Digital Ship
April 2012
www.thedigitalship.com

Wallem to install DNV Navigator on 190 ships

Wallem Ship Management has agreed a deal that will see the company install a software system from DNV Maritime Partner across its fleet of managed vessels

Wallem Ship Management in Hong Kong has ordered the DNV Navigator software system for its managed fleet of more than 190 ships.

DNV Navigator is a decision support tool used onboard ship to assist the Master in managing port operations. This new contract with Wallem is the largest ever signed for the software system, and was agreed after the successful completion of a trial programme.

Using the application, more than 1,200 port clearance forms are automatically filled in with ship data so that required paper work can be prepared quickly.

It includes a database of information about all world ports and terminals, including publications and data from UKHO, IHS Fairplay and other sources. Arrival and departure procedures for all major ports are available, as well as a nautical library providing maritime-specific information.

A Master's Notes functionality is included, which is used for sharing port specific knowledge within the fleet. Information can also be shared with other systems, such as gangway control systems and ECDIS.

The contract with Wallem additionally includes a Work and Rest Hours module to manage compliance with international legislation on rest hours for seafarers, particularly the Maritime Labour Convention 2006 and the Standard of Training, Certification and Watchkeeping for Seafarers.

Any violation of regulations will be identified, and user-defined reports can be generated.

Captain Deepak Honawar, Wallem's director of safety and quality, and Kaveh Mansoorian, DNV senior customer service manager, signing the contract in Hong Kong

Crew timesheets can also be created in MS Excel, and the system allows for company-specific forms to be added and for data to be shared with other company-specific or third party systems.

"Wallem is striving continuously to manage their fleet in safer and more cost effective ways," said Captain Deepak Honawar, Wallem's director of safety and quality.

"We were impressed by how quickly DNV responded to our demands and added new elements in the system. We have great expectations for the use of DNV Navigator and believe the product will play a key role in our portfolio of on-board applications."

Software growth

This new contract with Wallem represents a significant coup for the DNV software team, which celebrated the subscription of the 2,000th ship using its software when it was implemented by the container vessel HS Chopin, owned by Hansa Shipmanagement in Hamburg, during the fourth quarter of 2011.

The company has managed to reach this level in less than 10 years, with DNV Navigator having been introduced in 2002.

"Industry feedback indicates that the on board paperwork burden is reduced by as much as 90 per cent," said Odd Arne Haueng, head of DNV Maritime Partner.

"This enables ships' officers to focus on what should be their primary responsibility, that is operating the ship in a sound and safe way both at sea and in port."

Wallem commenced roll-out of DNV Navigator across its fleet in March 2012.

DS

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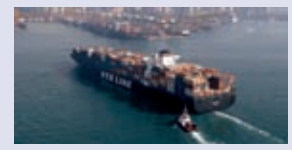

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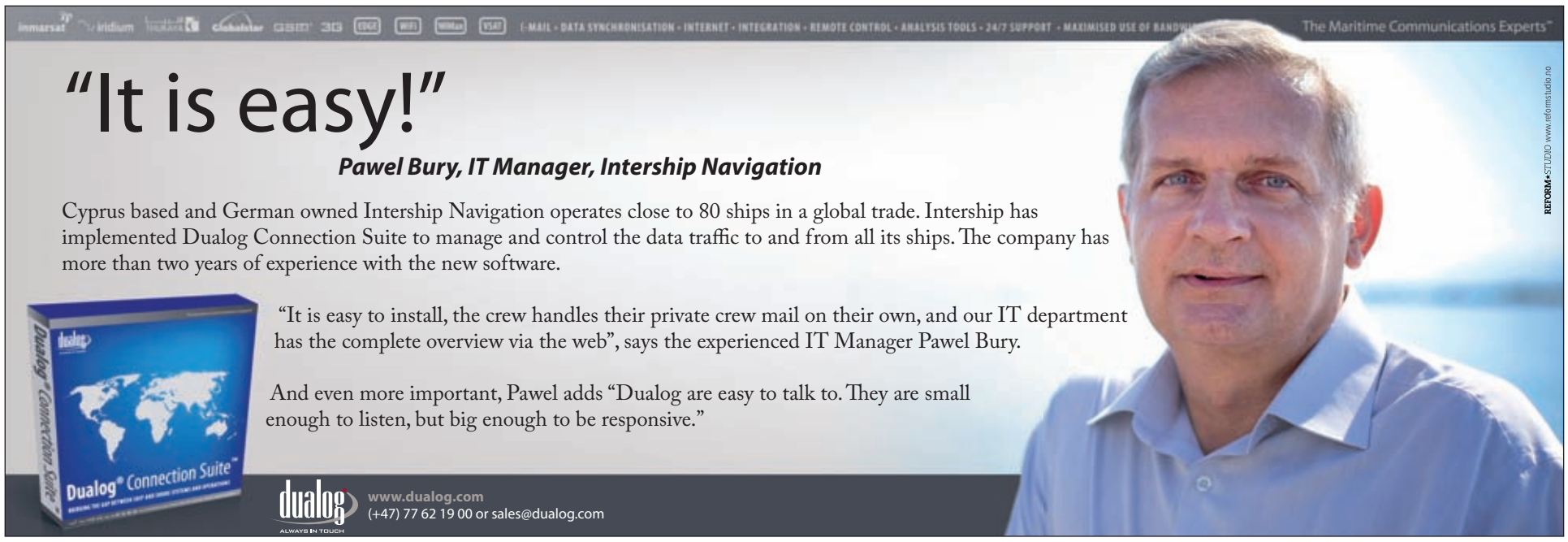

Digital Ship

Vol 12 No 7

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10-11 October 2012

Printed by
The Manson Group Ltd
Reynolds House, 8 Porters' Wood
Valley Road Industrial Estate
St Albans, Hertz AL3 6PZ
U.K.

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Tankers to install C-band VSAT from Orbit and Milano

www.orbit-cs.com
www.milanoteleport.com

ORBIT Communication Systems and Milano Teleport report that they have received new orders for their VSAT solution combining ORBIT's OrBand C-band VSAT system and Milano Teleport's C-Band satellite capacity and value added services.

The companies say that the solution will be installed on supertankers owned by an unnamed shipping company based in Greece.

In mid-2011, ORBIT and Milano Teleport supplied the tanker company with a single C-band system for testing purposes. The new contract is a result of the successful conclusion of that trial, which examined the quality of service and data transfer rates available with the system.

The shipping company will now equip its entire fleet of tankers with this VSAT solution over the course of 2012 and 2013, to support various broadband applications, including centralised management and control from company headquarters, VoIP telephony, as well as VPN and internet connectivity for the ship's crew.

A Greek tanker company will install OrBand units across its fleet in 2012 and 2013

"With the increasing demand for true global broadband at sea we have invested in a wide range of satellite airtime services, as well as value added services and highly innovated remote diagnostic solutions for the maritime market," commented Nicola Mossino, maritime managing director for Milano Teleport.

"Our service is specifically tailored to meet the requirements of maritime customers, providing always-on data and voice communication. With OrBand, our solution guarantees constant quality of service under any weather conditions across the globe."

ORBIT's recently launched OrBand can be shipped as a single, fully assembled and tested unit in a standard 20-foot container, for single-day installation, which the company notes is much quicker than what was possible with traditional C-band antennas.

"This substantial order is further confirmation of the quality and innovation that our revolutionary OrBand solution brings to the field of maritime broadband communications," said Avi Cohen, president and CEO of ORBIT.

"We are proud that this premier tanker company has selected our joint solution with Milano Teleport for global maritime broadband services, following its in-depth validation of system performance under difficult maritime conditions."

"We continue to pursue further commercial partnerships, which will help to position ORBIT as an industry leader and to expand the scope of our business activities."

Telemar and Vizada introduce SeaMore

www.seamore.net

Telemar reports that it is to launch a new communications package called SeaMore, in conjunction with Vizada.

Telemar says that SeaMore will offer access to private onboard communications similar to GSM but without roaming costs, as well as incorporating maritime applications and the Vizada XChange communications management platform.

The company says that ship owners and managers can use the service to provide direct access to a network of business applications, via a tablet, to captains and superintendents.

These applications include real-time tracking and maintenance reporting with the Telemar World Service app, a GPS locator, weather forecasts, fleet surveillance categorised by fleet, ship or users, remote IT control, 'store & share' business content, and other customisable apps.

On the crew side, Telemar claims that seafarers will be able to use their private smartphones and tablets to connect to the system and communicate in a way similar to how they use onshore communications networks, with voice calls, optimised e-mailing, SMS and instant messaging.

Web browsing is also available, with compression and caching to lower costs.

An onboard electronic library will be incorporated, providing access to free onboard news and sports content as well as videos, music, e-books or other media content.

Shipping companies can set their own usage policies for the various services, while the seafarers themselves can also create personal cost monitoring alerts.

Telemar says that SeaMore is currently in the beta-testing phase and will be installed on a select number of ships before its full commercial launch by July 2012.

"SeaMore is a potential game-changer in the maritime industry – mobility combined with privacy are becoming a reality for all maritime end-users," said Gennaro Faella, Telemar corporate business development and operations coordination director.

"Vizada's enhanced solution development capabilities benefits from our close understanding of end-users' needs to roll-out a unique product with high value in terms of simplicity, convenience and applications."

"Owners and managers will exploit the bandwidth to save time and money handling operations anywhere and anytime. Masters and seafarers can access their favourite newspaper every morning, view family pictures in the privacy of their cabin, and chat with loved ones."

Australian POP for ASTA

www.asta.net.au

Applied Satellite Technology Australia (ASTA) reports that it has extended its network to include a point of presence (PoP) in Sydney, Australia.

The new PoP will allow the company to provide direct termination of Inmarsat FleetBroadband and VSAT traffic locally, providing the shortest route possible for data transmission.

It also offers users the ability to connect via a 'local tail', such as multi-protocol label switching (MPLS) or virtual private network (VPN), which allows an end to end private network straight into their premises within the Asia Pacific region, rather than passing over the public internet.

This also allows end to end quality of service (QoS) to be assigned, and other value added services such as firewalling, as required.

ASTA notes that, due to the addition of force routing, all traffic that originates from Australia must first be routed back to Australia for legal interception before being sent onwards; the PoP in Sydney allows the company to achieve dedicated secure data transfer in that regard whilst providing the lowest possible latency for Inmarsat traffic.

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Acquisition interest in Thrane & Thrane

www.thrane.com

Thrane & Thrane has reported that it has received an unsolicited approach to acquire the company, which it will now take under review.

According to a statement, required through Thrane's listing on the Copenhagen stock exchange, the approach came from "a third party, who has expressed a non-binding interest in acquiring a majority interest in the company."

The statement notes that the indication of interest includes a list of certain conditions that would need to be met before a formal offer would be made.

Although Thrane notes that it is not certain that the approach will ultimately lead to a bid, the Board has unanimously decided to initiate a "strategic review in order to fulfil its fiduciary duties to serve the best interest of the company and all its stakeholders."

Thrane says it will announce the result of the strategic review no later than May 14, 2012.

The news caused a ripple in Thrane's stock price, which reached a high of 445 DKK before settling close to 400 DKK at the time of writing. Thrane shares had been trading in and around the 300 DKK mark the week before the acquisition interest announcement was made.

Lars Thrane, founder of the company and holder of 24 per cent of the shares in Thrane & Thrane, has reportedly been quoted in Danish newspaper Borsen as saying that he will not sell his stake to the company that has made the approach.

Lars Thrane (right), shown here with his brother Per soon after they founded the company in 1981, has said that he will not sell his share to the company that has made the approach

Horizon's VoIP service has been approved for use over SAILOR FleetBroadband terminals

In other news, Thrane & Thrane has also granted accreditation to Horizon Globex, a wholly-owned subsidiary of One Horizon Group, for its Horizon VoIP PBX solution to be used with SAILOR FleetBroadband.

The Horizon VoIP PBX allows simultaneous calling for up to eight analogue telephones over the FleetBroadband standard data link, and offers users the choice of three different call settings for cost and quality control.

Horizon says that its VoIP platform, based on the company's SmartPacket technology, enables VoIP from only 2 kbps, compared to around 8 kbps from other VoIP services.

It is compatible with digital telecommunications standards and is capable of interconnecting any phone system over IP on satellite, mobile and fixed networks.

"This is an important endorsement from the leading manufacturer of mobile satellite communications equipment," said Mark White, CEO of One Horizon Group.

"It further validates Horizon's quality and reliability, and brings significant incremental benefits to the users of SAILOR FleetBroadband."

Korean roaming agreement for cruise ships

www.sktelecom.com

Korean telecoms provider SK Telecom has begun offering mobile phone roaming services for passenger ships, according to reports in the Korea Herald.

The service is a result of a cooperation arrangement with Wireless Maritime Services, which is itself a joint venture of US telecoms company AT&T and maritime VSAT communications provider MTN.

The new roaming agreement will cover 126 cruise ships operated by 25 companies, according to the report, with the aim of serving the approximately 30,000 Korean passengers travelling on cruise ships annually.

The new T Roaming Cruise service from SK Telecom will be available to users with compatible 3G or 4G handsets, and will reportedly be charged at a price approximately one quarter of the cost of a satellite phone call.

Marine electronics company **e3 systems** has been awarded Platinum Provider status by **MTN Satellite Communications (MTN),** the highest award given by MTN to its Maritime Service Providers (MSPs), based on a combination of sales revenue and requirements on training installation and service personnel.

SpeedCast has announced the launch of a new DVB-S2 satellite service, based on an iDirect hub, in Perth, Australia. The new service will be aimed at gas exploration customers in particular.

Intellian has appointed Carl Novello as VP of product management, and also as the leader of the company's **Inmarsat** Global Xpress terminal programme. Mr Novello has worked in VSAT and satellite communications for over twelve years, having recently been with **Harris CapRock.**

www.e3s.com
www.mtnsat.com
www.speedcast.com
www.intellian.com

Satellite industry to grow for a decade - report

www.euroconsult-ec.com

Euroconsult says that its latest survey and reports have suggested that the satellite industry should see continued growth in commercial markets during the next ten years, while at the same time stagnating growth for government spending should be expected at least through mid-decade.

According to the company's 'Satellite Communications & Broadcasting Markets Survey', the satellite bandwidth used for traditional FSS services will be worth almost $15 billion in 2020.

"While we have seen slowing growth rates in leased capacity, FSS operators' revenue growth has continued to outperform the global economy, and operating margins remain high for most operators. In the near term, the difficult economic environment could weigh on the market," said Pacôme Revillon, CEO at Euroconsult.

"Still, connectivity needs and the growth of digital TV in emerging regions, combined with the launch of new generation high throughput satellite systems should continue to drive growth. The value of satellite capacity leasing should consequently grow at 7 per cent over the next ten years."

In the report 'Mobile Satellite Communications Markets Survey', Euroconsult forecasts that the MSS market will grow at nearly 13 per cent per year on average, from 2.4 million terminals in service in 2010 to 7.8 million by 2020.

Low-data rate machine-to-machine (M2M) devices will have a significant share in this subscriber growth, though their contribution to service revenues will remain limited.

"MSS wholesale revenue is expected to grow roughly 7 per cent per year over the decade, due to increased demand for broadband and other MSS services in a number of vertical markets and emerging regions," said Wei Li, senior consultant at Euroconsult and principal author of the report.

"Nevertheless, competition from terrestrial and VSAT networks will remain a major limitation for MSS growth in L-band."

Euroconsult's 'Satellites to be Built & Launched' report estimates that 1,145 satellites will be built for launch from 2011 to 2020, 51 per cent more than the previous decade. Revenues from the manufacture and launch of these 1,145 satellites will be worth $196 billion worldwide, of which 70 per cent can be attributed to government demand.

Euroconsult forecasts 203 commercial communications satellites, with a market value of $50 billion, will be launched into the GEO arc over the next ten years. Some of these satellites were recorded in satellite manufacturers' order books during a flurry of ordering activity over the past five years.

Commercial satellite services outside the geostationary orbit will get a boost over the next decade with a total of 165 satellites to be built and launched into medium and low Earth orbits (MEO and LEO).

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Iridium launches Pilot

www.iridium.com

Iridium Communications has launched its second-generation maritime broadband platform, Iridium Pilot.

Iridium Pilot will utilise the Iridium OpenPort service, and is offered via a small, lightweight antenna which the company says has been engineered for operation in the harshest of maritime conditions.

The fixed, electronically-steerable, phased-array antenna offers broadband connectivity in addition to three independent phone lines, all of which work simultaneously, with data speeds up to 134 kbps.

The platform offers a built-in firewall for traffic management and a bulk configuration capability to assist in managing large volumes of units.

The antenna will also be offered with the Iridium Global Service Program, featuring a standard five-year limited warranty.

"Importantly, Iridium Pilot will be compatible with Iridium's next generation satellite constellation, Iridium NEXT," noted Joel Thompson, vice president, product management, Iridium.

"Iridium NEXT, scheduled for deployment starting in 2015, is the largest commercial space programme underway today. Ship operators installing Iridium Pilot can have the confidence that their equipment will be supported well beyond 2020."

The new Iridium Pilot antenna will operate using the OpenPort service

Mitsubishi maritime VSAT passes roaming test

www.mitsubishielectric.com
www.comtechefdata.com

Comtech EF Data Corporation reports that it has completed interoperability testing with Mitsubishi Electric Corporation's MVA100 Maritime VSAT stabilised antenna system and the ROSS Open Antenna Management (ROAM) protocol.

This technology is used to enable the VSAT system to be used on vessels roaming across multiple satellite beams, maintaining connectivity as they move through different satellite footprints.

Mitsubishi Electric's MVA100 Maritime Ku-band VSAT antenna system is a 1-metre dish designed for 'earth station on the vessel' applications. It features a 3-axis stabilised mount built to ITU-R requirements.

The ROAM protocol offers a common management interface for Comtech EF Data's Roaming Oceanic Satellite Server (ROSS) and third-party Antenna Control Units (ACUs) by providing a generic set of commands, information, interfaces and status queries.

ROSS is an integrated location server that works in conjunction with Comtech EF Data's Vipersat Management System to facilitate on-the-move satellite communications for oceanic vessels.

ROSS enables remote modems to interface with stabilised, auto-tracking antennas. Vessel position data, satellite signal and management status are monitored to determine when satellite handoff is necessary.

Comtech says that, as ROSS can support different types of ACUs, the ROAM protocol can help to reduce complexity in operation by providing basic parameters required to globally roam across multiple satellite beams.

"Satellite-based communications on the high seas will be greatly enhanced for our maritime customers with the combination of our antenna system and Comtech EF Data's market-leading technologies," commented Keizo Miyawaki, general manager for the IT space solutions division of Mitsubishi Electric.

GMN launches FB multi-voice product

www.redportglobal.com

Global Marine Networks (GMN) has announced the availability of multiple voice channels on Inmarsat FleetBroadband terminals when used with its RedPort satellite VoIP phone service, allowing up to eight simultaneous voice calls.

RedPort VoIP and the multiple voice call capability work with all FleetBroadband terminals, including FB150, FB250 and FB500 models, with no modifications needed.

A fully-featured PBX is included with each RedPort VoIP router to carry the multiple satellite VoIP calls.

GMN says that, if combined with Inmarsat VLA and SCAP data rates, VoIP calls can be charged at approximately 50 per cent less than Inmarsat's suggested retail pricing of $0.55/minute.

It also claims that this could allow VoIP users to get up to 20 minutes of calling time per 1MB of FleetBroadband data.

Unlimited voice calling between RedPort VoIP customers is also available, for a flat monthly fee.

Thome agrees FleetBroadband deal

www.and-group.net

Singapore-based Thome Ship Management is to implement Inmarsat's FleetBroadband system on its ships following a deal with AND Group, which also includes delivery of AND's IPSignature2 communications software.

Under the new framework agreement, AND Group becomes the exclusive communications provider to Thome for FleetBroadband and will deliver the service through a combination of pricing packages, including Inmarsat's Very Large Allowance (VLA) offering.

The terminals will be mostly FB500s, though FB250 units will be provided to some Thome ships.

"We looked at the range of options for connecting our fleet and selected FleetBroadband from Inmarsat and AND Group because of its scalability," said Ryan Dalgado, procurement & supply chain manager for Thome Ship Management.

"This new deal provides plans for heavy users within our fleet and smaller packages for less intensive use. It gives us options for all vessel types, and with a large and diverse fleet like ours, that level of flexibility was very attractive."

"We liked the fact that the experience and reliability of the FleetBroadband service was consistently good. The addition of AND's IPSignature2 service, offering simple and effective cost control tools, made it a powerful proposition."

The IPSignature2 software being provided is used to manage ship-based e-mail, internet access and other data applications, allowing analysis and control of the usage and cost of data movements to and from the vessel.

AND says that this should help to increase network efficiencies as well as creating cost savings.

"We are extremely honoured to be selected as the exclusive service provider of Inmarsat FleetBroadband services for Thome Ship Management," said Mary Baey, CEO of AND IPSignature (Singapore).

"We believe our appointment will allow Thome Ship Management to streamline their communications and benefit from the synergy of Inmarsat and AND Group services deployed across the fleet."

'This new deal provides plans for heavy users within our fleet and smaller packages for less intensive use' – Ryan Dalgado, Thome Ship Management

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PRO NAUTAS to deliver HHL IT infrastructure

www.pro-nautas.com

PRO NAUTAS B.V. GmbH reports that is to provide ship-to-shore communications and maintenance systems to heavy lift shipping company Hansa Heavy Lift (HHL), under a contract covering approximately 21 vessels.

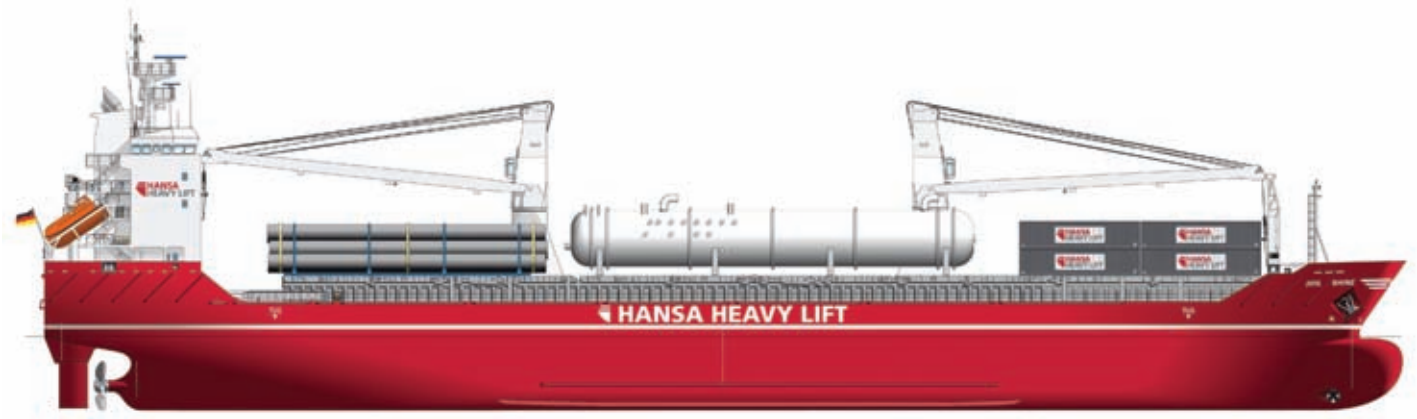
Hansa Heavy Lift is an existing user of PRO NAUTAS' fleet maintenance services, but has now agreed to extend its relationship by tasking PRO NAUTAS with implementing IT support networks for its ships, including installation, commissioning, maintenance and remote IT services.

All vessels will be equipped with Sailor 900 VSAT and Sailor 500 FleetBroadband from Thrane & Thrane.

PRO NAUTAS says it was the first company to order and install the newly launched Sailor 900 VSAT equipment from Thrane & Thrane, doing so in December 2011.

Vizada will provide airtime connectivity packages for the ships through its Global Maritime Broadband Bundles, integrating Ku-band VSAT, Inmarsat FleetBroadband and the Vizada XChange communications management platform.

PRO NAUTAS says that the new set-up will provide HHL with a standardised IT and communication infrastructure, offering redundant communication between offices and vessels.



Hansa Heavy Lift will install the comms system on approximately 21 vessels

GE-Satcom acquired by Trustcomm

www.signalhorn.com

GE-Satcom, also known as Satlynx, has been acquired by communications carrier Trustcomm International, Inc, and has formally changed its name to Signalhorn.

The change of ownership took place on February 2, 2012 and includes the entire GE Satcom or Satlynx group of companies located in Germany, Switzerland, Luxembourg, and other locations.

TrustComm already offers managed services for maritime customers through Skyport Maritime, including wireless broadband in ports, 3G and 4G mobile wireless connectivity, as well as maritime VSAT.

The company says that adjacent to one of its teleport and technical centres in Leuk, Switzerland, stands a popular navigation point called Signalhorn Mountain, which has inspired the new brand name.

"Our customers will benefit from an unparalleled combination of solutions, professional services, and expertise that highlight our existing and growing resources," said Robert Kubbernus, president and CEO of Signalhorn.

"We are bringing together our resources to focus on a new future under a new brand. With a unique blend of knowledge, innovation, platforms, and infrastructure, we are confident that our networks remain second-to-none."

"We look to the future with great optimism and continue to be active in developing solutions that meet and exceed our customers' communication requirements worldwide."

Marlink upgrades VSAT service with iDX 3

www.marlink.com
www.idirect.net

Marlink reports that it has upgraded its services by integrating iDirect's Evolution X5 Satellite Router and latest operating software release, iDX 3.0.

The company says that vessels operating with its WaveCall services have all received the required onboard equipment, through which it hopes to increase reliability and bandwidth efficiency for voice, e-mail, internet and remote business applications.

iDirect's Evolution product line is based on DVB-S2 with Adaptive Coding and Modulation (ACM), designed to provide better bandwidth efficiency compared with legacy systems.

The companies claim that this will help Marlink to ensure maximum service uptime for maritime vessels by automatically adjusting signal strength to overcome rain or solar fade outages.

Additionally, iDirect's built-in Group Quality of Service features allow Marlink to control how it allocates and prioritises shared bandwidth by market segment, customer group, or application type.

"Competition in the maritime VSAT market has recently grown more intense, making it imperative for Marlink to differentiate its services and keep customers satisfied," said Tore Morten Olsen, CEO of Marlink.

"Our three pillars of distinction are control, flexibility and support – iDirect's Evolution product line is an integral component to delivering these. By upgrading to Evolution, we have addressed an increased range of customer application requirements and expanded our customer base without sacrificing service quality or affordability."

iDirect's Evolution product line is based on DVB-S2 with Adaptive Coding and Modulation (ACM)

Hughes moves to HX 4.0

www.hx40.hughes.com

Hughes Network Systems has announced the planned release of HX System 4.0, which will introduce a range of technology enhancements to its HX product family for mobile satellite networks.

One element of the new release will be the incorporation of a dual stack IPv6/IPv4 design which will enable the simultaneous support of both protocols. The company says that this should assist network operators in transitioning to IPv6 while continuing to support their installed base of IPv4 customers and devices.

The company's HX90 Satellite Broadband Router will also be improved by the new technology, offering better efficiency and lower operational costs on satellite links through a new optimised encapsulation scheme on the outroute, and through LDPC coding on the inroute. This is the same coding scheme as used in the DVB-S2 standard.

The HX ExpertNMS (Network Management System) has been upgraded to provide improved management capabilities for VNOs, with monitoring and control functionality to allow wholesale network operators to partition their network and provide control to private users of these partitions.

A range of improved mobility features, including integrated Doppler correction, automatic beam switching and enhanced return channel spreading, will also be part of the new release.

"We are excited to bring our wide range of operator, enterprise and military customers the extensive benefits of HX System 4.0 for fixed and on-the-move broadband satellite solutions," said Dave Jupin, vice president, international division, Hughes.

"Supporting the full range of C-, Ku-, Ka-, and L-band frequencies, as well as WGS frequencies, the HX System 4.0 is the ideal choice across all specialty and mobility market sectors."

Hughes says that HX System 4.0 will be available for delivery later in 2012.

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Connecting the vessel with the office

German shipping company, Reederei Chemikalien Seetransport, has completely modernised its communications technology with a new IT infrastructure and a fleet wide roll-out of FleetBroadband. Patric Desanti, Chemikalien Seetransport, spoke to *Digital Ship* about the project

Remaining competitive in an increasingly tight market is a difficult feat for shipping companies, especially in the current economic climate. Modern information technology can help to achieve this goal, promoting efficiency in operation as well as improving the way of life of crews working at sea.

Tanker shipping company Chemikalien Seetransport GmbH is one company that is leveraging IT solutions to deal with these mounting issues.

Facing rising bunker prices and the increasingly problematic shortage of experienced seagoing staff in the tanker industry, the company decided that it needed to reconsider its communications solution, with the target of improving its operational efficiency as well as its attractiveness as an employer.

Chemikalien Seetransport concluded that a complete modernisation of its IT infrastructure, and specifically the broadband connectivity available to its fleet, was required, and the company embarked on an ambitious journey to try and achieve these essential goals, as Patric Desanti, project manager maintenance systems, Chemikalien Seetransport, explains.

"We needed a solution that would serve our company's day-to-day business," says Mr Desanti, "rather than one that requires us to go into the technical details of the satellite technique."

"Our main focus with regards to the implementation of the completely modernised communication solution was to cater for our company's present and future requirements."

Among the key targets of the modernisation project was to achieve better communication between ship and shore, bringing the vessels closer to the office to allow office staff to have comprehensive control of the vessels' IT systems.

To do this, a broadband connection was required, as well as an IT infrastructure able to support remote control and fast data transfers. In addition, a broadband solution would also provide better IT support options for the crew on board.

Apart from operational concerns, another important goal for the company was to improve its attractiveness as an employer. Chemikalien Seetransport is currently in the process of expanding its fleet significantly and qualified seagoing staff in the tanker industry are increasingly difficult to obtain, as Mr Desanti notes.

"We had recognised that our fleet is going to expand quite rapidly," he says. "From the point where we started the modernisation of our communication solution until now we have expanded our fleet of container, bunker and bulk ships tremendously - and there are easily 30 per cent more to come."

"For us the expansion of our fleet has brought certain concerns. Able seafarers, especially officers and captains are rare and we have a large number of new ships, which are in need of well-trained crew. At Chemikalien Seetransport we have experienced that providing access to good communication is essential in order to attract and retain qualified seagoing staff."

"A modern communication solution, including broadband connectivity, would allow the crew easy access to the outside world and better communication with their loved ones at home. This will be a leap forward for our company in terms of crew retention."

Problem solving

The modernisation of its communication solution brought with it a series of challenges for Chemikalien Seetransport – some of which the shipping company had anticipated and some that were unexpected.

As Mr Desanti notes, a surprisingly large part of the implementation consisted of problem-solving.

In order to upgrade the existing IT network and basic communication system of the shipping company, a new IT system was implemented. According to Mr Desanti, this new solution facilitates the use of virtual machines and remote management from the office, providing improved control over the vessels and better communication with the ships.

"The advantage of this new IT structure," says Mr Desanti "is that our IT support takes over the control of the server and prevents the crew on the vessel from installing any programs."

"This way we avoid a lot of difficulties that arise from poorly installed software or imported viruses. All new installations are done remotely by the Chemikalien Seetransport office."

In a next step, the internet connection using Fleet 77 on board the vessel, which Mr Desanti estimates offered around 13 kilobytes of throughput, had to be modernised in order to provide the necessary broadband connectivity.

To achieve this Chemikalien Seetransport started to roll out a FleetBroadband solution, with implementation of that system having now been completed on 30 vessels, with a substantial part of the rest of the fleet to follow.

The shipping company had anticipated a number of challenges that were likely during the rollout of the FleetBroadband solution, though the actual experience differed somewhat.

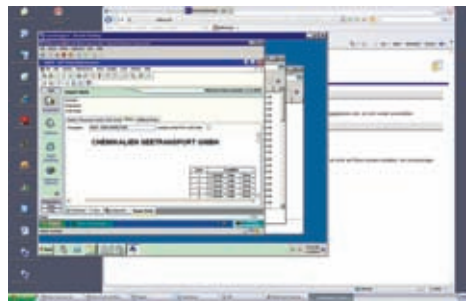
"To our surprise we noticed that the problems we had expected prior to the rollout did not all occur and that the most tricky problems encountered were not the problems we had expected," says Mr Desanti.

First and foremost, Chemikalien Seetransport had expected major problems with the assembly of the hardware, software and additional components and the transfer of the equipment onto the vessels. These logistical problems, however, did not materialise.

Mr Desanti explains that, instead, the most pressing problem of the installation process turned out to be the power supply for the different systems.

"Initially," he says "we had problems to ensure the power supply for all these new systems, which resulted in a serious of power cuts and failures in the power management system."

"Since the system is configured not to be accessible for the crew it was tremendously important to solve the power problem. Everything is remote-controlled from the office onshore, which means that if the servers on the ship shut down whilst the vessels are sailing, the technical support team has no means of accessing the system."



Using the new system IT staff on shore can remotely access shipboard computers

Chemikalien Seetransport managed to solve the power problem through the installation of a redundant system of servers on board, which enables the virtual machines to use different servers whilst sailing.

However, the shipping company did encounter another power problem, where failures in the power management system would lead everything to shut down.

A consequence of this was that, after the problem was resolved, there were still issues with restarting all of the software, clients, and ERP and maintenance systems, especially the ones that have an electrical generator.

"The problem is that when the server shuts down due to a power cut, the server recognises when the power is back on, however it does not reopen the software," explained Mr Desanti.

"Since everything is controlled remotely from the office and the crew cannot make any changes in the software, we had to find an automated solution, which would allow the server to set up again and go back to the point where the power cut happened. This required the system to save the right software setting."

"Once we had figured out how to solve the problem of the electrical supply system, everything worked fine. It is very important to keep in mind that during the implementation of a new solution, especially including a new IT system and the FleetBroadband solution, however detailed the plan was you will encounter a different set of problems due to the constitution of your vessels. In the problems will, most likely, be some that you had not anticipated."

Advantages and disadvantages

Chemikalien Seetransport has now implemented the new IT infrastructure and rolled out the FleetBroadband solution on more than half the fleet. The process has provided the company with valuable experience of IT infrastructure implementation, and highlighted some of the advantages and disadvantages of pursuing such a project.

One of the more obvious anticipated benefits of the new communication system is the higher throughput of the FleetBroadband solution.

"Compared to our previous Fleet 77, the throughput of our FleetBroadband system is astonishing," says Mr Desanti.

In addition to the increase in connection speed, Chemikalien Seetransport had a number of other specific expectations of its new system, some of which have been fulfilled, while others have not.

One of the main aims of the new communication infrastructure was to better connect the vessels with the office on shore and to ensure a high level of communication between shore-based and seagoing staff, offering IT support to the crew onboard through the use of remote management and higher bandwidth.

So have these goals been achieved?

"This question is easy to answer," says Mr Desanti. "Yes, we have definitely reached our goal successfully."

"The communication between our vessels and the office staff has much improved since the implementation of the new IT system and the FleetBroadband solution, and we are very happy with it."

Chemikalien Seetransport had anticipated that the new communication solution would bring about a tremendous additional workload to the IT staff in the office, but this appears to have been unfounded.

"We thought that because the system is configured so that the crew cannot make any changes we would need additional IT support," recalls Mr Desanti.

"However, this concern has not been confirmed. If you take into account that we have only two people working in the IT department that are responsible for all the ships it is working surprisingly well. And we are very happy with the new situation for us. This has been a big step forward."

Although the workload of the IT support team has not noticeably increased, the

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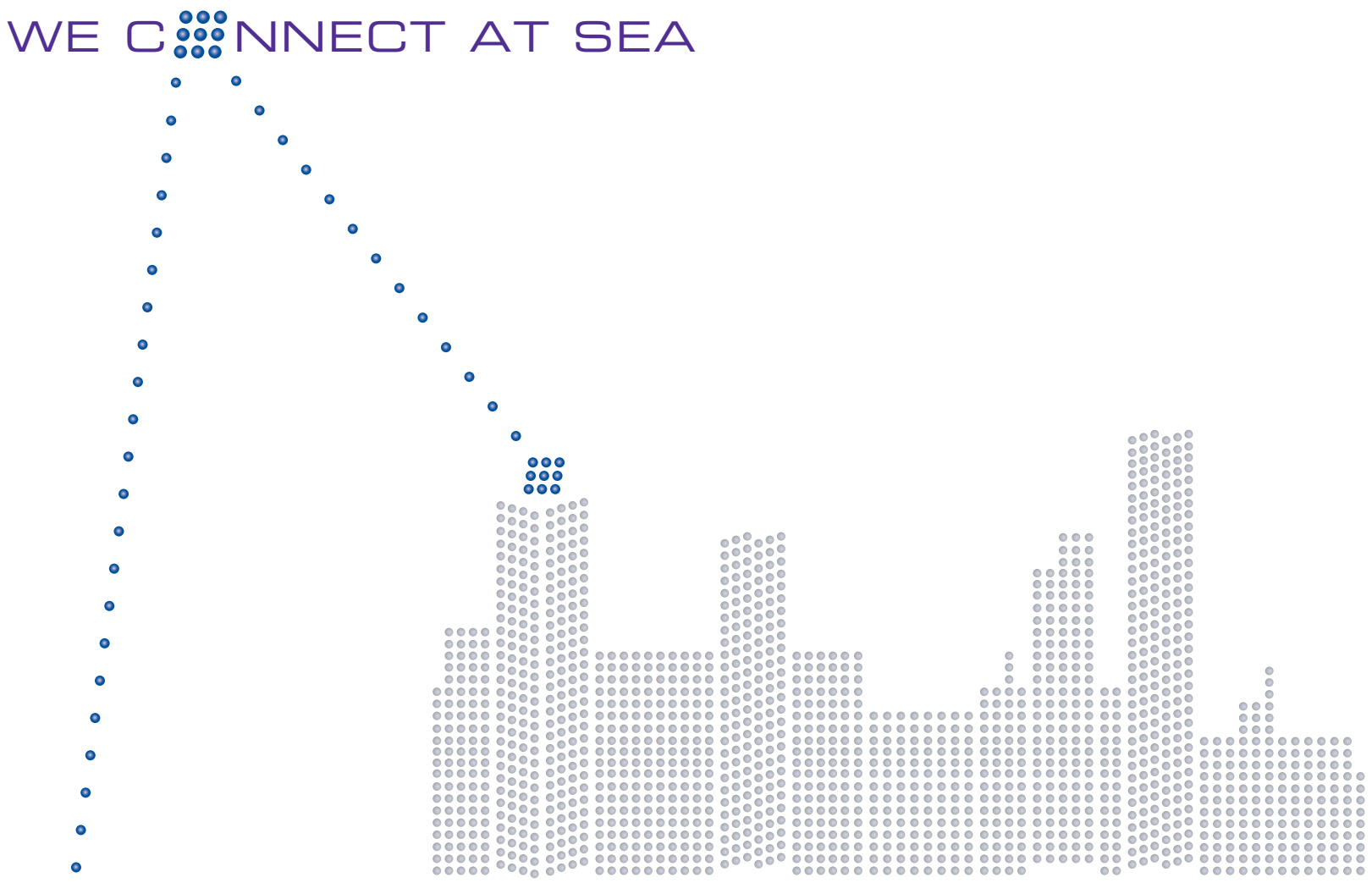

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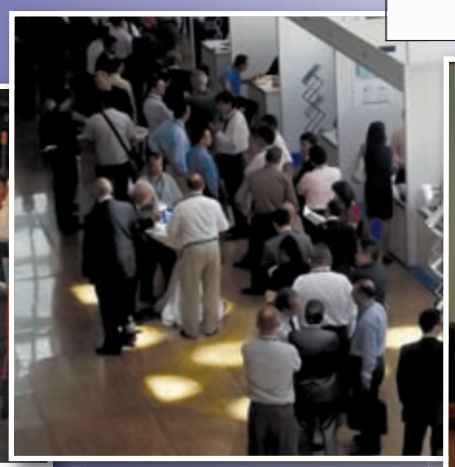

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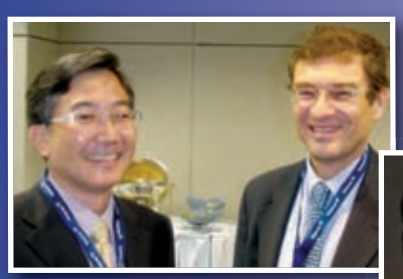

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shipping company has nonetheless experienced significant changes in the way its IT support works.

Prior to the implementation of the new communication package, IT support personnel mainly took telephone calls from the vessels. Having assessed the problems of the crew, this support team would search for a solution and communicate back to the vessel, mostly via e-mail or telephone.

"We would send manuals, instructions or pages of detailed screenshots," says Mr Desanti. "This was a solution, which cost us a lot of megabytes."

"In addition, the strategy was frustrating for the IT support in the office and not very helpful for the crew on the vessels, because we were only second-guessing and probing in the dark, and in the end we were effectively telling them to find the solution themselves."

The quality of the support has changed noticeably. Whilst previously crews would receive a large number of documents via the old satcom system, more often than not wondering how to solve their problems with them, now there is hardly any documentation sent across the link.

"The mindset of an IT officer on shore is often very different from that of an electrician on board who is trying to solve the problem on the bridge," explains Mr Desanti.

"Often they would not understand what the IT support asked them to do and consequently feel unsupported. In my experience, crew used to be quite unhappy about the type of support provided, especially because of the discrepancy between what the crew expected of the support and what we in the office were able to provide."

Following the implementation of the new IT system this has completely changed. Problems are no longer solved by sending lengthy e-mail explanations or manuals across to the vessel, and instead the company now has remote access to every IT system on board.

"Now, I can log myself in on the vessel and see what the crew are seeing," explains Mr Desanti. "I am able to give assistance to the captain, with regards to all types of questions."

"I can install new software, make updates and solve problems. It is much easier than before. And the crew really feel the quality of the support. They are extremely happy, and everything works like a Swiss watch!"

As an example of the simplified support system now available, Mr Desanti describes the process for installation of new software on the ship.

First, a CD with the software is sent to the vessel. The crew inserts the CD into the computer and then the IT support team from the Chemikalien Seetransport office can log on remotely and do the complete set up.

"This way," says Mr Desanti "the crew can do what they are hired to do, which is sailing the ship."

As an additional side-effect, Chemikalien Seetransport has experienced a substantial decrease in IT support travelling costs, and has subsequently reduced its expenses by over 70 per cent. Prior to the implementation of the new IT infrastructure the IT support had to travel around the world in order to solve problems, or at least organise some external service – these costs have now disappeared.

The final major target after implementing the modernised communication solution was to improve crew retention rates. According to Mr Desanti, Chemikalien Seetransport has successfully achieved this target.

Costs

Of course, while Chemikalien Seetransport has managed to save money on IT support expenses, it has also had to absorb the expenses incurred during the implementation of the IT infrastructure and FleetBroadband solution.

In addition to the initial one-off installation costs (a technician was sent to every vessel), monthly communication costs have to be taken into account.

In this regard, the company has not experienced a noticeable difference between the previous Fleet 77 solution and the new FleetBroadband system. Although the per-megabyte price has dropped under the new solution, the company is using its communication system much more.

Since data from the automation system can be obtained frequently Chemikalien Seetransport has improved its monitoring of the onboard machinery, but this requires a higher volume of data (the vibration analysis of the compressor alone generates an 18 MB file per day). High data consumption is also necessary in order to improve the monitoring and maintenance of the ship IT systems.

"Instead of dropping, our monthly costs have increased," says Mr Desanti. "With FleetBroadband you will not achieve big savings for your communication costs; however, this should not be the aim of such an implementation. If y ou want to reach savings with FleetBroadband, you will not make it. I do not see this as a failure because this was not our main goal."

"The share of communication costs, measured by the total operating costs of a vessel, is below 0.5 per cent. During the recession we have daily rates that bring headaches to our signature people. However, reducing communication costs even by 50 per cent would not have a significant impact on the overall cost structure."

"At least, with FleetBroadband we are able to achieve our goals," adds Mr Desanti. "Under the Fleet 77 solution this would not have been possible. We found it very valuable to invest into such a communication infrastructure."

In short, Chemikalien Seetransport regards the investment into the new communication system as money well spent.

"For us, the future lies in closer control of the vessel," concludes Mr Desanti. DS

Leveraging vessel data for efficient ship operation

Following an extensive programme of research and investment, Japanese company NYK Line is in the process of implementing a range of technologies that will use data transferred directly from its vessels by satellite to improve operational efficiency. Hideyuki Ando, Monohakobi Technology Institute (R & D company for NYK Line) spoke to *Digital Ship* about NYK's vision for the future

Constantly increasing bunker prices, the recent economic downturn and an increase in the number of international regulations have made management of fuel oil consumption a vital concern for ship operators.

The economic crisis and subsequent slow recovery have added to the strain that shipping companies are experiencing, and additional pressure to improve their energy efficiency has been exerted by initiatives such as the recently adopted Ship Energy Efficiency Management Plan (SEEMP) and Energy Efficiency Design Index (EEDI), mandatory from January 2013.

This ship efficiency framework aims to create improvements in energy efficiency through more efficient engines and propulsion systems and improved hull designs on larger ships, in order to achieve reduced fuel oil consumption and resulting CO2 emissions on a capacity basis.

In this environment, a large number of different approaches to reduce the fuel used by vessels have been tested and applied over the last number of years.

Japanese shipping company NYK currently operates around 800 vessels, necessarily consuming vast quantities of fuel oil, as well as producing emissions, that it is eager to reduce.

In this regard, the company is constantly innovating and improving its fleet operation with the aim of optimising safety, economy and protection of the environment. One of its most innovative concepts is the NYK Super Eco Ship 2030, which represents the Japanese shipping company's vision of the future.

This concept has been developed in accordance with NYK's ambitious goal of achieving zero emissions by 2050, in cooperation with the Monohakobi Technology Institute (MTI), Elomatic (a marine consulting company in Finland), and Garroni Progetti (a ship designer in Italy), as Hideyuki Ando, project manager, technical strategy group, MTI, Monohakobi Technology Institute (R & D company of NYK Line), explains.

"This concept is hoped to lead the development of shipping operations, including cargo handling and traffic infrastructure," notes Dr Ando. "Moreover, we hope that NYK Super Eco Ship 2030 will inspire many young people to pursue shipping services or marine technology."

While the NYK Super Eco Ship 2030 is a vision of the future, as part of the project's development NYK has already begun the implementation of a considerable number of fuel-saving technologies.

As Dr Ando explains, at NYK, similar to many other large companies, a ship information management system (SIMS) is employed. This information management system draws on data collected both onboard and on shore.

A device on the ship that NYK calls 'FuelNavi' collects data from a number of different sources, such as the engine and data logger in the engine room (containing data from the main engine, the FO flow meter and the torque meter) and the VDR/ECDIS (importing data from the GPS, the Doppler log, the anemometer and the gyro compass), as well as the motion sensor on the bridge.

A monitoring system on board the vessels then allows the master to view and assess the collected data.

After the information is collected NYK uses the ship's satellite communication system to transfer the data to its operations centre in Singapore, where it is evaluated and compared with technical analyses supplied by NYK's research institute.

NYK Line's vessels are implementing a range of new technologies to drive efficiency in operations

Shore-based staff in the operations centre use a 'SIMS viewer' for hourly trend monitoring of various indicators, including speed, M/E RPM, fuel oil consumption and other conditions, as well as to compare planned and actual schedules.

Ultimately, a voyage analysis report is created, with a breakdown of the fuel oil consumption for each voyage. This is sent to the master of the vessel and the operator in order to provide feedback.

The onboard data is also sent to weather routing service providers to help to improve their services.

Developing energy efficient operations

NYK's expressed target is to have zero emissions by 2050, and one important stepping stone on the way to achieving this goal is optimal operational management, through a process which NYK calls its 'PDCA cycle for improvement'.

PDCA stands for 'Plan, Do, Check and Act', or take corrective action. This scheme, which is currently being implemented on the company's container vessels, represents a comprehensive and all-encompassing view of ship operational efficiency.

"The PDCA cycle is one of our visions in order to fully optimise our fleet operation," explains Dr Ando.

"We are still in the progress stage, and this method belongs to the most advanced examples of container fleet operation applied at NYK today. Additionally, once the numerous remaining issues for bulkers, tankers, car carriers and other ship types are solved, we are hoping to expand the PDCA cycle to all our vessels."

NYK has found that effective communication between ship and shore and unimpeded information flows between all stakeholders are essential in order to improve operational efficiency effectively. As such, satellite communications play a key role in the implementation of these systems.

As Dr Ando explains, the information and communication systems need to function in tandem in order to encourage stakeholders to participate in energy efficient operation, suggesting that offering incentives to stakeholders may be a useful step.

"Even financial incentives might be in order," he says. "For example if a fuel oil reduction is achieved through an extremely high effort or brought forward through a very good idea, this stakeholder should be rewarded."

However, he also admits that this is easier said than done.

Firstly, every stakeholder needs to fully understand the target and to be aware of how a change in schedule can affect the fuel oil consumption. Additionally, an extensive information sharing process is required in order for all decisions to be based on accurate information.

As such, an important prerequisite before any information sharing system can be established is a fully capable satellite broadband connection.

"In order to improve the system, we need maritime broadband, such as FleetBroadband or VSAT," says Dr Ando.

"This is especially important in view of the necessary real-time information sharing. In order to optimise our vessels with regards to energy efficiency, large data transfers and full-time connectivity are essential."

Weather routing

NYK started its research and development of energy efficiency measures with the trial of an on-board weather routing system in 2005-2006.

"Before the modern weather routing was developed, the traditional weather services could do no more than help to avoid severe weather," says Dr Ando.

"Nowadays, weather routing providers, such as WNI (Weather News Inc) or AWT (Applied Weather Technology), are moving forward to minimise the fuel oil consumption and to provide optimal weather routing."

"There is a huge demand from operators for optimum weather routing, which we, at NYK, regard to contain the best balance of safety, schedule keeping, economy and environment."

Although, NYK considers the use of weather routing to be highly effective, the shipping company has also found that the providers need to cooperate with shipping companies to optimise their services with regard to fuel oil consumption.

These service providers require comprehensive information, including detailed ship performance models to calculate the best route for each weather and vessel type. In addition, the calculations should take into account the individual vessel's RPM, speed and fuel oil consumption, as well as ship motion and performance in severe weather.

This information, which is used to calculate the ideal speed for any condition (draft or weather), as well as to gauge the effect of aging on hulls and propellers, needs to be obtained from the vessel operators.

"This kind of technical understanding is absolutely essential in order to give

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correct and comprehensive advice," explains Dr Ando.

"Even with the highly sophisticated models that are needed in order to produce optimum weather routing, the ship performance model and the weather forecast are subject to errors, which is why ample feedback from the vessels is always needed."

"The live measured wind and ship motion data are valuable feedback for weather routing providers. The actual wind speeds can be compared to the forecasted wind speed, and the ship motion data (maximum roll angle in one hour) can be matched against the forecasted wave height. This way forecast systems can be refined."

In order to remedy this information gap and to further optimise its vessel operation, NYK has developed a system that combines weather routing and performance monitoring.

The shipping company first uses a weather routing model to devise a theoretical voyage plan, which includes course, speed, RPM, fuel oil consumption and weather data, as well as information from the ship performance model.

Detailed performance monitoring is then applied to provide comprehensive feedback on the actual voyage data, including the actual speed, RPM and fuel oil consumption, as well as live actual weather data.

NYK sends the analyses from the vessels to weather service providers, who use this data in order to improve the accuracy of their forecast. Dr Ando notes that for this system to be effective the company requires broadband on the vessels.

"Real-time feedback," says Dr Ando, "is essential in order for the weather routing service provider to verify whether his assumptions are correct or not. This way, corrective action can be taken quickly."

"We hope that through the participation of a large number of vessels, the accuracy of the weather forecasts can be improved significantly. This takes time, but in the long run the collection of weather and current data through the shipping industry and the sharing of this data will be to the benefit of all stakeholders."

Performance and fuel monitoring

Probably the most important aspect of energy efficient fleet operation is the reduction of fuel oil consumption.

One of NYK's key measures to achieve this is performance monitoring, collecting a variety of information from the vessels and assessing this data in order to monitor the fuel oil consumption and to take appropriate action to effectively reduce it.

NYK has realised how important it is to make both its seagoing and onshore staff aware of the importance of energy efficiency and fuel oil consumption topics if it is to create a process of continuous fleet optimisation.

"Again," says Dr Ando "the information flow is key. Information technology is an indispensable prerequisite to collect, aggregate and share the correct and necessary information at the right time."

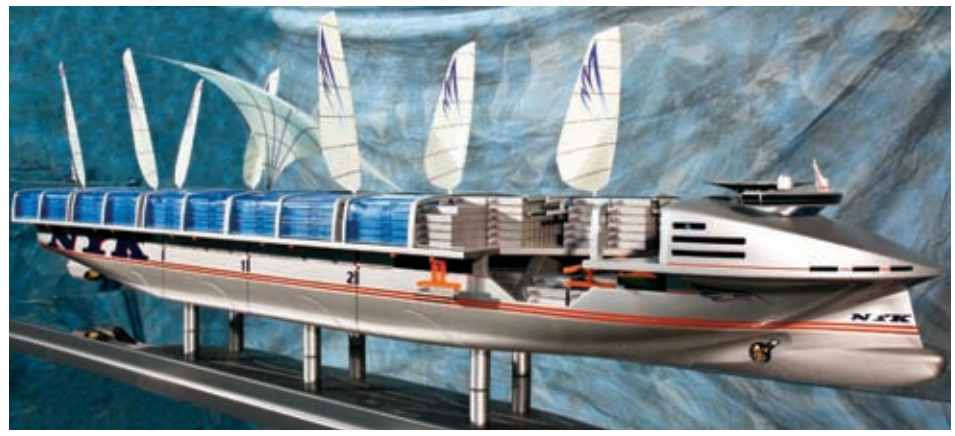
To facilitate this, NYK developed a performance monitoring device for onboard use, which was designed to provide crew with real-time information on their vessel's fuel oil consumption. This device, the previously mentioned FuelNavi, has been supplied to the entire container fleet and collects a number of key operational indicators.

FuelNavi consists of a data collection box that is installed on the vessel and interfaced with on-board equipment, such as engine data logger, GPS, anemometer, flow meter, thermometers for fuel oil and seawater, the rudder autopilot or the gyro compass.

Through the use of a PLC (Programmable Logic Controller) industrial computer, significantly more robust than a commercial PC, NYK says it has achieved a high level of reliability with the solution.

"These PLC," explains Dr Ando "are often used for the automatic control of mission-critical plants. They work 365 days 24/7 without maintenance."

Further advantages of the PLC technology, according to Dr Ando, include comparatively low implementation costs as well as the option and flexibility to customise.



NYK Super Eco Ship 2030 represents the Japanese shipping company's vision of the future

In addition to the PLC a monitoring device is installed on the bridge. This FuelNavi display allows the captain to monitor the real-time fuel oil consumption, which can be displayed in several formats, such as ton/day, ton/mile USD/day, USD/mile, the CO2 emission per day or per mile, as well as showing additional performance indices, such as OG speed.

The device also contains a trip meter function for on-board performance trials, which allows for energy efficiency comparisons.

"The FuelNavi monitor resembles the idea of the fuel meter in the car," explains Dr Ando. "The idea was to urge the master to drive efficiently by showing him the real-time fuel oil consumption of this vessel."

"Normally, real-time fuel oil consumption of ships is not shown to the captain on deck or the officers that operate the vessels. However, these are the people responsible for deciding on the vessel's engine RPM (speed) and course, and they should be more conscious about fuel oil consumption."

However, despite its impressive technological capabilities, after having tested the solution for some time NYK found that having the FuelNavi monitor on board did not noticeably improve the fleet's performance.

"It turned out that, although some captains do indeed use the FuelNavi, showing the real-time fuel oil consumption does not entice our captains to adjust their decisions accordingly. The effect of the FuelNavi on our performance monitoring aim, which was to achieve the reduction of fuel oil consumption, was hardly noticeable," says Dr Ando.

Shore systems

After the unsatisfactory trial of the onboard performance monitoring system, NYK decided to convert the FuelNavi solution into an on-shore monitoring system. This led to the creation of the company's ship information management system (SIMS).

SIMS combines the critical performance data collected through the FuelNavi data collection box on board the vessels with additional navigational data, with this data then shared between ship and shore via a broadband connection.

Today, NYK uses a combination of manually and automatically collected data for performance monitoring. Auto logging data, which is collected hourly and automatically transferred to shore via e-mail, is complemented by a daily electronic logbook entry, containing port departure/arrival information and other navigational data, which cannot be collected automatically.

The shore monitoring software displays information on all vessels, including their route, whether they are under way or in port, and the departure and arrival destination. The software also offers colour-coded information quickly highlighting important aspects of operation, such as safety, scheduling and bunker costs.

Green, yellow and red lights indicate the status of the vessel. If a red light is displayed, staff onshore will know that corrective action needs to be taken. This allows the shore operation to manage the fleet and to initiate immediate rescheduling or changes in routes.

The effectiveness of the process is a function of how often NYK can transmit data across its satellite link, Dr Ando explains.

"The quality of the corrective action taken," he says, "depends on the intervals in which the data is monitored."

Traditionally, vessels usually reported the manually collected data once-a-day, for example in the noon-day report.

NYK has experimented with different intervals and found that the more often data is collected, the more accurate the resulting information. This analysis was performed through a testing programme conducted by NYK using various different intervals on a VLCC vessel, over a period of three days.

The comparison between the traditional, once-a-day data collection process and the envisioned FuelNavi approach, which collects data every hour, has provided NYK with interesting results.

In the traditional scenario, the results for the OG speed and the log speed (over ground speed equals speed over ground measured by GPS, whereas log speed defines speed through water measured by doppler log or electromagnetic log) are very similar. Consequently, a graph would show the vessel is sailing at optimum speed most of the time.

However, if an automatic data collection and reporting system is used the result looks quite different, with sample data taken every second, and detailed reports on the vessel performance and weather conditions created every hour.

With this greater depth of information it becomes apparent that the vessel does not sail at a constant speed at all but speeds up and slows down, for example due to wind resistance or the effect of the current.

"Hourly reported data gives us much more detailed information on the vessel performance and helps with the analysis and decisions for corrective actions," notes Dr Ando.

"In general, the on-shore performance monitoring and fleet management option is very well received by the liner operation and we see the benefits of the FuelNavi system confirmed."

"In a next step we have combined the SIMS with weather routing services. This way we not only review the past voyage but preview the coming voyage, which is a better approach to support optimum ship operation. Now, the data interface between our SIMS and the weather routing service are in good working order."

Data analytics

Of course, collecting information and monitoring the fleet performance are only useful measures if the resulting data is subsequently analysed and corrective action is indeed taken by the ship. NYK notes that it is only through careful assessment of where improvement is possible that its vision of highly optimised vessel operation and fuel oil efficiency can be realised.

"Shipping companies use a variety of monitoring strategies and systems," says Dr Ando.

"These provide a large amount of data which, if not processed further, is often just stored somewhere in the company. This does not help. In order to carry out the ideal improvement cycle (PDCA - plan, due, check, act) it is essential for us at NYK to be able to pinpoint where corrective action might most efficiently be taken."

At NYK, technical staff on shore conduct a wide variety of analyses on the total fuel oil consumption data provided by the ship information management system and the FuelNavi solution.

Amongst the key aims of these analyses is understanding the different causes of fuel oil consumption, assessing vessel performance in different conditions, and establishing the ideal vessel speed for a variety of situations. The results are then subsequently shared with NYK's captains, operators, and ship management companies.

Through one analysis method, fre-

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The FuelNavi system collects information from around the vessel, and uses it to display updated fuel consumption levels

quently used at NYK, the different causes of fuel oil consumption on a vessel are displayed on a bar chart. The biggest, fixed part of fuel oil consumption is for basic ship performance (each ship is compared to model-based performance, which specifies the total fuel oil consumption under ideal conditions).

This base amount is added to by including various additional factors, some of which can be influenced and are therefore important to know.

For example, fuel oil consumption is subject to the trim and draft of the vessel, while some of the fuel consumption might be due to the use of the generator. The weather conditions can also have a significant effect on the fuel oil consumption, especially through wind (bad weather effect) and moving against a strong current.

In addition, the vessel might have to deviate from the planned route, for example, in order to avoid bad weather, and have to travel a longer distance. This also adds to the total amount of fuel oil consumed.

Lastly, the fuel oil consumption is influenced by the maintenance condition of the engine, propeller and hull.

So, drawing on all of these variables, in any particular set of circumstances there is an optimum speed for each vessel with regards to fuel oil consumption. If this speed is exceeded the amount of fuel oil used will be accordingly higher, so using all of the data available to calculate this figure as accurately as possible can make a big difference to operations.

"In my experience," says Dr Ando, "the factor that causes the highest excess of fuel oil consumption is the increase in speed."

NYK uses a particular analysis method to gauge the fuel consumption of the specific vessel under different weather conditions.

This speed/fuel oil consumption curve of a specific vessel identifies a baseline for that vessel model, indicating the fuel oil consumption under ideal conditions. In addition, there are curves gauging consumption under calm conditions (Beaufort less than 2), average conditions and bad conditions.

The vessel performance is measured over a period of 240 hours and this data is fed into a grid.

As an example, in one analysis a certain vessel, provided it is sailing at a planned speed of 21.5 knots, is predicted to consume 117 MT/day under ideal conditions (calm weather). The analysis further provides the information that the vessel is likely to consume 129 MT/day, with an added 12 MT fuel oil consumption, due to a predicted weather deviation.

Another NYK chart displays the actual fuel oil consumption of a certain voyage, broken down and allocated to different causes, such as distance, weather and speed, with the average fuel oil consumption for this vessel type and voyage.

On the basis of this analysis, NYK aims to assess if any increase in fuel oil consumption could be affected by the actions of the vessel's captain, the operator or the agent.

"The amount of additional fuel oil consumption due to bad weather is something that we can hardly influence," says Dr Ando.

"Having said that, there are other factors, such as speed, that might be within the responsibility of humans. We use these analyses to determine corrective actions and the responsible addressees."

"If, for example, an increase in fuel oil consumption is down to a delay in departure we discuss with the agent whether it is possible for the vessel to depart earlier. Based on this detailed analysis and breakdown we can discuss with each stakeholder the possible room for improvement and the corresponding corrective actions."

A post-voyage analysis, taking into account several factors, such as M/E RPM, speed (log, SOG), constant M/E load, M/E load, optimum M/E load and a slip weather index, assesses what would have been the ideal speed of the vessel for each situation.

The diagram shows deviations (higher fuel oil consumption) with regard to bad weather or drifting and subsequent reductions in speed. The post voyage analysis identifies how much improvement to the level of fuel oil consumption is possible.

"The voyage from Oakland (near San Francisco) to Tokyo, for example, takes about 10 days," explains Dr Ando.

"Each vertical line in our diagram shows the noon position. This diagram is basically checking the speed allocation. If vessels use unnecessarily fast speed or drift before arrival, those non-energy efficient operations can be easily checked."

"At the same time, if the vessel encounters bad weather, it can be also easily checked by using slip. Slip is a number calculated by using engine RPM, log speed and propeller pitch, and it corresponds to the severity of weather."

To improve the safety of cargo, NYK is examining various methods to compare the estimated ship motion with the actual movements of the vessel.

Before long voyages, or if a vessel voyage plan/schedule needs to be reviewed, a ship motion simulation is carried out which takes into account the type of vessel, the ship hull form, ship speed and waves (height, direction, length), as well as cargo securing parameters and ship structural safety.

This analysis tries to gauge how the ship will behave in the expected weather situation. Later on, this data is verified against the actual ship motion and acceleration data.

"Though it is still very much in a trial phase, we are planning to share these simulation tools with the captain on board, the operator and the weather routing service provider in the future," notes Dr Ando.

Performance monitoring roadmap

NYK is aiming for the ambitious goal of zero emissions in 2050, and this journey will incorporate a series of milestones which have been highlighted by the company in a detailed roadmap for performance monitoring, including past achievements and future key goals.

"The roadmap shows how we have approached performance monitoring until now and what our vision is for the future," says Dr Ando.

While a number of measures outlined in the roadmap have already been accomplished, such as the on-board weather routing trial (in 2005/2006), the electronic logbook SPAS (from 2006 onwards) and the development of the fuel oil consumption monitor FuelNavi (in 2007/2008), other measures are in the planning stage or in on-going development.

The next step towards optimum operations is real time monitoring, which necessitates the fleet-wide introduction of a broadband solution.

Currently, FleetBroadband and VSAT is used only on some vessels, and a substantial number of ships still use an Inmarsat Fleet solution. NYK is therefore planning to roll out a broadband connection on its entire fleet in the near future.

Another reason for the implementation of a broadband solution is the fact that weather routing service providers are developing the next generation of forecasts, which cover up to 15 days and offer high resolution displays of the currents.

"The high-resolution displays of current are very valuable for our vessels," says Dr Ando.

"However, in order to use this data, high bandwidth is needed to transfer the data from shore to the vessel. In order to improve the vessel performance, actual live data needs to be reported back and matched with voyage simulation data from shore and vessel."

NYK also believes it is essential to have good communication between the master on the vessel and the designated route manager onshore, and is currently assessing the potential introduction of a new position of route manager, which would be assigned to captains and chief engineers on shore.

The idea behind this role is that the captain on the vessel would be able to share live voyage data in real-time with the route manager, who could use their own experience and expertise to discuss the optimal route and speed.

The exchange of live data should contain the actual sea state, actual wind and ship motion and other factors influencing the fuel oil consumption like weather risks, operational requirements, berth windows and requirements from the next voyage schedule.

This way, the vessel's schedule can be continuously assessed, revised and agreed between ship and shore, and the optimum fuel oil consumption level reached.

"This is a new challenge for us and in order to excel we need broadband, and the NYK liner operation has started an IBIS project to evaluate all such possibilities," says Dr Ando.

"The different possible solutions will certainly take some time to be evaluated, but we are sure there will be reductions of fuel oil consumption through real-time information sharing. In addition, we believe that the information platforms will be utilised as SEEMP platforms."

NYK is also planning to expand its utilisation of ship performance monitoring data in order to improve its fuel-efficient ship design (with regard to new wave sensors, accurate wave and wind measurement, accurate torque and thrust measurement, accurate log speed management, accurate fuel oil consumption management and ship performance modelling), as well as to evaluate fuel saving coatings.

"We could have already successfully implemented such a new way of vessel performance evaluation," explains Dr Ando, "however, we realised that there are several necessary developments in the sensor technology."

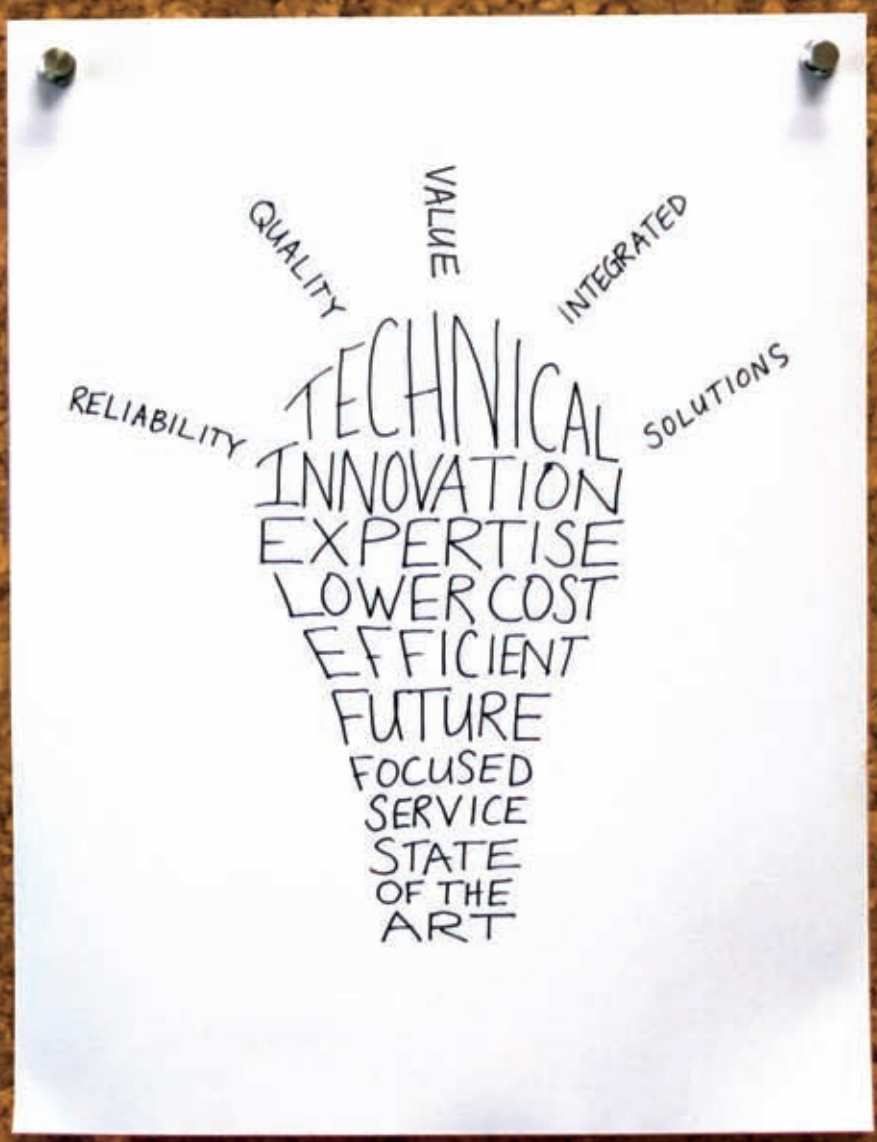
In addition, NYK is assessing the option to automatically process the collected data on board and to calibrate the ship performance model through the implementation of a system identification technology.

"This is part of our vision of a smart ship," says Dr Ando.

"At NYK, we believe that information sharing among all related parties and cooperation are key for energy efficiency. In addition, the integration of weather routing and performance monitoring is a base system for energy efficient fleet management."

"Automatic data collection onboard provides high quality and large data sample for making data analytics and high level integration of weather routing, performance monitoring, real-time broadband network and organisations are our current and next challenges." DS

This article will be the first in a series of articles in upcoming issues of Digital Ship covering different aspects of IT and communications development at NYK Line



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Videotel launches ship visit training programme

www.videotel.com

Videotel Marine International has launched a new training programme, Ship Call – Visiting a Ship in Port, designed to provide training to reduce the risks involved in ship calls.

Ship Call demonstrates graphically how visitors to ships can avoid the risks involved with any visit to a ship in port. Divided into three sections, the first shows how to prepare for the trip and the second looks at the risks involved in boarding the vessel.

If boarding by launch, this would include monitoring the weather conditions, inspecting the launch for any hazards and checking the sea conditions before attempting to board.

The final part addresses visitor safety while actually on board, ensuring that key safety procedures are adhered to and all appropriate safety equipment is used.

Videotel says that, as it addresses a range of maritime safety regulations, the programme is particularly useful for those joining a ship for the first time.

The training programme is available as a VHS/DVD with supporting booklet, and via an interactive CD-ROM.

"Seafarers are highly trained, but in the past even they have come to serious harm boarding vessels," says Nigel Cleave, CEO of Videotel.

"The situation is even more hazardous for visitors to ships who often lack training and experience. Individuals are expected to board vessels both day and night - often under time pressure - and in all types of weather. Tackling a gangway; alighting from a launch; using a ladder; all have their own inherent risks."

In related news, Videotel and US-based Maritime Training Services (MTS) report that they have produced a new training programme on US Port State Control.

The joint team from the two companies worked together to produce a programme which covers all US Port State Control procedures, focusing in particular on the US Department of Homeland Security's Customs and Border Protection (CBP) immigration and agricultural inspections.

In this regard, MTS was given the opportunity to follow CBP officers on a real agricultural inspection and immigration procedure, which proved especially valuable in creating the training programme.

The Videotel programme aims to identify potential hazards to ships' visitors

"CBP was a fantastic partner for us in producing this new programme," says Matt Gasparich, managing director, MTS.

"They are committed to educating seafarers about new policies and procedures and were very open with the way crews could prepare for the examinations."

The programme covers the US Coast Guard inspection process, following a team of inspectors through a typical boarding with Coast Guard commentary on the best way to prepare ships and crews for inspection.

It is available through Videotel's VOD system, and for purchase worldwide from MTS.

Five new contracts for ABS-NS

www.abs-ns.com

ABS Nautical Systems reports that it has signed five new contracts in Europe and the Middle East for its asset management software, NS5 Enterprise.

Piraeus-based companies Aegean Bunkering Services and Atlantic Bulk Carries Management will utilise the NS5 Hull Inspection software through the ABS Newbuild programme, which offers free software to ABS-classed vessels built after 1 January 2009.

Aegean Bunkering Services will implement the software on 15 vessels while Atlantic Bulk Carriers Management will install it on eight vessels.

ABS-NS says that both companies are using this software as a way to perform inspections more efficiently while reducing costs.

Donnelly Tanker Management, located in Cyprus, which manages and operates a fleet of tankers, is adding the Hull Inspection software to six of its vessels, two of which are ABS-classed. This is in addition to 11 other vessels that are already utilising the software.

The company has also purchased the Vetting module to be implemented at its onshore office.

Istanbul company Densa Denizcilik Sanayi ve Ticaret will install both the Hull Inspection and Maintenance & Repair modules on 20 ABS-classed vessels and in its central office.

ABS-NS says that this represents its largest contract win in Turkey.

Finally, Abu Dhabi Ports Company, formed by the Abu Dhabi government, is to implement the Maintenance & Repair module on four of its tugboats, two of which are ABS-classed, as well as onshore in its central office.

Abu Dhabi Ports Company has also procured the Purchasing & Inventory module, to initially be installed at its onshore office.

Donnelly Tanker Management is one of the companies to have signed a new deal with ABS-NS

Hans-Kristian Fjaerem – SIS' man in Brazil

Star Information Systems (SIS) reports that it is establishing a new base in Rio de Janeiro to serve Brazil's offshore sector. Hans-Kristian Fjaerem will lead the operation and recruit a local team.

Shipbuilding software developer **AVEVA** has opened a new office in Seoul, Korea, incorporating a dedicated product training centre. The office will also host sales, marketing, product support and administration functions for AVEVA customers in Korea. This is in addition to AVEVA's Marine Technology & Service Centre (MTSC) in Busan.

www.sismarine.com
www.aveva.com

Moxie Media to provide online OSHA maritime training

www.moxietraining.com

Moxie Media reports that it has become the first and only authorised provider of online OSHA (Occupational Safety & Health Administration) Outreach Training for the maritime industry by the United States Department of Labor and OSHA.

The New Orleans and Houston based company was chosen after a national competition that began in March, 2011.

Moxie will now be permitted to provide online OSHA Outreach training for shore-based maritime operations and their employees.

"We are extremely gratified to have our expertise in maritime training recognised by OSHA," said Martin Glenday, president of Moxie Media.

"But we also recognise this honour as an important opportunity to build a state-of-the-art online curriculum that will benefit the safety and health of maritime employees and employers across the country."

Moxie will offer three 10-hour OSHA Outreach Training courses via the internet to employees working in shipyard employment positions, marine terminals and ports, including longshoring and stevedores, beginning later this year.

The OSHA Outreach Training Program teaches workers how to identify, prevent, and eliminate workplace hazards including the use of personal protective equipment and safe operating procedures.

The course also informs workers of their rights under OSHA including employer responsibilities, the ability to file complaints and where to find additional employee safety resources.

GlobalView updated to version 2.0

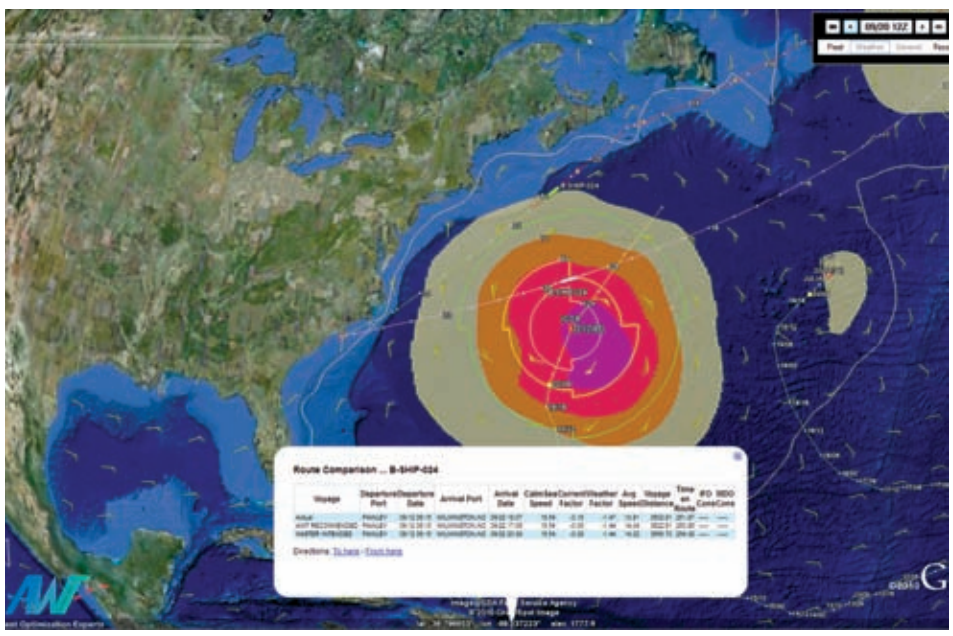
www.awtworldwide.com

Applied Weather Technology (AWT) has announced the release of GlobalView 2.0, a new version of the company's fleet management system.

The updated application features port forecasts, tide data, tools for customisation and direct access to bunker pricing, as well as improved safety features including global ice concentrations and spot forecasts with the latest weather and wave conditions.

In addition, fleet managers can now view the voyage tracks of captains using AWT's BVS onboard system in GlobalView.

According to Erik Hjortland, advisor, ship performance and bunker management, Odfjell Tankers, the updated options should offer additional value to users of the system like himself.



The updated application features a wider range of data for voyage optimisation

"With the addition of port forecasts, spot forecasts and bunker pricing, GlobalView is an even more valuable fleet management platform," he said.

"Ultimately, it helps us to be more efficient in managing our fleet."

The software now allows fleet managers to plan and schedule the best time for loading/unloading to avoid periods of precipitation or strong winds, with port forecasts available for more than 2,500 locations with hourly updates out three days, and three and six hourly updates out five days.

Real-time bunker pricing is also available for more than 70 locations globally, updated throughout the day. Barging rates can be included, on a subscription basis, in partnership with LQM Petroleum Services.

An Eco-Speed Calculator is additionally included, used to calculate the estimated cost of voyages at different speeds. Users can add their own parameters into the system and the calculator will show a comparison.

"GlobalView 2.0 makes it easier to plan fuel efficient voyages by offering access to additional data in one place," said Skip Vaccarello, president and CEO of AWT.

"The system also helps with critical functions like planning arrivals and optimal routes."

Transas Wave to save fuel

www.transas.com

Transas has launched a fuel efficiency monitoring system called Transas Wave, a standalone application used to record and analyse a ship's fuel consumption.

Wave connects to the vessel's navigation sensors, flow meter, engine data and emission sensors to collect information which is then used to optimise the operation of a vessel with help from an online decision support system.

Monitored parameters include speed, trim and planned route, and Transas estimates that optimal operation across these areas could lead to fuel savings of approximately 5 per cent.

The company says that integration with ECDIS for route optimisation will be available later this year, together with an ECO module designed to assist in ensuring compliance with new MARPOL requirements for recording and monitoring of vessel emissions.

"Change to a 'Green' mindset is important," commented Anders Rydlinger, Transas Marine navigation product development director.

"At Transas we demonstrate commitment to protecting the environment. Wave continues this concept and moves Transas to the very forefront of fuel saving technology making sure that our customers stay ahead of the wave."

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Silversea implements trim optimisation technology

www.eniram.fi

Cruise operator Silversea Cruises has implemented a real-time dynamic trim optimisation technology system from Finnish company Eniram, with the hope of cutting its fuel costs by around 3 per cent on long distance voyages.

The Italian cruise operator, headquartered in Monaco, has now deployed the software on two of its long-distance cruise ships, Silver Shadow and Silver Whisper, along with onshore systems to ensure consistency when crews change on its vessels.

Eniram's technology continually measures a vessel's trim during a voyage and informs the crew of the optimum level, with the aim of maximising fuel efficiency while reducing emissions.

"Ships operate with big fixed costs so our aim as an operator is always to maximise efficiency," explains Christian Sauleau, executive VP of fleet operations at Silversea.

"Fuel is one of the biggest costs, and prices have soared over the last 2-3 years so we are keen to keep associated expenditure under careful control."

"Several other operators we know use Eniram tools and report that they are working well. We understand we can expect to make a 2-3 per cent saving on fuel, which is a conservative estimate. When you're talking about an annual consumption rate of around 70,000 tons, the figures will soon add up."

Silversea's strategy has been to begin with deployment on the vessels travelling the longest distances, such as its cruise liner operating around Australia, for example.

"The technology offers maximum results at the highest speeds and for the longest distances. While we don't have ferries, we do cover long distances," said Mr Sauleau.

The company says that it expects to report results of the deployment within 2-3 months, following analysis of the data collected.

This will be supported by Eniram's analytics and reporting services, also part of the agreement with Silversea, which uses the data collected from the vessels for further analysis to help the operator identify additional efficiencies.

Commenting on the deployment, Eniram's CEO, Philip Padfield, said, "We are delighted to be working with such a prestigious and exclusive cruise operator as Silversea Cruises, and look forward to helping the company derive new efficiencies in fuel consumption and reduce environmental impact."

Eniram's dynamic decision support technology is used by more than 50 cruise ships, with a further 20 currently in the process of implementing the technology.

The Silver Whisper will implement the trim technology. Photo courtesy Silversea Cruises

PetroChina Taizhou to implement AMOS

www.spectec.net

SpecTec reports that it has recently signed a contract for the supply of its AMOS software system to PetroChina Taizhou Marine Company Ltd, in Zhejiang province in the People's Republic of China.

The contract is for the supply of AMOS Maintenance and Purchase, as well as database and associated consultancy services, for five ships.

A further software installation will be performed in the company's head office.

The requested module is a Windows application used for the integrated management of maintenance work and costs, stock control and purchasing.

SpecTec says that the product is specifically suitable for large companies and organisations, where maintenance, stock control and requisitioning take place at several local installations, and purchasing and transport planning take place at central headquarters.

PetroChina Taizhou Marine Company is a fully-owned subsidiary of PetroChina Company Limited (PetroChina), the largest oil and gas producer and distributor in China.

ST Management extends deal with MESPAS

www.mespas.com

French-based ST Management has extended its use of the MESPAS range of maritime software.

The initial deal between the companies focused on implementation of the mespas R5 system, to support ST Management's QHSE and ISM related requirements.

This will now be supplemented by the integration of PMS and Procurement modules.

The combined system will be used in the management of ST Management's fleet of 28 vessels specialising in the transport of petroleum and chemical products.

The R5 fleet management software system is a Cloud Computing service.

AVEVA software for Brazilian universities

www.aveva.com

Shipbuilding software developer AVEVA has announced that it is to expand use of its training programs with Brazilian universities, with federal universities in Pernambuco and Pará states to implement AVEVA's engineering and design software from the AVEVA Plant and AVEVA Marine portfolios within their engineering course curriculum.

AVEVA Marine is a set of integrated applications created for the engineering and design of ship and offshore structures, design management, and the generation of production information.

The agreement with Federal University of Pernambuco (UFPE) provides AVEVA PDMS (plant) and AVEVA Outfitting (marine) software licenses for use in its engineering degree programmes.

AVEVA will also provide AVEVA Outfitting software licenses to the Federal University of Pará (UFPA) for use in naval architecture, hydrodynamics, naval construction and the stability disciplines for its naval engineering degree programmes.

AVEVA will also assist UFPA with the training of teachers to undertake the classes.

"With engineering skill shortages in Brazil specifically and Latin America in general, training new users of our software is critical to the growth and on-going success of the plant and marine sectors," said Santiago Pena, senior vice president of AVEVA Latin America.

"In response, we have taken steps to establish several partnerships with educational institutions across the country to help close the gap on the shortage of experienced engineering talent."

Briggs Marine installs planned maintenance software

www.marinesoftware.co.uk

UK company Marine Software reports that it is to supply its Marine Planned Maintenance software system to Briggs Marine Contractors.

The agreement covers 18 vessels as well as separate shore side maintenance equipment.

The software was installed at Briggs' Burntisland office in Fife, Scotland, followed by an on-site training course conducted by Marine Software personnel.

The control and management of most vessel planned maintenance job cards will be done centrally by the head office, where shore side maintenance staff will record on-going maintenance completions.

The latest vessel to implement the software is the 61 metre supply vessel Kingdom of Fife (GT 1,459), classed with Lloyds Register.

The Kingdom of Fife is the latest ship to install the maintenance system

Stability system developed by Mitsubishi

www.mhi.co.jp

Mitsubishi Heavy Industries Ltd (MHI) reports that it has developed a system to enhance the damage stability of ships, enabling reduction in capsizing risk.

The company says it has already received an order for a vessel from Nippon Shipping Co. Ltd, a group company of Nippon Express Co. Ltd, that will be equipped with the new technology.

The 170-meter-long RO/RO ship on order is capable of travelling at a speed of 23 knots, carrying about 170 trailer chassis and 100 passenger cars. The ship consumes approximately 10 per cent less fuel than existing RO/RO ships in the same class.

It will be built at MHI's Shimonoseki Shipyard & Machinery Works in Shimonoseki City, Yamaguchi Prefecture. Delivery is slated for March 2013.

MHI developed the system in response to changes in regulations on ship stability during navigation in January 2009, based on revisions to the International Convention for the Safety of Life at Sea (SOLAS Convention).

The company says that it is aiming to attract orders for high-end ships to be equipped with the new system.

It is targeting installation of its righting moment recovery system on new ships to which the aforementioned regulations apply: namely, RO/RO ships, pure car and truck carriers (PCTC) and ferries.

If the ship's hull is damaged during navigation, the new system enables prompt conveyance of any flooded seawater into void spaces in the ship's bottom, thereby reducing capsizing risk through enhancement of righting momentum by lowering the ship's centre of gravity.

Further to this initiative, effective from the beginning of 2012 MHI reports that it has established a new Engineering Business Department within its Shipbuilding & Ocean Development business headquarters.

Two other technologies the company sees as particularly promising are the Mitsubishi Air Lubrication System (MALS), and another proprietary technology for vessels equipped with a ballast water treatment system.

The MALS is an innovation that reduces frictional resistance between a vessel's hull and seawater using air bubbles produced at the vessel bottom, thereby enabling significant energy savings and a reduction in CO2 emissions.

The ballast water technology aims to assist companies in complying with the Ballast Water Management Convention, an international agreement requiring installation of a system to purify ballast water prior to its discharge from the ship.

Hydrodynamic analysis software orders

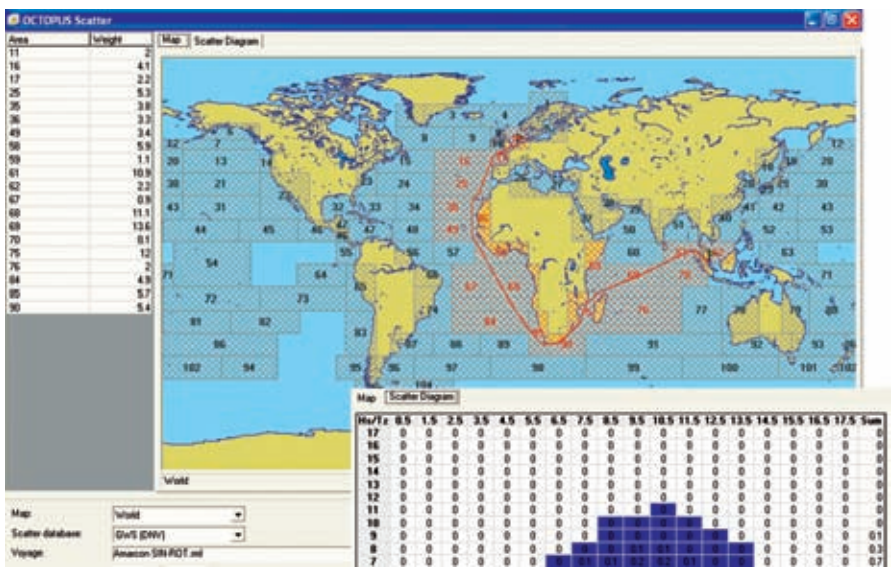
www.amarcon.com

Software company Amarcon reports that it has recently received orders from Shanghai Zhenhua Heavy Industry Co., Ltd. (ZPMC), Mammoet and RWE Innogy for its hydrodynamic analysis application, OCTOPUS-Office.

OCTOPUS-Office 6 is a hydrodynamic analysis program for the calculation of seakeeping characteristics of ships, with or without forward speed.

Using 2D or 3D ship hydrodynamics, the software calculates voyage dependent response statistics, both in the long term and short term. Voyages can also be defined based on the corresponding expected responses that will occur during the actual voyage.

The company says that it plans to update the application later this year by adding a DP Forecast functionality, already in use with its OCTOPUS-Onboard system, to OCTOPUS-Office.



The OCTOPUS program calculates seakeeping characteristics of ships

Futureship and Marorka to collaborate

www.futureship.net

FutureShip, a GL company, reports that it is to work with Iceland-based Marorka to integrate the two companies' product portfolios in the field of fuel efficiency, energy management and related consulting.

The announcement was made on the occasion of FutureShip's opening of an office in Singapore.

"Energy efficiency gains ever-more importance in the maritime industry," said Khorshed Alam, vice president FutureShip South Asia/Oceania.

"This cooperation will give us the opportunity to even better serve the need to monitor ship performance, raise energy efficiency awareness onboard and onshore, and enable shipowners to seamlessly manage the energy performance of their entire fleets."

FutureShip's ECO-Assistant is one of the products related to the agreement, a stand-alone software application used to manage the optimum trim angle for a specific ship when provided with its operational parameters.

This system has already been purchased for approximately 200 ships, and the company says that it regularly achieves efficiency improvements of up to 5 per cent.

Alongside this system, FutureShip will now offer selected Marorka hardware and software products like the Ship Performance Monitoring System used to calculate fuel efficiency based on fuel consumption, GPS and log speed, propeller power and main engine RPM.

This application displays performance values and trends on a touch panel computer, which collects measurement data, creates real time performance analyses, and records historical performance data that can also be sent to shore for further analysis with Marorka Online.

For performance monitoring, the Marorka Maren Operating Platform (OP3) will be offered. This product can be connected to relevant onboard systems for data collection from propulsion, navigation, machinery and cargo systems, as well as weather and oceanic forecasts.

Modular expansions based on and connected to Marorka Maren OP3, such as propulsion performance optimisation, simulation of voyage schedules and costs, monitoring of power and steam production efficiency, are also available.

Additionally, an automated interface to FutureShip's ECO-Assistant can now be ordered.

Jo Tankers installs emissions management system

www.jowatechnology.se

Norwegian ship owner Jo Tankers has installed the JOWA Technology Diesel Switch DS MKII to manage its change over and blend fuel requirements, to meet sulphur emissions levels in CARB and SECA areas.

The software employed by the DS MKII, developed by JOWA Technology, controls a specially designed blend fuel valve that provides a controlled change-over from HFO to MDO/MGO and vice versa, as well as a safe blend fuel operation whenever required.

The system can be used for both main engines and auxiliary engines, and is type-approved by Germanischer Lloyd.

After initial on-board testing was successful, Jo Tankers has decided to install the DS MKII on nine more vessels, as well as adding the technology to its new building projects in Korea.

"We are very pleased with the easy and quick retrofit installation of the system into the existing fuel systems on board," said Andrew Hills, fleet manager at Jo Tankers.

"We now know that we meet the strict sulphur levels requested in the SECA areas and in other environmentally controlled areas. They can be reached both by using the diesel switch DS MKII for a complete change-over or for running on blend fuel."

"We appreciate the software feature including the history log for change-over and/or blend fuel procedures performed. This saves us time and money, but it is also advantageous for the environment. To protect the environment as much as possible is very important, both for us as a responsible shipping company, as well as for our customers."

Jo Tankers' use of the technology is set to expand, following completion of a trial

The future of remote monitoring

Unique opportunities and challenges exist in the field of remote engine monitoring in the marine industry. If the technology continues to evolve in an integrated manner it could create significant benefits for shipping companies, *writes P. Jaime Tetrault, Caterpillar Marine Power Systems*

Global mariners are familiar with new industry trends. They've seen many new technologies come and go over the past centuries. The age of sail eventually grew into the age of steam powered paddle-wheelers with sails.

These hybrid vessels quickly removed the sails and trusted in the paddles and boilers for propulsion. Shortly thereafter, propeller technology took over, providing safety from the dangers of the exposed side paddles.

As seamen increasingly began to value safety at sea, improvements in control room technology became the standard. Eventually technology allowed unmanned engine rooms with a high degree of operational data logging.

The next obvious step was to attempt to monitor the engine data from shore, thus the beginning of the remote monitoring industry trend we are seeing today.

And why not? Isn't remote monitoring already a standard in land based power and even the offshore wind industry today? Unfortunately, the marine industry isn't so simple.

In the modern marine operating environment today, shipping companies still maintain traditional engine room theories on how to manage installed assets. Skilled on-board engineers who monitor vessel operating conditions from an engine control room or from the bridge are still the norm.

However, remote monitoring technology is advancing at such a pace that asset suppliers have capabilities to advise the engine room staff on the condition, deterioration, and eventual failure of most types of equipment.

Naval Architects will shortly need to understand how to design and install this technology during the new-build period to optimise the benefits to the owners.

Owners need to begin to understand this new technology in order to build the advantages into their operating procedures and financial models.

This paper explains the evolution of remote monitoring technology, some design requirements, and the advantages to the owners and shipping companies.

Technological assistance

There are limitations in the amount of data that a human can process in a single second.

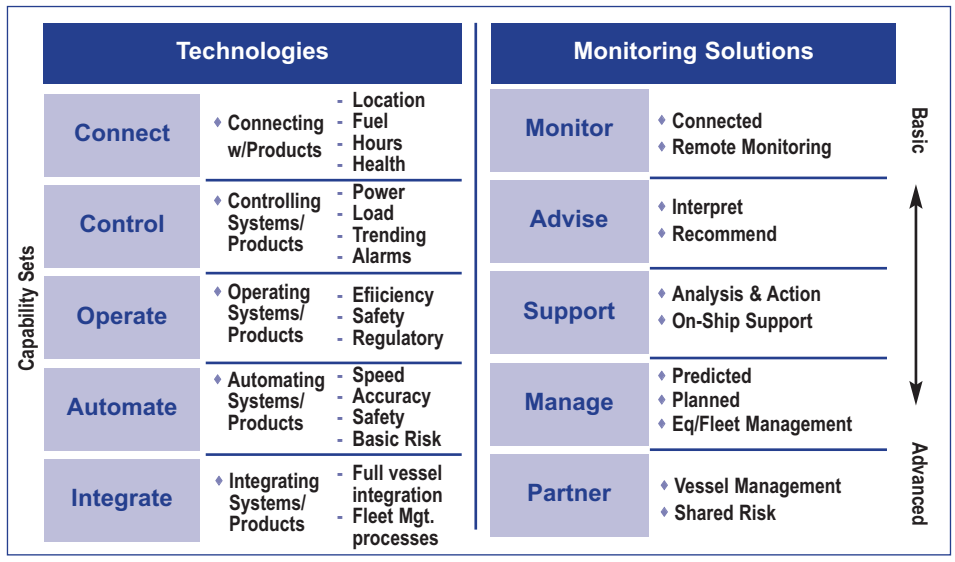
For example, a human eye has the capability to process one frame per millisecond. While this enables us to understand vessel operational data live, when we combine multiple datasets, this limitation is significant.

Have you noticed how it is near impossible to catch a fly? The primary reason is that a fly can process 20 frames per millisecond and our world appears to move in slow motion to a fly as compared to how we see it.

Imagine if we could process 20 times the data from an operating vessel at a time. How would we use this data and what would we do with the information the data delivers?

Data is only one element of remote monitoring. Advancing the technology to the next paradigm requires the ability to convert the data into information, the information into recommendations, and the recommendations into action.

This requires a subset of definitions that are critical to understanding the evolution of remote monitoring.



Monitoring can take a variety of forms, from basic connections up to highly integrated systems

We consider remote monitoring as the ability to monitor and read operational parameters from a remote location. Condition-based monitoring builds on remote monitoring by utilising the operational parameters to define running conditions.

A vast step forward is the ability to convert this conditional data being fed into a centralised location into useful advanced warnings, extended maintenance recommendations, and, ultimately, a lowered cost of operation.

Today we struggle in this area for a variety of reasons, many of which include the limitations of a single source provider to have the capabilities of monitoring vast amounts of data and making any level of useful recommendation.

For this reason, we define Advanced Condition Monitoring as the ability to integrate algorithmic capabilities into the datastream to identify critical parameters with high velocity.

Considering the number of monitored assets aboard a merchant vessel today, numerous advancements will need to be made for such a solution to be offered to the marine industry by a single supplier.

To begin to understand the complexities of Advanced Condition Monitoring ('ACM'), it is important to understand the technology value chain involved with each monitoring solution.

As suppliers evolve in the ability to provide open architecture for asset monitoring, an element of the future challenges becomes more transparent: How can a single supplier monitor all this data and provide value, integrate solutions into the vessel management system, and ultimately partner with the operator in sharing risk?

This is the ultimate value-add offering in remote monitoring and the future for operators who desire to partner with solution providers with the intent to lower operating costs.

Arguably, ACM is the solution to this challenge. The first providers to combine a technology derived from algorithmic processes with a commercially viable solution using remote capabilities with localized support will represent the future.

The future of remote monitoring is not limited to the monitoring element alone. The value chain of solutions will evolve for the 'do it myself (DIM)' customer to an operating environment of 'do it for me (DIFM)' ship owners.

The methodology to achieve this milestone is a combination of technical, commercial and legal solutions.

Selling solutions moves the suppliers into a proactive mode, partnering with the operators and predictably anticipating operational challenges and preventing them.

It includes extending maintenance intervals, optimising vessel performance and fuel consumption, reducing manpower requirements, and eventually and possibly even changing the owner environment into remote and non-remote engaged operators.

Don't misinterpret this prediction; there will always be the need for a living operator on the bridge of the ship to anticipate risks and make corrections.

However, in the future remote monitoring world, the remote operators will have the advantage of significantly reduced costs and thus can be much more competitive eventually capturing a leading market share.

If we examine the technologies in place today, it becomes clear that the ability to combine the operational assets onboard a ship into a single remote monitored datastream, and make actionable decisions from the data is very limited.

The leading marine remote monitoring solution providers today focus on four key areas:

- viewing
- reporting
- trending
- data-logging

If we examine some parallel industries (for example, mining), we begin to see the usage of this data for value messaging, supply chain management and fuel consumption optimisation.

This capability is creeping into the marine industry, albeit very slowly, as marine vessels are significantly more complex than a mining machine.

In addition to the inherent complexity associated with marine vessels, asset suppliers in the marine industry are not wholly comfortable opening up their operational architecture to third party monitoring solutions.

The risk of safety, warranty validity, and eventually proprietary knowledge unknowingly entering the open market is unacceptable and represents a significant obstacle that will need to be addressed prior to industry acceptance.

Despite the common usage of J1938 / 39 communication architecture, we are far from connecting all assets to a single data bus on board a vessel.

It is critical that the vessels being designed today anticipate this challenge and strive to bring all operating assets onto a common bus for eventual communication capability.

So are we limited in reaching this ACM goal? How do we enable the next evolution in remote monitoring to take place? As with all future predictions, we need to examine the progress one step at a time.

1: Predictive Component Maintenance (PCM)

This sounds much more rudimentary than it actually is today. There are numerous conflicting elements of this step that prevent it from becoming normalised, including:

- The lack of willingness by asset suppliers to share the early indicators for failure. Most suppliers in the industry provide and promote their own operating and maintenance schedules. Few define a pre-failure predictive protocol for operating machinery.
- Most suppliers profit on the parts business and in theory, while outside warranty, a failure of a component is prof-

Optimum network environment also for the future expansion of convergence

Converged IP Communication

IP CCTV

VoIP Telephone

Data sharing

Mobile communication

IPTV

Master clock

NET SWAN

Shipboard Wireless Area Network

- Wireless computer network
- VoIP System
- IP CCTV
- Mobile communication
- External Communication System
- IPTV(CAS , VoD , Satellite TV)
- IP Master clock

Ship & Marine Biz. Unit
mail : sales@netjoiner.com

NET Co., Ltd (NETWORK ESSENTIAL TECHNOLOGY)
Address : 3F, 190-6 Samsan-Dong, Nam-Gu, Ulsan, 680-813, KOREA

itable revenue. This challenge must be overcome, and we must challenge asset suppliers to become more willing to share this data and to integrate this data into a series of remote monitored asset solutions.

Many operating assets are not installed with an electronic monitoring capability, preventing the ability to link to a common communication bus. Architects have the ability to incorporate this expectation today for most equipment, providing options to the owner to allow them the ability to prepare for a vessel retrofit once the technology advances.

2: Commercialisation of PCM solution

There must be a resounding business case for a single supplier to invest in the technology and knowledge from various suppliers to build a common remote monitoring platform that will meet all the needs of the vessel owner at an affordable price.

Each operator balances on a fine line of risk and reward. No doubt, the reduction of a single off-charter day for a vessel generates significant savings, however, at what return on investment?

Today we have solutions that are targeted to individual assets (example engines, load management systems, bridge equipment); however, no single supplier has effectively brought all these assets into a single data system.

The naval architects today should anticipate the increasing need to build into the vessel design electronic solutions that will cost effectively allow third parties to access the data-bus and export data from multiple sources at rapid rates at near zero cost.

No supplier will likely be able to afford to retrofit an entire vessel in the commercial proposal to a ship operator; therefore, the ships being designed today are an important link in enabling this technology solution for the future.

3: Implementation of ACM

Advanced Condition Monitoring technology can interpret millions of datapoints per second for all monitored assets, translate the data into useful information, and allow a limited number of Fleet Managers to immediately make a recommendation or take action.

This milestone requires asset suppliers to be more open with their operating systems, and to allow third parties access to critical operational risk experience databases.

This is likely only to be accomplished with pressure from the supplier of the leading cost assets on-board a vessel, either the power management supplier or the engine supplier.

Architects need to partner with these suppliers to select sub-systems that only utilise electronic data communication solutions. The suppliers need to partner to provide the algorithmic solutions that will enable a rapid conversion of data into useful information for the Fleet Managers.

This single issue is representative of a multi-faceted challenge that is yet to be overcome.

4: Creation of vessel health management system

This solution would combine the information output of the ACM system, with a series of remote personnel who can evaluate solutions both on and off site and make critical operational decisions.

We can never fully remove the human value of diagnosing a product health situation. Additionally, we need to understand the operating profile of the vessel.

For example, we should never be in a position to shut down a critical system to protect the asset at the risk of running aground or hitting a fixed bridge structure.

A vessel health management system will likely be replicated from existing land-based solutions that are in place today, and is a realistic step once the ACM technology evolves.

5: Continuous improvement

A continuous improvement process is needed to constantly evaluate lessons learned and remove risk from the client solution.

The marine industry will continue to evolve, as will the on-board technology. Each new technology presents new risks.

Consider alone the challenges presented by IMO III, and the impacted emissions reduction equipment. How will a vessel health management system balance the need to move cargo with the environmental regulations and operational needs of the ship?

Who is empowered to make those rules as related to remote monitoring and what is the impact of a wrong decision?

We need a strong governing body to set limits on vessel health management and the tools utilised to provide value to the shipping company in the future.

The future of remote monitoring is full Vessel Health Management with Advanced Condition Monitoring.

These potential solutions are constantly being challenged due to improved and evolving marine technology and operational regulations.

We are only at the cusp of this journey in the technology evolution today, with various suppliers introducing new and improved solutions every year. Each has its own value, and each has its own limitations.

When a single supplier is able to combine all managed assets into a single datastream, evaluate the data from multiple vessels at once at very high speeds using ACM, combining a localised solution in a commercially viable vessel health management tool, we will have achieved the vision of this paper.

That future of remote monitoring is not today, but it is realistically achievable by the year 2020. DS

About the author

P. Jaime Tetrault *is product support director at Caterpillar Marine Power Systems, currently acting as the director for global after sales activities, including parts and service for Caterpillar Marine Power Systems, based in Hamburg, Germany.*

Mr Tetrault is a graduate of the United States Merchant Marine Academy in Marine Engineering, holds a Master's Degree in Business from Indiana Wesleyan University, and is a USCG licensed engineer in steam, diesel and turbines.

Seamanship Library to incorporate Guide to Tanker Ports

www.witherbyseamanship.com

Witherby Publishing Group and Shipping Guides Ltd have reached an agreement to produce an eBook of Shipping Guides' ten volume publication Guide to Tanker Ports (GTTP).

The new product will be available for purchase either as a module within the Witherby 'Seamanship Library' or as a standalone eBook. Purchasers of the standalone system will be provided with an eBook reader that is capable of downloading other books in the same format, as required.

GTTP is a tanker port reference manual that includes port information for tanker masters and owners/operators. The eBook version will be updated either by download from the internet or by DVD-ROM, with the first year's updating service included in the initial purchase cost.

The eBook of GTTP will include all information available to existing users, such as pre-arrival information, port plans, maximum size of vessel, berth details, mooring diagrams, cargo facilities, health, safety and security, communications, shore facilities, regulations and local information, but will also allow users to add simple annotations.

Shipping Guides says it chose Witherby Seamanship as its partner in this move toward digitization as it would allow users to access GTTP in the same format already used for other industry standards in eBook format, such as The International Safety Guide for Oil Tankers and Terminals (ISGOTT) and Liquefied Gas Handling Principles on Ships and in Terminals, as well as SOLAS and MARPOL.

The Seamanship Library has a core module of 10 IMO titles that apply to all ships to which additional modules, including GTTP, may be added.

The Library is recognised by the UK Maritime and Coastguard Agency (MCA) as being an electronic equivalent for the onboard carriage of IMO instruments such as the SOLAS, MARPOL, LL, COLREG and STCW Conventions and UK Regulations when these publications are required to be carried on board by the ship's Safety Management System.

Both the Seamanship Library including GTTP, and GTTP as a standalone version, will be available through the ChartCo and Thomas Gunn Voyager navigational data management systems.

GTTP will be available as an eBook from 30th March 2012.

Hong Kong Marine Department adds Autohydro licence

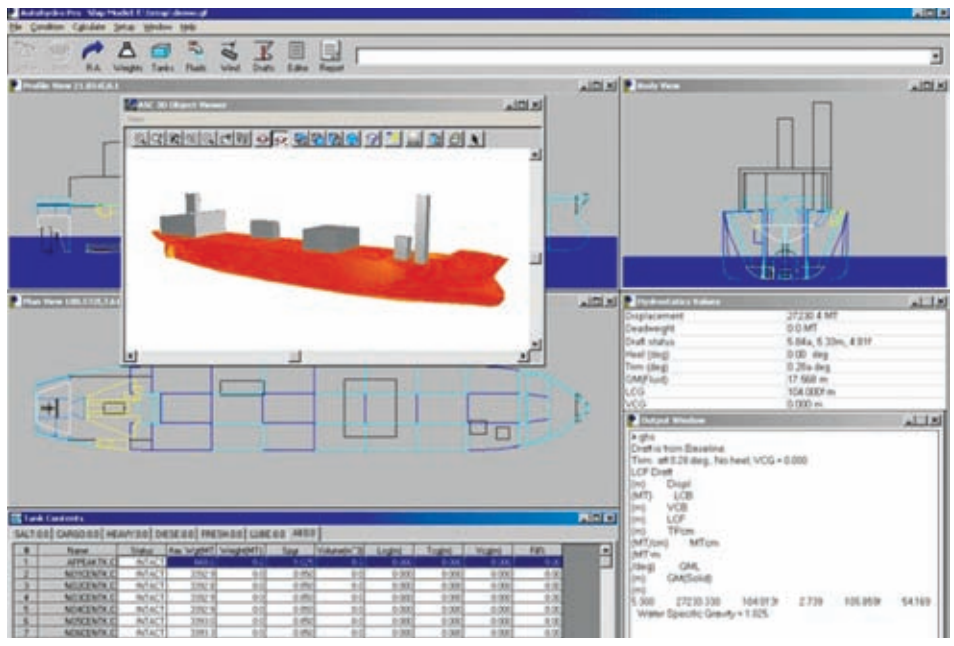
www.autoship.com

Autoship Systems Corporation (ASC) has announced that the Hong Kong Marine Department (HKMD) has added the latest Autohydro 6.5 licence to its operations.

It is now over 20 years since the Marine Department first purchased Autohydro 4.0 in 1991. During this time, ASC has been supporting HKMD naval architects with software updates, on-site training and remote technical assistance.

Autohydro is a hydrostatic and stability program used to perform stability calculations and create assessments, such as stability books.

Release 6.5 adds new functionality to the Probabilistic Damage assessment in order to handle recent changes to the rules for cargo and passenger vessels.



HKMD first started using Autohydro 20 years ago

Simulator centres open in US and Indonesia

www.transas.com

Transas reports that two new maritime training facilities in the US and in Indonesia featuring its simulation technology are now open, and ready to accept cadets for training.

The Massachusetts Maritime Academy (MMA) in the US recently opened the American Bureau of Shipping Information Commons Building, which houses the Academy's new Full Mission Ship Simulator.

The 42,000 square foot academic building will host the Marine Transportation programme offered at MMA, with simulation facilities including a full mission, 360 degree bridge simulator, debriefing room, instructors' control room and an ante room.

The simulated bridge will include an Integrated Navigation System (INS), Dynamic Positioning Systems (DP2), ARPA/Radar multifunction displays, and Electronic Chart Display and Information Systems (ECDIS).

The full mission simulator builds upon the Transas Navi-Trainer Professional 5000 simulator systems already installed at MMA. It can operate either independently, or in joint exercises across campus for multi-vessel scenarios with the existing Tug Bridge and Electronic Navigation Lab.

In Indonesia, a new Integrated Navigation System Building operated by PIP Semarang (Semarang Merchant Marine Polytechnic), one of the state education institutions administered by the Transportation HRD Agency, has opened.

The core of the training facility is a navigational simulator NTPro 5000 main bridge, with 12-channel visualisation and a 3-channel rear view screen for Dynamic Positioning (DP) training, providing 360 degree views.

Four cubicle part-task bridges extend the training capacity, as well as six trainee stations that can be used for training in DP (both DP class 1 and DP class 2) and Radar/ECDIS operations.

"(PIP Semarang) is very proud to be classified as one of the modern world class maritime training and education training centres in the world," said Capt Bambang Purnomo, director of PIP Semarang.

The new simulators in Indonesia (left) and the US are now ready to accept cadets

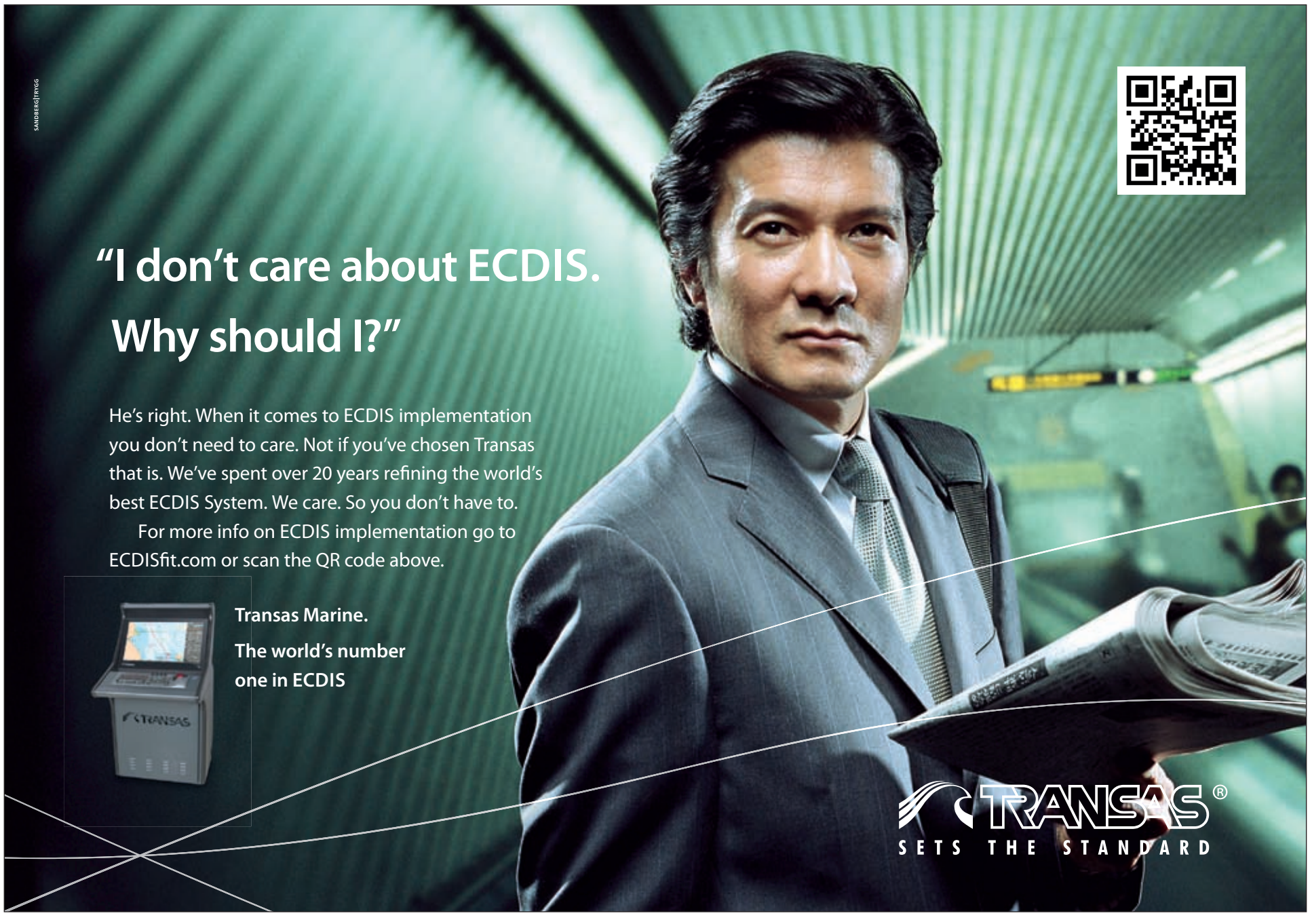
Martek Marine reports that its bridge watch and alarm system (BNWAS) Navgard has become the first such system to attain **US Coast Guard** approval. The company says that the BNWAS has already been approved by all major classification societies since its launch in September 2010.

Imtech Marine reports that it is to reshape its **Radio Holland** organisation in the US, expanding the service network to an increased number of ports, broadening the product portfolio, consolidating service dispatch and back office functions into one central location, and increasing flexibility in current logistics operations.

Imtech Marine has also appointed Sytze Voulon to the position of regional director north west Europe (Rotterdam). Mr Voulon has previously worked at **Mobil Oil, Stork, Lips** and, most recently, at **Rolls-Royce,** where he was regional director marine Europe & Africa / vice president services Europe & Africa.

MSG MarineServe reports that it has been appointed as an official training agent by **ChartWorld** to provide ECDIS training services locally and worldwide. The agreement is part of an arrangement involving MSG itself, its sister company **Safebridge** and **ETC**.

www.martek-marine.com
www.imtech.eu
www.chartworld.com
www.marineserve.de



New simulator centre opens

www.kongsberg.com

A new Offshore Vessel Simulator at the SimSea AS maritime training centre in Haugesund, Norway, has opened.

The simulator, supplied by Kongsberg Maritime, is part of a 1300m2 simulator park offering integrated training on offshore vessel operations as well as mission planning applications.

The Offshore Vessel Simulator includes an interface to a range of task simulators for team training of offshore operations.

Also included is an assisting offshore vessel simulator that can be configured as a second anchor handling vessel for team training of anchor handling operations, and an offshore crane simulator which has been supplied by the Kongsberg subsidiary, GlobalSim.

All simulated operations can be carried out individually as well as in an integrated environment where all simulated variables interact with each other within the scenario.

"Integration is critical to improving safety and competence for hazardous offshore operations," explains Rune Johansen, director, SimSea.

"Ours is perhaps the most integrated Offshore Vessel Simulator in operation so we are able to provide a unique platform for highly realistic team training that covers all aspects of offshore vessel operation either as standalone modules or as a fully integrated training exercise."

The Offshore Vessel Simulator is installed at the SimSea AS maritime training centre in Norway

MARIS and Seagull in product specific ECDIS training link

www.maris.no
www.seagull.no

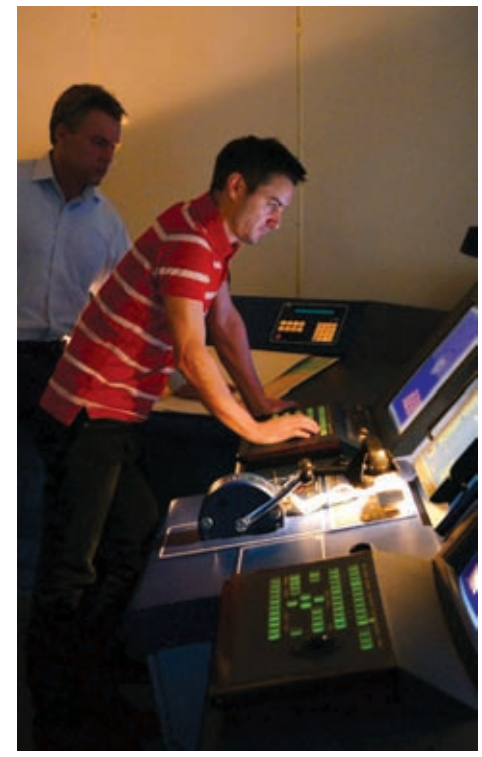
Maritime Information Systems (MARIS) has signed an agreement with Seagull AS covering cooperation on product specific ECDIS training at Seagull's shore-based training centre in Norway.

MARIS says that the agreement between the two Norwegian companies fits with its aim to develop a standard training package by working with those in the ECDIS training business to offer cooperation and market MARIS' products and services.

"Our strategy is to identify crucial safety and environmental issues facing the hazardous cargo sector and develop and publish recommended criteria that will serve as benchmarks for the industry," said Steinar Gundersen, deputy chief executive (corporate), MARIS.

"There is demand for product specific ECDIS training and our strategy is to work with leading training institutes around the world to offer the end-users such product specific training. In conjunction with the International Maritime Organization and regional and national regulatory bodies MARIS supports the development of international conventions and global regulations that enhance the safe operation of vessels."

"We support global enforcement of conventions and regulations and encourage industry-wide acceptance of guidelines and recommendations. It is vital for MARIS to offer product specific training to our customers in more than 40 countries as a leading ECDIS supplier. MARIS puts an agreement in place with training institutes ensuring that the training is based on the latest software, documentation etc and that the training institute is approved by MARIS."



Seagull will now be able to offer type-specific training on MARIS ECDIS

NAVTOR launches Pay As You Sail ENC service

www.navtor.no

E-navigation company NAVTOR has announced the launch of its 'Pay As You Sail' NAVTOR ENC Service, which has received approval from DNV.

The Pay As You Sail (PAYS) system allows users to begin the licence period on the ENCs that they require only when the vessel actually sails into the area covered by the chart.

NAVTOR uses vessel tracking data, collected every 90 minutes via AIS (both satellite-based and coastal) or directly by Inmarsat-C polling, to determine when the vessel has entered the area and when the licence period should begin.

"The service makes all ENCs immediately available, free of charge for planning purposes. Once you start sailing, only the ENC charts actually used for navigation are automatically calculated and charged," explains Jan Helge Skailand, NAVTOR's development manager.

"Hence it's not only more convenient, it is also far more economical and transparent, as the web-based ENC portfolio management tool NAVTOR NavTracker is included as part of the service."

ENCs are provided by PRIMAR, and the whole global folio of available charts is provided to the vessel on a secure USB memory stick.

Updates to charts can be imported to the USB stick via any PC with an internet connection (over satellite or in port), and then transferred to the ECDIS. Weekly updates are typically of an order of about 3MB.

The dynamic licensing concept is not a new one, with Dutch chart company Datema launching a system in 2009 where all ENCs would be available for viewing and planning purposes, but would not need to be licensed until the ship entered the chart area.

However, the roll out of that service had to be postponed following objections from UKHO, which disagreed with PRIMAR (also ENC supplier to the Datema service) on the issue of whether viewing and use of electronic charts for passage planning should mark the beginning of the licence period.

This debate took about two years to come to a conclusion, with the UKHO-led IC-ENC granting approval of the service under certain conditions from April 2011.

The Datema service differs significantly from the NAVTOR service in terms of ship tracking however, with Datema providing its own tracking unit to the ship. NAVTOR's system does not require installation of any hardware or software to operate.

The NAVTOR management team has launched its own take on ENC licensing

"The team at NAVTOR saw the opportunity to completely rethink the mechanisms for chart supply with the user, the navigator, as the number one priority," saids NAVTOR marketing manager Willy Zeiler.

"The system facilitates seamless chart management on the bridge. It not only eases the navigator's workload, but also increases safety and security at sea."

NAVTOR is also introducing a NAVSync ENC Updating feature with the service, an online system which ensures that the ENC database is always right up to date before setting sail.

The company says that the PAYS product has been trialled on board the Norwegian cruise ferry Bergensfjord for a number of months, with the testing monitored and controlled by DNV before it granted its approval.

"Our aim is to make the difficult easy and this product is true to that objective," said OEM manager Bjørn Kristian Sæstad.

"NAVTOR has only been in the market for around eight months, but we have already made agreements with some of the major ECDIS manufacturers to join forces and implement technology that really offers the market a seamless e-navigation solution."

New sim for National Taiwan Ocean University

www.nautissim.com

VSTEP, in cooperation with its distribution partner Shipbridge, reports that it has successfully delivered and installed a NAUTIS desktop simulator at the National Taiwan Ocean University in Keelung, Taiwan.

The simulator will be used to train university maritime students and maritime professionals in shiphandling and manoeuvring.

"We are proud to deliver this simulator to a leading maritime university such as the Ocean University. Shipbridge has played a pivotal role in this project," said VSTEP CEO Cristijn Sarvaas.

"Shipbridge will be a valuable partner to continue the steady growth of VSTEP in the region. In the past year, VSTEP has delivered simulators to a number of clients in China and South East Asia and this cooperation will significantly increase VSTEP's reach into this key market."

Siem Meling extends positioning contract

www.veripos.com

Veripos reports that it has won an extension of its positioning contract with Siem Meling Offshore DA, the Stavanger-based shipping company jointly owned by Siem Offshore and OH Meling.

The three-year contract extension is for the continued provision of GNSS positioning facilities to Siem Meling Offshore's fleet of Platform Supply Vessels (PSVs).

Veripos will provide its dual-beam Standard positioning service for the Norwegian company's Siem Pilot and Siem Sailor PSVs, both of which are also equipped with LD2 integrated mobile receivers for real-time processing of data.

Similar hardware is also to be installed aboard Siddis Mariner, which is being provided with Veripos's Standard Plus and Glonass positioning service, while other vessels joining Siem Meling Offshore's PSV fleet are expected to be supplied with comparable Veripos positioning services and equipment.

Engine Monitoring Unit interface set for launch

www.actisense.com

Actisense reports that it is ready to launch its new EMU-1 device, a specialised analogue to NMEA 2000 interface, designed to operate specifically with engines.

Working in conjunction with the UK distributor for Nanni Diesel, the device is due to be beta tested in Q1 of 2012, with a planned release in Q2, following successful tests.

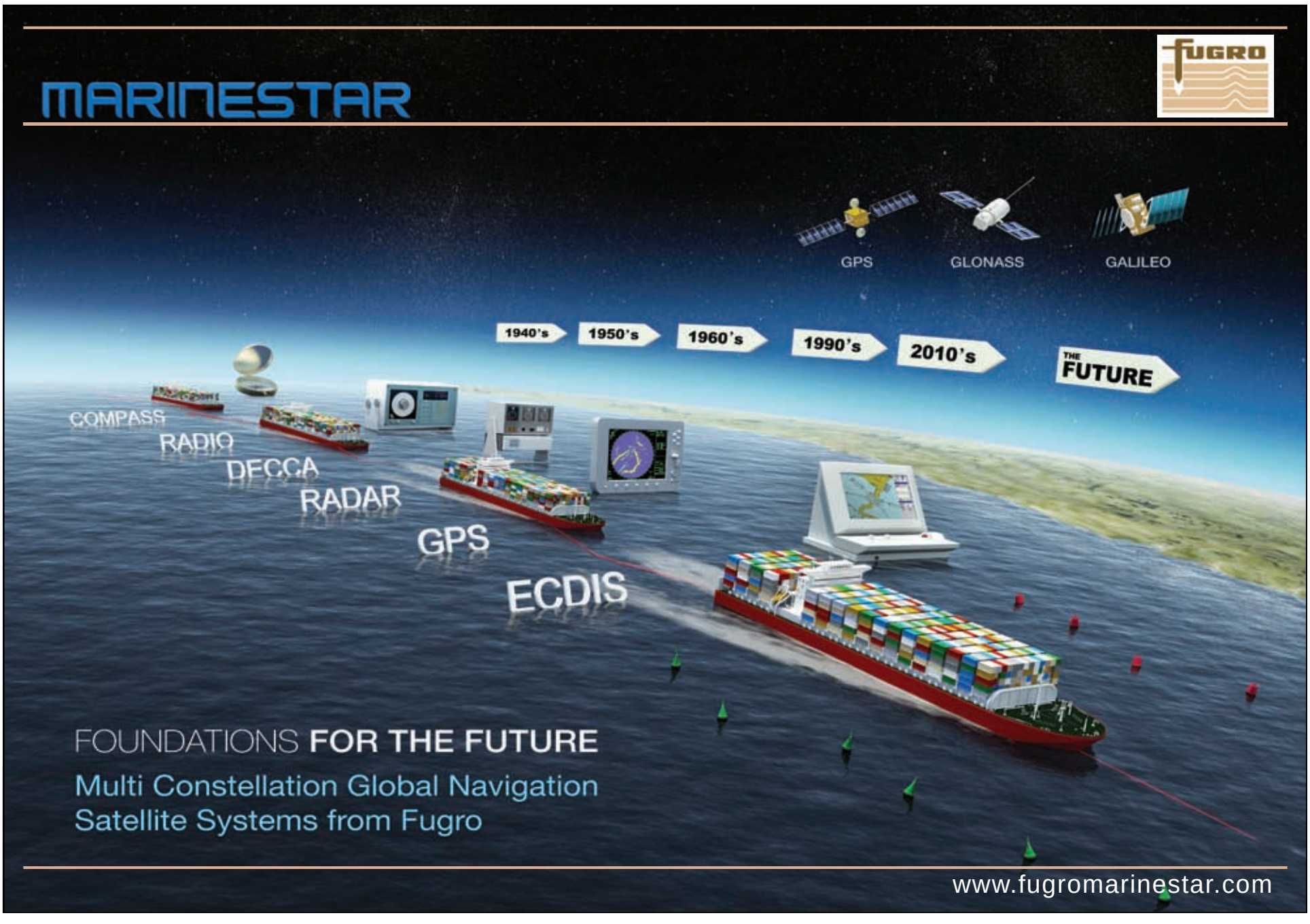
The EMU-1 is being designed to simplify the conversion of analogue engine parameters (of temperature, pressure, Tach / RPM etc.) into the corresponding NMEA 2000 engine parameter PGNs, reducing the number of input/output wires required at each engine.

The EMU-1 can handle six gauge / parameter inputs (these can be instead of the gauge or in parallel with the gauge), four alarm inputs, two Tach inputs and two additional auxiliary inputs, which are flexible to suit each installation. Most notably, the device will be backwards-compatible with older engines.

"The EMU-1 has been designed with simplicity in mind," said Phil Whitehurst, managing director of Active Research Limited.

"This will change the way analogue to NMEA data conversions are done. This product meets the rigorous demands of a marine environment and we are sure that it will become highly sought after in the trade."

The new unit will allow data from engines to be transferred to NMEA 2000 devices



Videotel and Safebridge join forces on ECDIS training

www.videotel.com
www.safebridge.de

Videotel and Safebridge, in conjunction with Safebridge sister company MSG MarineServe, report that they are to work together to provide a range of generic and product specific ECDIS training.

With the support of the IMO, Videotel is updating its original ECDIS course to follow the new STCW Manila amendments and the proposed new IMO Model Course 1.27 (latest edition).

This training, in the form of distance learning using a generic ECDIS model, will be available through VOD (video on demand) and the newly launched VOD Online, so that study can take place at sea or on shore.

Once deck officers have interim certification of successful foundation training from Videotel, they can progress to type-specific training and final certification by attending one of the training centres around the world that form part of the MSG controlled ECDIS Training Consortium (ETC).

The type-specific training and final testing will use simulation of the actual ECDIS equipment installed on the planned assignment. Booking of the onward training can be arranged through Videotel.

Experienced seafarers transferring to ships with different ECDIS models, necessitating further type-specific training, will also be able to avail of classroom based training in Hamburg, on board a vessel itself if requested or, through ETC, at 11 locations around the world.

Alternatively, Safebridge will offer online type-specific training with real time simulation on the original ECDIS manufacturer's software, with testing and certification.

All Videotel clients can also book Safebridge and MSG ETC courses through Videotel.

Certification and a reference database for the appropriate regulatory authorities will form part of the services offered.

"Whilst the IMO Model Course 1.27 content has still to be ratified by the IMO, with Flag State Authorities also yet to agree on what specific ECDIS training they will require, over the past year very careful thought has gone into providing what we hope will prove to be a very satisfactory, practical and cost effective ECDIS training solution for our clients," said Nigel Cleave, CEO of Videotel.

"In addition to the valuable input received from the IMO, ICS, MCA, OCIMF, Dr Andy Norris and participating ship owners and ship managers, we would also to like to thank Furuno for their invaluable input throughout."

In related news, Safebridge reports that Japan Radio Co. Ltd (JRC) has become the latest ECDIS manufacturer with which it has reached agreement to develop type-specific training.

JRC joins a number of other ECDIS manufacturers that have agreed deals with Safebridge for the development of online type-specific training, including SAM Electronics, Sperry Marine, Imtech Marine, 7Cs, ChartWorld, Raytheon Anschütz and Transas Marine.

The Safebridge training process will be approved by JRC in accordance with STCW and Flag State requirements. Safebridge will also provide course certification on behalf of JRC and trainee database services for reference by Port State Control and other concerned authorities.

The courseware will be released in the late summer of 2012.

"It is expected that tens of thousands of vessels will be required to install ECDIS over the next six years and we are more than pleased with the partnership with Safebridge," said Bas Eerden, product manager at JRC Europe.

"Effectively, with nowadays the importance of the total cost of ownership, JRC is content with this new and innovative way of offering cost-effective JRC ECDIS type specific training solutions to ship owners and seafarers."

Software integrates with Broadband 4G Radar

www.navico.com

Navico has updated its Simrad brand Broadband Radar software development kit (BRPC SDK) to allow OEM and third party developers to integrate the technology with their own applications.

Developers will be able to integrate features of the Broadband 4G Radar into PC-based applications, with the radar data able to be received and manipulated on a PC with Windows, without the need for a Simrad multifunction display.

The BRPC SDK works with an off-the-shelf Simrad Broadband 4G Radar, meaning there are no special models to purchase, and the 4G system is available with two levels of functionality, basic level (LL1) or advanced control (LL2) operation.

Navico says that the Broadband 4G is the first dome radar in the world to use Beam Sharpening, a technology used to improve azimuth resolution, the effective horizontal beam width of the radar.

Third party developers can integrate with the 4G radar

LED display from North Invent

www.northinvent.com

North Invent has introduced its new 19-inch Sea Line MK3 (LED) maritime display, designed primarily for ECDIS, radar, Integrated Bridge System and engine room applications.

The new display features AC or DC power (self-sensing, with priority for AC) and graduated dimming for differing lighting conditions, in addition to being waterproof to IP65.

It also features various interface options including DVI-I (analogue and digital), VGA, Composite Video and S-Video, and joins the existing range of North Invent Sea Line MK3 displays, available in a selection of different sizes.

The 19-inch Sea Line MK3 LED display is EN60945 approved, and North Invent says that type approval for ECDIS and radar use from the major classification societies is pending and expected before April 2012.

"LED technology enables better performance in terms of brightness so our new 19-inch Sea Line MK3 (LED) display offers excellent viewing clarity," said Søren Refsgaard, international sales manager, North Invent.

"Reliability and operational life expectancy have also been improved because LED displays use fewer components. Based on these benefits we have chosen to introduce LED versions of our most popular sizes first, but we plan to offer this technology throughout the Sea Line MK3 range in the future."

The new display is primarily aimed at use in bridge systems

Seafarer fatigue project releases data

Findings from Project Horizon – an 11-partner European research study – on how watchkeeping patterns can affect the sleepiness levels of ships' officers have been made available.

The 32-month EU part-funded research programme included work by academic institutions and shipping industry organisations, with specialist input from transport and stress research experts.

A total of 90 experienced deck and engineer officer volunteers participated in tests at Chalmers University of Technology in Göteberg and at Warsash Maritime Academy at Southampton Solent University.

The project used bridge, engine room and cargo simulators to scientifically assess the impact of fatigue in seagoing scenarios, measuring their levels of sleepiness and performance during the most common watch keeping patterns – four hours on/eight hours off (4/8) and six hours on/six hours off (6/6).

Some volunteers were also exposed to a 'disturbed' off-watch period, reflecting the way in which seafarers may experience additional workloads as a result of port visits, bad weather or emergencies.

According to Project Horizon its testing was able to provide detailed empirical data on the sleepiness levels of watch keepers working within those scenarios, enabling researchers to analyse the impact of sleepiness on decision-making, reaction times and other key elements of performance.

The project's key findings include data that:

- at least one occurrence of sleep was detected among 45 per cent of officers in the 6/6 team working the 0000-0600hrs watch at Chalmers and one occurrence for about 40 per cent of those on the 0000-0400 watch in the 4/8 pattern
- at Warsash, where the watchkeepers remained undisturbed in their off-watch rest periods, the number of occurrences of sleeping on watch for officers on the 6/6 pattern varied, and was up to more than 20 per cent on the 1800-0000 watch
- such incidents of sleeping on watch were found within both watchkeeping patterns, and they mainly occurred during night and early morning watches
- participants in all the groups reported relatively high levels of subjective sleepiness on the KSS scale, which got higher towards the end of a watch and the end of the week
- varying degrees of sleep loss were observed between the watch systems and depending on whether off-watch periods were disturbed or not. Overall sleep duration for those on the 4/8 pattern was found to be relatively normal, with around 7.5 hours a day for those in team 1 at Chalmers and about 6 hours for team 2
- participants working 6/6 watches were found to get markedly less sleep than those on 4/8, and data showed a clear 'split' sleeping pattern in which daily sleep on the 6/6 pattern was divided into two periods -- one of between three to four hours and the other averaging between two to three hours
- reaction time tests, carried out at the start and end of each watch, showed clear evidence of performance deterioration – and the slowest reaction times were found at the end of night watches and among those on the 6/6 patterns
- watchkeepers were found to be most tired at night and in the afternoon and sleepiness levels were found to peak towards the end of night watches
- the 6/6 regime was found to be more tiring than the 4/8 rotas and 'disturbed' off-watch periods were found to produce significantly high levels of tiredness
- in both watch systems, the disturbed off-watch period was found to have a profound effect upon levels of sleepiness
- there was evidence that routine and procedural tasks could be carried out with little or no degradation, whilst participants appeared to find it harder to deal with novel 'events', such as collision avoidance or fault diagnosis, as the 'voyages' progressed
- researchers also noted a decline in the quality of the information being given by participants at watch handovers as the week progressed

Researchers say that they have been able to use the data to develop a new fatigue management toolkit for use by ship owners and managers, seafarers, regulators and others, to help arrange working schedules to mitigate risks to ships and their cargoes, seafarers, passengers and the marine environment.

"Seafarer fatigue is one of the biggest safety issues in the shipping industry, and this research has taken our understanding of the way in which the quality of sleep off-watch affects the sleepiness of watchkeepers on watch to a new and much deeper level," commented project coordinator, Graham Clarke.

"It is hoped that the fatigue management toolkit will be a lasting legacy for the sector, providing a resource that, by establishing improved working patterns, will help to enhance the safety of ships and passengers, and the welfare of seafarers."

Weather overlay for Raytheon ECDIS

www.raytheon-anschuetz.com

Raytheon Anschütz reports that it is now offering an integrated weather chart overlay for its Synapsis ECDIS system, developed in cooperation with German sea weather provider WetterWelt.

The new overlay combines the sea chart and weather chart in one display. All weather parameters important for navigation are presented as values or symbols on a separate layer and can be switched on and off at any time.

The system can show all available weather forecasts for the next few days, which can also be played as an animation.

The parameters which can be displayed include the mean wind with direction and speed as well as gusts, wave height, wave direction and swell, period intervals of waves and swell, current, air pressure, weather conditions and air temperature.

The navigator can define which data they want to have displayed in a particular situation, and which limits they would like to set. If individual weather values exceed the pre-set limits, the values are shown graphically as weather warnings.

"The consideration of weather data is becoming more and more important for the shipping industry," says Thomas Wolter, product manager at Raytheon Anschütz.

"Wind and waves or weather conditions such as fog have a direct influence on safety. Wind and waves, swell and currents have a direct influence on fuel consumption. And all together influence the travel speed and prompt arrival at the destination harbour."

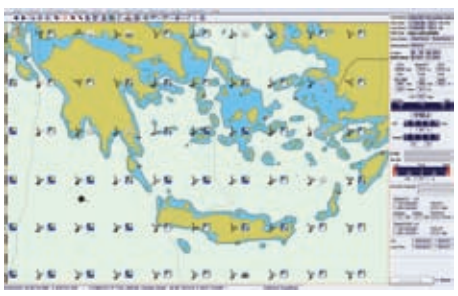
"The Gulf- or Canary Streams move at about 1 to 1.5 knots, or 24 to 36 sm per day. Even at a relatively slight decrease in its own speed, the engine requires significantly less fuel, which at today's bunker prices has a great effect on the cost. For a 15-year-old, 20,000 dwt container ship with a speed of 20 knots, a speed change of one knot can make a difference of about 10 tons of fuel per day."

The Synapsis ECDIS imports the weather data via a standardised GRIB-file from a weather data provider. Customers can choose themselves from which provider the data are to be taken.

Free weather subscriptions are available which offer some basic parameters, but sea weather reports from professional weather service providers are also available.

The paid data packages contain complete sea weather information and range in size from 25kb for the Baltic Sea to 500kb for the complete North Atlantic. The data can be imported into the ECDIS by download or e-mail, either directly or via a USB stick.

Raytheon notes that free weather data usually contains less information, but at the same time much larger amounts of data.



The new overlay will combine weather and chart data within the ECDIS display

Unicom extends navigational data contract

www.thomasgunn.com

Thomas Gunn Navigation Services has announced that it has been awarded a new contract by Unicom to supply an additional 43 vessels with its outfit management service, adding to the 78 vessels already being supplied with navigation solutions, the bulk of the Unicom fleet.

Unicom will be provided with both Russian Hydrographic Office and UK Hydrographic Office charts and publications, in both digital and paper format, customised to its own operational and vessel specific requirements.

"We value the strong business relationship we have built up with Unicom over a number of years," says Thomas Gunn, founder and managing director of Thomas Gunn Navigation Services.

"We are very pleased that their positive experience of that relationship has enabled us to develop our partnership further, and are looking forward to working closely with them in the future." Unicom is a member of the Sovcomflot Group.

FURUNO adds type-specific training partners

www.furuno.com

FURUNO reports that it has reached agreement with the Turkish company Özsay, the national distributor for FURUNO in Turkey, and the Greek training centre GMC for the provision of FURUNO type specific ECDIS training.

Özsay has already been providing type specific ECDIS training courses to navigators since last December under the FURUNO NavSkills training agreement, while GMC began providing ECDIS training as a member of the FURUNO NavSkills network of training centres in February.

Furuno says that the aim of its NavSkills training concept is to ensure that mariners receive the same level of quality, content and competence from training in any of the accredited training centres, or from any future training platform provided by FURUNO.

It is based on a mutual agreement between FURUNO and the training centre, which stipulates the necessary qualifications of the local instructors, the need for compliance with STCW-2010 requirements and a commitment to match the level of training provided in FURUNO's own training centres in Denmark and Singapore.

As part of the agreement FURUNO will educate the local instructors and provide updated training materials and exercises as required. Instructors will also be offered refresher training when required.

The type specific ECDIS training course offered by FURUNO is a two day course covering the functionality and operation of FURUNO ECDIS model FEA-2107/FEA-2807.

With these two training centres having joined the NavSkills network, FURUNO is now able to provide type specific ECDIS training in Germany, Turkey, Greece, Singapore and Denmark, and is currently working on establishing similar co-operations with local training centres in South, Central and North America, Europe, Africa, Oceania and Asia.

Industry Recommendations for ECDIS training

A group of international shipping industry organisations have joined together to issue a series of recommendations on ECDIS training, published by The Nautical Institute, in light of concerns over whether training on the equipment may fail to meet minimum standards

The Nautical Institute has published a set of 'Industry Recommendations for ECDIS Training', with the aim of addressing what it calls "confusion" with regard to ECDIS training.

This guidance document has been issued by an industry group made up of a number of international shipping industry organisations and organised and coordinated by The Nautical Institute.

These organisations include BIMCO, GlobalMET, International Federation of Ship Masters' Associations, International Group of P&I Clubs, International Maritime Pilots' Association, International Chamber of Shipping, Intermanager, Intertanko, International Shipping Federation, Marine Accident Investigators' International Forum, and OCIMF.

The guidance note covers issues of training and competency for ECDIS and offers an interpretation of IMO requirements for ECDIS training.

The Nautical Institute says that discrepancies have arisen between flag states' regulations and training that is aimed at meeting the IMO standards, and that these discrepancies have led to a concern that training might risk not meeting the minimum standards – something it says is of great concern to the shipping industry.

There are two key dates for ECDIS this year – in January 2012 ECDIS training regulations came into force as part of the STCW 2010 Manila amendments and, from July 2012, mandatory carriage requirements start to be phased in.

The organisations supporting this guidance say that they want the industry to understand that ECDIS must be taught in the context of navigation, rather than just ECDIS operation, and that ship owners and operators will require those who have taken generic training to be capable of demonstrating, in full, the competencies required by the IMO.

The shipping organisations that have endorsed this guidance are demanding a thorough generic training course (unlikely to be less than the IMO recommended 40 hours) and effective familiarisation of onboard equipment for all watchkeepers prior to taking charge of a navigational watch.

They have also emphasised the need for watch-standers to demonstrate all IMO identified competencies and to maintain these competencies – including familiarisation with any updates or alterations.

"ECDIS is a complex system and will be one of the most essential tools for supporting mariners in their efforts to ensure the safety of navigation and protection of the marine environment," commented James Robinson, president of The Nautical Institute.

"Shipowners must not assume that an ECDIS course certificate is enough to ensure safety and shipmasters should work with their bridge teams to ensure that ECDIS best practice and company procedures for familiarisation and use of the ECDIS are continually maintained."

Guidance on ECDIS training

The text of the guidance document follows below:

Being aware that the implementation of Electronic Chart Display and Information Systems (ECDIS) has given rise to confusion in regard to ECDIS training, an industry group, organised and coordinated by The Nautical Institute and comprising leading international shipping industry organisations, held a series of meetings in order to produce this guidance on issues of training and competency for ECDIS.

A wide range of industry bodies have backed the ECDIS training recommendations

The 2010 amendments to the STCW Convention for ECDIS training will not take full effect until 2017.

Therefore in accordance with best practice it is recommended that approved ECDIS training be undertaken as soon as practical to ensure that all bridge watchkeeping officers meet all the competencies required by STCW prior to sailing on a ship fitted with ECDIS.

It is recognised by all signatories to this guidance that ECDIS, as defined by the International Maritime Organization (IMO), when implemented will be one of the most important navigation and decision support tools.

The complexity of ECDIS should be recognised and the ability of a watchkeeping officer to be competent and confident in operating ECDIS as part of the shipboard navigational system is essential for safety, security and protection of the marine environment.

The regulatory requirements for Generic Training and Familiarisation in ECDIS are covered by various international instruments including the IMO STCW Convention, the ISM Code, SOLAS and also by national laws.

The industry also recognises that compliance with these regulations including the required competencies are increasingly being examined by external parties including Port State Control, insurance inspectors, charterers and accident investigators.

The industry organisations recognise the following definitions for ECDIS Training:

Generic ECDIS Training: ECDIS training to ensure that navigators can use and understand ECDIS in the context of navigation and can demonstrate all competencies contained in and implied by STCW 2010.

Such training should ensure that the navigator learns to use ECDIS and can apply it in all aspects of navigation, including the knowledge, understanding and proficiency to transfer that skill to the particular ECDIS system(s) actually encountered on board, prior to taking over navigational duties.

This level of training should deliver the competencies at least equivalent to those given in IMO Model Course 1.27.

Familiarisation: Following the successful demonstration of competencies contained in the Generic ECDIS Training, familiarisation is the process required to become familiar with any onboard ECDIS (including backup) in order to assure and demonstrate competency onboard any specific ship's ECDIS installation, prior to taking charge of a navigational watch.

The industry further endorses the following issues pertaining to ECDIS training:

All watchkeeping officers must be competent in the use of the onboard ECDIS prior to taking charge of a navigational watch. An implicit element of continual competence is the ability to demonstrate that competence.

Familiarisation pertains to any ECDIS onboard including any backup systems. This includes any pertinent information required for the safe operation of the ECDIS including all updates and alterations.

Focus should be upon achieving and demonstrating the necessary competencies, rather than time spent on training or achieving certification alone.

There are a wide range of training methods and tools available that can be used, alone or in combination, that may contribute to a navigator's competency. Familiarisation should be structured, specific to the onboard equipment and its arrangements and should be complementary to generic ECDIS training.

In order to meet the competencies identified in the IMO Model course (1.27) 'The Operational Use of Electronic Chart and Information Display Systems (ECDIS)', the minimum training time is unlikely to be less than the IMO recommended 40 hours, and assessment of competency should be conducted by a suitably trained instructor/assessor.

The competencies contained in Model course 1.27 should, for trainee OOWs, be incorporated into the STCW Officer of the Watch II-1 Navigation at the operational level training.

The requirement for familiarisation is recognised under the provisions of section 6.3 & 6.5 of the ISM Code which requires not only effective training, but familiarisation of equipment and regulations with respect to safety and emergency related duties.

Pilots should be able to demonstrate the competencies contained in Model Course 1.27, however pilots should not be expected to meet familiarisation requirements. It is recognised that manufacturer provided tools for structured onboard familiarisation will enhance and possibly add value to onboard ECDIS.

Recommendations

In concluding the guidance document, the supporting organisations offered the following five specific recommendations to ensure that adequate standards are achieved in ECDIS training:

1. Ship operators are recommended to recognise the critical importance of ECDIS for navigational safety and ensure that crew competency is achieved and maintained.
2. ECDIS trainers should take the contents of this document into account and ensure that their courses deliver at least the competencies for navigators which have been identified by the IMO.
3. Equipment manufacturers should take the contents of this document into account, are urged to recognise their role in the familiarisation process and to work with ship operators to meet their needs.
4. Flag States are encouraged to note this document and to consider its content when developing requirements and guidance for ECDIS.
5. Port States and other inspection/auditing authorities are encouraged to provide appropriate ECDIS training to their staff.

DS

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ECDIS training – past, present and future

The demands for ECDIS training are increasing, but so are the options available to shipping companies looking to make sure that their crews are adequately trained in the use of this soon to be mandatory equipment, *writes Björn Röhlich, MSG MarineServe*

Since the rolling time frame for ECDIS implementation has already started, shipping companies and crewing agencies have to prepare their nautical personnel.

ECDIS training actually requires two components: generic training and equipment-specific training, generally described as type-specific training.

Training requirements are nothing new: in 2000 the IMO introduced its IMO Model Course 1.27 for the 'Operational Use of Electronic Chart Display and Information Systems'. This generic ECDIS training was designed to be held in a classroom environment during a 40-hour course. A new edition of this Model Course is currently under review as STW43/3/1 by the IMO.

They then published the INTERIM GUIDANCE ON TRAINING AND ASSESSMENT IN THE OPERATIONAL USE OF THE ELECTRONIC CHART DISPLAY AND INFORMATION SYSTEM (ECDIS) SIMULATORS (STCW.7/Circ.10, June 2001).

In spite of these initiatives, ECDIS training was not included in the STCW Convention and Code for a long time.

This led to inconsistencies in the regulations from the various Flag States: for the Isle of Man and United Kingdom registered ships, for example, it was mandatory for the navigation officers to attend a Flag State accepted IMO Model Course 1.27 or an MCA approved generic ECDIS course; other Flag States like Germany did not require any kind of ECDIS training and therefore did not certify the courses; and some Flag States, like Cyprus, certified the IMO Model Course 1.27 for Greek training institutes but with the certificates expiring after a period of 5 years.

With the changes to the STCW Convention and Code (also known as the Manila Amendments), ECDIS training becomes an integral part of the nautical officers training scheme, starting January 2012.

Within the next five years every officer serving on an ECDIS equipped vessel must have attended a generic ECDIS training, which is accepted by his home country and the Flag State of the ship in which he/she is serving.

This is certainly a step in the right direction since the quality of the ECDIS training provided worldwide varies from a three-day classroom course up to a five-day, 45-hour course. In some cases sailors get on-board training with an IMO Model Course 1.27 certificate but have never touched an ECDIS before.

Training providers

Looking at the various training providers, you will find excellently equipped facilities with ECDIS classrooms and individual simulators for each student, but there are other training providers who teach up to 30 students in a beamer equipped classroom with only one ECDIS, reading the manufacturer's manual page-by-page.

Within the next five years every officer serving on an ECDIS equipped vessel must have attended generic ECDIS training

Manufacturer approved, high quality, training providers are hard to find in some parts of the world.

The training equipment and method used, however, is just one step on the way to a successful ECDIS training. Much also depends on the knowledge and teaching skills of the instructor and the quality of the courseware in use.

Some ship owners have experienced problems with well-equipped training centres because the instructors are either too old, and have therefore never sailed with ECDIS before, or are young officers lacking training experience due to the fact that they are only filling in during their shore time.

Accidents involving vessels, like the CFL Performer, Cosco Busan, LT Cortesia and the Pride of Canterbury, show the pressing need to not only invest in the right equipment and paper work, but to make sure that the crew really has solid knowledge of the equipment in use.

This is not, however, only about accidents: it is also about safe administration. Keeping all charts updated, loading new charts and applying T&P notices needs to be learned in order to avoid a deficiency that can be noted by Vetting or Port State Control.

In a recent study, Germanischer Lloyd pinpointed that most of the deficiencies reported were due to a lack of knowledge in the field of navigation.

Some of this knowledge can be acquired by attending an equipment specific training course.

In the past this was a non-regulated obligation for the ship owner, implicitly mentioned in the ISM Code, the Paris MOU and required by vetting.

The content of the equipment familiarisation was not described and certificates could be issued by anybody (there was a situation some years ago, when a distance learning provider with no manufacturer course training issued type-specific training certificates even though no tutoring was provided and based solely on an exercise sheet completed using the ship's equipment).

Much of the knowledge was, in fact, simply acquired through trickle-down training from one officer to another with the event being recorded by a note in the ship's logbook.

In 2011, however, the MPA issued circular No. 3 of 2011, which was followed by the MCA's MIN 405. Both documents place much of the responsibility for training on the ECDIS manufacturer.

The MCA requires, for the ECDIS ship-specific equipment training, that "it should build on an approved generic training course and be delivered by the manufacturer, the manufacturer's approved agent or a trainer who has attended such a program."

MPA also requires an approved generic course and in addition points out that "the navigating officers should be provided with training on the specific make and model installed on their ships. This equipment-specific training can be supplied by the shipping company itself as part of ship familiarisation, using the services of trainers appointed by the manufacturer or the manufacturer's agent."

Since the new STCW Convention and Code implicitly requires a lot of practical know-how from the navigator, it is very likely that more and more flag states will issue similar national regulations in order to ensure a certain minimum quality in the equipment-specific training.

As on many occasions in the past, the MCA has already set a high standard by requiring the following topics to be covered during such equipment-specific training:

- familiarisation with available functions
- familiarisation with the menu structure
- display setup
- setting of safety values
- recognition of alarms and malfunction indicators and the actions to be taken
- route planning
- route monitoring
- changing over to backup systems
- loading charts and licences
- updating of software

Taking these topics into account it becomes obvious that the training has to be done on a live, running, system and that it is therefore very necessary to invest two full training days.

Manufacturer involvement

In the past, selling the equipment and conducting maritime training was generally split between the manufacturer and independent training providers. Certainly, every ECDIS manufacturer should be able to offer equipment specific training but not all of them got seriously involved in Flag State approved generic ECDIS training.

With increased system complexity on board modern vessels and the lack of standardisation, however, the transfer of know-how from the ECDIS manufacturer

to the navigation officer on board becomes more and more critical.

The approaches to the whole question of training vary considerably: some ECDIS manufacturers have set up their own training facilities, some of which now cover a much broader training programme than originally conceived and are achieving independent status; one has created a network of approved training providers for its own equipment; others are outsourcing the work to vetted and approved training providers; and some, in the face of the high demand, do both.

Training providers, too, are gearing up to meet the demand by installing ECDIS units and/or simulators to meet the type-specific training requirements.

All of these solutions, however, are not able to change the fact that the training is classroom based and therefore restricted in terms of the numbers that can be handled: they are qualitative solutions and not quantitative and represent a high cost factor to the client in terms of time and money.

One manufacturer has already recognised this disadvantage and is now selling ECDIS training, including ECDIS training courseware and instructor courses, to the shipping companies direct and has also started to utilise its own local offices for training.

Other manufacturers solve this challenge by partnering with local independent training providers. This certainly saves travel costs for the crews and leads to a situation where the manufacturer with the most training facilities gains a competitive advantage.

Given that MCA still insists on the use of original hardware, these providers either offer the customer the possibility of receiving training on a wide range of manufacturer's equipment in large, fixed location, training facilities or, in one particular case, ECDIS training is provided using a laptop-computer based classroom that is fully mobile, allowing the provider to conduct training in its offices, on-site or wherever the customer wants.

In order to ensure the quality and to comply with MPA and MCA requirements for official manufacturer approval, your training provider should have signed official partnership agreements with all his offered brands.

A minority of these providers has also addressed the DoE issue and, together with the relevant local authority, achieved accreditation for type-specific ECDIS training.

Going online

Today, experienced training providers are trying to deliver the best possible support to their clients, providing ECDIS consulting and giving post-course advice. The challenge in the immediate future will be the multiplicity of equipment and interfaces, the demand for training and the costs that this combination will generate.

One of the independent providers has tackled this problem by broadening the manufacturer training network concept to a training provider network such that its manufacturer approved courseware can be offered through its partners to achieve standardised, high quality training.

Using a modular course structure, they offer a standardised generic component that can be individually combined with a type-specific component for the different ECDIS brands offered.

To make this available worldwide, it has launched a training consortium in which all partnering training institutes receive a detailed instructor course, are regularly audited to ensure the quality and work to the one set of course material. Such a training alliance also offers global training capacities to smaller ECDIS brands.

This modular approach is very interesting, as it generates the consistency of a single learning platform.

Such an approach has been used by one particular provider offering online training which provides training on the live, running, OEM software and requires the single platform to permit delivery using a web-based solution. Most major manufacturers' ECDIS equipment can be offered using a free play or a guided training mode, which is followed by candidate assessment leading to certification.

To cover the certification requirements, all test results, feedback forms and copies of each certificate are kept in a centralised database. The authenticity of each certificate can be checked via an automated system using a smart phone camera and a 3D barcode, which eases the work of a vetting or Port State control inspector.

Using an online system the sailor can familiarise himself at home before joining the vessel and training institutes only need to invest in one ECDIS classroom, which allows them to provide ECDIS generic and type specific training for a much wider range of manufacturers than would otherwise be the case.

From the point of view of the individual sailor, the owner or the crewing agency, this saves a lot of travel time and money; from the point of view of the training institutes on the other hand, this enables them to offer ECDIS training for a wider variety of ECDIS manufacturers without incurring the investment costs that this would normally entail.

ECDIS training is changing today: in the age of electronic communications and games, the teaching methods need to move with the skill set of those coming into the industry. In the end, it will certainly become more professional and the officer on-board will feel more confident using ECDIS to its full potential. DS

About the author

Björn Röhlich *is managing director of German maritime training provider MSG MarineServe, having formerly been global training manager at Transas Marine as well as serving as an officer with the German Navy. Mr Röhlich holds a business degree in marketing and international human resources from the Helmut-Schmidt University in Hamburg and is a certified project-manager.*

Multifunctional awareness

The concept of multifunction displays, combining elements of the various navigational systems onboard ship to create a comprehensive information display, has been around for some time – but the practicalities of optimising for various functions on one screen need to be considered, as *Dr Andy Norris explains*

The possibility of creating a ship's situational awareness display was first put forward some years ago. The basic idea then was to replace separate radar and electronic chart displays with a single unit, allowing the complete navigational situation to be more easily observable.

Depending on the navigational information required at any particular moment, the user could readily optimise the displayed view, such as by simply changing scale.

The outputs of the basic navigational sensors, for instance gyro, log and depth indicator, would be continuously displayed and there would be ready access to enable the control of advanced functionality, such as a track keeping system.

This single display would become the primary means of navigating the ship and, being multifunctional, would be instantly reconfigurable to facilitate any situation-specific action.

Integrated navigation systems can consist of a number of displays, that can be set up in the optimal configuration required for current operations

With time, this somewhat over simplified concept has evolved into more detailed thinking, which has been generally consolidated into the 2008 revision of IMO's performance standards for integrated navigation systems (INS).

However, the concept of using situational awareness displays frequently resurfaces, perhaps because of the growing availability of ECDIS and chart radars.

They can apparently be set up to give very similar information and so why don't we just combine their functionality into a single display, which can be used for all situations?

In fact, one essential difference is that the ECDIS display requirements are optimised for route monitoring but a radar display is optimised for collision avoidance.

Significantly, no chart information is permitted to be obscured on an ECDIS by overlaid radar data, including tracked targets. Conversely, on radar no radar-derived data can be obscured by ENC information.

The implication of all this is that if collision avoidance decisions are taken on an ECDIS then critical target information may be missed. If route monitoring decisions are made on a chart radar then critical ENC data may not be taken into account.

It is conceptually very difficult to resolve this conflict but it becomes a non-issue when it is realised that route monitoring and collision avoidance are parallel operations that normally require quite differently optimised displays, both of which are being regularly adjusted to meet the requirements of the specific situation.

Therefore, at least two displays are essential for situational awareness – one for route monitoring and the other for collision avoidance.

Bridge workstations

Back in 2000, IMO's Maritime Safety Committee adopted guidelines on 'ergonomic criteria for bridge equipment and layout'. They are published in the document MSC/Circ.982, which is available on IMO's public website.

The guidelines divide the bridge into activity-related areas, with the user sitting or standing at a specific workstation. Examples are the ones for Navigating and Manoeuvring, Monitoring and Communications.

The Navigating and Manoeuvring workstation is described as the "Main workstation for ship's handling conceived for working in seated/standing position with optimum visibility and integrated presentation of information and operating equipment to control and consider ship's movement."

The Circular defines 46 different functions and display items that are to be made available at the workstation, with ECDIS and radar functionality making up just two of these.

It stresses the need for highly important or frequently used information to be permanently displayed – but it also encourages display simplicity to avoid information overload, with only the necessary data being shown for any task.

Despite the specific requirements within Circ.982 for a Monitoring workstation, the Navigating and Manoeuvring workstation also has to provide a monitoring role for its user, typically the OOW. The separate Monitoring workstation is primarily intended for use by other bridge staff, such as the master, pilot or assistant watch officer.

It is quite clear from all this that the Navigating and Manoeuvring workstation is far from being a simple display, not least because of the multiple parallel tasks that are ongoing – particularly the need for adequate information to decide upon specific actions, while monitoring the overall situation.

In the computer world the term *workstation* is often used for a single computer, display and keyboard. However, the IMO use of this term is totally disconnected from its computer implications and does not imply a computer-display dominated bridge, let alone a single display solution for each bridge workstation.

Integrated Navigation Systems

The requirements within MSC/Circ.982 provide the backbone to the revised performance standards for integrated navigation systems, which are contained within MSC.252(83) and agreed in 2008.

This document starts off by defining the purpose of INS, which is to "enhance the safety of navigation by providing integrated and augmented functions to avoid geographic, traffic and environmental hazards."

It proceeds to identifying the concept of a *task station.* Unlike the term *workstation* this can often be looked at as being a single display with associated controls but is certainly not restricted to such an interpretation.

Task stations are defined as being multifunctional, allowing them to be switched to any particular task or set of tasks.

The INS performance standards emphasise that sufficient task stations must be available to at least simultaneously support the operation and presentation of the detailed carriage requirements defined within Regulation 19 of SOLAS Chapter V.

The standards particularly stress that the workstation design, layout and arrangement must follow MSC/Circ.982.

All this implies that a workstation will typically consist of a number of multifunction task stations, together with appropriate controls and auxiliary information displays, such as digital and analogue readouts.

For the Navigating and Manoeuvring workstation this is certainly necessary, as several major tasks are usually being simultaneously performed, major examples being route monitoring, collision avoidance, manual or automatic steering, display of navigational and control data, and alert monitoring management.

In particular, since it is unlikely that a single display optimised to decide on the best collision avoidance manoeuvre will also give an effective wider view of the overall situation needed for route monitoring, it calls for at least two adjacent and appropriately configured multifunctional task stations.

An additional benefit of a task station based approach is that it makes it feasible to have instant reconfiguration at the workstation level, enabling the bridge to optimally meet the different layout requirements needed, for example, when on route, during docking or on anchor watch.

All this is immensely different to the not uncommon misconception that an INS is just a term for a single display, generally configured for situational awareness but instantly switchable to perform different tasks.

On the bridge of a ship we are not particularly short of space and so there is no pressure to have a single display approach.

Into the future

Ironically, perhaps future bridge workstations really will consist of a single screen – a very large, high definition flat panel enabling the simultaneous display of optimised visual information for a number of parallel tasks.

This is functionally very similar to having separate smaller displays, but it should allow improved optimisation of the position of displayed data to better suit the particular situation and in the future could become less expensive to install and maintain than a multi display system.

However, redundancy issues would also need to be taken into account if bridge operation were to rely on a small number of very large displays.

As we go into the future it can be expected that the emphasis will be increasingly on task functionality. For example, reference will be made to the route monitoring and the collision avoidance task station, rather than the ECDIS and radar display.

A future collision avoidance task station in its normal mode would perhaps consolidate the target derived information from all onboard radars together with AIS, automatically identifying the integrity of each displayed target.

With the excellent auto clutter settings on most radars presently available, this is a very attractive route for the immediate future, especially as the possibility is explicitly mentioned in the INS performance standards.

Of course, the targets would also be available for display on the route monitoring task station but quite different selection criteria would generally be used, ensuring that the visibility of critical chart information was not compromised and that the screen does not become over-cluttered.

Maybe we should already be using the terms route monitoring and collision avoidance displays rather than ECDIS (in route monitoring mode) and radar to better reflect their use – and minimise misuse? DS

Dr Andy Norris has been well-known in the maritime navigation industry for a number of years. He has spent much of his time managing high-tech navigation companies but now he is working on broader issues within the navigational world, providing both technical and business consultancy to the industry, governmental bodies and maritime organizations. Email: apnorris@globalnet.co.uk

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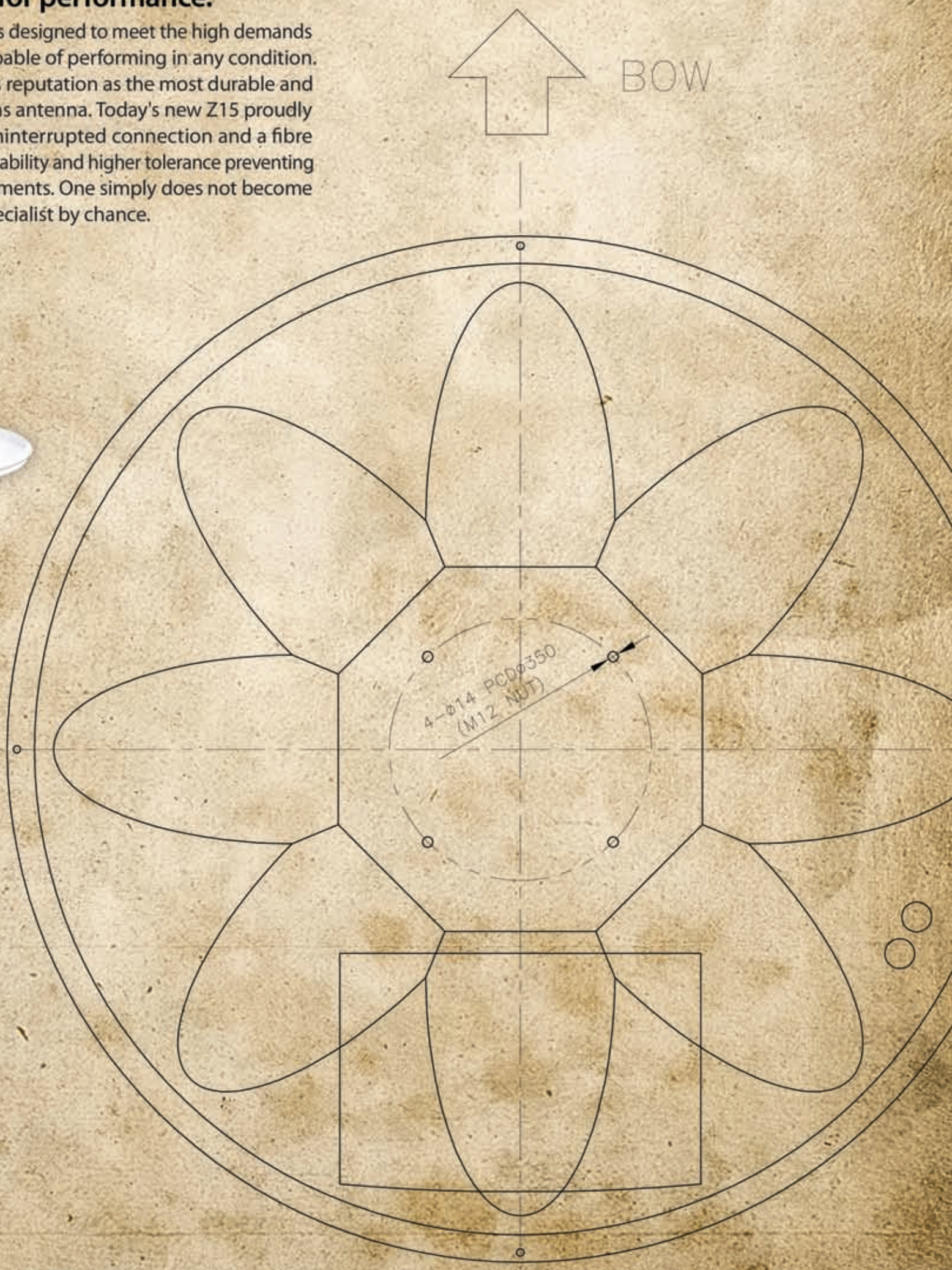

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