, Entry into Enclosed Spaces.

The programme delivers what Videotel calls "a hard hitting message to both ship board and shore based personnel" which it hopes will encourage those working in enclosed spaces to make sure that the correct equipment and good safety procedures are employed.

The package consists of six programmes covering awareness; preparation and procedures; equipment; enclosed spaces entry; emergency procedures and rescue; and the correct use of breathing apparatus. Case studies and student exercises are also included.

It is available in a range of formats - as an interactive CD-ROM, through the computer-based Videotel on Demand (VOD) service, and on VHS/DVD with supporting booklets.

"There is no excuse for the unacceptable casualties we have seen recently," says Stephen Bond, deputy chairman, Videotel.

"Again and again we hear of seafarers coming to grief in enclosed spaces. These incidents could have been avoided by an understanding of the dangers of entering enclosed spaces and the critical importance of following proper procedures. We are convinced that the Entry into Enclosed Spaces Training Series will help save lives."

One Maritime reaches 120 countries in 6 months

www.onemaritime.com

Online ship supply portal One Maritime reports that its system is now being delivered into more than 120 countries worldwide, just six months after its launch in January 2011.

The service provides access online or by CD to ship stores catalogues and other information sources, to assist companies in efficiently and cost effectively securing provisions, bonded stores, pantry and deck and engine stores worldwide.

The online system includes built-in filtering which aims to ensure that individual customers are provided with only the information they need from data sources like catalogues, ports, communications and vessel tracking information.

"We are delighted that the maritime industry has welcomed One Maritime so warmly - a day doesn't go by without a serious business enquiry," said Torben Brammer, co-founder and CEO of One Maritime.

"In this business one size doesn't fit all - to be successful you need to be flexible, and make the catalogue work around the products it contains. This meant investing in a long development process and that has been a key part of the reason for our success."

"This flexibility means our team can work with any customer or supplier, accommodating different product views and incorporating additional features. Our customers value the unrivalled cost and efficiency benefits we deliver throughout our relationship with them, and we in turn are committed to building upon our success and providing them with constant product improvements."

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Fred.Olsen – going green with trim technology

Over the last eighteen months shipping company Fred.Olsen has been trialling a trim optimisation system which aims to reduce fuel costs by up to 5 per cent. Amanda Slade, Fred.Olsen Marine Services, told *Digital Ship* about the company's experience with the technology

In the current shipping market, 'green' technologies are fast becoming one of the most popular innovations for companies that are looking to improve efficiency while also staying mindful of their responsibility to protect the environment, both at sea and ashore.

Norwegian operator Fred.Olsen has always prided itself as an innovator in this regard, and has a policy of pursuing the 'greenest' technologies available to use onboard its ships.

Building on a heritage that stretches back over 160 years to 1848, when Petter Olsen founded the company, Fred.Olsen now operates a wide ranging fleet of vessels across a variety of sectors.

Among these are the four vessels that form Fred.Olsen Cruise lines, and over the course of the last 18 months the company has completed the trial and installation of a new trim optimisation system from Fugro which it will use to reduce its use of fuel by up to 5 per cent – and consequently produce a significant reduction in the carbon emissions created by its ships.

The trim of a vessel affects the total resistance of the vessel through water, so for different loading conditions and speeds there is an optimum trim value. If the vessel is not sailing at or near the optimum trim, it is experiencing more resistance and thereby using more power and fuel.

Fugro's Marinestar MS system measures the trim of the vessel at sea using sensors mounted on the ship, and this information is then presented graphically to the user alongside the speed.

The software provides the option to configure the optimum trim values based on draft and speed of the vessel, which is compared with the actual ship's trim to advise the user on any changes that would improve efficiency.

According to Amanda Slade, safety and security manager with Fred.Olsen Marine Services, which provides the technical support for the cruise vessels, the company has been impressed with the performance of this system since an initial trial installation was performed in March 2010.

"I think within the first few months we realised that this was something we wanted," she told us.

"We are actively pursuing every green technology there is out there, and Fugro offered us a new option in this regard."

"Across the spectrum of energy saving technologies that are available to ships now, there are a range of technologies that can impact on ship efficiency but there aren't a lot of players in the 'dynamic trim' market."

Enhancing existing skills

The concept of operating the vessel with the most efficient level of trim possible is not a new one, and is something that navigators onboard ship have been doing intuitively for a very long time.

However, the application of advanced positioning and the computational abilities of software systems to the process allows those operating the ship to apply their own skills with a higher level of accuracy – and thus improve vessel efficiency.

"Understanding where your ship is positioned in relation to the x-y-z axis has always been very important," notes Ms Slade.

"Experienced navigators over hundreds of years understood how their own ship was trimmed, even without the availability of these supporting technologies."

"Where this has been advanced has been in giving the shipboard navigator a tool to understand much more precisely where the ship is in that x-y-z axis."

In addition to this enhanced accuracy in trim calculation, the use of these technologies also reduces the amount of time required for bridge officers to decide on any required changes in their trim management, and allows them to focus instead on other aspects of running the ship.

"We want to keep the focus on safety, and this has allowed us to provide a tool to the navigators on the bridge that they can use on an ongoing basis to allow them to do that," said Ms Slade.

Fred. Olsen's Braemar has optimised its trim using Fugro's Marinestar MS system

"Within seconds they can look at the display and be aware of the situation, of whether the ship is in good trim or needs adjustment."

Following that first trial installation aboard the cruise ship M/V Braemar, Fred.Olsen has since committed to a second installation, on the M/V Boudicca, which is currently being completed under the management of the technical superintendent.

While it is still the Marinestar MS system that is being employed, Ms Slade notes that the software has been customised in collaboration with Fugro over the course of the last 18 months to create a tool that is specifically tuned to the vessels' particular needs.

"Fugro worked with us through this process, we collaborated with them and provided a lot of feedback about how the system was operating," she said.

"They took that on board and introduced a number of improvements, and I think this process will continue as we try to evolve and improve even further going forward."

"If we can achieve an extra 0.1 per cent in fuel savings, the return is significant enough to justify the effort."

Technology

The Marinestar MS system from Fugro uses two independent combined differential GPS/GLONASS receivers installed on a vessel – one forward and one aft – to determine ship's position. With this long baseline, the ship is effectively navigated independently at both the bow and the stern.

The receivers are also able to share differential corrections with each other, adding a level of robustness to the system. Fugro operates its own GPS/GLONASS differential corrections service, which is integrated into the system and received using spot beam antennae.

Using these different satellite systems and applying the additional corrections allows the service to provide a global solution with a horizontal and vertical accuracy of 10-15 cm – and having an accurate real time calculation of the vertical positioning of both ends of the ships allows the trim to be calculated to an accuracy of better than 5 cm.

The ability to perform these calculations dynamically while the vessel is undertaking a voyage is where a system such as this one can provide value to a navigator, as Haydn Jones, marketing director at Fugro Satellite Positioning, explains.

"It's not that easy to work out the trim with the vessel moving up and down with the waves," he said.

"In the past you could work out the trim alongside the quayside in port without too much difficulty, but to try and do it at sea is the step forward."

Knowing the actual trim of the vessel at any particular moment represents only half of the process in improving the efficiency of the vessel, of course – this must then be compared to the optimum trim, the trim level at which the vessel will encounter the least resistance and will use the least amount of power and fuel.

As the ship's navigators adjust the actual trim to approach the optimum trim the efficiency of the vessel's fuel usage will increase.

In the case of the vessels Braemar and Boudicca, Fred.Olsen was able to provide its own optimum trim figures, provided by the ship yard, for use by the software onboard. However, not every vessel operator is in possession of these figures relative to its own ships.

This situation prompted Fugro to update its Marinestar product with the addition of vessel trim tables provided by Det Norske Veritas (DNV), to allow the system to be applied on a wider range of vessels.

Under this agreement DNV Ship Hydrodynamics provides technical advisory services on the calculation of optimum vessel trim in a range of circumstances.

Using information about hull geometry and loading conditions, DNV carries out an optimum trim assessment using a combination of two Computational Fluid Dynamics analysis tools ('potential flow and 'RANS') running on a high performance computer cluster.

The DNV study is required for one ship type and can then be used for any other sister vessel.

This latest version of the Marinestar system, incorporating compatibility with DNV's data analysis, was released in March of 2011.

"Some companies may find it difficult to acquire this trim data, which is why we have reached an agreement with DNV who are able to calculate optimum trim based upon hull form analysis and resistance calculations," said Mr Jones.

"A basic dynamic trim function was included in the software at the beginning of the trial with Fred.Olsen, but based upon feedback and requirements from Fred.Olsen improvements to this were made, in particular to display the optimum trim for the vessel."

"We are now making further enhancements to trim functionality to display a target trim range rather than just a single target figure."

"According to DNV's calculations they say that theoretically it should make a difference of about 2 to 5 per cent in fuel reduction, based on their mathematical models. But even a much lower figure would still justify the use of this kind of technology."

For Fred.Olsen that justification has been twofold – allowing the company to continue in its pursuit of the latest 'green' technologies, while also providing the added bonus of reduced costs and more efficient operations. DS

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Shipping KPIs – ready for the roll-out

Concluding a six-year development phase, which was completed in June 2011, InterManager's extensive Shipping KPI Project is ready to be rolled out. The launch of the project at the IMO in London has highlighted some of the major the challenges and benefits of establishing an international standard for performance measurement in ship operation

In late 2004 the Shipping KPI Project was initiated by InterManager, formerly the International Association of Ship Managers, in partnership with major stakeholders in the shipping community such as Intertanko, Intercargo, BIMCO, the European Community and IMO.

Key goals were to boost performance improvements internally in companies engaged in ship operation activities as well as enhancing communication within the companies and with external stakeholders.

InterManager says that the Shipping KPIs will allow companies involved in the industry to easily monitor, assess and compare their operational performance. It will also provide a yardstick enabling charterers, shipowners, insurance and port state control as well as other stakeholders such as P&I clubs, class societies and academics to compare different ship operators.

In the course of its role as an international trade association InterManager has repeatedly voiced its concern about the lack of efficiency in communication among stakeholders. Ineffective communication, says the association, has negative effects for both the organisation and for the shipping community.

According to InterManager, money can be saved through more efficient communication with respect to time as well as manpower.

KPIs have been in use for a long time and come in many different forms. Traditionally, the companies utilising a KPI monitoring system in the shipping industry would choose the parameters individually.

This diversity has led to a variety of indicators that made comparisons between companies extremely difficult. In addition, there has, so far, been no industry standard against which individual performance could be benchmarked.

The Shipping KPI Project has been set up to provide a solution to this.

Its aim is to standardise the many different ways of describing performance management, which have previously made direct comparison between companies difficult.

The launch of a pilot project, led by a steering committee that consisted of six shipping community representatives, in January 2005 marked the project's kick-off, the purpose of which was to figure out which methodology of evaluating KPIs would be most effective.

A CVH (Conjoint Value Hierarchy) model was selected, as the output from this model produced results that were relevant to the prime attributes required – operational safety and environmental excellence in ship management.

The pilot project was succeeded by phase I of the Shipping KPI Project, which was launched in January 2006. The main focus during that first stage of the project was to establish the indicators that would be used.

This part of the project proved to be complicated. Due to the near endless amount of data used by the individual ships and companies it was necessary to start a comprehensive screening process, evaluating the existing parameters' significance for the Shipping KPI Project and reducing the array of data to a few common denominators.

After having determined a collection of basic parameters, standard KPI categories, evaluating the information gathered on the first level, were set up.

In order to provide a practical and reliable tool, there were several requirements that the KPIs had to meet.

Firstly, the indicators had to be universally applicable to all types of vessels and thus independent of vessel type specifications.

The KPIs also had to be observable and quantifiable. This meant that their calculation had to be based on unambiguous, observable measurements and be executed according to a mathematical formula.

Further, the parameters had to be robust against manipulation and therefore precisely and unambiguously phrased leaving no room for 'favourable interpretations'.

In order to reflect the actual developments in ship management performance over time, such as improvements and deterioration, the KPIs also had to be sufficiently sensitive to change.

Importantly, the KPIs had to be transparent and easy to understand. For the participants to interpret their meaning and informative value equally, double-meaning and context-dependence had to be prevented.

When all parameters had eventually been successfully pre-determined in 2008, phase I was completed and led to the launch of Shipping KPI Phase II in March 2009.

During the second stage of the project the KPI definitions were reassessed and further developed. At the same time, vessels started reporting back their data. This growing contribution, soon amounting to 700 vessels, enabled the association to elaborate and validate the KPI tool and start establishing benchmarks for the industry.

Besides refining the KPI tool, focus was put on securing the acceptance of the model throughout the industry, which InterManager deemed vital to the success of the project.

Broad recognition and participation would also be needed to allow for representative benchmarking.

Six years after laying the corner stone of the Shipping KPI Project, it has now been completed and launched at the IMO in London. Whereas, during the previous two stages, the development of the KPIs was kept within the working group, the Shipping KPI website has now been made publically available.

The launch at the IMO has also marked the commencement of the last stage of the Shipping KPI Project, which is expected to be concluded by April 2014.

The Shipping KPI pyramid system

The Shipping KPI Project distinguishes between three different kinds of performance indicators which are linked together and form the structure of a pyramid.

Top of the hierarchy is the narrowest group containing the Shipping Performance Indexes (SPI). The KPIs form the intermediate layer and the lowest level consists of the broadest cluster called Performance Indicators (PI).

The different levels of the pyramid are based on one another. Whereas the base level is made up of the raw data that is collected and entered by the ship operator, the middle section represents calculated values that condense the Performance Indicators into different specific groups.

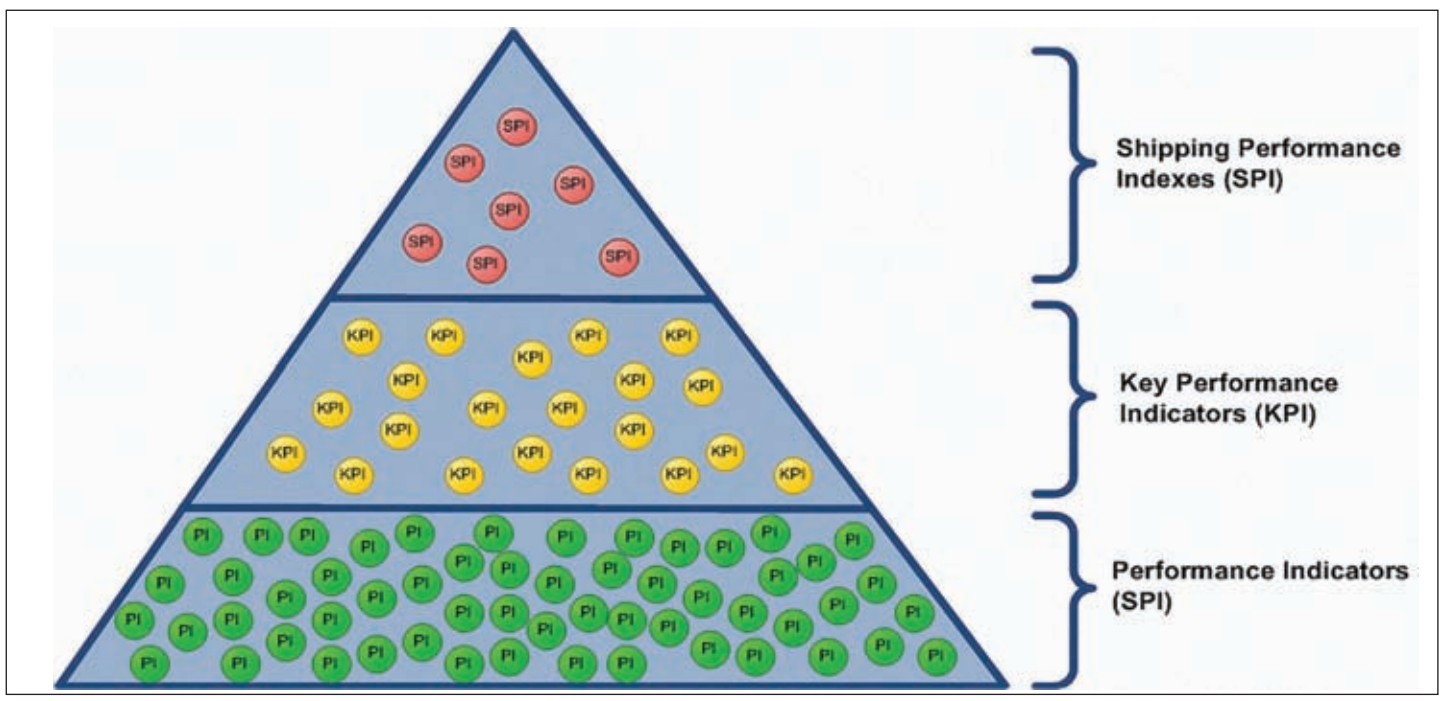
The top level, consisting of the SPIs, represents performance in particular broad areas. Its calculation is based on the KPIs of the subjacent section.

Shipping companies, wanting to make use of the Shipping KPI Project, will have to spend some time to familiarise themselves with the hierarchy of the pyramid structure.

In order to enter the correct data, and thus receive significant results that also allow for benchmarking, it is important to fully understand the levels of the system and their informative value as well as the individual parameters.

As a first step the data that makes up the Performance Indicators has to be collected. The PI are a range of 66 observable and measurable parameters that form the real core of the standard.

They are low level parameters and InterManager has paid particular attention to defining them unambiguously. They should be easily obtained as most of the PIs are existing measurements in the



KPIs build up on each other enabling the user to drill down from the top to the bottom to spot the cause of unexpected results

shipping industry.

The information is either gathered by the vessel directly or through the office where it is bundled. The data can be counted, noted down from a machine or copied from a chart and is either collected manually or through implemented ICT solutions.

Examples for PIs are the number of crew dismissed, number of collisions, or number of fire incidents.

This seemingly basic process can cause initial difficulties. Special arrangements may have to be set up, where KPIs have previously not been used. The responsibility of overseeing and executing the process has to be allocated and the person in charge familiarised with the system. Then the data has to be concentrated in one central location and fed into the system.

Once the data has been collected and entered into the system, the KPIs on the next level of the pyramid are worked out.

The 34 KPIs are expressions of performance in certain aspects of ship operation. They are based on the information that has been collected in the PIs on level I.

There are two different ways of expressing the KPIs. A first one is to express the KPI as a value. The KPI Value is a mathematical combination of the respective PI Values, expressed in a natural number. The second way of expressing the KPI is as a rating, which simply ranges the KPI Value on a scale between 0 and 100.

KPI Ratings make it possible to compare vessels with different characteristics or amount of data captured. On a scale from 0 to 100, where zero indicates unacceptable and 100 outstanding performance, the Rating allows for easy benchmarking.

KPIs can be things like budget performance, dry docking performance and vessel availability.

Ultimately, the KPIs are condensed into Shipping Performance Indicators, which form the highest level of the pyramid.

The SPIs represent performance within broad areas and are expressed as weighted averages of relevant KPI Ratings on a scale between 0 and 100.

There are seven SPI performance groups: environmental performance, health and safety performance, HR management performance, navigational performance, operational performance, technical performance and security performance.

The main idea of the pyramid structure is that the user shall be able to easily spot irregularities or – through benchmarking – room for improvement on the higher levels. They can then drill down from the top level right through to the bottom.

This moving from the general to the company-specific and then case-specific data is expected to provide the management with a handy tool to pinpoint the cause of objectionable results.

Benefits for the industry

Having invested six years of continuous collaborative effort and a substantial financial input of around $7-8 million, InterManager has high expectations for the impact of the KPI Shipping Project and hopes for wide acceptance in the shipping community.

Shipping KPIs are expected to boost the performance of participating companies. Thus, InterManager says, they should make processes and operations more transparent, assessable and comparable.

The model shall enable the management to spot room for improvement more easily and also facilitate benchmarking, a comparison against industry standards or a particular group of competitors.

Another key advantage is the development of more efficient communication throughout the industry, says InterManager. Whilst the use of Shipping KPIs should improve operations and satisfy the need to save on manpower, cut costs and streamline processes, it will also provide common ground to communicate about KPIs externally.

Better communication and improved operations are expected to not only benefit the individual companies but ultimately the global maritime industry.

Moreover, the Shipping KPIs are designed as a tool for charterers. The system will allow for clear distinction between ship operators and disclose their merits.

According to InterManager, this should enable charterers to find financially attractive partners that also meet their non-monetary requirements.

Through greater transparency the project is further hoped to provide an incentive for improvement and bring on financial rewards for aspects of ship operations that are very important but have in the past been underrated. InterManager mentions spending on maintenance and training or environmental friendliness as examples.

A long term goal of the project with regards to regulation is to move the focus away from the present compliance culture to self-regulation. This, as InterManager highlights, will require the Shipping KPIs to be successfully used on an industry-wide basis.

In this regard, the KPI tool is also hoped to satisfy newly emerging reporting requirements, e.g. on environmental performance and corporate social responsibility.

InterManager additionally emphasises the Shipping KPIs function as a forum, where members can pursue their mutual interests together and promote and improve industry developments with regards to safety and efficiency.

Industry-wide quality improvement and more transparent communication is further hoped to increase public awareness of the shipping industry as well as boost its image.

InterManager hopes that the entire shipping industry will buy into the scheme, the response to which is keenly awaited.

With the launch of the KPI Project the benchmarking database IMKE has been made available online. The ball is rolling and it is now up to the maritime community to support InterManager's project with its participation. DS

Software as a Service - revolutionising fleet management

Implementing a software as a service (SaaS) model can allow companies with a modest IT infrastructure to still enjoy the benefits of the latest software applications, without having to make major investments. This can prove particularly useful in an industry like maritime, *writes Christa Thoma, MESPAS*

Shipping companies running traditional technical fleet management software are often sobered by the high investments and operational costs of running and maintaining the software.

In addition, they are disillusioned by the limited additional benefits the software offers, for instance in terms of reporting functionalities.

Although many shipping companies are thinking about employing a professional technical fleet management software, they often hesitate to introduce such a third party system.

There are several reasons for this: companies are wary of the time and costs involved in evaluating different products and implementing the system, as well as training the users.

In addition, implementing a traditional software system also means shipping companies have to invest heavily in hardware, IT personnel, security, and support, on an ongoing basis.

Yet, in times where affordable bandwidth and increasingly powerful processors are simplifying how we do business, many companies are re-visiting the choices they made with regards to the type of software they use, and how they run it.

Software as a Service (SaaS) is one of the most important recent innovations in terms of deploying and using software, and it has eliminated many of the negative aspects associated with running software systems.

As a consequence, the Software as a Service concept is becoming more and more widespread.

In this regard, this article discusses two things – it explains the pros and cons of SaaS, and takes a snapshot at how the maritime industry can employ SaaS to improve its technical fleet management operations.

What is SaaS?

The concept of Software as a Service has been in use for a number of years.

The acronym SaaS first appeared in February 2001 in an article called *Strategic Backgrounder: Software as a Service*, published by the Software & Information Industry's (SIIA) eBusiness Division.

Simply put, SaaS means delivering software over the internet, which is used to provide, support and run the system.

Not long ago, SaaS was almost exclusively limited to CRM (Customer Relationship Management) applications such as Salesforce. Today, typical SaaS applications include accounting, E-commerce, ERP (Enterprise Resource Planning), database applications, project management, and many other applications.

Previously, such applications were expensive on-premises products that only large companies could afford.

Today, with SaaS, even small companies can access state-of-the-art applications for a reasonable fixed subscription fee. The web-based model allows businesses to maintain a single system, and to make use of applications operated by service providers rather than themselves.

That relieves them of the need to buy, operate and maintain IT infrastructure and application software.

SaaS has become increasingly popular for its ability to simplify deployment. It also permits software providers to support many customers with a single version of a software.

It is far more cost-efficient to develop and support one version of a software centrally – and to offer the application as a web-based service – than to maintain a variety of software versions locally and on a number of servers.

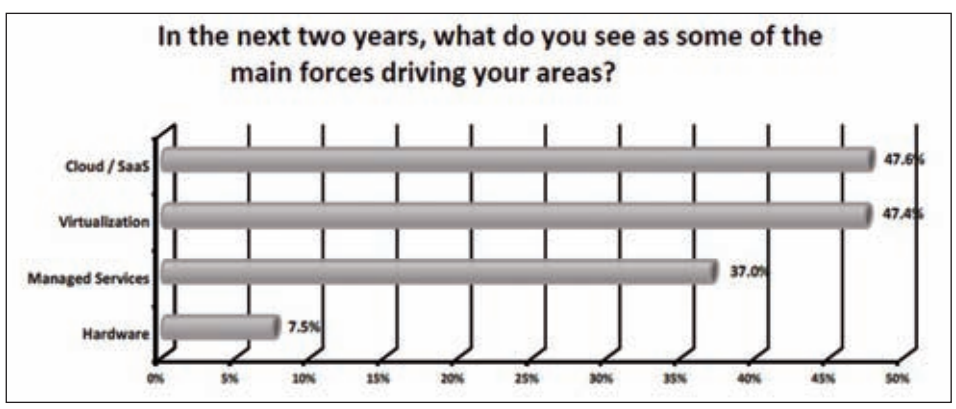
Not only does the SaaS concept allow for more efficient resource utilisation, it also eliminates the high costs of proprietary hardware and applications, and the IT resources to maintain and operate the infrastructure.

With SaaS, a software provider licenses an application to customers as a 'service on demand'. This approach to application delivery is part of the utility computing model where all of the technology is in the 'cloud' – accessed over the internet as a service.

This is in contrast to the traditional approach where every application is licensed, installed, maintained and supported on every device or computer.

Today, many companies in a variety of industries have adopted SaaS applications. The main aim is to optimise reliability and costs by offloading the burden of hardware maintenance (i.e. server, network) and software maintenance, as well as data backup.

In a 2010 study by 'Computerworld', almost 50 per cent of the respondents mention 'Cloud' and 'SaaS' as belonging to the most important IT issues over the next two years.



Source: 'Computerworld' August 2010, Top 500 ICT companies in Switzerland. Multiple answers were possible.

SaaS versus on-premises systems

While there are different SaaS models available in the market, a few key characteristics are common to all SaaS models (see table below right).

When comparing the costs of an on-premises solution with a SaaS solution, one has to be aware of the different cash outflows incurred by in-house data centres and server infrastructure:

- The direct costs that go with running a server: server, power, floor space, storage, backups, various licenses, and IT operations to manage these resources.
- The indirect costs of running a server: network and storage infrastructure, IT operations to manage the general infrastructure and data security.
- The overhead costs of owning a server: procurement of server infrastructure, administration and accounting personnel, IT management, depreciation.

Once the infrastructure is put in place, the above costs are incurred regardless of whether the software application is being used or not.

This could be compared to buying versus renting a car. Even if the car owner doesn't like his car anymore, the full purchase price is due for payment, and the ongoing costs such as insurance, maintenance, new tires and so on are incurred. When the car has reached the end of its useful life, one has to buy another car.

By contrast, if a car is rented, the driver is committed to it only as long as he wants to use it. Once the driver paid for that use, there are no further financial obligations.

It's the rental car company's obligation to pay for insurance and other disbursements to keep it in excellent shape. And it's in the rental car business' best interest to keep its cars in good shape, or else the company won't stay in business for long.

Similar to the above analogy, SaaS presents a low-cost, flexible alternative to the have-your-own-software approach. The software is neither installed nor operated on the company's IT landscape, but is offered as a hosted service.

Employees utilise the application via a web-based frontend, or open an offline software client which regularly synchronises with the central database.

This is particularly important in the maritime industry, i.e. for ships that have no continuous internet connection. No server needs to be hosted at the client's site, nor do clients have to worry about security, backups or installing software updates on users' computers.

So how come SaaS providers can provide software at lower costs?

Traditional applications require a dedicated set of resources to fulfil the needs of just one organisation. This means, with traditional systems, each customer covers

On-premises Software	SaaS delivery model
The software is purchased upfront and integrated into the IT landscape of the company	SaaS suppliers provide customers access to the software via the internet
The software is owned by the customer	Software is not owned by the customer; it's owned by the SaaS provider
The software is deployed, managed and supported as well as maintained by dedicated in-house IT personnel	The services noted on the left are offered by the SaaS provider as part of the subscription fee
The customer provides the in-house infrastructure to support the software, such as servers, hardware, networks and security measures	The SaaS provider is responsible for maintenance, upgrades, support and security of the software and infrastructure
It's the customer's decision whether or not to utilise the latest version of the software. If so, additional costs are incurred	The software provider makes available the latest version of the software to all its customers, at no additional costs

On-premises Software	SaaS delivery model
CapEx ◆ Costs for hardware, networking equipment, infrastructure and security measures, plus costs for replacements and upgrades of hardware over time ◆ Purchase and licensing price of software, plus recurring costs for software upgrades ◆ Additional costs for licenses and hardware when the business grows, i.e. when new users are added	**CapEx** ◆ No capital expenditure incurred if the company already has sufficient internet access
OpEx ◆ Integration and deployment ◆ Managing, supporting, maintaining the software, including deployment of new releases ◆ IT Personnel costs and overheads ◆ Purchase or renting of floor space for server room	**OpEx** ◆ Subscription fee (e.g. per user, per transaction, per month, per year, per company)

his own server hardware and care for maintenance, upgrades, security, backups and so on.

In the maritime industry, sometimes a server is run for each individual vessel.

With SaaS the magic words are 'Economies of Scale', and the table above highlights some of the advantages in terms of Capital Expenditure (CapEx) and Operational Expenditure (OpEx).

A SaaS platform can satisfy the needs of multiple customers, using the hardware and personnel resources to manage just one single software instance. Customers access the software on the central server by using their existing computers.

The data remains on the central server; no need for customers to worry about security, backups, implementing software upgrades and other IT related tasks.

This yields tremendous economies of scale, as only one set of hardware resources (central server) is necessary to meet the needs of all users; a relatively small staff can efficiently and securely manage only one stack of software and hardware; and developers can build, support and further develop a single code base on just one platform, rather than on many.

Benefits of SaaS

The following are what I believe to be the top eight benefits of SaaS.

1) Save Money. No up-front costs: No dedicated on-premises servers needed, and no other expensive infrastructure for their operation. In addition, there's no tied-up capital for hardware or up-front costs for software licenses.

Reduced IT costs: Purchasing software the traditional way results in significant expenditures for installation, maintenance, managing updates and migration of the data. By contrast, system maintenance (backup, updates, patches, security, technical support, etc) is already included in the subscription fee of a SaaS solution.

Predictable, low pricing: The pay-as-you-go model incurs significantly lower costs in comparison with traditional systems, and it includes the costs for maintenance, support, and upgrades.

This means: Instead of investing in hardware and purchasing software licenses, clients pay only for what they actually need, e.g. based on the subscribed applications and number of users.

Apart from the relatively low operations costs of running SaaS applications, clients also benefit from the fact that future software upgrades are included in the fee.

Positive side-effects: no capital is tied up; capital can be used for other projects; no need to provision for future computing resources.

2) Save Time. Speed of deployment: SaaS solutions are up and running within a very short time span. System implementation, ranging from evaluation to specification, data implementation and deployment and training, usually happens within weeks as opposed to months or years.

This is because many of the issues related to the implementation of proprietary software do not apply, and because the software is already in full operation on the SaaS provider's infrastructure.

Additionally, training needs tend to be minimal as the software must be intuitive and easy-to-use in order to meet the requirements of its broad user-base.

3) Access software from anywhere. SaaS applications are accessible from anywhere with an internet connection. Users aboard ships work with an offline software client.

4) Concentrate on core business and increase productivity. Being relieved of many IT related issues means that companies can redirect human and financial resources to the company's core business.

5) Benefit from a flexible and rapidly scalable system. With SaaS, there are no hardware issues connected with an increase (or decrease) of the number of users. This means the system quickly adapts to changing numbers of users.

This offers a great deal of flexibility, particularly in the shipping industry, where fleet sizes may vary on a regular basis.

6) High reliability, performance and security. Software applications offered as SaaS are hosted in high-capacity, powerful and secure data centres. No provider can afford to upset its clientele with long reaction times, unavailable services or unsecured system architecture. Redundant server farms ensure continued availability in peak times or in case of a server breakdown.

Infrastructure operated by SaaS providers outclass customer-operated infrastructure simply because of their focus and size: they're run by companies whose core business it is to run complex IT systems.

7) Always current and compatible software. SaaS applications are upgraded on the central server. This happens with little or no involvement by the customer. This ensures that all users of the system automatically work with the latest version, and time consuming updates or problems due to differing software versions are eliminated.

With SaaS, there is centralised backup, recovery and archiving. Crews aboard vessels work with an offline version of the application. Regular synchronisation ensures that both software and data are up-to-date.

8) Low entry and exit barrier. Due to the moderate initial costs and the subscription fee, SaaS has a very low entry barrier. This enables small to medium sized companies to employ professional software applications which previously were too costly and time-consuming to implement for them.

Businesses reduce the risk of being tied down with proprietary, under-performing solutions.

Drivers and reservations

So what might drive companies to adopt an SaaS model? A survey done by Information Week Analytics in 2010 reaffirms several key benefits of SaaS adoption (see table below left).

The table above right, from a January 2011 Australian Government, Department of Finance and Deregulation, Cloud Computing Strategic Direction Paper, also outlines a number of key drivers in the adoption of cloud computing.

However, despite the highlighted advantages of SaaS, some reservations exist.

Driver	Outcome
Value for money	◆ Reduced duplication and costs ◆ Leveraging economies of scale ◆ Increased savings through virtualisation ◆ Allow for 'measured' payment (pay as you use) ◆ Reduced energy use ◆ Ability to reinvest in, and concentrate on, core objectives ◆ Adopt, where fit for purpose, modern technologies and practices that improve ICT effectiveness and efficiency
Flexibility	◆ Create a flexible services-oriented environment ◆ Rapid provisioning and deployment of services as well as on demand scalability and elasticity for services & capabilities
Operational reliability and robustness	◆ High resiliency and availability ◆ Standard offering

Issues such as security, data sovereignty and inflexibility in terms of customisation of the software tend to be mentioned. When it comes to extremely sensitive data, particular attention must be paid to data security and legal issues.

On the other hand, this applies to any software application, be they traditional or SaaS applications. In terms of data sovereignty, some people may worry about losing physical control over their data.

However, experience shows that security issues tend to be dealt with more professionally at a dedicated SaaS application provider than would be the case with in-house solutions. Cloud providers have a vital interest in safe IT environments – security problems would soon mean the end of a SaaS company.

For SaaS applications to work efficiently, access to the internet is essential. Yet, this is already a given in today's business environment – internet access is usually part of the standard infrastructure.

For use aboard ships, the SaaS application is managed offline, and data transfers as well as software updates are conducted via regular synchronisation.

SaaS checklist

This checklist, below right, may help you evaluate whether a SaaS application is appropriate for your company or your project. Any YES answer points you to the system more appropriate in relation to the question.

While there are many SaaS companies in the market, there are only a small number of specialised SaaS software providers focusing on the maritime industry. In our view, there are two main reasons for this.

This is firstly due to the conservative thinking in shipping. The industry is not known for taking up new technologies fast, they're more comfortable in the role of followers than in the role of early adopters.

Secondly, at the moment, not many SaaS providers for the maritime industry exist. Most established software solutions are built on software architecture that cannot be used to reliably and securely deliver software applications and data via the cloud.

Typically, a SaaS software provider is a relatively young company, whose solution is based on a multi-tenant architecture (a single version of the application is used for all customers, i.e. 'tenants').

In terms of technical fleet management, there are two distinctive features the software must possess: high quality data management and offline availability.

In terms of data management, the SaaS provider manages – on behalf of all customers – the data and documents that are shared by all users of the application, for instance product specifications, OEM manuals and the like.

Since this is done centrally and for all clients, the costs for this are very low for each client, i.e. definitely much lower than if each customer would have to do this on his own.

In terms of ownership of the data, customer-specific or vessel-specific data belongs to the customer and not to the system provider, and cannot be accessed or viewed by any other user of the system. Customers, on the other hand, can access and download their data in any industry-standard format.

Having offline availability means that office staff can access the central database in real-time through a secure internet connection – no matter when and where they are located.

Crews aboard the vessels work offline by accessing the database onboard, which is mirrored to the central server's database ashore. Regular synchronisation as part of the standard sync schedule of each vessel ensures that both ship and shore work with the same up-to-date information.

There is also an added benefit of freeing up resources for other projects. Working with traditional procurement and fleet management applications involves many time-consuming and costly issues that aren't part of the core competencies of a typical player in the shipping industry, mainly in the area of Information Technology (IT).

Not so with SaaS. SaaS allows applications to be centrally provided and maintained. All clients use the same technology and benefit from continual software improvements at no additional costs.

The software is not installed on-site, but accessed via the internet, meaning the software solution is available anytime and anywhere.

Outlook

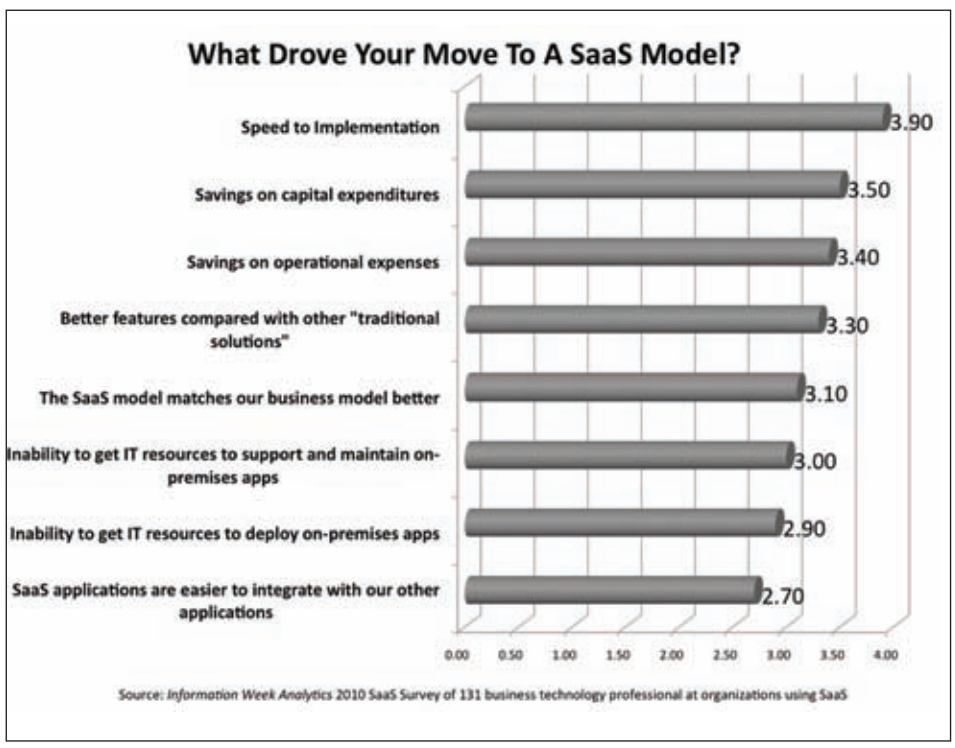
Cloud computing services and SaaS applications will play an increasingly important role in the shipping industry in the future.

It is predicted that more and more businesses will outsource complexity (IT and hardware concepts) to external service providers and data centres. With SaaS, these companies will benefit from professional software applications without having to worry about all of the hardware resources.

Regardless of whether financial considerations or outsourcing complexity are the drivers behind employing SaaS, the main priority remains unchanged – the application must be easy-to-use, safe and work flawlessly. DS

About the author

This article has been adapted from the white paper ***Revolutionizing Technical Fleet Management in the Maritime Industry - How to improve efficiency and reduce costs by introducing Software as a Service (SaaS)*** *by Christa Thoma. Ms Thoma is head of corporate communications with software company MESPAS AG, of Zurich, Switzerland. www.mespas.com.*



	SaaS	Traditional or inhouse
High initial costs unacceptable?	X	
Costs are no deciding factor?		X
Any time pressure for the implementation?	X	
Multiple locations involved?	X	
Requirements that cannot be met with standard solutions?		X
Want to employ additional IT personnel?		X
Application to be accessible from any location?	X	
Regular upgrades of the software to be managed?	X	
Low or large number of users involved?	Low / rather low	High/rather high

IPoP – Network Solution for Vessels

– Gentay Ltd launches low cost plug-and-play networks for vessels

BPL (Broadband via Powerline) technology has been around for many years, utilising the power grid to transmit computer network signals as an alternative to fixed wired networks or Wi-Fi networks. However, the existing technology has suffered from significant limitations in signal strength, signal transmission distance as well as frequency interruptions that have proven the existing technology as unsuitable for commercial and industrial applications.

Significant financial resources have been allocated by global Power Generators and suppliers to upgrade the existing BPL technology to enable Smart Grids that transmit real time data of energy consumption from the energy users to the power suppliers. The results of this investment is the latest generation of BPL technology adapted by Gentay Ltd for the Maritime Industry.

Currently, the conventional method of installing computer networks on board vessels is by installing fixed network cables between desired access points on the vessel. This is both expensive and time consuming due to the wiring and ducting required. In addition, Wi-Fi networks are limited by the difficulty of the Wi-Fi signal to penetrate metal bulkheads.

IPoP – Network Solution for Vessels overcomes these limitations and restrictions by transmitting the network signal via the vessels existing power grid.

The shielded power cables on board vessels have proven ideal for transmitting network signals over distance reliably and with throughput speeds rivalling office networks. Installations conducted on various types of vessels including Bulk Carriers, Chemical Tankers, Gas Carriers, Car Carrier and others have demonstrated conclusively the effective application of this technology to carry the signal to various required locations on board the vessel.

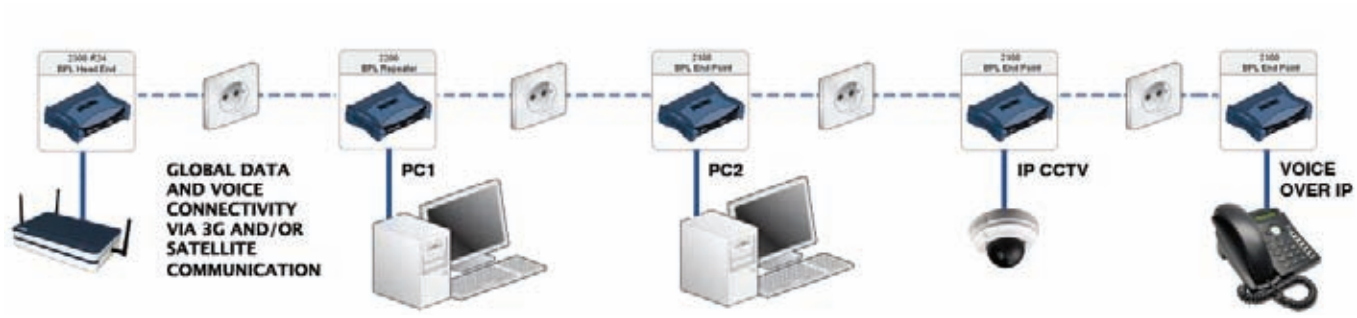
This installation of the iPoP- Network Solution for Vessels system does not require third party installation services and can be done by the on-board crew within a matter of hours. Configuration is also not required as the system is plug-and-play out of the box. As a result, the iPoP-Network Solutions for Vessels technology is significantly more cost effective then existing wired or Wi-Fi networks for establishing or extending an existing network.

Due to the portable nature of the equipment, this technology is ideally suited for ship managers as the equipment can be unplugged from a vessel exiting ship management and reinstalled on a new vessel entering management, thus facilitating a vessel network only during the duration of the management of the vessel.

All IP compatible devices can be used in conjunction with the iPoP- Network Solution for Vessels including IP-CCTV. This facilitates the installation of an IP CCTV anywhere on board the vessel in proximity to a power source allowing for monitoring and surveillance of critical and strategic areas feeding the images directly and in real time to the desired computer monitor.

In addition, the iPoP – Network Solutions for Vessels systems will allow the simple and low cost installation of computer network access point in the crew member's cabins. Combined with a global 3G SIM Card or in conjunction with the vessels satellite communication systems, this will allow the crew members to utilise web applications such as Skype or chat programmes as well as email to maintain communication with their family on shore.

Gentay Ltd focuses on applying technological solutions from land based environments to the Maritime Industry and is continuing to research, develop and launch technological solutions to challenges faced by the global Maritime Industry. Gentay Ltd operates from offices in London and Singapore.



Low cost computer networks on board vessels utilising the existing power grid

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- Self installed within 1 hour Plug-and-play.
- Eliminates the need for wiring and ducting.
- Portable and transferable between vessels.
- Proven installation on bulk carriers, chemical tankers, car carriers and many others.
- Facilitates IP CCTV vessel wide as well as Voip and other IP compatible devices.
- Ship/shore communication cost reduction using global 3G sim cards.
- Gentay sales and service offices located in United Kingdom and Singapore.
- Localised interconnecting Wi-Fi coverage throughout the vessel.
- Crew welfair - Easy installation of network connections in crew members cabins.

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Raytheon joins Safebridge online training

www.safebridge.net
www.raytheon-anschuetz.com

Raytheon Anschütz has become the latest navigation systems supplier to agree a deal with online simulation training company Safebridge, which will see Raytheon technology available for study within the Safebridge computer based training system.

Raytheon joins fellow ECDIS manufacturers Imtech Marine, Sperry Marine and Transas in joining the online training programme.

Safebridge specialises in type-specific simulation training for the maritime industry, and was created to meet the demand for ECDIS training contained in the new STCW 2012 and ISM Code regulations.

The training course allows the user to access the equipment in simulation mode over the internet, thus providing familiarisation with the system by practising real-life scenarios.

A 'GuideMe' function is also included, a learning environment where the user is shown, through instruction, the type-specific features of the system in question.

Interactive tasks are performed under continual assessment, with users guided as to when and how they may be using it incorrectly.

The type-specific familiarisation courses will utilise an LMS (Learning Management System) providing a mixture of guided tutorials, examinations and tests to build confidence and competence in the use of the ECDIS.

According to Safebridge director, Professor Captain Ralph Becker-Heins, it is estimated that up to 500,000 seafarers will require training over the next few years.

More critically, he says that around 75,000 of these seafarers will require training in the short-term given that existing installations will become the primary onboard navigation device and the first new build ships in the progressive phase-in period, cruise and other passenger vessels, are required to conform from July 2012.

By signing co-operation agreements with manufacturers, allowing Safebridge to use their ECDIS software for simulation purposes, the company is providing access to training before joining ship and also offering server-based programmes to re-train on specific installed equipment.

Following this latest deal Raytheon Anschütz' NSC ECDIS and its new generation of Synapsis ECDIS will be available for training via Safebridge.

The Synapsis ECDIS provides full server functionalities with automatic duplication of routes and charts in multiple installations, online chart updating services, automatic route planning, AIS integration and data input, integrated Navtex messages on the screen, and integration of weather data and forecast symbols.

"New requirements in ECDIS training from STCW 2012, the ISM Code, and consequently tough Port State Control regulations mean that flexible and hands-on, type-specific training is fast becoming essential for today's seafarers," said Prof Capt Becker-Heins.

"As from July next year, the mandatory fitting of ECDIS onboard ships will begin. The legislation will be applied in a rolling timetable, phased by vessel type and size, starting with new build passenger ships and tankers, but will eventually apply to almost all large merchant vessels and passenger ships."

"Providing online simulation means the seafarer can access hands-on training from anywhere in the world, at any time. This not only fits the changing lifestyle of the seafarer but saves the shipping company the time and expense of organising and scheduling familiarisation training at a fixed date and location. From my own experience at sea, I can appreciate the great advantage this holds for the seafarer, the shipping company and ultimately the entire maritime industry."

The first Safebridge type-specific ECDIS familiarisation courses will be available to the market from Autumn of this year.

GICA members gain access to AIS tracking

www.portvision.com

PortVision has reached an agreement with the Gulf Intracoastal Canal Association (GICA) in the US to provide access to vessel information within the area's waterways to the organisation's members.

Members will be able to view GICA waterway alerts and related notices in the web-based map display of PortVision's Automatic Identification System (AIS) vessel-tracking service, which combines real-time AIS data visualisation and historical information with management tools to deliver an overview of vessel traffic in user-defined monitoring zones.

All GICA members will have web access to PortVision's map display, where they can view all current GICA alerts and notices.

GICA members who are also PortVision customers will be able to see the alerts in a single integrated display alongside other regularly used PortVision information, including vessel position reports, PortVision alerts and current weather conditions.

"We are pleased to be offering this valuable service to our members," said Jim Stark, executive director with GICA.

"GICA will be placing alert icons on PortVision's web-based map display, and annotating them with other useful details to provide a variety of timely, actionable information that will enhance the value of GICA membership and improve efficiency and safety on the Gulf Intracoastal Waterway."

Kongsberg simulators in Kazakhstan and the US

www.kongsberg.com
www.star-center.com

Kongsberg Maritime has announced that the company's Maritime Polaris bridge simulators and Maritime Neptune engine room simulators have been selected to equip a new state-of-the-art facility in Kazakhstan.

The Caspian Maritime Training Center (CMTC), which opened in July in Aktau, is the first maritime training facility in Kazakhstan, and is aimed at developing the maritime industry in the Caspian region. It was established by Wagenborg Shipping and the Maritime Institute Willem Barentsz, both of the Netherlands.

The Kongsberg simulators are hoped to promote realistic training in normal working and emergency conditions, and encourage the optimum and efficient use of ships' equipment.

The plan is to provide a mix of training scenarios across numerous disciplines, including bridge team management, ship-handling and manoeuvring, radar observation and plotting, automatic radar plotting aids and engine resource and team management.

"As the first maritime training facility in Kazakhstan, we will be offering advanced training for navigators, engineers, electrical engineers and seamen," says Igor Valerievich Tyazhkorob, general director at CMTC.

In related news, in the US, Kongsberg has announced that it will supply its dual-redundant Advanced K-Pos DP trainer to the Florida-based maritime training facility, STAR Center.

Under the agreement Kongsberg will also supply six Basic K-Pos DP trainers. The training centre will apply the same DP technology used onboard a wide variety of offshore support vessels, cable layers, research ships, cruise ships and other DP-enabled vessels and oil rigs worldwide.

While the Basic DP training system is designed for practising DP operations, the Advanced Trainer satisfies class notations equivalent to Dynamic Positioning Class 2, including dual redundancy with no single-point failure; failure detection; fault isolation; switchover to hot standby; and comparison of sensor data between computers.

STAR Center will also receive four DP Models, three of which will be twinned with three Polaris simulator 'ownship' models for use on STAR's existing Full Mission bridge. The DP models include a supply vessel, a semi-submersible, a tanker and a drill ship.

"We view this important addition to our suite of simulation training services to be of strategic importance to ensuring American Maritime Officers members are prepared to operate the most technologically advanced vessels in support of AMO contracted companies," says Phil Shullo, managing director, STAR Center.

Ocean Signal SafeSea V100 has been awarded MED product certification

Ocean Signal's SafeSea V100 GMDSS hand-held radio has been awarded Marine Equipment Directive (MED) product certification from the British Approvals Board for Telecommunications (BABT), meeting the relevant requirements for a portable survival craft two-way VHF radiotelephone.

Ocean Signal also reports that it has appointed **CMC Electronics** as its exclusive Canadian distributor. Ocean Signal was launched into North America earlier this year after its European debut in 2010.

Kongsberg Maritime has officially opened a new 25,000 m² factory in Zhenjiang, China, established in order to meet the growing demands for systems and products within the Asian shipbuilding market. The new factory features systems for the design, project engineering and production of Kongsberg Maritime's sensors for use in engine monitoring and cargo monitoring applications.

L-3 Marine & Power Systems has opened a new office in Brazil. All regional operations will be led by Jonas Henrique Lobo, who will serve as director of business development and report directly to Brian Pope, senior vice president of business development for L-3 M&PS.

Hatteland Display has appointed Korean ECDIS provider, **e-Marine LogiX (e-MLX),** as its sole agent in Korea. Under the agreement, e-MLX will offer support for all Hatteland customers in Korea, as well as providing sales facilities for its products.

www.km.kongsberg.com
www.L-3com.com/MPS
www.oceansignal.com
www.emlx.co.kr
www.hatteland-display.com

Training technology upgraded in Tanzania and Turkey

www.transas.com

Transas reports that it has successfully completed a project to supply a training package including navigational, engine room and GMDSS simulators to Dar Es Salaam Maritime Institute (DMI) in Tanzania, and has also completed 'Train the Trainer' courses at simulator facilities in Turkey.

Under the contract with DMI, Transas has upgraded the Institute's navigational simulator to the newest generation Transas Full Mission Ship Simulator NTPRO 5000, with a 270 degree horizontal field of view and rear visualisation channel.

The simulator features wind-generated sea states and variable swell models with a user selected sea state spectrum, as well as vessel and wave interaction, full scene and environment reflection, and three dimensional bow waves and propeller wash with associated floating object interference.

New grounding, synchronous rolling, broaching and other modelling features are included, and integrated with VHF and Intercom solutions allowing voice communications to be made available for debrief and assessment.

The project also featured the supply, installation and commissioning of a Full Mission Engine Room Simulator, Steam boiler and Gas Turbine simulators and a PC based Multifunctional Classroom Simulator for 12 Trainees to study ECDIS and GMDSS operations.

In Turkey, Transas reports that it has carried out a 'Train the Trainer' course at the Maritime Faculty at Dokuz Eylul University, with the aim of updating simulator trainers on the latest training methodology and efficient use of simulators.

21 lecturers from 12 different colleges participated in a programme consisting of Navigational Simulator and Engine Room Simulator courses, and also covering developments in ARPA radar and ECDIS, innovations in maritime training and new simulators' applications.

As a part of this programme a Facebook Group was created, which allowed for communication and information exchange between the lecturers of different colleges.

"The number of educational institutions providing manpower to the maritime industry has rapidly increased in the last decade," commented project manager Associate Prof Selcuk Nas, Deputy Dean of Maritime Faculty, Dokuz Eylul University.

"Moreover, there have been a lot of investments in laboratories, classrooms and simulators in order to enable sufficient training. Still we see that the most important factor is an investment in 'human capital'. In other words, highly educated, skilled trainers who create added value by educating seafarers, are the most valuable resource for us."

"With this in mind, we always make sure that our trainers have the latest knowledge in using simulation systems and in bridge and engine room operations."

Dokuz Eylul University and Dar Es Salaam Maritime Institute have both installed new systems from Transas

Two new space-based AIS satellites launched

www.exactEarth.com

Satellite-AIS company exactEarth Ltd, a subsidiary of COM DEV International, has announced that it has successfully launched two new AIS (automatic identification system) satellites designed to extend its exactAIS constellation and increase the capacity of its global vessel monitoring service.

The two spacecraft were built by SpaceQuest, and exactEarth will take ownership after the successful completion of in-orbit testing, which is expected to be concluded within 90 days.

These satellites incorporate a new generation of AIS payloads designed to further improve the company's AIS message detection capabilities from space.

The addition of these new spacecraft will bring the exactEarth constellation to five operational satellites.

"Today's launch marks another important step in the ongoing expansion of our global vessel monitoring service," said Peter Mabson, president of exactEarth.

"Our existing spacecraft have proven that advanced AIS payload technology combined with our proprietary ground-based processing results in a significant increase in detection capability."

"This launch helps ensure that exactEarth will continue to provide the world's most comprehensive and high performance satellite-based AIS service for years to come."

Tideland wins contract with GLAs

www.tidelandsignal.com

American marine navigation aids provider, Tideland Signal, has announced the signing of a three year agreement with the General Lighthouse Authorities (GLA) of the UK and Ireland, with an option to extend.

The GLAs will use Tideland's SeaBeacon 2 System 6 for the next three years

The contract calls for the supply of Tideland radar beacons, specifically SeaBeacon 2 System 6 dual-band racons.

As part of a joint-GLA framework agreement the racons will be installed around the coastline of Scotland and the Isle of Man. The equipment is intended to replace older racons as they fail and will be stored onboard service vessels rendering them available for immediate installation.

Tideland claims that its SeaBeacon 2 System 6 racon can be programmed quickly and easily by the user at sea, rather than having to be pre-programmed in the factory.

They offer sensitivity of -50dBm for both X- and S- Band, and can respond simultaneously to both X and S-band radars.

Pole Star and Absolute in merger talks

www.polestarglobal.com
www.absolutesw.com

Pole Star and Absolute Software (including Absolute Maritime Tracking Services) have announced that they are in talks about a potential merger of the companies' respective global operations.

Pole Star Space Applications provides fleet management and telematics services, and is particularly involved in long range identification and tracking (LRIT) as the manager of 38 LRIT national Data Centres. In total the company is monitoring the movement of more than 25,000 ships worldwide.

Absolute is also a provider of LRIT systems and other vessel monitoring services, and manages the Panama LRIT National Data Centre, the world's largest data centre, monitoring over 6,000 vessels. This forms part of the 12,000 ships that Absolute is tracking on a daily basis.

NGSCO installs CCTV across fleet

www.km.kongsberg.com

Kongsberg Maritime reports that it has completed delivery of a number of CCTV systems for installation on National Gas Shipping Company's (NGSCO) entire fleet of eight LNG carrier vessels in the Middle East.

The project has been managed in conjunction with Unique Systems FZE, Kongsberg Maritime's local sales agent. Unique Systems FZE will be assisting in the installation and commissioning of the CCTV systems, with two vessel refits having been completed already in April, another in July and the remaining five planned over the next few months.

Each ship's CCTV system comprises a range of marine grade stainless steel above deck PTZ (pan, tilt & zoom) and fixed camera stations with lowlight (day/night) viewing capabilities and washers and wipers, along with a multichannel telemetry matrix controller and 350 GB digital video recorder (DVR), and an additional control and viewing station.

New CCTV cabling will be used to install the equipment on the four Al Khaznah class vessels – the Al Khaznah, Shahama, Ghasha and Ish – and existing cabling will be used to upgrade the four Mubaras class vessels – the Mubaras, Mraweh, Al Hamra and Umm Al Ashtan.

The new CCTV systems replace the original ships' CCTV systems and will be used to monitor critical above deck processes.

Kongsberg Maritime and Unique Systems FZE already had an existing relationship with NGSCO, having installed systems and performed service and maintenance support on many of its vessels.

"The safe transportation of LNG is in itself a challenging process and it is vital that reliable CCTV surveillance equipment is used to monitor on deck processes and ensure safe operations," said Dan Williams, business development manager at Kongsberg Maritime.

"Kongsberg Maritime and Unique Systems FZE secured this contract via a competitive tender, based on the quality of our marine CCTV systems offering. It's very satisfying to work with NGSCO and we look forward to developing our strong relationship with them going forward."

Kongsberg CCTV on NGSCO vessels will help monitor critical above deck processes

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Marine Aids to Navigation Strategy - 2025 and Beyond

The General Lighthouse Authorities (GLAs) of the United Kingdom and Ireland **have outlined their strategy to deal with evolving technology for the maritime sector as part of IMO's e-Navigation strategy, and how this will affect Aids to Navigation in the busy waters of North West Europe**

'2025 and Beyond' is the United Kingdom and Ireland's marine aids to navigation (AtoN) strategy. It has been prepared by the General Lighthouse Authorities (GLAs) of the United Kingdom (UK) and Ireland for their users, partners and stakeholders.

Since the publication of the GLAs' '2020 The Vision' the global maritime risk to life, property and the marine environment has continued to increase.

The International Maritime Organisation's (IMO) response is e-Navigation to enhance berth-to-berth navigation and related services, for safety and security at sea and protection of the marine environment.

Without this fundamental change, given the increasing complexity of navigating around the British Isles, the risks of collisions and groundings will undoubtedly increase.

The GLAs' coastal environment is already complex: the Dover Strait is the busiest and potentially one of the most dangerous pinch-points in the world; there are strong tidal currents in the Pentland Firth and large tidal ranges in the Bristol Channel; and there are around 255 offshore oil and gas platforms.

New plans for up to 7,000 offshore wind turbines and other tidal or wave energy installations, as well as marine conservation areas around our coasts, will add further complexity to our already challenging coastal waters.

These many factors reduce the sea area available to shipping and increase the pressure on mariners. Their task becomes more complex and their room for manoeuvre ever more constrained as the number of traffic pinch-points increase, notably on the approach to major ports.

The long-term trend is generally towards larger ships with an overwhelming over reliance on GPS in the coastal voyage phase. At the same time, crew sizes have reduced and there is a severe shortage of seafarers, superintendents, surveyors and pilots.

The Nautical Institute has stated that 80 per cent of accidents at sea are caused by human error, while 2008 evidence from one of the leading marine insurers directly links the rise in the number of accidents at sea with human and navigational error.

IMO's e-Navigation response is defined as:

"The harmonised collection, integration, exchange, presentation and analysis of maritime information onboard and ashore by electronic means to enhance berth to berth navigation and related services, for safety and security at sea and protection of the marine environment."

The concept is that all charting, communications and navigation information will be integrated into a coherent presentation on the bridge. It will be data-linked to shore to give a clear and up-to-the-minute presentation of current charts, incidents and shipping.

Strengthening e-Navigation

The benefits of e-Navigation in the high-risk areas off the coasts of the UK and Ireland are clear. e-Navigation will bring a fundamental change to the concept of operations used for maritime navigation.

GPS is undoubtedly the primary navigation system at present and will be joined by other satellite systems such as Glonass, Compass and Galileo.

Due to the vulnerabilities of the signal, the need for a terrestrial backup to GNSS is widely accepted in IMO but such a system has not been mandated as yet nor the global or large region coverage defined.

However, until the backup is defined there is a clear single point of failure, as e-Navigation would rely almost exclusively on satellite navigation systems for its positioning, navigation and timing inputs.

In the e-Navigation environment the sudden reversion to traditional visual and radar navigation methods in congested and confined waters is a genuine concern which may be beyond the experience of future watchkeepers and thus would potentially be unsafe.

This is why the GLAs continue to press the need for an independent, dissimilar terrestrial Position, Navigation & Timing backup.

The GLAs' choice for an independent terrestrial Position, Navigation & Timing backup is enhanced Loran (eLoran). We continue to participate in a pan-European Loran network on a trial basis in the belief that eLoran or a derivative provides a reliable, accurate, secure and low cost enhancement of GNSS derived PNT for multi modal uses and applications.

eLoran, or an equivalent terrestrial backup to GNSS, is a key building block of e-Navigation.

The GLAs believe that, if it is delivered along with secure and reliable communications, charting and chart displays and if it becomes mandated by IMO as a universal equipment carriage, then it will allow, subject to risk assessment, a significant reduction in the current number of Aids to Navigation and allied to simpler designs will result in a corresponding reduction in the cost of the AtoN service.

Contemporary technologies already provide the capability to deliver much of what IMO e-Navigation strategy envisages.

However, if such technological advancement remains uncoordinated, there is a risk that the future development of the global shipping industry will be hampered through lack of standardisation onboard and on land, incompatibility between vessels, and an increased and unnecessary level of complexity and cost.

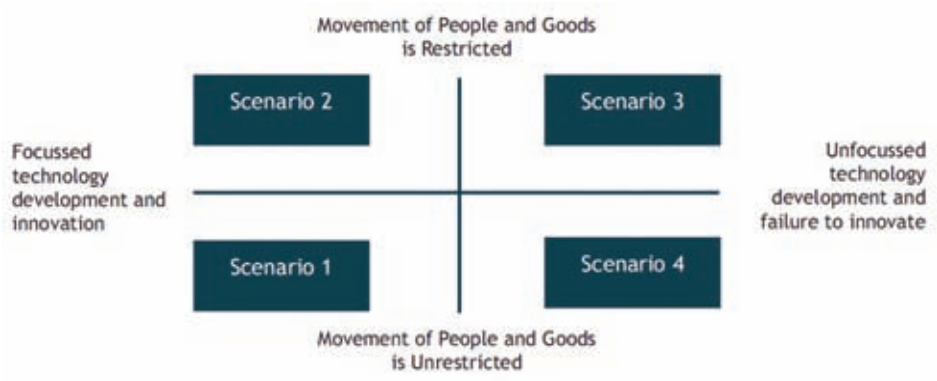
The transition period to e-Navigation will, by its very nature, carry a degree of temporary risk that will require mitigation by the continuing deployment of physical AtoN.

Even with the full implementation of e-Navigation, the GLAs are of the view that spatial awareness in inshore and some aspects of coastal navigation will remain important and thus leading lights, sector lights and buoyage will continue to be a mix of the AtoN provision.

It is reasonable to assume that technology will continue to develop and that solutions will emerge which will consolidate confidence and reliance on the integrity of the navigational position.

For example, the validation of radar returns by comparing them to identified objects on the ENC perhaps or a system of automatic bearings.

Nonetheless, if eLoran or equivalent is not mandated as a backup to GNSS, the GLAs will be slow to reduce the amount and nature of the physical AtoN that are presently deployed and that have served the mariner so well thus far.



Future use of AtoN technology will be dependent on environmental factors

Long-Term strategy

Over the last thirty years, there has been a huge increase in the availability and use of technology – positioning, communications and information technology – within the maritime sector. We have no evidence to suggest this rate of change will reduce.

Therefore, the GLAs have followed the UK Government's horizon scanning best practice in a combination of scenario development and trend analysis techniques to 2038 to support the creation of '2025 and Beyond'.

These techniques do not attempt to predict what will happen. Nevertheless, they have helped the GLAs to develop '2025 and Beyond' by stimulating future concepts as well as spelling out potential opportunities and threats.

The GLAs addressed four scenarios based around two axes (see graph below left):

- free or constrained movement of people and goods; and
- focussed or unfocussed technology and innovation.

'2025 and Beyond' broadly assumes a future where there is free movement of people and goods and where focussed technology and innovation allows economic growth within environmental limits (Scenario 1).

However, other scenarios are also possible and so '2025 and Beyond' recognises the importance of contingency planning in order to respond swiftly and effectively to future uncertainties.

Looking forward, it is also important that the GLAs develop ways of anticipating future risks and challenges, assess in advance how they might respond and continue to track the external environment to confirm their likelihood.

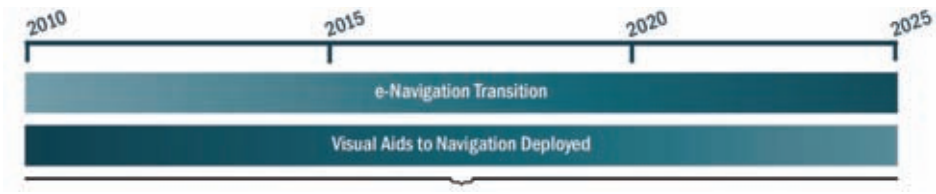
Short-Medium term strategy

The short-medium term brings its own challenges and opportunities.

Institutionally, there will be marine management organisations supported by appropriate regulation with responsibilities that include marine science, planning, policy development, management and compliance monitoring.

There is also the potential for changes to the Merchant Shipping Acts to define further the role of the GLAs.

From a regulatory perspective it is expected that the global and regional desire for increased harmonisation of traffic management, maritime domain awareness, marine spatial planning, marine operations and the safety of navigation will result in further legislation linked to protecting the marine environment and enhancing commerce.



Period of Transition: The GLAs will conduct their AtoN reviews to match the increasing potential for rationalisation depending on regulation, investment programmes, on-board equipment carriage, AtoN technology, training, risk and volume of traffic

Financially, the GLAs will look to the United Kingdom and Irish Governments to continue to provide a stable mechanism for funding our statutory responsibilities.

Operationally, the GLAs will continue to be driven by user requirements and the need to respond to international and national developments linked to regulation, offshore developments and technology, including e-Navigation.

Technologically, new systems will allow us to continue to meet our statutory responsibilities while improving our environmental footprint and extending maintenance intervals.

This will allow the GLAs to reduce costs, become more cost-effective and deliver better value for money.

However, managing the lengthy transition associated with infrastructure deployment and onboard carriage requirements is likely to bring its own challenges.

For example, new lights technology including synchronised lights will deliver improved range and conspicuity and allow increasing use of renewable energy. Developments in paint, materials and battery technology will allow extended maintenance intervals.

At the same time, improvements in PNT technology, additional navigational systems, advances in onboard and shore equipment, should allow for a reduction in the range of major lights and a reduction in offshore buoyage primarily intended for the use of SOLAS equipped vessels. Some main lights may also be discontinued.

Conversely however, there may also be an increase in AtoN in inshore waters.

With improved track analysis from AIS resulting in better risk analysis for sea areas and the traffic using them, the GLAs will continue to cater for and respond to the needs of their users taking into account their diverse range of vessels and craft, equipment, experience and competence.

Future navigation

Ultimately, marine AtoN are an important and essential component for ensuring safety of life, facilitating commerce, maintaining security around our coasts and ensuring a clean maritime environment.

They are an important strategic resource for the United Kingdom and Ireland:

- they mark both natural and man-made hazards around our coasts that might otherwise lead to maritime incidents with loss of life and damage to the environment;
- they provide situational awareness for mariners, improving the link between the physical world and the digital world of radio navigation, electronic charts and radio communications;
- they demarcate areas and routes so that merchant shipping, fishing, leisure users, offshore energy, aquaculture and nature conservation can co-exist and thrive in our increasingly crowded and complex coastal waters.

The GLAs' marine aids to navigation vision is for a balanced mix of physical and radio AtoNs that will meet the UK's and Ireland's responsibilities as Contracting Governments to the IMO's SOLAS Convention.

This mix will support and promote the introduction of the IMO's e-Navigation initiative and will deliver a reliable, efficient and cost-effective AtoN service for the benefit and safety of all mariners.

The GLAs' marine Aids to Navigation strategy for the British Isles between 2010 and 2025 is:

- to continue to provide an appropriate mix of AtoN for general navigation;
- to continue to provide a timely and effective response to wrecks and AtoN failures;
- to continue to undertake superintendence and management of all aids to navigation in accordance with international standards, recommendations and guidelines;
- to introduce e-Navigation AtoN components and services in the UK and Ireland;
- to work with users, partners and stakeholders nationally and internationally, to promote the safety of marine navigation based on harmonised international standards, recommendations and guidelines;
- to embrace relevant technologies as they evolve, successfully transfer from old to new technologies and integrate them into our mix of AtoN for general navigation;
- to improving reliability, efficiency and cost-effectiveness while ensuring the safety of navigation.

Period of Transition: The GLAs will conduct their AtoN reviews to match the increasing potential for rationalisation depending on regulation, investment programmes, on-board equipment carriage, AtoN technology, training, risk and volume of traffic

The GLAs deliver their services in a transactional environment that comprises organisations that have an impact on our business and with whom we deal directly; while the contextual environment comprises organisations that have an impact on our business but with whom we don't deal directly. This is illustrated by the graph above.

The GLAs use IALA risk management techniques when identifying the AtoN requirement (type location etc).

Risk management is a term applied to a structured (logical and systematic) process for:

- identifying, analysing, assessing, treating, monitoring and communicating risks for any activity, and;
- achieving an acceptable balance between the costs of an incident, and the costs of implementing measures to reduce the risk of the incident happening

The Risk Management process comprises six steps that follow a standardised management or systems analysis approach:

1. Identify risks/hazards;
2. Assess risks;
3. Specify risk control options;
4. Make a decision; and
5. Take action;
6. Monitor and review

The GLAs will ensure that the appropriate balance between the requirement for a quantitative assessment is combined with a qualitative approach using the principles of six steps to risk management.

GLA Commitment

In line with these strategies leading up to 2025 the GLAs have committed to a plan of action where they will:

- work closely together to maximise their benefit and impact whilst reducing costs where the safety critical nature of the service allows.
- consult regularly with users through the Joint User Consultative Group, individual consultative committees and local user groups, to understand their needs, inform them about developments, and consider their views to improve the service we provide for all classes of mariners.
- engage with other maritime service providers in the UK and Ireland to ensure a coordinated approach to safe ty of navigation in our areas of responsibility.
- work with local lighthouse authorities and our neighbouring littoral states to ensure that users receive an effective and seamless service.
- provide a stable and resilient Aids to Navigation service for general navigation that meets international standards, recommendations and guidelines.
- respond to wrecks, new dangers and Aids to Navigation casualties in a timely fashion to minimise the risk to users.
- engage with international organisations, governments and other bodies to promote the harmonisation and standardisation of Aids to Navigation services.
- ensure that through constant review the Aids to Navigation mix is relevant, reliable and cost-effective.
- conduct their activities in a way that minimises their impact on the environment.

When delivered, this strategy will mitigate risk to provide for the safety of navigation, the protection of life, property and the marine environment, in line with the GLAs shared mission – "To deliver a reliable, efficient and cost-effective Aids to Navigation Service for the benefit and safety of all mariners." DS

*This article has been adapted from the General Lighthouse Authorities of the United Kingdom and Ireland's '**Marine Aids to Navigation Strategy – 2025 and Beyond**' report. The original paper, including references, can be downloaded at http://tinyurl.com/2025-and-Beyond. For more information on the GLA visit www.trinityhouse.co.uk.*

AIS – towards the future

Automatic Identification System (AIS) technology is now a mainstay of modern navigation, with its use spreading to applications far beyond those originally envisioned – some better than others. *Dr Andy Norris* looks at the strengths and weaknesses of modern usage of AIS, and how it might evolve in the future

In principle, the Automatic Identification System can provide excellent navigational data and is also a unique source of information to support many governmental and private shore-based activities.

The beauty of AIS is its universality. In fact, it is officially named as the Universal AIS (UAIS) but this nomenclature has not survived in everyday use, even though it has probably become more universal than ever originally envisaged.

For instance, in the mid 1990s when AIS was being conceived, who would possibly have thought that AIS apps with quasi-global coverage would be available at virtually zero cost to any smartphone user?

In fact, probably few had even realised that AIS data would get used beyond ships, coastal stations and national security departments.

Its present-day universality has made it of huge benefit to shipping offices and dockside facilities, as well as providing invaluable statistical data to enhance routeing facilities and to improve environmental protection.

Unfortunately, use has also extended to crime-related activities, including piracy. The benefits of universality surely greatly outweigh its possible disreputable uses but it does mean that special precautions concerning AIS need to be taken by vessels in certain situations.

However, despite the benefits of the present-day system it does suffer from a significant drawback that generally prevents the concept being used to its fullest possible extent. This is the relatively poor integrity of its transmitted data – which especially compromises its use as a navigational tool.

When first introduced, the inherent integrity issues of AIS were underlined by numerous erroneous transmissions from ships, mainly resulting from actions or, indeed, lack of actions by inadequately trained bridge staff, in many cases exacerbated by improperly performed installations.

Linked to the additional inadequacy of AIS for many aspects of navigation when used solely on an IMO-defined Minimum Keyboard and Display (MKD), the system created a very negative initial impact on many shipborne users.

It is only when AIS data is displayed and used knowledgably on other navigational monitors, especially radar, that its navigation benefits become really useful.

Lack of integrity

There are a number of integrity issues. A major one is that the navigational inputs into the transmitting AIS – the dynamic data – are from individually operating sensors, which are not normally checked for consistency by any automatic system.

Another is that the system is reliant upon operators remembering to correctly input voyage related data, such as the destination port. Furthermore, the static data, such as the vessel's name, IMO number and GNSS antenna shipboard position, has to have been correctly set and maintained.

Monitoring by coastal authorities has considerably improved data accuracy since the early days of AIS, particularly because many impose fines if action is not taken to correct anomalies that have been highlighted to the vessel.

Even so, the system remains vulnerable to newly arising data errors and inaccuracies, which can occur at any time.

Another issue that can affect the integrity of AIS is that it is technically quite easy to generate spoof signals, which, in the hands of subversive users, can potentially play havoc with the system, such as by generating false targets.

All these inherent integrity issues have led IMO from the outset to caution its use for making collision avoidance decisions. AIS remains unmentioned in the COLREGs, in effect highlighting its relatively poor integrity – although Rule 7 implicitly requires AIS information to be used in assessing whether a risk of collision exists.

Of course, radar also has integrity issues, such as when targets are obscured by clutter and with operator set-up problems. However, problematic scenarios are generally more easily recognised by users, not least because its operation is entirely self contained and does not rely on 'cooperative targets' – a highly significant advantage over AIS.

Despite the real concerns for the integrity of AIS data it is perhaps ironic that its inherent accuracy and information content for vessel-to-vessel encounters normally easily beats that of marine radar.

For instance, its range resolution and accuracy is typically around a few metres, compared to tens of metres for a standard radar. The latency of target turn information from AIS is normally of the order of a few seconds but is generally a minute or more from tracked radar data.

AIS also gives a lot of extra information about the target that is not available to a radar based system and the use of VHF frequencies means that vessels separated by a moderate landmass can often still receive AIS signals from each other, whereas their mutual radar vision would be blocked.

Of course, it is the combined and intelligent use of visual, radar and AIS derived information, together with other appropriate navigational data, that maximises the total benefits and minimises the possibility of an unnoticed integrity failing in any one system.

In particular, it highlights the reliance that can be given to the perception of any actual situation, enabling decisions to take into account the degree of uncertainty.

As a note of concern, some vessel traffic systems only have AIS information available to them, at least in some sectors of their coverage. Allegedly, this does not stop all VTS operators from giving ships detailed instructions based solely on such data – or is this hearsay?

The use of AIS data has become more universal than ever originally envisioned

AIS evolution

The future of AIS is intimately linked to that of e-navigation, which is based on relevant high integrity information always being available to ensure the safe passage of vessels.

The navigational integrity inherent in e-navigation thinking will ultimately ensure that the dynamic data input into AIS will be automatically assessed and perhaps even tagged with an integrity message.

In addition, a separate onboard receiving system could continuously and automatically make integrity checks on the actually transmitted data from own ship. This would also flag up any nearby system attempting to spoof own ship's transmissions.

The increased integrity possible could even make AIS become the prime tool for avoiding ship-to-ship collisions and may considerably enhance the possibilities for a greater element of 'sea traffic control' in crowded waters.

It is easy to dream up additional AIS services, especially with e-navigation in mind, and a host of new messages are already becoming available, including those for AIS Aids-to-Navigation. However, the currently allocated bandwidth will quickly become saturated in some parts of the world if all possibilities are used in earnest.

In addition, as more and more AIS Class-B users come on line, they put considerable extra pressure on the network, which is likely to limit the effectiveness of these transmissions in some areas.

However, it is in everybody's interest for small craft to become AIS users, despite it requiring special techniques to reduce the display clutter that will inevitably arise.

This particular topic is being specially discussed at a seminar being held by the Royal Institute of Navigation at Trinity House, London, on the 8th November.

For all these reasons there is already talk about increasing the number of VHF channels dedicated to AIS.

The current system is very cleverly thought out for today's use, giving adequate performance to all users but using miniscule bandwidth resources.

However, it is based on messages being compact and in the more distant future, as more and more information is considered necessary, it may require a fundamental rethink.

In essence, AIS is just an automatic digital communications system that requires good availability and, in particular, relatively low transmission latency for some of its critical navigational data.

Perhaps into a mature e-navigation future it can just become high priority data sent on future standard communications channels, whether satellite or terrestrial based.

In principle, because the bandwidth is not so highly restricted as present day AIS, such channels offer very high levels of data security, greatly reducing the opportunities for spoofing.

Aspects such as latency would have to be carefully controlled but current thinking on advanced digital communications systems recognises the need for giving data priority to certain categories of message.

In fact, only a small class of AIS messages need such high priority.

It is its transmission cost, rather than fundamental technology and knowhow, that prevents this prospect becoming viable in the relatively near future.

But data costs are ever reducing ... 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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