Digital Ship
December 2007
www.thedigitalship.com

# Faster, smaller, cheaper
## Inmarsat launches FleetBroadband

**Five years after the launch of its current flagship Fleet service, Inmarsat has officially unveiled its next generation satellite communications system - FleetBroadband. *Digital Ship* examines the future of maritime broadband communications**

The next generation of Inmarsat satellite communication services, FleetBroadband, is now commercially available, following the launch of the system on November 19.

The new IP-based offering, capable of delivering speeds up to 432kbps to the merchant maritime community, promises to be a major step forward in the functionality that Inmarsat can provide to the sector, with wider communications options as well as a host of new pricing plans expected to pique the interest of vessel operators.

FleetBroadband equipment is now available from manufacturers JRC and Thrane & Thrane, with services being provided by Bezeq, KDDI, Korea Telecom, MCN, Morsviazsputnik, Otesat-Maritel, SingTel, Stratos and Vizada. Inmarsat says it expects partners to commence terminal shipments within the next few weeks.

"The development of FleetBroadband is part of our strategy to keep innovating, to develop new services that are faster, smaller, cheaper and more accessible for a range of maritime users globally," said Michael Butler, president and COO of Inmarsat.

*FleetBroadband is our most capable service, for our most important sector - Michael Butler, Inmarsat*

"We've enjoyed double-digit growth in revenues this year, for the first time in over a decade, and we've also launched six new services, including a range of low-cost voice services, a messaging service, and broadband for the aeronautical sector. But I'm pleased to say we've left the best until last, as we officially announce the introduction of FleetBroadband, our most capable service for our most important sector."

These new services that Inmarsat has introduced have been made possible by the investment in the company's latest constellation of two Inmarsat-4 satellites, what Mr Butler calls "the most capable communications satellites ever conceived, built and launched."

While the current satellites only offer coverage of the Indian Ocean and Atlantic Ocean regions at present, a third Inmarsat-4 satellite is scheduled for launch in 2008, which will complete full global coverage for the FleetBroadband service by adding spot beams in the Pacific Ocean region.

"(The latest satellites) have 16 times the capacity of the Inmarsat-3s, but in terms of the power it has increased 60 times, and that's why we can provide such high bandwidth, low cost services to such small and cost effective termi-

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**CYPRUS**
St Raphael Resort,
February 5-6, 2008

**SCANDINAVIA**
Telenor Expo Centre, Fornebu, Oslo
March 11-12, 2008

ABC



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nals," Mr Butler explained. "This really is the bedrock for the services we'll be introducing over the next couple of years."

"We have firm plans to launch our third Inmarsat-4 from the Baikonur Cosmodrome, hopefully in April 2008, which means that by the time services are really getting rolled out we'll have complete global coverage for our maritime users."

Inmarsat says that a change in the operation of FleetBroadband compared to the Fleet system, whereby it will run the infrastructure for the service itself from a small number of groundstations rather than rely on partners running land earth stations as with Fleet, will also help to lower the cost base.

Mr Butler expects, however, that Inmarsat will continue to work with the distribution partners that had been running land earth stations for the previous systems, but with those partners focusing more on providing customer solutions and value-added services.

## Evolution

As FleetBroadband reaches the market Inmarsat is also in the final stages of preparation for the termination of its first analogue service, as it reaches the end of a quarter century lifecycle.

"(On December 31) we are closing down Inmarsat-A, our original analogue service which we introduced in 1982," Mr Butler said.

"I'm pleased that there's a good crossover now, already Fleet is established as the maritime standard, but I think FleetBroadband will be able to go on and do similar things."

"The service we're launching probably has the same length of service as Inmarsat-A does. Those members of the maritime community that are looking to invest in FleetBroadband will know that in 25 years time we'll still be supporting services, whether it be on the Inmarsat-4s or on Inmarsat-5s."

"That's our commitment. I'll probably be drawing my pension before FleetBroadband is drawing its."

The longevity and reliability of its services is one of the key points for Inmarsat in how it will present FleetBroadband to the market, with slow gradual improvements rather than explosive growth the current strategic focus. The company is at pains to stress that it sees the introduction of this service as "evolution, not revolution."

As a result, Inmarsat has made sure to support existing technologies established for use with Fleet on the new system, but at higher speeds and with greater efficiency.

"FleetBroadband is cutting edge, there's no doubt about it, all from terminals that are faster and smaller than ever before," said Piers Cunningham, head of maritime business, Inmarsat.

"But we'll keep the legacy ISDN services that are now the backbone of our merchant marine community available for use in the future. That's very important, and we haven't lost sight of what's gone before and is tried and trusted by our mariners."

"The merchant market is our backbone, it's one of our most conservative and one of our most judgmental. We've had to make sure that our service is right for launch, and today it is. FleetBroadband will become, I have no doubt, the de facto standard in the deep sea merchant world. It's type approved to a known standard and is not proprietary in any way."

The legacy Inmarsat services available through FleetBroadband will also be improved through the use of the improved technologies, and will be supplemented by a new range of communications capabilities.


*The FB 500 terminal from Thrane & Thrane allows speeds of 432 kbps, and dedicated streaming channels of 256 kbps*

"With voice we're making strides in terms of the quality and number of terminations we can derive from smaller amounts of bandwidth, but it really takes a quantum leap in terms of the crystal clear voice that you'll be hearing," said Mr Cunningham.

"There's SMS, being a 3G network it acts as an SMS gateway where you can actually send messages from mobiles to vessels at sea. And we now have voicemail, when a voicemail is left ashore an SMS will be sent to the vessel to say that the messages are indeed waiting."

"We also have new added value applications like mobile to mobile calling, bypassing terrestrial networks completely, at very cost effective rates, something that will be very good for operational fleetwide control."

To further increase the functionality to the user Inmarsat has extended its system to be able to handle a multitude of different connections, for any of the supported applications, at any one time.

This can allow the user to make better use of the improved bandwidth speeds, with the new terminals now capable of speeds up to 432kbps, compared with the 128 kbps maximum available with the Fleet system, using IP technology rather than MPDS. Guaranteed throughput for streaming applications is also available, up to 256 kbps.

"This really is a move that's not just double or triple, this a leap of light years in terms of what we can offer in throughput and capability," said Mr Cunningham.

"The main leap is the performance, and being able to do it simultaneously. For the first time ever with Inmarsat you can carry out voice sessions while maintaining your data applications, taking us into a whole new realm of applications."

"FleetBroadband will take us into the next few years and beyond, safe in the knowledge that we have the most cutting edge technology deployed globally in the marine community. The evolution doesn't just end here, our network has the flexibility to meet coming standards and IP requirements going forward, and that's very important as we evolve our communications capability."

## Pricing

As well as introducing new options for users in how they use their communications, Inmarsat has also introduced a new range of pricing plans that will see it move beyond flat rate usage tariffs for the first time.

"We're still going to keep the pay as you go system that everyone knows with Inmarsat," said Mr Cunningham. "If you don't use the service, you don't pay for the service, you don't have to pay a subscription to gain access to the network. This is still the main requirement of the majority of our users."

"It will be much more competitive than Fleet MPDS, charged per megabyte, not per megabit."

"Where it really changes is in the value allowances that allow our distribution partners to go and contract vessels for an entire fleet and aggregate their usage for a confirmed amount per month," he continued.

"That's something that we've evolved for FleetBroadband. It takes the ability to have cost control across entire fleets to another era."

"Of course, (the distribution partners) offer discounts and flexibility compared with standard pay as you go pricing. If you commit to a partnership then we will commit to you, and the value you derive from that commitment will be more than if you were paying with no commitment."

Jeffrey Irwin, director commercial initiatives with Vizada, confirmed that, as one of these distribution partners, Vizada will be able to offer the FleetBroadband service to the market with a number of different contract options that could result in major cost savings for maritime users.

If a shipping company is willing to contract for a minimum dollar amount of communications usage across its fleet the distribution partners will offer significant discounts that were not available under the Fleet pricing arrangements.

"You're looking at much better prices when compared to Fleet services, and then you do have the allowance plans," Mr Irwin explained.

"We have the allowance packages, we have the SCAPs (shared corporate allowance packages) for fleetwide, multiple terminal agreements. In exchange for those commitments we'll give better rates."

"If a company wanted to combine and pool their traffic together, like when a vessel goes to drydock and isn't using any communications and passes its allowance to a vessel that's using a lot because it's in the Caribbean in the wintertime, it allows that flexibility."

As FleetBroadband runs over the existing BGAN network, the land-based satellite communications service that was the terrestrial forerunner to the new maritime service and has been in operation for over

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*continued from page 2*


*JRC's FB 250 terminal offers speeds up to 284kbps, but only weighs about 5kg*

two years, it could be reasonable to assume that the prices for FleetBroadband would mirror those of BGAN.

However, the mobile nature of the service compared to BGAN has added complications, which has, for example, meant a slightly lower maximum speed for FleetBroadband, 432kbps compared with 492kbps.

These added complications of the mobile service may also mean slightly higher prices than the $4 to $7 per megabyte that was initially quoted for the BGAN system, though Mr Irwin was reluctant to commit to a dollar figure and pointed out that this will vary widely dependent on allowances and committed contract terms.

"The premise is the same, so in some areas the voice pricing would be roughly the same," he told us.

"But you are talking a significant discount depending on what level you're willing to commit to, be it monthly, or quarterly or annually, in exchange for that you are getting significant discounts. That is one of the perks that comes with it, then it's our job to take our value added services and include that on top."

"It's going to fluctuate because it depends which package you're on, if you're using standard pricing or one of the pooled packages. Then you have to look at it from the Vizada perspective, if you're a heavy user of other services then you're going to get an even better rate than that."

"There are many different factors involved that you could say its 50 per cent cheaper, or 80 per cent cheaper, and it won't be exact," Mr Irwin continued. "If you're talking strictly background IP then yes, you are going to see that it's going to be much more cost effective."

"If you look at Fleet now, the hardware is not very expensive compared to other maritime solutions, and it's a solid service, there are very few, if any, issues with the service. So I think we're going to see Fleet sales continue. Inmarsat-B customers will probably start investigating (FleetBroadband's) potential, some of them may have a need to go with a Fleet terminal now and have a migration path."

## Future growth

Both Inmarsat and Vizada see this launch as the beginning of a long introduction process for the service, and know that it will take time and proof of FleetBroadband's capabilities before it can become a mainstay of the market.

"I think what you are going to see is that many companies will wait for a global service," said Mr Irwin. "You'll see the regional take up first obviously, but then people will wait until, say, the end of next year when there is a global service."

"That's fair, because it gives time to prove the service, I think people want to see it work. It will be a slow take up, but so was Fleet, and now Fleet's the number one service that Inmarsat sells. It's not all going to change tomorrow, but I think we're going to see this get to the same place as where Fleet is."

Return on investment will be key in the uptake of the system, and this will have to be decided by individual companies on a case by case basis.

With reports suggesting terminal prices in the $10,000 or $20,000 range, for the JRC FB250 and Thrane & Thrane FB500 terminals respectively, savings in communications costs will have to be offset against that amount, meaning that the actual traffic needs of each specific company will determine the cost effectiveness of an investment in FleetBroadband.

If the new service does represent a saving of between 50 and 80 per cent over the use of MPDS (mobile packet data service) on Fleet, as Inmarsat has suggested, then the length of time until those costs have paid for themselves may not be too far into the future if the company is sending multiple megabytes over the pipe on a monthly basis.

However, if a shipping company is sending huge amounts of data it may be coming closer to where a VSAT (very small aperture terminal) unlimited usage system might become more cost effective in the long run, so Mr Irwin says that Vizada, as a supplier of both systems, will ask customers to thoroughly examine their requirements before deciding on a communications system.

"The key differences come in with the amount of traffic you send," he said.

"Inmarsat is very reliable, the hardware is not as expensive as a VSAT solution, but you do pay on demand, as you use it. VSAT is maybe not as reliable in inclement weather, it's more expensive as far as hardware goes."

"There are plusses and minuses on each side so it really depends on what your throughput is and what your communications needs are."

What does seem to be certain following the launch of FleetBroadband, and further advancements in satellite technology, is that, whatever your requirements, the communications options available to the maritime industry are becoming faster, smaller, and cheaper. DS

***For a comprehensive round up of the capabilities of the FleetBroadband technology, as well as all of the available pricing options, see the Digital Ship November 07 issue. Back issues of Digital Ship can be downloaded in PDF format from our website, at www.thedigitalship.com***

# Inmarsat bond issue follows $8.5m Vizada discount

Inmarsat has announced that it intends to make an offering of $265 million in principal amount of 1.75 per cent convertible bonds, due in 2017. The net proceeds of the bond issue are expected to be used to fund directly or indirectly a loan that Inmarsat Finance III (Inmarsat III) has agreed to provide to CIP UK Holdings.

CIP Canada's acquisition of Stratos is expected to complete before the end of the year.

In addition to the offering there is an increase option of $25 million in principal amount of the bonds that Inmarsat has granted to the joint bookrunners of the offering.

The bonds to be issued by the company are convertible into ordinary shares of Euro 0.0005 each of the company and are expected to have a semi-annual coupon of 1.75 per cent, a semi-annual yield to maturity / put in the range of 4.5 to 5 per cent, and a conversion premium of 25 to 30 per cent.

The bonds will be issued at 100 per cent of their principal amount and, unless previously redeemed, converted or cancelled, will mature on November 16 2017 at a redemption price of 134.25 per cent to 141.51 per cent.

The company says it will retain option to call the bonds after 7 years at their accreted principal amount under certain circumstances. The holder of each bond will also have the right to require the company to redeem such bond at its accreted principal amount at years 5 and 7.

The bond issue comes on the back of Inmarsat's Q3 financial reports, which saw shares in the company drop by 2.4 per cent on the back of lower than expected revenues for the period.

Despite a rise in sales in the three months to September 30 of 8 per cent, to $139.6 million, and an increase in pre-tax profits of 25 per cent, to $33.6 million, share values dropped 11.5p to 467.5p after Inmarsat detailed that revenues had been impacted by the merger between Vizada Satellite Communications, incorporating France Telecom Mobile Satellite Services, and Telenor Satellite Services.

The company explained that this merger had resulted in it granting large volume discounts to the newly combined users, resulting in an additional discount cost of up to $8.5 million.

Inmarsat has maintained that it will still hit upgraded forecasts for the year despite these developments.

# Globalstar satellite launch successful

www.globalstar.com

The 21st October launch of four Globalstar next generation satellites from the Baikonur Cosmodrome in Kazakhstan, using the Soyuz launch vehicle, has been successful, the company reports.

These satellites, together with an additional four satellites already launched in May of this year, will augment the current operating Globalstar constellation and provide satellite voice and data service through the launch of the second-generation satellite constellation, which is scheduled to begin in 2009.

The eight satellites launched this year will then be integrated into the Globalstar second-generation satellite constellation.

The new satellites were launched from the Baikonur Cosmodrome in Kazakhstan on Sunday, 21 October at 2:12 am local time (8:12 pm UTC and 1:12 pm October 20 in California), using the Soyuz-Fregat version of the Soyuz launch vehicle. This is the 1726th successful launch of the Soyuz family of rockets.

Launch services provider Starsem confirmed that the upper stage accurately injected the four-satellite dispenser into the targeted low earth orbit of approximately 920 km. Globalstar says that all four satellites have been successfully acquired following separation of the Fregat Upper Stage and release from the satellite dispenser.

While Globalstar is continuing to perform initial satellite in-orbit tests, the performance of all four spacecraft is said to be nominal at this time.

Tony Navarra, president of global operations for Globalstar, said "Globalstar has invested approximately $120 million to launch these four satellites plus the four satellites launched earlier this year."

"We consider these eight satellites to represent the beginning of our next-generation constellation, because they will not only help bridge the gap today, but last long into and seamlessly operate with, our second-generation constellation. We are also pleased that we will continue to use the reliable Soyuz launch vehicle when we resume our Globalstar launches with our second-generation spacecraft in 2009."

In December 2006, Globalstar signed an $885 million contract with Thales Alenia Space for the design, manufacture and delivery of 48 new satellites for the second-generation Globalstar satellite constellation. The satellites are being designed to provide service until at least 2025.

In September, Globalstar signed a contract with European launch services company Arianespace for the launch of Globalstar's second-generation LEO (low earth orbit) satellites using the Soyuz launch vehicle. The agreement provides Globalstar with the ability to conduct back-to-back launch campaigns and commence launching its second-generation satellites as early as the summer of 2009 from Arianespace's Guiana Space Centre launch complex located in French Guiana.

*Globalstar successfully launched four new satellites on October 21*

# AmosConnect reaches 100 million messages

www.stratosglobal.com

Stratos has announced that it has reached a milestone of 100 million messages sent via its AmosConnect maritime satellite communications service.

Over 16,000 AmosConnect system licenses, designed for use with Inmarsat systems, as well as with Iridium data and Iridium RUDICS systems, have been issued and Stratos notes that the service is currently used by more than 100,000 officers and crewmembers for communication via e-mail, fax, telex, and GSM text.

Stratos President and CEO Jim Parm said, "This major milestone is an excellent indicator of our ability to meet the maritime industry's need for integrated communications services that are cost-effective, reliable and easy to manage."

"Recruitment and retention of well-trained seafarers is among the chief concerns of chief executives at ship-management companies. With hundreds of new vessels being built each year, there is intense competition for qualified seafarers."

"One of the most effective ways to improve shipboard life for seafarers is to provide advanced voice, email and SMS communications systems that are powerful, economical, easy to use, and available away from the bridge."



# Iridium and Globalstar release Q3 results

Iridium and Globalstar have both released their Q3 results, with both companies reporting substantial increases in subscriber numbers compared with 2006.

Iridium says that it now has approximately 225,000 subscribers worldwide as of the end of the third quarter, a 33 per cent increase over the third quarter 2006 total of 169,000, while Globalstar subscribers are up approximately 30,000, to 285,268.

Iridium also reported revenues of $74.2 million for the quarter, a 36 per cent increase on the Q3 2006 figure of $54.7 million. Third quarter EBITDA (Earnings Before Interest, Taxes, Depreciation and Amortization) of $22.5 million was 61 per cent greater than the third quarter 2006 total of $14 million. EBITDA for the first nine months of the year was $56.3 million versus $39.9 million for the same period in 2006, a 41 per cent increase.

Globalstar service revenue for the third quarter of 2007 was $21.3 million compared to $27.6 million during the same period of 2006. During the third quarter of 2007 Globalstar recorded an operating loss of $0.3 million compared to operating income of $8.8 million for the quarter last year.

However, the company is optimistic for the future following the successful launch of eight satellites over the course of the year, and the agreement of contracts for the construction of its second generation satellite constellation.

Globalstar also reported adjusted EBITDA of $7.8 million compared to an adjusted EBITDA of $10.1 million during the same period in 2006.

Net income for the third quarter of 2007 was $0.7 million compared to $2.7 million in the same period last year, with the decreases due primarily to lower retail ARPU (average revenue per unit) related to the introduction of unlimited satellite airtime price plans and lower equipment sales, the company said.

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**Satamatics** has launched the Ocean Alert MKIII, a satellite tracking unit for maritime applications that provides seamless and uninterrupted global roaming over the Inmarsat network. On the unit the triggering of any of the covert activation points will immediately raise an alert, automatically sending SMS text, fax and email alerts to the fleet operator's chosen points of contact.

**CapRock** has appointed Hank Winfield as CFO. Mr Winfield has previously worked as executive vice president, CFO and director for one of the largest private independent oil and gas companies in North America.

*www.caprock.com*
*www.satamatics.com*

# Stratos launches GSM over Inmarsat service

Stratos, in partnership with Blue Ocean Wireless (BOW), has introduced a new service called GSM Oceanwide, a dedicated global GSM service for crewmembers and officers of merchant ships.

GSM Oceanwide is the first service to use Inmarsat satellites to offer GSM services to seafarers onboard merchant ships in deep ocean waters using their existing mobile phones, exactly as they would in port or on land.

Stratos says that the system, available worldwide, is ideally suited as a crew-calling solution, enabling users to receive and place calls and send SMS messages via their own GSM number. The service also provides reliable voice connectivity, enabling ship managers to quickly contact merchant maritime officers.

Over the past year, Stratos completed a successful trial program of GSM Oceanwide onboard two large container vessels managed by its customers. In the future, the company also expects to expand the capabilities of GSM Oceanwide to include e-mail and web browsing.

The service uses an onboard pico cell, gateway and two Inmarsat F33 terminals. The JRC F33 terminals can be upgraded to the new Inmarsat FleetBroadband terminal through the replacement of the below deck unit, without modification of the antenna. BOW says it will deploy the hardware infrastructure on the customers' vessels for a monthly fee, without the need for upfront capital expenditure.

"We expect that GSM Oceanwide will receive an enthusiastic response from the 1.2 million seafarers worldwide," said Stratos president and CEO Jim Parm.

"We expect ship owners and ship managers will derive great benefit from this flexible new service, which is available without a large upfront cost. For a low monthly fee, GSM Oceanwide provides a valuable tool that can help expedite official business communications and also serve as crew-communications solution to help recruit and retain qualified seafarers."

More information about the service is available at www.stratosglobal.com/gsmoceanwide.

# SMA to introduce maritime satcom training centre

Singapore transport minister and second finance minister Raymond Lim has announced the launch of a new maritime satellite communications training centre that is to form part of the Singapore Maritime Academy (SMA).

The concept of the Maritime Satellite Communication Centre, or SatCom@SMA, has been developed in collaboration with SingTel and Globe Wireless at a cost of approximately S$500,000, and intends to use the latest in maritime technology to enhance the training of seafarers at the Academy.

Housed within the SMA Integrated Simulation Centre, SatCom@SMA will enable the simulation of satellite communications between vessels and shipping company offices, as well as the live testing of e-learning software developed by the Academy.

Speaking at the SMA 50th anniversary dinner, Mr Lim commented: "It is crucial that SMA continues to keep pace with changes in the industry, so that it continues to prepare its students to meet practical industry needs."

"Technology has become an important competitive advantage that must be harnessed. Modern-day ships are technologically advanced and sophisticated. Hence the people who man these ships must be familiar and comfortable with technology."

"With SatCom@SMA, SMA graduates will develop greater expertise with maritime satellite communications and join the industry even better equipped. Initiatives like this will keep SMA at the forefront of maritime training."

Courses in satellite communications at the centre are expected to begin from the next academic year.

# DFM to install Blue Ocean GSM

www.blueoceanwireless.com

Blue Ocean Wireless (BOW), an Irish company delivering GSM communications for the merchant maritime sector, has announced that Dobson Fleet Management (DFM) of Cyprus is to be the first full commercial customer to install the service on its fleet.

DFM has chosen to evaluate BOW's GSM solution on five of its managed container ships. The vessels have a capacity of between 2,100 and 3,500 teu.

Using the BOW service, seafarers onboard these vessels will be able to make and receive voice calls and send and receive SMS messages using their existing mobile phones, coupled with a special BOW SIM card.

Two JRC F33 satellite terminals are used to carry the GSM traffic to and from shore, both of which will be upgradeable to JRC FleetBroadband 250 capability, improving the capabilities of the equipment and the number of simultaneous calls that can be made.

BOW says that it has made significant progress in rolling out its maritime cell phone product since its launch in March 2007, and that it has signed up over 100 unnamed vessels for installation to date.

DFM's Managing Director, Peter Waller, commented, "This will provide our crew, who are our greatest asset, an easy and affordable way to stay in contact with family and friends."

Blue Ocean Wireless CEO, Robert Johnson added, "DFM's signing up for the BOW solution represents a significant milestone for BOW as it marks our entry into the Cypriot ship management market, one of the world's most important shipping hubs."

"Installation on DFM's vessels will demonstrate to Cypriot and other ship owning and management companies the benefits of GSM enabling deep sea merchant ships with the Blue Ocean Wireless product."

# KVH to offer FleetBroadband

www.kvh.com

Satellite communications company KVH has announced that it is to offer Inmarsat's new FleetBroadband service, in both FB 250 and FB 500 forms, using its own antenna systems.

The company will offer FleetBroadband, to be launched on November 19, alongside the mini-VSAT system that KVH launched earlier this year.

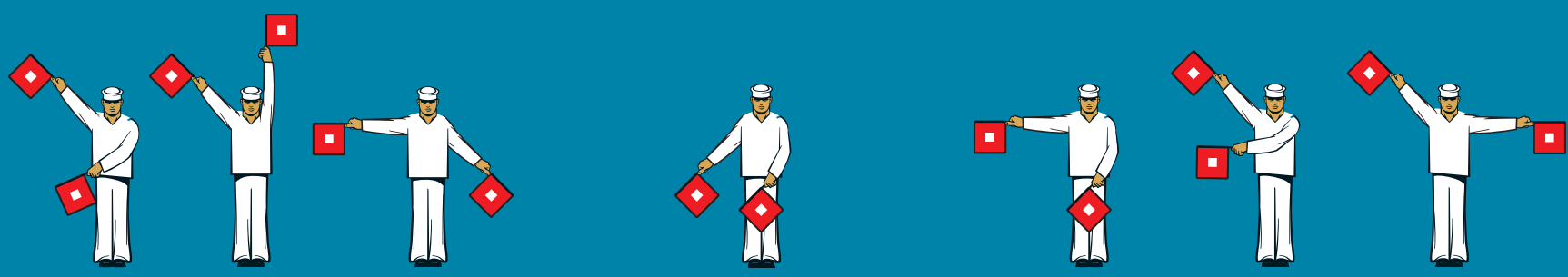
"Our new KVH TracPhone FB250 and FB500 antenna systems offer not only powerful communications tools, but also the convenience of a simple installation," said Ian Palmer, KVH's executive vice president of satellite sales.

"Each antenna includes a choice of two dome sizes to match our award-winning TracVision M-series satellite TV systems, plus a common below-decks unit and a versatile IP telephone handset for easy system setup and use."

There are two different sized units for both the FB 250 and FB 500, with the different versions aimed at matching with the antennas KVH already offers for its ocean based TV systems.

The FB 250 has a suggested retail price of $12,995 or $13,495, depending on the size, while the FB 500 is available for $19,995 or $22,495. The respective antenna diameters are 27cm and 48 cm for the two FB250s, and 66cm and 89cm for the FB 500s.

Further information on the antennas is available at www.tracphone.com.




# Isn’t it time for SeaAccess?

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www.CapRock.com/SeaAccess

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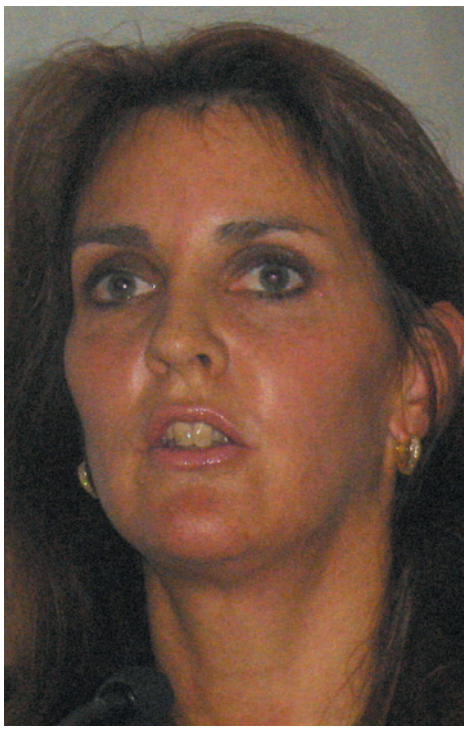
SeaAccess communications™ by CapRock

# Satcoms installation - meeting the challenges

**The end of 2007 will mark the conclusion of a two-year fleetwide satellite communications installation project for Greek company Teo Shipping Corporation. *Digital Ship* spoke to Susan Radford, IT manager at Teo Shipping, about some of the lessons they learned throughout this process, and the key factors to ensure success**

While the promise of high-speed and lower cost satellite communications systems might have IT managers licking their lips in anticipation, choosing a new communications package means installing new antennas, new software, new cabling, and a host of other challenges that can threaten to take the sheen off this shiny new toy.



*Planning your installation is key - Susan Radford, Teo Shipping*

Teo Shipping Corporation in Greece is one company that has recently conquered these challenges and is set to complete the installation of the Inmarsat Fleet 77 system across its fleet of vessels at the end of this year, marking the end of a process that began in 2005.

Susan Radford, IT manager at Teo Shipping, says that the experience has been an educational one, and that the process was not quite as straightforward as they may have first imagined.

"We were hastened into the decision of replacing our Inmarsat-A terminals with Fleet 77 for a few reasons," she explained.

"One was the reliance on e-mail as the primary form of communication, due to pressure from charterers, as well as the increasing size of the data that needed to be transferred for our own communications needs."

"Second was the Inmarsat-A to Fleet migration incentive, which was threatened to be withdrawn as early as the end of 2005. Finally, of course, there was the upcoming cessation of the Inmarsat-A services by the end of 2007."

"(At that time) in 2005 we had just two old PCs on board (the vessels), and e-mail was sent by Mini-M or Inmarsat-A, or via the VHF radio network. So we selected one vessel to proceed with a pilot Fleet 77 installation."

Having decided to go ahead with the pilot project Ms Radford and her team looked at all of the available Fleet 77 options before deciding which antenna they would choose for their first installation. It was not long, however, before the first logistical issues of the project began to cause problems.

"The first terminal we bought was a Nera, which we chose because of the superior features we thought it had over the Sailor (Thrane & Thrane) terminal," Ms Radford explained.

"However, shipping costs to get the terminal to Italy (where the first installation was performed) and the engineer's costs were extremely high. We also had a problem with the shore crane, which could not reach over to the other side of the ship in order to lift the antenna into place as the vessel was berthed on the wrong side."

"In addition, we were unable to source some of the ISDN accessories, like wall sockets and the like. So we settled for a very simple (installation)."

Having had to deal with these initial problems when the project began in Italy, the installation then continued in stages, with different tasks being carried out in different ports as the ship travelled across the world.

"The ship later reached Singapore, and a crane there was able to lift the antenna into place," Ms Radford told us. "The ship's electrician was then able to connect the antenna cable."

"Then the ship continued to Japan, where we got a Nera-certified engineer to board the vessel and certify the full installation. As a result the final cost up to this point for the terminal installation had reached about $27,000 to $30,000."

"The following year, in 2006, in China, we had to lay new antenna cable down to the radio room when we installed the computer network. At that time we concluded that the work that had been done by the engineer in Italy was not up to the standard which we expected, and realised the importance of getting good engineers involved on the project."

## Fleet wide

Despite the complications involved with the installation of the initial Fleet 77 onboard the pilot vessel, Teo Shipping was happy enough with the resulting service that it decided to proceed with plans to install the system across its whole fleet.

Second time around the team was a little more savvy, and had a better idea about what exactly was required.

"A year (after the initial installation), when we embarked on serious negotiations to purchase Fleet 77s for our other vessels, we gathered proposals from at least five providers, and in the end decided to buy the Sailor terminal, which had less features but was easier to set up," Ms Radford said.

"The actual cost of hardware had come down considerably, including discounts, and the airtime rates were highly negotiable for a larger number of vessels. This included services for the crew, where we decided that scratch cards would be best for our company. So far we have seen that the crew have been consuming the scratch cards much quicker than we anticipated."

"Another major point was that we selected one provider to work with. This was contrary to our policy up until then, where we had always gone with more than one airtime provider. We felt that this commitment was necessary to ensure the project's success."


*The antenna position needs to be carefully selected, considering the specifications*

Apart from a stronger negotiating position the team had also paid more attention to the logistical details necessary to help the installation to proceed smoothly.

"This time around we carefully ordered all of the accessories up front, and we found it was easier to ship our equipment from Greece," said Ms Radford. "Also very important was the quality of the engineer who would carry out the installation."

"We decided to use a local Greek engineer and interview him in our office before the job. Now we insist on using the same engineer for all of the other jobs."

Teo also decided to schedule the installations for the vessels during the time they would be in drydock, so as to have time available in the shipyard for any of the heavy work needed.

"Getting the commitment we needed from our technical manager was very difficult in the beginning, since he had other priorities during the drydock. I personally attended our second installation in China, and this was an important step in getting him involved in the job."

"Today we plan together, and he is responsible for installing the antenna and the laying of the cables, before Celeste (Perez, IT technician at Teo Shipping) goes onboard the vessels."

## Preparation

The lessons learned from that first pilot project were a major help to Ms Radford and her department in preparing for the different aspects of the Fleet 77 project, which had to include all of the IT infrastructure surrounding the communications set-up rather than just the satellite antenna system itself.

"We made a concerted effort to plan for the installations down to the very last detail," said Ms Radford.

"First we drew up a topology chart of the existing equipment onboard based on the vessel's general arrangement plans. Then we added the Fleet 77 BDU (below deck unit), network equipment, and servers, which were all located in the radio room."

"We took the PC off the bridge, due to a new policy discouraging officers from working on it while on duty. Four good PCs were installed on the network, one in the captain's cabin, one in the chief engineer's cabin, one in the engine office, and one in the ship office."

"A detailed work plan was drawn up before each job, and used throughout to mark off all work on the job that had been done," she continued. "A detailed list of all hardware and software to be purchased was also tabulated, including the name of the supplier."

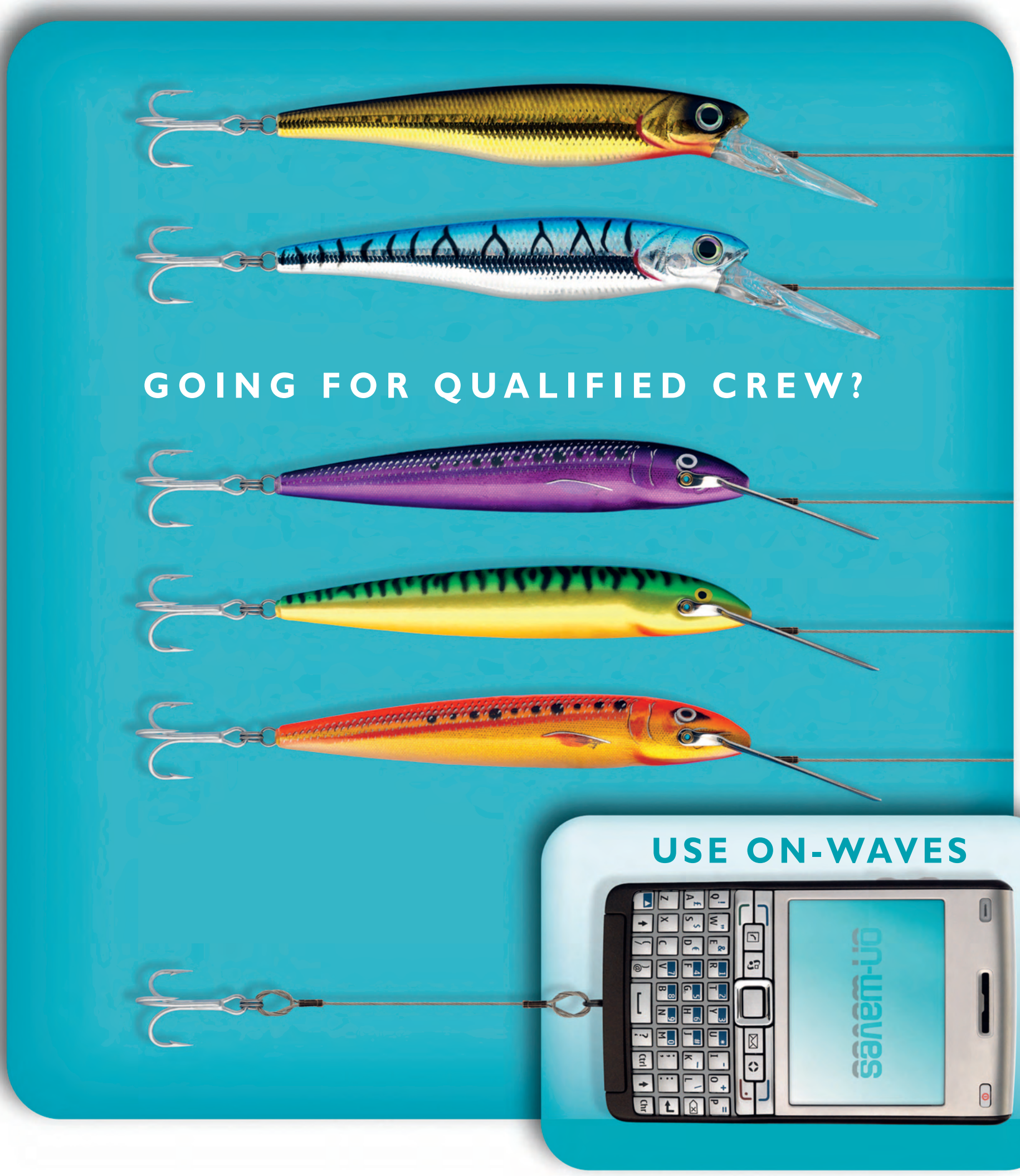
"The software is installed in the office on shore, and then all hardware is tested and re-packed, because it's too late if we find out that the hardware is defective when already on board. It remains untouched until it is to be installed on the ship."

With all of the surrounding network carefully laid out, the team could then concentrate on the installation of the above deck antenna unit itself.

"The antenna position needs to be carefully selected, considering the specifications written in the manual, for interference and so on," said Ms Radford.

"We found that the engineer was the best person to decide finally on the position while he was onboard. The most likely position, of course, was the position of the old Inmarsat-A antenna, which is usually on a 'Christmas-tree' mast and gets no interference."

"Sometimes a new mast was built by

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the shipyard or the crew based on the specifications in the manual, and sometimes had to be rebuilt when it wasn't built correctly."

"On our first vessel the antenna platform was built wider than the specifications, and the Nera engineer noted that he was unable to lock down the hatch cover latches on the antenna radome, and had to put in rubber stops to stop it from moving. We also found that the antenna cable was unprotected in places. For successive installations we ensured that the cables were all properly protected."

The cabling to connect the antenna to the network down below deck proved to be one of the more troublesome aspects of the project for Ms Radford.

"Cable lengths must be calculated correctly, if cables are left coiled it causes degeneration of the signal," she told us. "And if cables are cut there is a strong possibility of damage and a loss of quality in the signal."

"The installation of the network cabling proved to be tremendously difficult during drydock. There were too many people in the way."

"A team from the shipyard were eventually called in to do this job. After opening all the ceiling boards they found that the best way to run the cables was through the existing cable ducts."

Teo Shipping has become very thorough in keeping track of the installation process since the first system was installed in 2005, which has had benefits from a management point of view as well as purely from a planning perspective.

"Now we have installation reports compiled for every installation, with all documentation and pictures detailing the process, which has proved very useful in communicating the scope and success of the project to upper management," Ms Radford said.

## Results

Teo Shipping has been pleased with the results of the installations to date, and with the performance of the systems connected to its satellite communications. Part of this improvement is put down to a training programme the company initiated to help crew members to get up to speed with the new technology.

"While on board (our IT technician) Celeste organised training sessions in the radio room, over a four or five day period for about 4 hours per day," Ms Radford explained.

"It covers nine modules in total. Time was taken for hands-on exercises and question-and-answer sessions, which proved critical for the crew. Printed training materials were also produced."

"Training certificates were awarded on completion, and this seems to have definitely boosted crew morale and helped create an attitude of responsibility towards the new system. Training sessions are also conducted in the office for captains before they go onboard, which can last for up to two weeks."

One of the major parts of this training schedule has been familiarisation with a new e-mail system, which had been one of the main requirements for the company when it first embarked on its communications upgrade process.

"After the Fleet 77 installations we now have two independent e-mail systems working onboard, that not only use different satellite terminals, but also different e-mail hub providers," Ms Radford told us.

"The back-up e-mail system is the original e-mail software we had installed on the master's PC, and works independently of the network. This software and configuration was also copied onto another PC in case the captain's PC fails. The primary e-mail system is installed on a network on the communications server, and a back-up installation is configured on the file server."

"The e-mail clients on the network have minimal software installed, and the master is able to access his mail from any PC on the network by just selecting his own profile. All client PCs are controlled by route policies and access is restricted on the network, limiting user interference. They're not allowed to install their own software, for example."

Teo Shipping has also expended a lot of effort in learning how to initiate remote access to the Fleet terminals onboard the vessels to perform maintenance operations. Ms Radford believes that this facility will be extremely beneficial to the company in the long run.

"Many hours have been spent testing the remote access of the Fleet 77 terminal with ISDN and MPDS, using an ISDN modem," she said.

"We got the MPDS remote access working with a free software called 'Log me in'. The ISDN access worked, but calls are very expensive. We find that this is a viable option for maintenance if the vessel is inaccessible or is in an area where the costs for sending a technician are too high."

"Sending foreign engineers to the vessel is a risk, at times they may not understand our configuration. They have lost our configuration at times when upgrading the firmware, and generally are not able to communicate sufficiently well in English to do the job. Sending replacement units could sometimes be more practical, and this has happened once before on one of the terminals."

Ms Radford would like to have a little more assistance from the company's airtime provider in the area of security to reduce the possible maintenance requirements as much as possible.

"We are still waiting for our providers to give us static IP connections so we can set up a VPN for better security, and more flexibility to filter internet access to and from the vessel," she said.

"At the moment we have anti-virus software installed with incremental updates automatically distributed around the network. This was very effective in eliminating one serious virus that had infected one of our vessels in China."

Following the launch of FleetBroadband Ms Radford told us that the company was considering installing this new system on the final vessel in its installation project, but expects that waiting a little longer to see the system in action might be a wiser move.

"We still have one more Fleet installation to do before the end of the year, and we would like to install the FleetBroadband terminal," she said.

"But from what we have gathered so far this new service is not yet completely ready (worldwide coverage is not planned until the end of Q1 2008), and the hardware has not been tested in the market, so I think we will settle for a Fleet terminal with an upgrade path to FleetBroadband in the future."

"It's my guess that we won't be moving to broadband until at least 2009." DS

# Broadband - taking control

**With maritime broadband now available over smaller and smaller antennas, with cheaper airtime than ever before, management of the increasing traffic over the ship-shore communications channel could become an even bigger headache for the shipping company IT manager. *Digital Ship* spoke to Norwegian company Dualog about how its next generation satcom management system can help to control your connectivity**

Norwegian maritime technology company Dualog is currently completing the final trials and beta testing of its next generation satcom management system, Dualog Connection Suite, and is now gearing up for the official launch of the new system in early 2008.

Communications technology has evolved rapidly since the company entered the market in 1994 with its first software tools for satellite communications management, and the pace of these changes has climbed to new levels in recent times, with the strong growth of VSAT (very small aperture terminal) and the emergence of FleetBroadband making high-speed services more accessible to vessel operators than ever before.

These fundamental changes in the maritime communications market have been one of the main drivers for Dualog in the development of the new system, which aims to allow shipping companies to make the most of the technology available and maximise the value to be gained from their satcom investments.

"Until recently, bandwidth cost limitations meant that most optimised solutions were 'store and forward' or 'transaction based', such as with the batched delivery of compressed e-mail messages and the automatic transfer of files between ship and shore systems," said Lars Martinussen, sales manager for Europe with Dualog.

"With the advent of VSAT and FleetBroadband, Dualog (and its customers) recognised an important requirement to provide complete management of both transaction and IP based communication via higher available bandwidths."

At its core the Dualog software system incorporates an advanced least-cost routing tool, designed to make sure that vessel satellite communications traffic is always transmitted via the most cost effective method available at that moment, and that traffic is prioritised to make sure that essential business traffic takes precedence over less important satcom usage.

"With VSAT and FleetBroadband, it's essentially a phone line on steroids, and the challenge is to make use of this pipe in an efficient way," Mr Martinussen told us.

"Dualog Connection Suite (DCS) enables ship managers and shipping companies to take control of, and effectively manage and monitor, all transaction based and IP based traffic. VSAT and FleetBroadband provide cost effective IP communication opportunities - but with those new opportunities there are also some new challenges."

"(The system) enables shore-based administrators to completely manage access to bandwidth via all available communication systems - restricting bandwidth usage if the primary fixed-cost circuit is unavailable and permitting higher bandwidth usage when another higher fixed-cost circuit is available."

*VSAT and FleetBroadband provide new opportunities, but also new challenges - Lars Martinussen, Dualog*

Essentially the idea is to allow or restrict usage of communications dependent on what options are available. This might mean, for example, that large data files for database synchronisation could only access the communications system when the vessel is close to shore and within range of a GSM of WiFi connection.

"Some early adopters of broadband solutions imagined the benefits of ship networks existing as an extension to their shore infrastructure," said Mr Martinussen.

"But that just doesn't match, vessel based communications exist in a different frame to what happens ashore. 'Broadband' is a relative term, and this leads to operational and technical problems."

"These are things that are pretty standard in a shore based infrastructure, the difference is that, based on our experience and collaboration with our customers, we have made this for a ship-shore environment. This is designed for bandwidth that is limited, as opposed to what happens on shore."

"The management of bandwidth availability for business and personal traffic (e.g. web browsing) is important," he added. "Even if these guys have VSAT, we're talking about fairly modest bandwidth if you compare it to what happens on shore."

"It remains imperative that business traffic be prioritised, be it e-mail or data synchronisation between planned maintenance or other systems, or whatever is most important."

## Shoreside control

DCS helps to manage the use of the vessel's bandwidth by incorporating a number of different security layers into the application that become an integrated part of the communications set up, such as user profiles with strict definitions and firewalls for added network protection.

"These are things that are pretty standard in a shore based infrastructure, the difference is that, based on our experience and collaboration with our customers, we have made this for a ship-shore environment," said Mr Martinussen. "This is designed for bandwidth that is limited, as opposed to what happens on shore."

"It is important that control can be managed in a least cost routing environment. For example, numerous ships equipped with VSAT also use Inmarsat Fleet as a backup. In the event that VSAT is unavailable (for example due to position or heading) business critical data continues to be transferred via the backup system, but there has to be cost awareness when using a 'pay as you go' communication system in such an environment."

"Instead of this being a burden to the captain, DCS provides shore-based (web) control over all of the relevant parameters. The ship manager or shipping company determines which services are available on which circuits."

The ability to manage the communications configuration of all of the vessels through the use of a web-based interface in the company offices is a feature that Mr Martinussen thinks will appeal to maritime IT managers.

"One of the best things about the Connection Suite is that it is completely web-based," he told us. "The ship manager, superintendent, or whoever is the IT administrator will have his own web-based interface, which allows him to manage the whole fleet and update configurations on the actual vessel."

"All updates, maintenance work, and software upgrades are done in the shore based office and then sent over to the vessel, which also has a web based interface. The interface on the vessel will then mirror what happened on shore automatically."

"An exact replica of the ship administrator's web interface is also available to the shore administrator enabling direct control over each ship's configuration."

He continued: "What we want to achieve by doing that is to reduce the administration needed, especially for the captain so he can focus on his core business and not have to deal with configuration changes."

"Most companies will have a shore-based IT department, and their core business is to make the infrastructure work. The Connection Suite will enable them to do that more efficiently than before."

The common web interface is also used to run a corporate e-mail system that Dualog has introduced with DCS, part of what it calls a 'global user' concept. The Dualog WebMail service enables users to sign on and off ships as required, while also allowing them to access the same e-mail accounts when ashore.

## Improvements

The introduction of the DCS system has been a direct response to the changing needs of the market, but also reflects changes in the specific requirements of Dualog's existing customers, who have been an important part of the development process for the technology.

This new technology aims to build on the benefits of the existing system by adding new functions that are more suited to a market with a greater availability of broadband connectivity.

"The existing 'Generation 2' Dualog solution is extremely powerful and reliable but, in lieu of the narrow bandwidth systems it was originally designed to work with, it's limited to management of transaction based information flow only - such as e-mail and automatic file transfers," said Mr Martinussen.

"The core of DCS contains key technology inherited from its Generation 2 predecessor, such as least cost routing, compression, and optimised full duplex data transfer, with the addition of new services like remote control over ship computers, remote configuration, optimised web surf-

ing and acceleration, forms management, and so on. But the most important common denominator is bandwidth management."

"It's a completely customer driven project, we had nine contributing customers actively participating. These customers all have a different number of vessels running versions of the Connection Suite, and the software directly reflects their requirements - a combination of 'needs' and 'nice to haves'."

Mr Matinussen notes that ship trials of the system with these customers (via a whole range of communications systems such as VSAT, Inmarsat, Iridium, Aces, Thuraya, GSM, 3G, EDGE, WiFi, and WiMax) have already commenced.

"The system is designed to work with any combination of dial-up or IP based communication systems," he said. "We're airtime independent so we have to adapt to all of the customer requirements, for all of the technologies available, including, for example, emerging WiMax technologies."

"Transparency is important to Dualog as well as the provision of clear migration paths enabling customers to adapt to new technologies in the future. For example, many customers are now taking advantage of fixed monthly pricing for EDGE when near the coast. DCS is designed to take maximum advantage of such high bandwidth while maintaining stricter cost control when out of EDGE coverage."

Dualog currently counts approximately 700 ships among its customers, all of which will have defined upgrade paths to the new system. Installation is of the system is a straightforward process from the point of view of getting the technology set up, but Mr Martinussen points out that the more challenging aspect of the process is for the user to fully define their requirements and usage strategy to complete the configuration.

"Installation is quite easy to do from a technical perspective, but it needs to be well planned ahead," he told us. "We're probably talking about a couple of days work, but the most important part is that the customer has thought their communications strategy through beforehand."

"That's really the biggest job, for the customers to decide what's important, what's not important, and to decide where they want to benefit. It's a great piece of software, but the input from the customer is the most important thing."

## Pricing

The Dualog Connection Suite is scheduled for release on February 1 2008, and will be available in a number of different packages, starting with a 'Standard Edition' and upgradeable to other versions such as the 'Premium Edition' for a fixed additional cost.

The software runs on standard PC hardware with the Microsoft Windows operating system, which the company says will enable onboard redundancy in the case of hardware failure. Dualog also says it will make the pricing rates for the system available on the launch date, and aims to be open and forthcoming about what the costs will be.

"Dualog pricing is straight-forward - a monthly fee per ship," Mr Martinussen told us. "There are no hidden charges or magic invoices coming out a month or a year later. It's important to us to keep the pricing transparent." DS

# ShipServ service enhancements announced

www.shipserv.com

ShipServ has launched two new enhancements to improve its services to buyers and sellers of ship supplies, services and parts.

One of the upgraded features is the ability for ShipServ system suppliers to upload their catalogues onto ShipServ Pages, the company's online search and sourcing tool. This will allow them to provide more detailed, searchable information on products and services to prospective customers.

The Pages tool will also now include a ShipServ TradeNet matching functionality, TradeNet being the company's core trading network. With the matching function, buyers will be shown those suppliers that have a history in TradeNet of providing the product they are searching for, which ShipServ hopes will offer users added reassurance in the supplier selection process.

ShipServ says that these two new developments should deliver benefits to both buyers and suppliers, with buyers able to access more potential suppliers through enhanced matching of their requirements to supplier offerings, and suppliers able to increase sales by more detailed representation of their business on Pages and the ability to leverage ShipServ's own marketing of Pages through search engines such as Google.

"Pages is rapidly becoming the 'who's who' of the Supplier world and TradeNet the 'who's done what'," said Paul Ostergaard, ShipServ CEO.

"Combining the two, and adding uploadable supplier catalogues, gives buyers the most comprehensive, searchable information source they could ever need to support their buying decisions and suppliers an unrivalled opportunity to broaden their sales reach."

# Veson completes Neste Oil installation

www.veson.com

Veson Nautical reports that Neste Oil Corporation is now fully operational on Veson's Integrated Maritime Operations System (IMOS) to manage its fleet of 30 tankers.

Neste Shipping transports about 40 million tons of crude oil, oil products and chemicals annually; tonnage consists not only of crude oil, product and chemical tankers but also of two barge / pusher combinations and three tugboats. The operations are concentrated mainly on the Baltic, the North Sea and the North Atlantic region.

Veson says that the visual design of IMOS helps to shorten training time for new staff getting accustomed to the system, and provides companies a corporate wide, consolidated platform for access to crucial information.

"The greatest benefit we have experienced is having an integrated system that handles chartering, operations and accounting," explains Joakim Kärkkäinen, vice president of Neste Oil Corporation's Shipping, Finance and IT Department.

The software was installed alongside the company's existing corporate financials system, and Mr Kärkkäinen says that he was pleased with the success of the implementation process.

"The project received a very high score in the end evaluation of the project which proves that the people involved - both end-users and staff involved in the implementation - felt that the project was a big success," he said. "I can confidently say that this implementation was the most successful I've ever seen."

**SpecTec** has recently presented an award to Russian company SovComFlot, marking the tanker operator's 20th year as a SpecTec customer. SovComFlot, via the then owned Black Sea subsidiary Black Sea Shipping Company (BLASCO), ordered their first Amos system in 1987, for the cruise ship Fedor Dostoevskiy.

**Fortune Technologies** has introduced a new Tanker Vetting software solution, designed to help tanker operators improve the accuracy of responses to observations made during a vetting inspection. The application can operate either as a stand-alone system or in conjunction with other Microsoft Dynamics Nav - Maritime Add on modules.

*www.spectec.com*
*www.frtntech.com*

# ITIC issues e-mail fraud warning to ship agents

www.itic-insure.com

The International Transport Intermediaries Club (ITIC) has issued a warning to ship agents following an increasing number of criminal attempts to obtain delivery of cargo using forged e-mails.

ITIC's annual publication, The Intermediary, states, "Fraud in shipping is endemic, cargoes are valuable, and it has never been easier to forge documents, electronic communications, bills of lading, etc. Carriers and their agents must continuously be aware of this fact and take whatever steps are necessary to avoid becoming unnecessarily involved in costly claims for damages which have resulted from a failure to be careful and vigilant."

ITIC notes that carelessness in dealing with telex releases has contributed to losses in many cases. 'Telex release' refers to the release of cargo at one port when the bill of lading has already been surrendered at another.

In modern ship agency these telex releases are almost always made by e-mail.

As such, this leaves telex releases open to exploitation by e-mail fraudsters. In its Guidelines for the Release of Cargo, ITIC recommends that agents check the authenticity of any messages from other agents to be sure of where these instructions are coming from.

ITIC says that it has been made aware of several recent claims involving telex release by faked e-mails, manipulated to appear as though they are from the load port agent. These e-mails have then been accepted as authorisation for cargoes to be released and as confirmation that freight has been received when it has not.

ITIC said, "One forged e-mail confirmed that the original bills of lading had been collected at the load port for four containers of mobile phones, and another forged e-mail confirmed that the original bills of lading for a cargo of fruit and the attendant freight had been collected."

"In both cases the fake e-mails were accepted by the discharge port agent at face value, and cargo was released. In the first case valuable cargo was misdelivered, and in the second case a large amount of freight remained unpaid."

The Club advises agents asked to perform a telex release to first obtain written authority from their principal, and not to accept telex releases at face value.



# Intertanko database available online

www.q88.com

INTERTANKO reports that its Terminal Vetting Database will now be hosted on the Q88.com website, allowing members to access near real-time information about the terminals their ships plan to visit.

The Terminal Vetting Database works in a similar way to the SIRE and CDI systems.

Any low scoring comments on a particular terminal will be forwarded by INTERTANKO to the terminal in question (withholding details of ship and owner) requesting comment from the terminal on root cause analysis and successful implementation of corrective actions and close out.

The terminal's comments will be entered into the database alongside the original report; or if no comments are received by the terminal after 30 days, then that will also be recorded.

INTERTANKO notes that this is not a commercial enterprise, with information supplied at no charge to the Association's members and associated members as a direct service whose primary purpose is to enhance safety.

Manager of Q88.com, Fritz Heidenreich, says, "Since a majority of the INTERTANKO members are also subscribing to our vetting questionnaire service, it makes sense to have the Terminal Vetting Database accessible from the same web site. We have upgraded the Terminal Vetting Database to include new internet technology which will make the system easier to use than before."

# Reaching further

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# Maritime masochists - software for shipping

**With dozens of vendor companies competing for the business of a limited pool of potential shipping customers, being a maritime software vendor can be a difficult business. *Digital Ship* spoke to Giampiero Soncini, SpecTec CEO, to analyse the figures for the shipping software industry**

As almost anyone will tell you when a discussion turns towards maritime IT, the market for technological systems in shipping is a small one when analysed on a global scale. Bill Gates' house might not be so large were he dependent purely on shipping companies to pay the mortgage, rather than the billions of customers using Microsoft systems in land based offices around the world.

But exactly how small is this market that causes consternation for shipping technology suppliers the world over? *Digital Ship* spoke to Giampiero Soncini, CEO of SpecTec, about the results he has gathered from crunching the numbers for the maritime software market.

"It's a very difficult job to sell and support information technology on ships," he told us. "By this I don't mean integrated navigation systems or things like that, I'm talking about ERP solutions, maintenance planning, procurement, spare part management, and so on. It's a niche area of a niche area."

"To start with, not all ships need to have software onboard. We have small craft like yachts, and old ships more than 25 years old will be very unlikely to need a system onboard. Vessels that do very short trips or ferries that are only used during the summer period, normally they don't make use of any information technology system."

"If I try to size up what the market would be, normally I come out to a definition of a market that is all the ships which are above 2,500 tons and below 15 years of age. I know some people will say 'I have a ship which is 2,000 tons' or 'I have a passenger vessel which is 30 years old and I really want the system onboard', but generically this definition applies to all of us in about 85 per cent of cases."

With this definition in mind Mr Soncini consulted Lloyd's Marine Intelligence Unit (LMIU) to put a figure on such a grouping.

"It comes out that the number of ships above 2,500 tons and below 15 years of age, around September, was 15,652 ships," he said.

"Of course, these ships are located all over the world, there may be a couple in Angola, one in Mozambique, 25 in Chile, and so on. So, refining the search further, I looked at only the ships in the countries where we usually go, and picked 32 countries. The number then came to 14,255."

"Of these, 9,000 are in the first seven biggest countries: Japan, Germany, Greece, China, Norway, USA, and Denmark. These are classified by LMIU according to owner interests, so, for example, if a ship is managed by a shipmanagement company in Cyprus which is owned by German interests, then it comes under the German umbrella."

Having reached this estimate of 14,255, Mr Soncini decided to then compile a list of the maritime software companies operating in the sector, all competing for their corner of this same market.

*All of these maritime software companies are competing in such a small market, I think we are all masochists - Giampiero Soncini, SpecTec*

"I did a list of all of the main companies I could think of that sell software in shipping - and I came up with 26 companies," he said.

"And that's not all, there are other companies that are not working in providing full integrated solutions, but work in sectors, like voyage management, procurement, training, and so on. Also, there are shipping companies and classification societies developing software."

"All of these companies are competing in this same market - I think we are all masochists."

## Competition

A market of 14,255 potential customers might not seem like a disaster for some IT providers, but Mr Soncini points out that this figure does not represent a list of companies that are all looking to purchase new systems.

"I said that a figure of 14,255 ships represented a good reachable market, but I think that about 10,000 of these already have a system on board," he said.

"At SpecTec we are about 6,700 ships and the rest is a bit of a guess, but more or less, between all of us all over the world we have 10,000 ships with a system onboard. If I'm wrong I'd say that it would only be that there were more than that, not less."

"So there are about 4,255 left. If you add that there are about 2,000 ships that are currently being built, that represents a potential target market for IT in shipping today of about 6,000."

With his estimates of the potential market shrinking rapidly, Mr Soncini looked at how the figures would work when spread among the long list of potential suppliers.

"Let's assume you can target them all, which is impossible - you have 6,000 ships, in 32 countries, with 26 suppliers," he said. "That's 187 ships per country, 230 ships per supplier - since we are all working in most areas that means a bit over 7 ships per supplier in each country."

"OK, when you play with numbers people can say that you can come out with whatever you want, like 'there won't be 187 ships in every country', and I agree - but it's the idea I'm trying to show. Even if I say I'm wrong, and double this estimate, that would still be only about 16 ships per supplier per country."

Mr Soncini added: "In some of those countries there is barely a shipowner without a system onboard. Italy, UK, Cyprus, Norway, Sweden, Spain, and Denmark - they basically have 99 per cent penetration."

"In Italy there is just one shipowner without an IT system onboard. It's not a huge country, but basically that tells me there is no possible growth, only stable recurring business if they continue to build ships. The day they stop building ships, if the market goes down, the business will dry up very quickly."

"Some of the other markets not fully taken, that might only be 5 per cent taken, like China, Japan and Taiwan, for instance, are extremely difficult. I just returned from China, and they tell me that all of the software has to be in Chinese. The same happens to me in Russia, in the Ukraine. Those markets are all very difficult."

Mr Soncini believes that the nature of the shipping industry also makes it very difficult to convince potential customers to turn away from their current software supplier and move to a different system.

"It's something which is beneficial for all of us (software vendors), when a customer selects a software, even if they hate it, it's very difficult for them to abandon it," he said.

"In normal IT life it's fairly common to say 'I bought some software, I don't like it, I'm going to change to another one', but in our world I may lose one customer a year, I may win one customer a year from the competition."

"It's the same for all the competitors, once they made the investment they are very stable. It's hard for the IT guy to have the guts to go to the shipowner and say 'remember the $300,000 we spent on software, well I mucked it up completely, it's wrong and people are not using it, can I have another $300,000 please?'. It doesn't happen."

## Potential earnings

So what does this bleak assessment of the maritime software market add up to in terms of potential revenues for the companies involved? Mr Soncini suggests that it will be difficult for all of the competitors to prosper in this environment.

"If we're talking about 6,000 ships, and we sell software at $10,000 per ship, that means that we have a potential market of $60 million," he said. "But do we sell it at $10,000 per ship?"

"We can have consultancy, even that might be $20,000 per ship, so that's a $120 million market. But do we do that? Do we value our software and our consultancy that much?"

"Let me give you an example of an offer I saw that was presented in Asia by a company that defined itself in the offer as 'a premier provider of IT products and services to the maritime industry'," Mr Soncini said.

"The offer was made to a very highly-reputed company in Asia, for 35 ships plus the office, plus training, plus installation onboard, and the database."

"The quotation went like this: the office software was free of charge, then a charge of $3,750 per ship, including the planned maintenance, spares, purchasing, and drydock modules, plus $2,000 for the database. The management information software was free of charge, set-up for the office was free of charge, training for the office for 7 days was free of charge, and training for the ships for 7 days each was free of charge."

"What do you get for that?" he continued. "For $2,000 you get a database, but it will be a skeleton database, and it's worth zero. If you try to get KPIs out of it you'll get nothing. If the data is wrong, even the best software in the world is worth nothing."

"When you buy a $2,000 database you throw away $2,000, you don't save money."

Mr Soncini suggests that any shipping company that expects to get an efficient system without a willingness to invest a reasonable amount of money should shoulder most of the blame if it all goes horribly wrong.

"We don't hear comments like 'I ordered a $2,000 database for my $75 million tanker, I guess I deserve it', just the comments 'the system doesn't work'," he told us.

"Even with (SpecTec), we got a message recently saying 'the system doesn't work' we asked why, they said 'we can't locate such and such'. We replied 'you did the database yourselves, did you insert the data in the first place?'. And they said 'we're sure we did, you must have deleted it when you came onboard'."

Returning to his example, Mr Soncini then questioned how any software company could afford to offer so many days of training, with the man hours that would entail, completely free of charge, and still hope to make a profit on such

an installation.

"The offer included 252 days of free consultancy," he said. "People might say 'I can get people in Asia who I can employ with very modest wages', but that's not true anymore, rates are skyrocketing."

"But even supposing I have one young engineer I'm paying $1,500 per month to carry out the job, doing 10 hours a day, 6 days a week, that would cost $24,000. I think that's impossible, but let's assume it's true."

"Then there's the cost of the software development. Even in India or Russia, or wherever, to develop decent software today for less than $500,000 is impossible. SpecTec spends $4 million per year. But assuming we can do it for $500,000 and sell it to 200 ships per year - and I don't believe anyone else out there can sell 200 but let's be generous - that's a cost of $2,500 per ship."

If costs were at the level that Mr Soncini suggests there would be little room left for substantial profits from his example offer.

"A gross software gain from all of those calculations would be $19,750 gross," he said. "Even if we assume I made a massive miscalculation and it's twice that much, it's a gross gain of $40,000 when I've sold a system to 35 ships. That's $1,100 per ship of gross gain."

"Would you come into this business? I'm impressed by these people."

## Market movement

With all of these market challenges in mind Mr Soncini predicts turbulent times ahead in the maritime software market, with consolidation and acquisition a likely scenario in a many cases.

"So what has happened in this market?" he asked. "Many companies have gone belly-up. ShipNet has been sold to Inchcape, three reputable Norwegian companies are for sale, and nobody's buying them. Several companies have rightsized their business."

"It's not a surprise. When you have a market where basically you don't make any money this is what's happening. Companies will go belly up, companies will be up for sale."

"The problem is that to try and survive people lower their prices to a level that will kill them, and then the only asset that they have is that they are cheap."

Mr Soncini believes that consistent 'lowest-price' competition will not only be bad for the companies themselves, but detrimental for the industry as a whole.

"More companies will go, more shipowners will lose their investment, and what irritates me is that most of them, once they've lost their investment, they will say 'IT doesn't work'," he told us. "And investors will lose confidence in this sector."

"Who is at fault? Everybody. Shipowners who are spending $70 million on a ship and $2,000 for a database to maintain that asset for 20 years. Shipmanagers and class, they are creating software but not doing a good job, it's the equivalent of SpecTec starting to issue certificates."

"Suppliers, who in order to get a share of the pie sell at any price, even if they lose money. And investors, who deserve to lose money if they don't get their calculations right."

"If we want to survive in this market, all of these people must become more serious. Otherwise we will all lose. Nobody wins in these cases." DS

# Lessons learned - implementing a PMS

**Exmar Shipmanagement knew that it needed a new planned maintenance system, but problems with previous software installations meant that a new approach was necessary. *Digital Ship* spoke to René Jungbluth, technical director with Exmar, about the company's approach to this PMS project**

When Exmar Shipmanagement of Belgium decided that it needed a new planned maintenance system to help manage its fleet of gas and chemical tankers and to organise its systems in line with the requirements of TMSA (Tanker Management Self Assessment), it had a list of different factors that would be key in choosing the most suitable system.

The wish list that the company had come up with was a result of a number of lessons that Exmar had learnt over the course of implementing a range of varied software systems during the previous five years, according to René Jungbluth, technical director with Exmar Shipmanagement.

"In 2000 we bought an ISM software as a package," he told us. "It has been operational, stable, and satisfactory."

"For crew management software, we first made a contract in 1999 in preparation for the Euro, because we wanted to link crew management to the wage calculations. We never managed to implement that as a single package, but we ultimately managed to link the two software packages and it's in operation in the office, though not on the vessels yet."

"For our accounting software, we started in 2001, and looked at a Belgian based integrated software, but found it wasn't fit for shipping. In 2003 we took another package and started experimenting. That was a shipping-based package, but we found that we couldn't adapt it to the Belgian accounting rules. So that failed."

Mr Jungbluth continued: "In 2005 we bought a local accounting software and integrated it with our PMS (planned maintenance system) and purchasing software. We're now stable and operating satisfactorily."

"For the planned maintenance system, we had an in-house PMS that had been developed since 1995 and was a stable, stand-alone package. We had an integrated PMS and purchasing module, but keeping the software up to date was time consuming and costly."

It was decided that a new PMS software package was required, but Exmar was anxious not to repeat the same mistakes it had encountered with some of its previous installations.

"We had different problems with all of these things," said Mr Jungbluth.

"First of all the configuration of these packages, we could say that some of them were incomplete designs, meaning they were maybe went into production prematurely. Some of them were difficult to adapt to the workflow of our company."

"Then the implementation of software would always brings resistance from the users. Any change, anywhere, you will meet resistance, though when they try it and work on it you can gain acceptance. It's something that has to be looked at because some people are capable of delaying your projects."

Coupled with these logistical problems Mr Jungbluth also found that the installations could prove to be technically challenging.

"Installation is difficult as the vessels are moving targets, and in the beginning we had problems with satcoms," he told us. "Five or six years ago high-speed transmission technology was not as good as it is today, it's moved on a lot and is quite good now."

"Upgrading and debugging by the software companies is also usually slow - upgrades come out late and you have the installation problems all over again. And financially, some of these projects have proven to be a bottomless pit, that's the only way I can describe it. Modifications, reprogramming, consultancy - it's really very costly."

To analyse these problems, and to try and prevent repeats as far as possible when implementing the new PMS system, Mr Jungbluth and his team tried to isolate the root causes of these problems.

"We started to look at 'why'," he said. "We've heard a lot of arguments - is it the software designers, who don't understand what their clients want? Are we dealing with aggressive, ambitious sales and marketing?"

"Is it our IT department, are they not qualified for these things? Are we getting too far ahead, trying to get the latest technology rather than using proven systems? Maybe there's a lack of understanding from the management. Does the management give enough guidance when they start these projects?"

"These are some of the general issues that have come up in our company, and these things have now come into our criteria for choosing software."

## Planned maintenance systems

As part of the process of developing this list of criteria for the system, Exmar proceeded to do a thorough examination of its existing PMS, to find the specific areas where improvements were required. Properly analysing the existing systems was enough to convince the company that a new solution was necessary.

*'Financially, some of these projects have proven to be a bottomless pit' - René Jungbluth, Exmar Shipmanagement*

"We had a computerised system in place, that had been developed in-house with a Sybase database, and it recorded maintenance tasks and running hours, listed the equipment and spares on board," Mr Jungbluth explained.

"But it was incomplete. Our data was not well protected, we still had to develop a security module. The reporting module still had to be developed. And a lot of new customer requirements came on the market, TMSA being the biggest one. So we decided that we had to have a new maintenance system."

"We thought 'we have to be able to do comparisons across the fleet, we have to be able to measure things - we still have a lot of work to do on this system, why don't we go and buy professional software?'.

To avoid the problems of the previous software implementations Mr Jungbluth and his department made a list of the functions and capabilities that were prerequisites before considering any of the software packages on offer.

"We set off on this project, and there were a number of criteria we had in mind," he said.

"First, we said that it has to be off-the-shelf software, because it will give you protected databases. And they'll only need upgrading when Mr Bill Gates decides to do something else."

"We also needed a flexible structure, in the sense that we have to be able to make certain modifications specific to the workflow of the company. Thirdly, we wanted easy deployment of the system - in installation, replication, and intervention in the

office. Some systems are absolutely terrible in that respect."

"We wanted importing and exporting facilities, an open structure, and to allow for interaction with other software. If we have PMS with purchasing, of course we want this system to talk to the accounting system, and vice versa."

Mr Jungbluth and his team also placed great importance on the services that the vendor would be able to provide on a continuous basis after the installation was completed, and having a training programme that would allow the system to be operational in a relatively short time.

"We wanted software with simple and quick operation, which would allow for simple and quick training," he told us. "When we started this wasn't the highest priority, but in the end it became very important when we realised how many people we'd have to train."

"We wanted continuous technical support from the vendor. This has been the biggest cost factor in some of our other projects, the availability of the vendor and the cost of consultancy in these matters."

"And finally we wanted it to be cost effective during development, implementation and operation. So we were looking for a fixed price contract with limited extra programming costs, or at least a programming cost that was defined in hours, before we agreed, and to have low communication replication costs."

## Choices

With a clear idea in mind of the software and services that were required, Mr Jungbluth began to consult with a number of software vendors to find out how they could meet the particular needs of his company.

"We looked at four or five software makers, and we tested them out," he said.

"We started in September 2003, and decided in October 2004 to go with Ulysses systems for the Planned Maintenance and Purchasing. The ISM module we have is a separate software, it works well so we continued with that. In January 2005 we migrated the first vessel and had it in operation."

"What pulled us over the line? The software we bought was task oriented, so when someone is in front of a screen their own functions, as an officer or whatever, are clearly indicated. You don't have to go and look for them."

"It was also quite flexible, we could plug in other software. We have some people in the office with software knowledge that can easily plug stuff in and out of this system. It also was good on the ease of use and support from the vendor."

Once the choice had been made the more painful business of installation followed, and Exmar decided it would need to dedicate a significant amount of resources to the project to make sure it was successful. The implementation plan was also heavily influenced by TMSA requirements.

"We decided to implement this system in a different way to what we'd done with our previous software," said Mr Jungbluth. "TMSA said that if you had a major change in the company you should have a management of change procedure, and look at your risk as to what will happen if I do this."

"We said 'ok, let's do that'. We're not really used to that in shipping, well, we weren't in 2003, but we tried it out."

"We had several brainstorming sessions in the office and came up with an implementation group. We had a particular procedure for setting up the database and the data entry, for the installation of the hardware of software, and for the training. Then the implementation group would report directly to the technical director."

"The group was a separate entity, it was a full time job, people couldn't really combine being in the group with their day to day duties. They did all of the planning, and coordinated with Ulysses on the creation of the databases."

One of the key factors in helping the project to progress, from Mr Jungbluth's point of view, was communication with internal company stakeholders about the project.

"One important thing they did was inform personnel and management about the progress and planning of the implementation," he said.

"This is something that will go on before you have your 25 ships in operation, that will take a year or a year and a half. You have to keep telling the people what you're doing, because they'll lose interest. It was promised in 2003, and if it's now 2005 and we've got nothing up and running, you'll need to keep them informed about what's been going on."

Once the project was completed Exmar then had to put together a training programme that would get the crews and shore based staff up to speed quickly, so the software could perform the tasks for which it was purchased. The results so far have been pleasing, said Mr Jungbluth.

"Training was something we were concerned about," he told us. "As gas carriers, we are in port anywhere from 12 to 18 hours, and it's difficult to do training when the ship is in port."

"It's expensive to send people out, ship by ship, to do the training. So we said we'd do the initial training ashore. One day sessions were found to be enough to be ready to use the systems."

"Training today is still done ashore, but we've now reached a stage where there are a sufficient number of people on board that know and use the system that they can train each other."

With the system properly implemented, and crews competent in its use, Exmar has already seen a number of advantages that have increased the efficiency of operations.

"We now have improved communication with the vessels, and better documentation and reporting," said Mr Jungbluth. "The way of reporting is standardised and is much easier to check."

"It's also easier to see where they are and if they're compliant, we can see the planned maintenance stages virtually every day. We can see breakdowns every day as they come through, so we don't have to wait for a long time to get messages from the ship."

## Future

Mr Jungbluth says that the success of this project has motivated the company to look at further improvements in its systems, and he believes that the maritime software market is continuing to offer interesting options to shipping companies that want to increase the efficiency of their IT systems.

"I think that the number of software packages will further increase," he said. "Maybe there will be dedicated software in specific fields, perhaps from smaller companies. There are a number of things we have in mind that we'll either incorporate in the existing software, or 'plug in' to the system."

"We're looking at software for standardised drydock specifications, for root cause analysis, risk assessment, e-commerce maybe. The question will be if we are going for integrated software or open structures."

"A few years ago everyone was talking about an integrated system, but I have the impression that we are moving towards open systems, to a platform where you can plug in more specialised units as long as they have the same language to communicate with."

As software systems improve the imperative will be on shipping companies to make smarter decisions as to what type of systems they need and what type of systems, and vendors, can meet those conditions.

"I think the choice of software will become more important for companies," said Mr Jungbluth.

"It's a customer requirement that you make use of it and you show that it's audited and checked so it becomes more public. The process of choosing software has to become embedded in the company structure, decided by the company management in a reasoned way."

"Owners are losing faith in IT and in the sector to some extent. It's through our own mistakes and through the poor performance of some of the software companies. Owners will eventually, I think, choose companies with a good reputation and a good performance track record. Maybe the software companies need to more often show how good their track record is."

From Exmar's point of view, the PMS project has definitely offered some lessons that Mr Jungbluth hopes will benefit the company in the future when the time comes for the next system implementation.

"Introducing new software in the company is a major change in the operation of your company," he said. "I would recommend that you apply the management of change procedures. I would recommend that you work out the consequences, and assess the risks to the organisation from the start."

"Continuous and active management involvement is an absolute must if you want success for your software projects. It's not only a question of initiating it, and then walk away to the golf course."

"Start it, follow it up, see how they are progressing, how much money they are spending. See if we are on track, how we keep it on track, what additional resources we need. You need continuous involvement if you want this to succeed. The changes are too big. It's too important to leave it all to IT people alone." DS

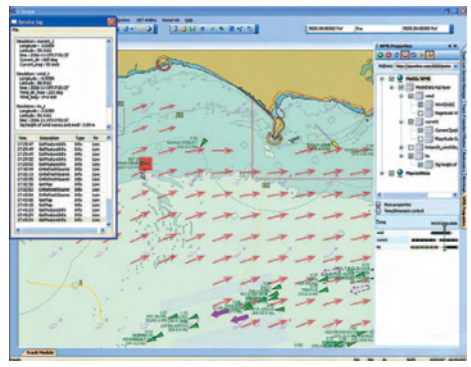
**UKHO** has released the 2008 version of its Admiralty Digital Publications (ADP) package, which includes Admiralty TotalTide, Admiralty Digital List of Lights and Admiralty Digital Radio Signals Volume 6 on a single CD and can be licensed, installed, used and updated via a single common interface. New functions include an electronic update service via CD-ROM or the internet (e-mail or web).

*UKHO's 2008 Admiralty Digital Publications are now available*

**UKHO** and representatives of the **Korean Ocean Research Association (KORA),** on behalf of the **National Oceanographic Research Institute (NORI),** have reached agreement on the introduction of 297 new cells covering Korean waters. Nearly half of the cells depict harbour areas, and are supported by chart cells in all of the scale bands, including overview cells for planning purposes.

**Kongsberg Norcontrol IT** has completed a £1.1m upgrade to the Humber Estuary VTS (vessel traffic system) in the UK. Kongsberg had installed the original VTS at Spurn Point in 1994 and extended the system in 1997 with a new radar at Stone Creek and remote displays at King George dock Hull, data centre Hull, and Immingham. An AIS base station was also later added at Spurn Point.

The **German Society for Maritime Technology (STG)** has become a member of **CEMT, the Confederation of European Maritime Technology Societies.** During its latest board meeting in Hamburg STG was welcomed by CEMT's nine member institutions from the UK, Poland, the Netherlands, France, Spain, Portugal, Greece and Italy.



*The software for phase 3 of the UK AIS system has completed testing*

The **UK's Maritime & Coastguard Agency (MCA)** has implemented Phase 3 of the UK AIS network, following the successful Factory/Site Acceptance (FAT/SAT) testing of **Kongsberg Norcontrol IT** software upgrades to its C-Scope User Interface. An earlier release of the interface was already in use with the MCA. Phase three includes a range of new functionality, and has been rolled out to 65 workstations in 18 regional control centres.

**Transas** reports that it is to supply simulation systems, in cooperation with **Alliance Nav**, to Georgian College's **Great Lakes International Marine Training Centre** in the US, as part of an estimated $7 million investment by the facility in marine technology upgrades. The upgrade programme is scheduled for completion in September 2008.

Canadian company **Seaspan** is to install the **Transas** Navi-Sailor 3000 ECSi charting system aboard its fleet of coastal, deep sea tug, barge transportation and shipdocking vessels. The systems will be supplied and serviced by Transas Western Canadian agent Austin Navigation of Vancouver, with forty-six ship sets fitted to date.

Greek company **SRH Marine Electronics** has been the subject of a 100 per cent management buy out by managing director Athina Vezyri, meaning that the former **Radio Holland** subsidiary will leave the group and now be operating independently. SRH had been part of Radio Holland for 13 years, and will continue to operate out of its existing offices in Piraeus.

*www.ukho.gov.uk*
*www.kongsberg.com*
*www.cemt.eu*
*www.transas.com*
*www.radioholland.nl*
*www.srhmar.com*

# FarSounder grant for long-range sonar

www.farsounder.com

Sonar company FarSounder has been awarded a $2 million grant from the US National Institute of Standards and Technology (NIST) for work to develop a long range/high speed navigation and obstacle avoidance sonar.

The company plans to develop a forward looking navigation and collision avoidance sonar system, providing real-time 3-dimensional location (bearing, range, depth) of obstacles at distances up to 3.2km (2 miles) for vessels travelling at up to 65 km/hr (35 knots).

FarSounder says that the sonar would allow for faster operation through more direct transit routes, with reduced risk of groundings or collisions with floating objects. In addition, growing concerns regarding marine mammal mitigation could be alleviated by using this technology.

This 2.75 year, $2M project will require work on a number of technological innovations, including the development of high-speed signal processing algorithms to compensate for the ship's motion, the changing acoustic environment and background noise at high speeds and development of other signal processing methodologies for sonar signal processing.

FarSounder estimates that when fully deployed such a system could reap economic benefits of up to $500 million a year through increased efficiency, reduced insurance costs, and reduced accident rates, in addition to the benefits of increased passenger safety and reduced environmental damage.

# New VTMIS from Saab

www.saabgroup.com

Saab TransponderTech is to introduce a new vessel traffic management and information system (VTMIS) called CoastWatch, designed to offer increased flexibility to meet differing user requirements.

The VTMIS can be installed as a scalable system, from a single user version with one or two sensors, to a large multi-user network with a wide variety of integrated sensors and subsystems, including radars, AIS, direction finders, infrared night vision, closed-circuit television (CCTV) and underwater sensors.

Saab says it can provide CoastWatch as a complete turnkey system including all the sensor arrays, or can utilise an existing radar and AIS infrastructure. The software used by the VTMIS is modular, and as such can be modified reasonably easily depending on requirements.

The CoastWatch operator stations include a graphical user interface based on a digital chart display, which is also configurable to a user's own preferences to avoid information overload and clutter.

The operator can view information on any displayed vessel, including CCTV pictures, and generate reports with standard point-and-click functionality. CCTV control is fully integrated into the chart functions, and with a mouse click on a ship's icon, the cameras will automatically start tracking the vessel.

System capabilities also feature data recording and playback for training and post-event analysis.

Saab says that the system provides full redundancy in accordance with IALA requirements for 99.9 per cent availability. This is achieved by duplication of hardware and software modules, to eliminate any single point of failure.

# Software agreement for space-based AIS

www.comdev.ca
www.gatehouse.dk

COM DEV International and GateHouse A/S of Aalborg, Denmark, have announced the signing of a strategic alliance agreement to work on data management systems for COM DEV's space-based AIS (Automatic Identification System), currently under development.

The companies will pool their resources to create new tools for the system which will allow data from the space-based network to be collected, stored, managed and displayed, with the aim of providing a global turnkey AIS solution for a range of user groups.

COM DEV says it is focused on developing an end to end system capability, which will support key maritime areas like search and rescue, environmental monitoring and protection, vessel traffic management and maritime surveillance. The space-based AIS system would work on a global basis, in comparison with the approximately 50 nautical mile restriction on current terrestrial AIS.

GateHouse already provides application and analysis software for processing the AIS data currently transmitted by over 68,000 ocean going ships to maritime authorities, governments and port authorities around the world, and is also involved in the International Maritime Organisation's (IMO) Long-Range Identification and Tracking (LRIT) Project.

Under the agreement, GateHouse will supply a software solution including display, archiving, historical reporting, user authentication, web access and other core AIS functionality, along with hosting facilities for integrated data being produced by COM DEV.

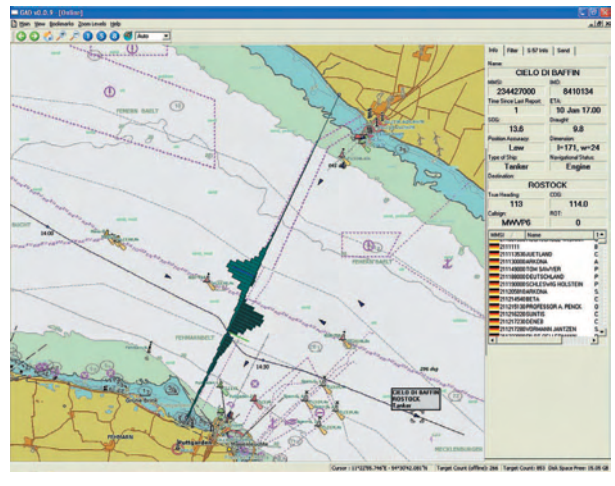
COM DEV is currently proceeding with aircraft and spacecraft trials to validate the advanced AIS capability which will enable global AIS coverage with a minimal number of spacecraft. Data from these trials will also be stored, managed and displayed using GateHouse software.

The global shipping view that will be created by the software will also be capable of being integrated with other display systems.

"GateHouse believes that AIS received from space is going to increase maritime domain awareness significantly, increase maritime safety and security and, not least, improve global environmental protection," said Michael Bondo Andersen, GateHouse CEO.

"AIS from space will supplement other technologies such as shore-based AIS, LRIT and radar monitoring and enable the global community to reach a berth to berth vessel monitoring much similar to what has been common for air traffic management for many years. We look forward to working with COM DEV to achieve this."

COM DEV says it has already received expressions of interest from a number of maritime agencies around the world to evaluate the space-based AIS system capabilities for potential operational use, acting as a complementary system supporting other initiatives being deployed around the world, such as shore-based AIS base station deployments and the LRIT initiative being led by the IMO.



*GateHouse AIS software will be used to manage the data collected by the satellite network*

In addition to being able to monitor a much wider range of vessels than traditional AIS systems, COM DEV says the space-based version has the added benefit of being able to detect vessels which intentionally or unintentionally transmit erroneous data. To ensure data security and integrity the system ensures that all data is encrypted, and will only be available for controlled distribution to authorised users consistent with resolutions and policies established by the IMO.

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

"Both COM DEV and GateHouse have been investing in complementary AIS-related technologies for several years. This alliance enables us to provide a complete AIS solution that we believe has significant market potential. Over the next year we anticipate entering into additional partnerships and alliances with leading providers in the infrastructure and services area as we continue to build out the capability to deliver this global service solution."

# UKHO pursuing digital future

www.ukho.gov.uk

UK Hydrographic Office Chief Executive Mike Robinson has outlined a digital future for the organisation by reaffirming the UKHO's intention to launch a new global vector chart service next year.

Speaking at the Institute of Marine Engineering Science & Technology (IMarEST) President's Day Forum in London, Mr Robinson said the world of marine navigation was changing from paper based to digital products.

He also highlighted that the UKHO, with its Admiralty brand of navigational products and services, is determined to remain a commercial success in this digital future.

He said: "We are about to start trials of a new global vector service which we will make available during the first half of next year. This will form the basis for a number of future products and services over the next few years."

Mr Robinson also explained that the availability and quality of 'official' vector charts had not improved as quickly as expected by the maritime community and widespread adoption has yet to occur, despite potential safety advantages.

He said: "The principles established by IHO member states in vector charting are somewhat different than in paper and effectively prevent any one nation from charting the world."

"Although the UKHO considers that where they have 'the capability' sovereign nations are best placed to chart their own waters, we are offering our services to take that base navigational data and add value with our world class cartographers and provide products and services to the mariner that the mariner deserves."

Mr Robinson added that the challenge of moving to a digital world would test the capabilities of the UKHO and its partners, and that co-operation would be necessary going forward.

"We are going to need assistance from industry in a number of different ways; from Original Equipment Manufacturers (OEMs), system integrators and software companies," he said. "The world is going to change but there is time if we plan and invest in our people."

The UKHO is currently an MoD Trading Fund but it is undergoing a status review which may see all or part of the organisation become a Government-Owned Company (GovCo); such a change in status could possibly increase its ability to compete commercially, and would certainly mark a significant change in the way the company operates.

Mr Robinson was keen to stress that despite the organisation's growing commercialisation the UKHO's primary objective would remain supporting the Royal Navy.

*We are starting global vector service trials next year - Mike Robinson, UKHO*

"We supply 70 per cent of all charts and publications sold to merchant shipping, but the Royal Navy remains our largest and most important customer," he said. "Our commercial success strengthens our service to the Royal Navy."

# Jeppesen agreement with Russian Academy

www.c-map.no

Jeppesen Marine has signed an agreement with the Admiral Makarov State Maritime Academy in St. Petersburg, Russia to co-operate on scientific research and training of cadets.

The strategic collaboration was signed on 26 September, the 131st anniversary of the school's founding, and will initially last three years.

According to the agreement, Jeppesen and the Academy will undertake joint research in the development of mathematical models of ships, carry out joint conferences, conduct independent evaluation of navigational information and designs and jointly develop distance-learning educational programs on nautical astronomy and navigation using electronic charts.

"The long-term value of ensuring that the next generation of Russian officers is trained on and fluent with our products is tremendous, particularly considering the mounting officer shortage," said Tor Svanes, director, Jeppesen Norway.

The Admiral Makarov State Maritime Academy, founded in St. Petersburg in 1886, has 2500 students.

# US port ID card scheme begins

www.tsa.gov

The US Department of Homeland Security's (DHS) Transportation Workers Identification Credential (TWIC) ID card scheme is finally underway after five years of discussion and deliberation, with the Port of Corpus Christi, Texas, joining the Port of Wilmington, Delaware, as the first ports to begin the enrolment of maritime workers under programme.

Eleven more ports were to be added during the course of November, with a further five ports to begin testing electronic card reading systems, according to the DHS. More than 1 million workers across the US with unescorted access to secure areas, such as ports, will be expected to apply for a TWIC card during the rest of 2007 and in 2008.

The TWIC scheme, which will restrict access to ports to people carrying the government-issued cards, has been plagued by delays and criticisms during its five year history, with many still disappointed at the progress that has been made despite the commencement of enrolments.

At a hearing held by the House Homeland Security Committee's subcommittee on border, maritime and global counterterrorism, committee chair Bennie Thompson said that the system had failed to meet requirements in a number of different areas.

"The Department began rolling out the TWIC program, which was mandated five years ago, just (recently)," said Mr Thompson in a statement. "Already there are glaring problems."

"TWIC readers are years away from installation. Without the readers, a TWIC is merely a flash pass that can be fraudulently duplicated and misused."

However, Maurine Fanguy, programme director for TWIC at the TSA (Transportation Security Administration), defended the initiative, and said that substantial progress had been made in the last six months that would improve the operation of the system, particularly in relation to the design and testing of the ID card readers.

"The TWIC program is moving towards its objectives while making sound decisions focused on enhancing port security and a reasoned, phased-in program implementation approach," she said.

With respect to the launch in Texas she added: "We appreciate the support of our partners at the port of Corpus Christi for helping to make one of the world's most advanced interoperable biometric systems a reality."

# RIN president slams Galileo development

The President of the Royal Institute of Navigation in the UK, Professor David Last, has launched a scathing attack on the EU's Galileo positioning system, a European answer to American GPS which has suffered a number of delays and is already at least three years behind schedule.

Speaking at the NAV07 conference in London, Professor Last accused the EU of having "ignored the elephant in the room" and having squandered opportunities due to "pork-barrel politics" in its pursuit of the system.

"With delays allowing other nations to steal a march on the development of 'Europe's GPS', we now have to ask - where on Earth is Galileo going?" said Prof Last. "Does its development even have a clear destination any more?"

"Two key arguments then convinced the politicians. First, that Galileo would give Europe that independence of the US it sought. Second, that it would bring to Europe a substantial new industry."

"Independence has proved to be a myth. The mass market demanded technical compatibility between Galileo and GPS, not a separate and different Galileo. And US national security blocked Europe's freedom to operate Galileo without US co-operation. So free-to-air Galileo has become essentially another version of GPS."

He continued: "And that major new industry? Well, Galileo has stimulated those companies that design and launch satellites. But for every satellite you launch, there are a million users on the Earth. Here is where the money's made, or lost."

"As the Japanese showed the US, operating the satellite system doesn't guarantee that you dominate the satellite navigation user market."

Prof Last feels that the fact that a fully functioning positioning system already exists with GPS makes this a somewhat pointless exercise.

"In a sense, Europe's dreamers had ignored the elephant in the room," he said. "And what an elephant: GPS. Probably the most successful technological innovation of the late 20th century."

"A high-tech industry with no downside, whose customers seized the opportunities it offered, a technical enabler that spawned a thousand products across the world."

"Galileo once promised a technically superior system to GPS, to be delivered in 2008. The Galileo schedule has slipped roughly two years per annum. That window of opportunity has now slammed shut, lost largely to the pork-barrel politics of which nation got which part of the work."

"By now, the US has a new and better GPS on the way. Russia's GLONASS is being upgraded and China, Japan, and India are each planning their own satellite navigation system. At least one of them could well be in place before Galileo. A second elephant and a third!"

# ECI Partners buys Kelvin Hughes

UK private equity group ECI Partners LLP has acquired Kelvin Hughes in a £52 million transaction from Smiths Group PLC.

The purchase price comprises £48 million which was paid in cash on completion of the purchase and a deferred payment of up to £4 million depending on certain conditions being satisfied.

Senior members of Kelvin Hughes management also invested alongside ECI, becoming shareholders in the business.

Following the transaction, Kelvin Hughes says it will increase its investment in technological innovations and product development to further strengthen its position in the navigation technology market.

ECI says it is backing the existing management team led by Russell Gould, managing director, and that the growth of the business will be driven through both organic expansion and acquisitions.

The private equity group pointed to the company's SharpEye radar technology as one of the innovations it sees as a key component of the company's portfolio.

"Kelvin Hughes has developed an extremely impressive product in SharpEye," said Ken Lindsay, ECI.

"It has been developed by military radar experts and represents a step change in terms of performance and cost effectiveness far in advance of other radar products available today. This product is creating enormous excitement in the marine sector."

Russell Gould, Kelvin Hughes managing director, added: "This is an exciting time for everyone at Kelvin Hughes. With ECI's support we are extremely well placed to build on our current position as a world leading producer of navigation technology."

"The sector we operate in is growing due to the increasingly legislative environment affecting the marine industry, and we feel that we are ready and equipped to capture the market opportunity."

# ECDIS evolution at Transas

**Transas has released the latest evolution in its ECDIS range, the Navi-Sailor 4000, which offers a greater range of integration and configuration than ever before. *Digital Ship* spoke to the company about the new technology, and got its views on mandatory carriage requirements for this navigation technology**

Marine electronics provider Transas has released the latest system in its ECDIS (electronic chart display information system) range with the recent unveiling of its Navi-Sailor ECDIS 4000.

The release of the system is the first of a number of expansive moves that the company has lined up in the next 12 months, with the aim of providing better technology and better service to the maritime community.

One of the key developments in the ECDIS technology itself has been the increased capability for the system to be integrated with other navigation display types, with the aim of bringing all available information to the mariner in a single unit, says Anders Rydlinger, sales and marketing director, Transas.

"We were the first company that got type approval for ECDIS in 1999, the Navi-Sailor 2400," he told us. "Some years later we were the first company to receive type approval for INS."

"Our development has continued, and we are now on our fourth generation of type approved ECDIS, and this ECDIS will actually be type approved as a multi-function display."

The new systems will offer the option of connecting existing bridge technologies to the ECDIS, which Mr Rydlinger believes will prove highly beneficial to navigators.

"There has been, for many years, a requirement from users to combine different types of information on one screen," he said. "The solution in the past has been to use switches, to switch between different VDU or different keyboards, and so on."

"By introducing the technology that we developed for the INS system into the standalone product we can now offer a solution where seven different applications can be run on one single computer."

"The systems, which are 'stand alone', would have one computer on the bridge that could contain different types of applications, like the conning, the ECDIS, and the radar. You can combine them in different configurations - one station, two stations, three stations, for any type of need."

He continued: "On these stations we can connect to a lot of old radars, so even on an old vessel where they have a radar that is not a modern one and can't show AIS information, then we have a solution - get this ECDIS from Transas, connect it to the old radar, and you get the short radar with all of the AIS information."

"You can also connect other information for conning, and so on. You can do any type of combination of the applications."

"It's type approved, it will be type approved by DNV, and operates with all different types of chart formats, and has all of the functionality you've found in ECDIS in the last few years, plus some new functionalities that we are developing. It also integrates with the SPOS weather system, enabling the user to have one product for the route planning and the rest."

"The new conning is vector based, which makes it very easy to customise for different types of ship or different operations, like moving operations, navigation in deep sea, navigation in narrow water, and for anchoring. This can all be combined with charts, radar, and even CCTV cameras that you use for monitoring the engine room, or loading operations, you can present this in a small window on the screen."

*Aviation is learning all the time from its mistakes. In the marine industry we have a history of maybe not talking about these things - Anders Rydlinger, Transas*

As well as the new ECDIS system, Transas is also launching a new VDR (voyage data recorder) and S-VDR (simplified voyage data recorder) 3200 range, with improved playback functionality it hopes will encourage vessel operators to take advantage of all of the data the systems produce.

"For many shipowners the VDR or S-VDR is just a cost, it's not something they really use in daily operations," said Mr Rydlinger.

"In our new VDR and S-VDR we have inbuilt functionality of a powerful playback tool which makes it possible to use the recorded data onboard with the chart system to learn about how we manoeuvre. If you have an incident you can see what you did wrong, right, and so on. I think very few shipowners are actually using the VDR information to improve safety onboard and learn from their vessels."

"If we compare with aviation, they are learning from every little mistake or incident that could be some sort of problem. They're learning all the time. In the marine industry we have a history of maybe not talking about these things, but by using this technology we can improve the situation a lot, as well as the management on board the vessels."

## Service

To supplement these new technologies Transas is also planning to expand its presence around the world, opening new offices in different locations as part of a new customer service policy.

"We have decided to open an office in the port of Rotterdam, and it will open its doors officially on 1 January 2008," said Peter Mantel, Transas business development director.

"We will also have a new office in France, in Nice, supporting the Mediterranean countries, as of 1 July 2008."

"It's quite a large expansion programme, to service the marine industry better, and more efficiently. If you look at all the major ports there is a Transas owned office - Singapore, Dubai, Seattle, all of these strategic locations."

Mr Rydlinger added: "We're going to have a completely new service policy and structure from the first of January, based on three major service centres around the world, one in Seattle, one in Europe, and one in Asia. There will be one common telephone number for all our customers, and an always available help desk. So it will operate for 8 hours in Europe, then 8 hours in Asia, then 8 hours in Seattle during the night time over here."

"We have a target for our operations that we should be able to reach all vessels within 8 hours. We are focusing on all the deep sea vessels."

Mr Rydlinger notes that maritime customers today expect high levels of after sales support, and that the company must keep up with demands if these users are to be satisfied.

"When you come to upgrades, and equipment that is a carriage requirement where you need to do annual surveys, you need to be able to do that in different ports. Then you also need to do maintenance. It's part of the package that we offer to our customers."

"It can take a year or two years to get a customer in this industry, but only one or two missed service calls to lose him."

Transas is also looking at doing more remote diagnostic and maintenance work for the ECDIS systems, using onboard satellite communications, but admits that there are still limitations on how feasible


*Transas' latest ECDIS, the Navi-Sailor 400, is type approved as a multi-function display*

this will be for most deep sea vessels.

"The weak part is still the communications, though that is improving quite rapidly," said Mr Mantel. "Broadband is becoming more available at sea."

"It's more difficult to fix a broken hard disk over the internet of course, but for the software it's all possible. We can go into the system, clean it up. If there are accidents we can go online and download track files out of the system and it's instantly available at the office of the ship operator. The technology is there, and it's been there for quite some time."

Mr Mantel also noted that a lot of the problems that do tend to happen are not so much a fault of the maritime applications themselves but the Windows XP kernel that those applications are built on.

"In 99 per cent of cases the operating systems for the equipment in the marine industry are supplied by Microsoft," he said. "If you go to the aviation industry there are no Microsoft operating systems for any of these applications. It's either Unix based or some other kind of advanced operating system, simply because of the unreliability of some Microsoft products."

"It's very difficult, sometimes you get involved with very complex integrated network solutions, where shipowners want to have access to all types of information, and sometimes the Microsoft solutions simply do not support those requirements. This causes problems, and they go back to the manufacturer and say 'your system doesn't work properly', when very often the underlying problem is in the operating system."

"The problem comes when it gets too expensive to use other platforms other than standard PCs for the maritime industry. It's a bit different in the aviation industry, because the prices are so different. You can't compare a navigation system for a Boeing 777 with a marine unit. It's not really more advanced at the hardware level but the operating systems are different."

## Carriage requirements

The debate about whether or not ECDIS systems should be made a mandatory carriage requirement has heated up over the course of 2007, and was one of the main topics on the agenda at IMO's NAV53 subcommittee meetings during the summer. Despite strong calls from a number of national delegations the Organisation has decided to postpone any decision until after next year's NAV54, at the earliest.

Mr Mantel is disappointed that there has not been further movement on this issue, and believes that a mandatory carriage requirement would be beneficial for the industry as a whole - though it must also be pointed out that a mandatory ruling would also be beneficial for the ECDIS manufacturers themselves.

"Unfortunately IMO and all the regulatory organisations are never on top of things, they're always following the industry," he told us. "There'll always be an excuse 'we cannot make ECDIS a mandatory carriage requirement because there's no official data to support it', and of course there's no ECDIS without official data."

"I think it's a shame it is still not a mandatory carriage piece of equipment, I think everybody realises it's probably the best invention since the invention of radar, and it's very unfortunate that for some reason people also associate ECDIS with going paperless. I don't necessarily think that's the key advantage of ECDIS."

"Of course it's a financial benefit getting rid of the paper charts, but there are a lot of other benefits like improved safety, improved operational efficiency, and so on," he continued.

"Some of the benefits are there whether with official data or not, there's a lot of good private data available. It's a bit of a power struggle between the various Hydrographic Offices."

"For me it's not understandable why we are in this situation with ECDIS. With other equipment like AIS, long range tracking, that seems to fly through the IMO and all of a sudden ships need to carry these things. For some reason they haven't been able to do this with ECDIS."

*It's a shame ECDIS is still not mandatory - Peter Mantel, Transas*

An all encompassing LRIT (long range identification and tracking) ruling does seem to be closer to reality than mandatory ECDIS at the moment, but all of these technological systems fall under the IMO's strategy for the development of e-navigation.

Mr Mantel is unsure as to how successful this type of project could ultimately be, in relation to the pace of change at IMO in other areas.

"It's the next generation of solutions, long range tracking, navigation, the exchange between ship and shore - all of this stuff is going to be integrated in one large solution," he said.

"But again, we have to be a bit careful, because if the authorities can't just approve, for example, a product like ECDIS, how are they going to approve e-navigation? That is much more complicated, and it's not just one component, it's lots of different components which all have to be type approved."

## Pricing

One aspect of the continuing development of ECDIS systems that Mr Mantel thinks will be of interest to maritime users will be the reduction in equipment prices that has accompanied it.

"If you look at the pricing history for an ECDIS, ten years ago you would buy an electronic navigation system, a basic one, for Euro 100,000," he said.

"Now a new ECDIS system sells for around Euro 30,000. (Comparing all of the competitors) the prices seem to have levelled out. There are always manufacturers who will go a bit lower maybe, but you do have the Rolls Royces of the market and you have the Fords."

"It depends on value for money, and you get very good value for money with the support. We'd like to consider ourselves to be the Rolls Royce of the ECDIS systems."

Mr Rydlinger also noted that a mandatory ruling on ECDIS would have a big impact on these prices, and push them much lower.

"(With a mandatory carriage requirement) the volume would increase dramatically, so perhaps the price will also decrease," he said.

"There would be more competition, we saw it with AIS and VDR. It could be the same for ECDIS, so we're looking at what more service connected to ECDIS will the shipowner look for in the future. That's part of our strategy." DS

# Human error or equipment failure - Cosco Busan

**The case of the *Cosco Busan* and a recent incident in San Francisco Bay which led to the spillage of more than 50,000 gallons of oil has confused investigators, with the story of the vessel pilot seemingly contradicted by the records of the navigation equipment on board. In times of doubt who do the investigators believe - man or machine? *Digital Ship* looks at the facts**

A recent accident in California has once again brought the issue of equipment failure and human error to the forefront of maritime discussion. In this instance, however, both the onboard technology and the human pilot are offering very different versions of the events that took place, leaving investigators with the intriguing conundrum of deciding who to believe - man, or machine?

The accident happened after the six-year old container ship *Cosco Busan* left its berth at the port of Oakland en route to South Korea on November 7, navigated by pilot John Cota, and attempted to pass under the San Francisco Bay Bridge.

In foggy conditions the 901-ft vessel was aiming for the 2,200 foot gap between the bridge's two towers. Unfortunately, an error in course caused the ship to miss this opening, and the *Cosco Busan* struck a fender on the base of the second tower, west of Yerba Buena Island.

The resulting 12 foot long, 212 foot wide gash in the ship's hull spilled 58,000 gallons of bunker fuel oil into San Francisco Bay, causing the deaths of approximately 400 birds and leading to the suspension of all fishing for human consumption by California governor Arnold Schwarzenegger.

Questioned during the ensuing investigation, the pilot, Mr Cota, placed the blame for the accident squarely on the electronic navigational equipment onboard, with Mr Cota's lawyer, John Meadows, stating that the ship's radar had "conked out" as he was approaching the bridge.

In Mr Cota's version of events he says that while waiting to depart with the vessel, which had been delayed for 90 minutes due to the fog, he had inspected the onboard systems, and become concerned about its reliability.

Mr Cota told investigators that he had seen "clutter" on the radar, and that he was unfamiliar with some of the symbols that were used on the vessel's ECDIS (electronic chart display information system), as they were different to those he was used to on the paper charts he had used previously.

However, assurances from the captain that it was okay to continue were enough to convince Mr Cota that it was safe to proceed with the voyage, but before the vessel had even made it out of the channel the fog worsened, and the pilot reverted to the radar as his primary means of navigation.

Soon after switching his attention to the radar Mr Cota says that he began to experience some problems, telling the investigators that the equipment became "distorted" and "unreliable".

Unable to pilot the ship with the radar he turned instead to the ECDIS. Even at this stage, Mr Cota told investigators, he still expressed his confusion about the symbology on the screen to the captain, who explained what he believed the images represented.

The vessel was then radioed by the Coast Guard's Vessel Traffic Service, monitoring vessels coming in and out of the Bay, which warned that the ship was steering a south-westerly course and asked the pilot what his intentions were. Mr Cota explained that he was heading for the 2,200 foot gap between the bridge towers and continued on his way, though it was unclear if he knew which heading he needed to assume this course.

Directly after this conversation the bow lookout notified the bridge that the vessel was about to strike the tower. Mr Cota told investigators that he had just realised this himself at that moment and ordered the helmsman to make a hard turn.

While this action averted a head-on collision, which could have had drastic consequences for the Bay Bridge as well as the vessel, it was not enough to avoid an accident, and the substantial oil leak that ensued.

## Responsibility

While Mr Cota's version of events points to equipment failure as the root cause of the accident, subsequent investigation by the US National Transportation Safety Board (NTSB) has cast doubt on this assertion.

In the course of its investigation NTSB had the equipment inspected by a private technician, who it says reported the systems to be "performing as expected."

Debbie Hersman, a member of the NTSB, noted that information gathered from the vessel's VDR (voyage data recorder) had been reviewed by investigators and technicians, who examined radar images that were sampled every 15 seconds.

*The USCG response team cleaning oiled rocks in Berkley Marina. Photo: USCG*

Ms Hersman said that the downloaded information recorded close to the time of the accident was "consistent of what we'd expect to see on a radar image", casting doubt on the claims of Mr Cota.

In addition, neither of the pilots who had handled the vessel both before and after Mr Cota had reported any difficulties with either the radar or ECDIS systems onboard, said NTSB.

With regard to Mr Cota's confusion over the ECDIS symbols, Ms Hersman noted that: "The paper chart, which is fairly standard, has standard symbology. The symbology that was on the electronic chart was not the exact same as the symbology that appears on the paper chart that the pilot was familiar with, so he queried the captain with respect to particular symbols."

NTSB appears to be somewhat sceptical about Mr Cota's story in light of these results of its investigation to date, and has also been hampered in its attempt to find out what really happened by a refusal on the part of other crew members to speak about the incident, on the advice of their lawyers.

## Counter claims

Mr Meadows, lawyer for Mr Cota, has insisted that the NTSB's claim that the onboard equipment seems to have been working as usual is incorrect, and countered that the faults in the equipment made it almost impossible for Mr Cota to pilot the vessel properly, thus leading to the crash.

Despite the evidence obtained from the VDR, Mr Meadows maintains that the radar "definitely wasn't working when the pilot went on board. It took about an hour for the ship's officer and master and pilot to get it working. It wouldn't have been safe to go out without."

The ship's officer, master and pilot have so far refused to comment to investigators as to whether or not this was the case.

Mr Meadows continued: "As they approached Yerba Buena Island, that's when it began to show distortion. The radar was still on, but the bridge became elongated on the screen. (Mr Cota) couldn't see the tower. He couldn't even see the radar reflecting buoy outboard of the bridge."

"This is when, for the third time, he asked the master to point the centre of the bridge on the electronic chart display. He pointed to an area that turned out to be the tower."

With this statement Mr Meadows is suggesting that the captain had told Mr Cota to aim for the area on the chart which they both assumed to be the gap between the bridge towers, when in fact it represented one of the towers itself.

It seems strange that the pilot could plot a course leading directly into the structure of a bridge without the ECDIS offering some sort of alarm or warning, and that the two radar systems on board the vessel could have simultaneously failed, something NTSB has already stated to be an "unusual occurrence." However, though unusual, NTSB has still not been able to rule it out as impossible without more evidence to substantiate such a claim.

With Mr Cota sticking to his interpretation of the incident, and other witnesses refusing to confirm or deny the veracity of his story, it seems that NTSB will have to continue to delve further into this case to see which version of events is the correct one - that of Mr Cota or the onboard VDR.

Investigations in California are continuing. DS

# Galileo in Crisis?

**Infighting, rumours, money troubles - while this might form the basis for a compelling soap opera, it is in fact the unfortunate story behind the EU's hotly debated Galileo project, touted as Europe's answer to GPS. Dr Andy Norris examines where the future lies for this troubled venture**

Galileo, the proposed European Global Navigation Satellite System (GNSS), is currently going through a period of extreme doubt concerning its funding to completion.

This has been exacerbated by the recent publication of a critical report on the programme by the UK House of Commons Transport Committee. The Chairman of the Committee, Gwyneth Dunwoody MP, has also been vocal in publicising the concerns stated within the report.

It is estimated that £1.1 billion pounds will be spent by the end of the Development and Validation phase, stated by the Committee as overrunning the originally forecast spend by nearly 50 per cent. One experimental satellite has been launched and is operating successfully.

Costs to completion appear to be rising and are now standing at more than another £2 billion. Once up and running it is estimated that the operating costs will be about £275 million a year. The Commons Select Committee are concerned that all these projected costs will also escalate.

The plan is to have a 30 satellite constellation - 27 operational plus three in-orbit spares. This was originally expected to be completed by 2008 but has now slipped to at least 2013, if it goes ahead.

At the base of the problem has been the growing realisation that little income can be expected from users of the system. Therefore the vast majority of the expenditure will have to be borne by taxpayers.

The Commons report is effectively calling for the programme to be abandoned 'unless a comprehensive and thorough business case and funding solution had been presented and explained to the Commission'.

## Marine use of Galileo

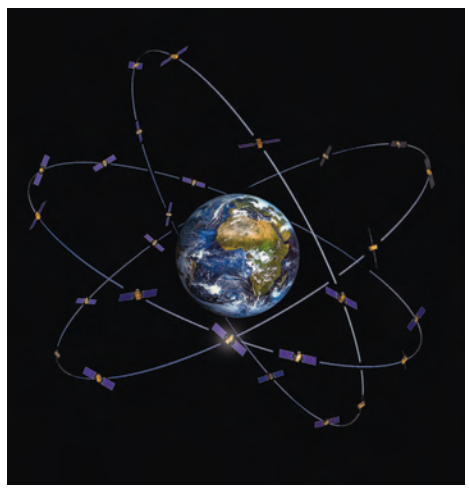
It is worth examining whether there is a marine case for Galileo. The system has been conceived to permit a very high integrity subscription service, specifically for safety-of-life applications, designed to alert users to accuracy problems within about 5 seconds.

However, the biggest benefit for marine applications appears to be that it would provide a reliable addition to GPS, giving an independent source of position data.

Used together, they would give a very high continuity and integrity of service, even without using the optional and potentially expensive Galileo Safety-of-Life service. One system could completely fail and precision navigation would continue.

There is no doubt that many marine users have been accepting an unknown risk by relying entirely on GPS. On some ships there are inadequate practices, resulting in the failure to adequately check GPS position with visual and radar data. GPS coordinates, whether plotted on a paper chart or as own ship position displayed on an electronic chart, are accepted as statements of fact.

In some ways, it is not surprising that this has happened. At a system level, GPS has proven itself to be highly accurate and reliable. In addition, GPS receiver equipment on ships rarely fails.



*The projected overspend for Galileo is currently at 50 per cent*

However, groundings still occur because some navigators rely too heavily on GPS. This is despite the publicity given to an early incident, when the Panamanian cruise ship Royal Majesty grounded in 1995 on a shoal off Nantucket because of an onboard GPS failure.

This incident influenced marine GPS receiver design and maritime training, but onboard failings of GPS equipment continue to result in the occasional grounding.

It can therefore be assumed that if the GPS satellite system failed for any reasonable length of time or became grossly inaccurate over a wide area it would catch out a number of unaware navigating officers, greatly increasing the chance of groundings and other incidents.

A GPS system failure would also affect AIS transmissions. This could also contribute to accidents on ships if the OOW is poorly trained or motivated.

In principle, a second independent positioning system would help to reduce the likelihood of accidents. If truly independent, including separate antennas and cabling on the ship, a direct comparison of the positions would identify both satellite system and ship equipment problems, immediately shown up by the displayed differences in position.

Ideally, these differences would be monitored automatically, for instance by an integrated navigation system (INS), so that the bridge staff would be alerted when significant differences occurred.

Such an automatic system is preferable, as some groundings have occurred even when there has been a secondary GPS receiver clearly indicating a different position to that of the primary.

## GPS System failures

It is such 'hand-waving' arguments that make it easy to state that a second independent GNSS will give benefits. Unfortunately, it is difficult to quantify properly the actual risk if we continued to rely solely on GPS.

The actual probability of a major GPS system failure is probably unknown, at least in the public domain.

Also, although the US has given international assurance that accurate signals, except in war zones, will remain for general use, some people are worried that future decisions taken in different circumstances may reverse this undertaking.

The most commonly experienced system problem with GPS is that one (or more) satellites are temporarily transmitting inaccurate data before correctional action can be taken by the US authorities. This typically only lasts for periods of a few tens of minutes.

IMO has therefore specified that RAIM (receiver autonomous integrity monitoring) must be incorporated on marine receivers to automatically detect this type of anomaly.

With a second independent positioning system, accuracy of navigation would be retained during these occurrences, providing both systems were not exhibiting problems simultaneously.

A second independent positioning system can alert users whenever there is a meaningful discrepancy of position, for whatever reason. Even if it cannot be deduced which system is inaccurate, the fact that there is a known positioning problem would enable the OOW to take appropriate action and navigate safely.

## Independence from GPS

The real need for normal maritime services, therefore, is a system independent of GPS.

This does not have to be Galileo. The Russian system, Glonass, could be equally useful once it has a complete constellation. Other states are also developing, or considering developing, their own global navigation systems. In particular, China is actively launching satellites for a system known as Compass.

IMO is very careful in its SOLAS carriage requirements for position fixing equipment. It does not mention specific systems and even allows terrestrial radionavigation systems or 'other' means to be used for positioning. It is inconceivable that it will ever mandate the use of a particular system, such as Galileo.

However, in the future it is possible that IMO would require the use of two independent systems, although it is unlikely that this would be mandated within a framework of at least 7 years.

Any pressure from within the marine community for Galileo could come from European coastal authorities and from European companies and organisations involved in shipping. These bodies may feel that a non-European system may not provide the reliability and long-term continuity for a parallel service to GPS.

In particular, as with GPS, Glonass and Compass are primarily military systems. Galileo has been conceived as a civilian system.

There are good arguments from some within the marine community that the back-up to GPS should be a land-based system, such as enhanced Loran (e-Loran). If such a system could be implemented globally it provides a number of advantages over a second GNSS.

This is mainly because of the common mode failures that can occur with any GNSS, such as vulnerability to simple jamming and known detrimental effects that can occur from solar and cosmic radiation.

However, although systems encompassing Europe and North America will possibly come to fruition, it is perhaps unlikely that e-Loran will be adopted globally. For this reason, a second reliable GNSS is essential to continue the improvement in maritime safety and the protection of the environment.

It also underpins the improvements in safety and efficiency envisaged by the e-Navigation initiative.

The only question that needs to be answered is 'should Europe provide such a system?' DS

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