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A new approach to seafarer training

In any field of training, gaining the attention of the trainee is half the battle. At the *Digital Ship* Hong Kong conference, Captain Pradeep Chawla, of Anglo-Eastern Shipmanagement, outlined his company's newest weapon to focus the minds of today's prospective seafarers.

IN A PROVOKING and imaginative presentation to the assembled crowd at the *Digital Ship* Hong Kong event, Captain Pradeep Chawla, director of quality assurance and training at Anglo-Eastern Shipmanagement, extolled the virtues of IT, KPIs and TMSA, while questioning the quality of maritime software and the exploitation of seafarers by communications companies. But the main focus of his speech explored the issue of seafarer training.

"The problem is trying to get people to sit through 20 minutes of PowerPoint", Capt Chawla suggested to the audience. At this point he showed an extract from one of the videos used by Anglo-Eastern as part of their training regime, which features attractive women to hold the attention of the trainee. It certainly grabbed the attention of the assembled representatives of the shipping industry.

"Training is incredibly important, and if it requires a beautiful girl to do it better, we'll hire a beautiful girl", he said. "Girls are used to sell whiskey, cars, cigarettes - why not shipping?"

Capt Pradeep Chawal, director of quality assurance and training, Anglo Eastern Shipmanagement

"The students are usually young men, and this is a good way to grab their attention. My job is to get the message across and I am prepared to use any means whatsoever. There were 4,500 people trained in 2004 - a record. Already, up to August 2005, there have been 3,019 people trained."

Computer Based Training

Capt Chawla also talked about the problems that he has seen in some of the existing simulator training programs.

"The problem with CBT (Computer Based Training) systems is that they are too expensive, and they have a low awareness level", he said. "Annex VI has come around and has six chapters. It's not what ship managers need. Ship managers are making their own problems."

"The problem with CBT is getting the attention of the people. You can have the best gadgets in the world, but if your people aren't well trained you're flogging a dead horse."

"We had many fights with the vendors, to make an engine simulator. Now we have a liquid cargo handling simulator", he said. "We wanted one control panel for different ship types. Making large touch panels with a control panel was a nightmare."

New Technologies and KPIs

Capt Chawla wants to see the maritime industry become more proactive in the uptake of new technologies. "IT systems are no longer the indulgence of big companies", he said. "Software companies have improved in the maritime industry."

"Now it's all about harnessing information, analysing information, and making rational decisions based on that information. The last decade has been about gathering information and putting it in an easily readable format. IT is part of every organisation now."

"Look at TMSA", he continued. "Look at what it has brought about in the tanker industry. Knowledge management - that's what websites are all about. You have forms going up and down. TMSA has brought about a new awareness."

The use of Key Performance Indicators (KPIs) to measure performance and plan for improve-

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ment was an issue that received a lot of attention and support at the conference. Capt Chawla also believes that KPIs are important, and becoming more accessible.

"KPIs are the buzzword of this year", he said. "They can be churned out by the system using the new technology. IT is reaching the stage where it's part of each aspect of a shipping company."

A raw deal in communications

But despite the improvements that have been made in shipping technology, Capt Chawla feels that this has also led to instances of opportunism on the part of some communications system providers, particularly in relation to the seafarers themselves.

"Crew is getting a raw deal for phone calls to loved ones", he said. "There's a lot of clever marketing going on - and this also seems to be an area of growth for some coastal states. I think it's a disservice to seafarers - some revenue models need to be changed."

"Seafarers know if there's a minimum one minute charge. It's charging for 6 seconds instead of 1 second that's a big problem."

Broadband connectivity was another major issue at this year's conference, with different parties explaining their views as to the future implications of continuous, high-bandwidth services. Capt Chawla was somewhat sceptical about the current market.

"I've heard of charges of $2,800 for this", he said, referring to the Connexion by Boeing monthly, 2,000 minute package. "But I don't think a lot of shipowners are willing to pay that. Will it happen at $2,800, or $2,500? I think that's a slow cycle of selling."

"We have all seen systems where if you only change one word, you only send one word. All PMS systems will only send data changes. We can work around 24 hour connectivity if we have to."

Poor quality software?

Capt Chawla also questioned the quality of some of the available software. "Is software really tested to a quality standard?" he asked the audience. "Is it being sold 'before the cake is baked'? Then the fine print of the contract says 'but this…'. We say ok, we made a mistake once but we're not going back to you."

"The mean time between failures is still an important issue for superintendents", he continued. "Technical support from IT vendors is still very poor. The winners will be the people who take this seriously."

"A shipowner doesn't get rid of a radar until it breaks down. I want to say in the COMSAT council - 'it should last for 15 years, and not 8 years'. At IMO you have to plan 10 years ahead."

Capt Chawla concluded with a plea for an increased focus on safety using the technology available. "Oil majors are the major force for safety in shipping", he said. "You can't say that standards on a tanker have to be better than standards on a cargo ship - it doesn't make sense."

Perhaps a brunette in a mini-skirt will prove more effective at getting this message across to tomorrow's seafarers than the traditional methods have done. DS

3rd Annual Digital Ship Hong Kong Conference - Satellite Communications

The Excelsior hotel in Causeway Bay, overlooking what has been the world's busiest port during the last decade, was the scene of the 3rd annual *Digital Ship* Hong Kong conference, a forum for some of the world's leading ship owners, managers and IT providers to discuss the issues and challenges facing the industry today

THROUGH ALL of the provocative presentations, probing questions, and revealing answers, a few key issues emerged time and again as the major points of interest and concern at the **Digital Ship** Hong Kong conference, and were the subject of vigorous debate between both vendors and users of shipping technology.

The newest buzzword on the block for those involved in fleet management seems to be KPIs (Key Performance Indicators). As has been the case with land based industries for some time, using KPIs to measure a company's performance and focus efforts for improvement is becoming an increasingly important part of modern, efficient ship management. With the added focus on these indicators, ship managers are calling for improved technology to assist in the collection of the data necessary to compile this information, in an efficient and easy to use fashion.

The Excelsior Hotel, Hong Kong, was the venue for our latest gathering of shipping company IT anagers and suppliers to thrash out knotty issues in modernising the maritime industry

A further extension of this issue lay in the recurring theme of 'measurability'. Many ship operators laid the gauntlet down in front of technology vendors, saying that their products needed to create a demonstrable and measurable improvement in performance if they were to be accepted as essential equipment on their vessels. Some vendors countered by saying that the ship managers themselves were not doing enough to measure and analyse their business, and that a lack of measurability of business items was a function of their own lack of investment in an IT infrastructure.

Broadband connections

The "will we or won't we" debate about the need for broadband connectivity on ocean going vessels also continued unabated, with various parties making their case as to why they feel that a broadband connection is an essential, or unnecessary, addition to a ship's communications system. This point was the basis of the first session of day one at the conference, which explored the latest developments in modern satellite communications and the providers' moves towards increasing high-speed services.

The session opened with the remarks of Ubaya Nandasena, technical department, Neptune shipmanagement. "We've come a long way with communication systems", he said. "But the lack of sufficient bandwidth, and poor data communication, is the biggest problem facing shipping today."

"The shipping commu-

nity eagerly awaits new technologies, and various broadband options - but the bottom line is always cost", he continued. "Unless market forces drive the cost down, maritime broadband won't be feasible."

With that it was left to Arthur Bowring, managing director, Hong Kong Shipowners Association, to welcome all comers to the event, and open the conference by inviting the first speaker to the podium, Patrick Slesinger.

Patrick Slesinger, Wallem shipmanagement

The keynote speech of the morning was delivered by Patrick Slesinger, chief information officer, Wallem shipmanagement, with the overriding message that "not all data is created equal."

Patrick Slesinger, CIO, Wallem Shipmanagement

"We started in 1993, and at that time we had to buy a hub - there was no public messaging system", he said. "We wanted to be able to integrate ship-shore and shore-ship communications, but with a flexible system that could change to different ship managers or owners. It started with e-procurement, which was the first application we put across our data pipe."

"But not all data is created equal. Some data is needed in real time, some at the end of the week, some at the end of the month, some at the end of the quarter. There are static data and dynamic data."

"It's a question of: Why do we need data? Where do we need it? People tend to forget that. There's a rush to get stuff to shore, and then it sits in someone's inbox for a week. You need to ask: what's the commercial driver for having this stuff online?"

'Pull' or 'Push'?

Mr Slesinger then moved on to how the industry seems too centred on 'pull' rather than 'push' applications. "Pre-MPDS we had 'push' enabled messaging with Inmarsat C, though we hadn't optimised it. But if a vessel wanted information it would connect of its own volition. Why is always-on required?"

"We've had the technology to do push enabled applications for some time, we just haven't utilised it. MPDS is a good way to work it out if a pull is required - it's an enabling technology. But maritime applications have been engineered to take advantage of push. We have an enabling technology in front of a business need."

"Why should we do it? Because we can? No. Doing things for the sake of doing things is not adding value."

"A store and forward system creates resilience. If we put a process in place we need resilience. What's the point having a process if the connection goes down?"

Mr Slesinger remarked that people need to put more consideration into what data they're sending, and why. "When a 56k modem was fast people thought about how much data they were sending, and they wrote applications for that. But now that's gone, and people have programs with a minimum operating requirement of 1MB of RAM. We've also talked to LESOs about a packet counter, to make sure that people don't put in 'chatty' applications."

"It's a question of picking the right method of communication for the right

job. If something says 'value, value, value' along the supply chain, it makes sense to send it. Correct data, correct time, correct place. If it was done right, dynamic data would only be sent out at the right time."

Cost and value

He then changed tack to look at costs, and the hidden costs of communications systems, paying particular attention to VSAT. "I'm not anti-VSAT", he explained, "but I am concerned about how it's being sold. There is no such thing as free bandwidth. If two people are talking on the phone it could be costing $100 (if the people are being paid $50 per hour).What's the real cost, even if your bandwidth is free?"

"You don't cap your cost by using VSAT, you just set your minimum cost, not your total spend." Mr Slesinger also suggested that VSAT costs could, in future, be linked to Inmarsat costs.

Not all applications are suitable for shipboard use in Mr Slesinger's opinion. "Shore based applications are shore based applications. Why would you want to use shore based applications on a vessel? Because you can? If you optimise your processes to work 'always on', then you need it to be always on, and you'll have to pay for redundancy to make sure."

In concluding, he returned to the main point of his address - value. "We should be communicating to add value. If you can't answer the 'what, why, when, where' questions, then probably the data shouldn't be sent. I'm sure, in the future, there will be a 'killer' application - but I haven't seen it yet. I assume it will be plastered in one million font on the front of *Digital Ship* when it does come out."

"We mustn't get seduced by 'it's new, it must be better'. If we are smart with enabling technologies we can add enormous value. The best way to get value is, irrespective of the price of a minute, look at the value added."

To illustrate this point, Mr Slesinger gave a personal example. "I had Windows 97 on my computer, but I couldn't use more than 20 per cent of the functions in it. Now we have Windows 2003. Will I get value out of these features?" he said. Looking for value in every process - Mr Slesinger believes that this is the key to efficient modern communication.

Captain Subramaniam, Eurasia Training Institute

The session continued with a speech by Captain Subramaniam, general manager and principal, Eurasia Training Institute, Mumbai, exploring some of the real life effects of communication systems on board ocean going vessels.

"Some landlubbers think that life on board a ship is a comfortable and easy-going one", he said. "But that's not the case. Seafaring is a highly technical and skilled profession. It requires teamwork and leadership - you can't have one without the other."

"And communications can annoy and disturb people", he continued. "People start to think that phone calls become more important than the man in front."

The Digital Ship Hong Kong exhibition

Changes and improvements in technology have created new challenges for seafarers. "Increased technology means increased training", said Capt Subramaniam. "Crew skills now have to be integrated due to the decreases in manning levels. Certificates of Competency (CoC) are for only for safety - that's the only concern of governments. But the shipowners' intention is to make a profit."

"Seafarers must fully understand that they perform an important role and have a huge amount of responsibility. They are an integral part of the management of the vessel and we need to integrate them well within our shoreside activities."

"We treat the ship like a floating factory", he continued, "but instead of manufacturing goods it transports them. VACs (Value Added Courses) are for managers and owners who want to do much more than required. But we still have bridge team management where some people are doing no jobs."

Capt Subramaniam then talked about some of the training that's now available. "We work on accident analysis, and then create simulations of the accidents to show how they happened and how to prevent them."

"These days, seafarers need to know about everything to do with the ship, and the budget, and so on. With the latest training, they are getting the chance to ask the questions they can't ask anywhere else."

Robert Johnson, Inmarsat

The first representative of the satellite companies took the stand when Robert Johnson, director of maritime, Inmarsat, delivered his speech outlining the possibilities that will be enabled by the launch of the company's newest I4 satellites.

"Hardware choice", he said, "is a key issue for the shipping industry. At Inmarsat we have the largest commercial satellites ever launched. The new satellites have 16 times the capacity and twelve times the efficiency of the previous generation. With other operators you can be limited with your hardware - with Inmarsat you have a choice."

"There are questions you need to ask your satellite company", said Mr Johnson. "Ask them about service providers, back up services and equipment, and LESO backup and support. Can they prove it works in all conditions? We did intense trials with Fleet products before we put them out for commercial launch."

"Vessels work in the real world - and things happen out there", he continued. "When things happen, will you still have coverage? We have 10 satellites, which allow for redundancy if something was to happen. We're kept on our toes by the IMO, who require us to have 99.9 per cent availability as part of GMDSS safety requirements. We are available everywhere, in all conditions - if that's important to you, then Inmarsat is important to you."

Mr Johnson also mentioned the advantages of having a network as widespread as Inmarsat has. "The benefit of the Inmarsat system is that you do have a choice, and it's also easy to put in and take off. It's a standard. When you have Inmarsat you don't have to re-train your guys."

"Communications with our equipment can be by packet or voice", he added, to illustrate the options available. "You can't have both at the moment. But there is call waiting, which you are able to control."

As for the future, Mr Johnson envisioned an increase in bandwidth. "Where are we going? Into broadband. We will start in November in the land mobile market, followed by aeronautical, with the maritime market coming in 2007. We will offer up to 432kbps packet data, with simultaneous voice and IP. We will have up to 256kbps streaming, and there will be a clear conversion path for existing Inmarsat products."

In conclusion, Mr Johnson asked the audience to "take a breath and ponder what you want to do, and the hidden costs of other systems. 71 per cent of Rydex vessels put out under 700kbs per day. You do not need a contract. Existing services have packet pricing options, so you can cap your costs. Choose a package which meets your 600kbs requirements."

Dharmendra Shirsat, Iridium

Dharmendra Shirsat, Iridium satellite director, maritime vertical, was the next satellite representative to make the case of the communication system vendors. He made the point that it is incumbent upon each company to calculate their effective bandwidth rate based on their own needs, and to choose the services they need based on that.

"More than 50 per cent of the shipping companies that were surveyed during the *Digital Ship* Cyprus conference this year used 1 to 5MB of data per month", he said, as an example of vessel communications requirements.

At present, according to Mr Shirsat, Iridium offers the lowest cost crew calling rates in the market. Total maritime traffic accounts for 40 per cent of their revenue from all markets.

They also allow for the transmission of free SMS messages to the ship, and will be launching a fax service in quarter four of this year. Mr Shirsat also says that their service offers voice data tracking and SSAS as an 'all in one' package.

"Iridium is a narrow band service", he said, when asked about the company's position in relation to its competitors. "The surveys showed that a lot of the generated data onboard is not sent between the ship and the shore. The actual cost of sending the data must be calculated."

Richard Nordstrom, Connexion by Boeing

Connexion by Boeing was the last company to present their view of the future of satellite communications with a presentation by their director of maritime sales and marketing, Richard Nordstrom.

"I first want to challenge the perception of the 'always on' connection", he opened.

"The connection is not quite always on, but an extremely fast connection can be said to be 'always on'."

He continued by referring back to the lack of 'killer applications' in the maritime industry, a point raised by Patrick Slesinger in his earlier speech. "We challenge the service providers to provide these 'killer applications' - we've provided the conduit for them to operate. It's about the evolution of technology - if you're always 'in the box', you'll never know what's going on outside."

Mr Nordstrom gave a description of the purpose of the company. "We design, manufacture and build mobile platforms", he said, "and we now have up to 150 flights every day with Connexion by Boeing wi-fi in whole aircraft. I hate it when I get to a hotel tired and I have to do e-mail, but this technology allows you to move that effort back to the flight."

"You can discipline how you use the technology", he continued, "and you don't have to be online for the whole flight, which is what a lot of people think."

"Mitsubishi Electric builds the hardware", he added, when describing the equipment. "They also build stabilised antennae for the Japanese navy. It works with a VIASAT modem, with a customised waveform. We know it has to be global and seamless."

The Connexion system allows for the transmission of 2000 minutes of data per month, at a price of $1.40 per minute (a monthly total of $2800). Any additional minutes are charged at $1.25. Voice transmissions will be charged at $1.30 for the first 100 minutes, and $1.25 thereafter, with billing recorded in 15 second increments. There is also an allowance whereby vessels within the same fleet can transfer unused minutes from their monthly 2,000 to one another if they have one vessel under, and one over, their allocation.

The advantage of this system, according to Mr Nordstrom, is that "you can mix it any way you want." By this he means that each minute of time can host a bundle of separate transmissions added together. "You could have 10 people all making phone calls simultaneously for 10 minutes - but the charge would just be for 10 minutes, not 10 by 10", he said.

Mr Nordstrom went on to further explain the Connexion services. "We also offer 4 channel TV coverage through our system, and it is planned to be able to offer this in maritime in 2006. It will use an MPEG 4 stream, 4 seconds late for encoding but essentially live. And the TV stream does not use up any of the 2,000 minutes, it is included in the monthly fee."

Full scale in maritime

Full scale operations in the maritime market haven't commenced yet for Connexion, who are currently in the process of selecting vendors for their product. "We will be geographic in representation and vertical in market", said Mr Nordstrom. "We don't think you need 26 LESOs and 400 ISPs knocking on your door selling the same thing. We want to ensure a single thread of responsibility."

Connexion by Boeing has already done its first major maritime deal, with Teekay installing the system on their fleet. "Teekay was a hard company to sell to - they really put us through the wringer", he said of the negotiation process. The financial details of this deal have not been disclosed however, suggesting that they took on the system at the proposed $2,800 commercial rate.

When asked if this system would increase a company's costs dramatically, Mr Nordstrom answered that "it could, but you've got to consider the value process of the company. Teekay looked at line items in their budget they could eliminate because of our system. They weighed the costs."

"We're not going to benefit everyone", he continued. "We're here to provide an alternative. We give you the conduit, you decide how to use it."

Connexion by Boeing have already established regulatory relationships in 217 countries for their service, and have Ku band authorization in 147.

Panel discussion

Speed and cost were the cornerstones of the panel discussion that followed the morning presentations, showing that, for all the 'bells and whistles' that the satellite companies may wish to add to their systems, ship managers only want to be able to send the data they want quickly and cheaply.

The panel included chairman Ubaya Nandasena, G.A. Shankar, ship IT superintendent, NYK Shipmanagement, Nicholas Li, organisation development manager, Eurasia International (China), Robert Johnson, Richard Nordstrom, Capt Subramaniam, and Dharmendra Shirsat.

The bottom line was the basis for the first question: "What's the real cost of 'always on'?"

Mr Johnson replied that "once the system's installed you only pay for the data you use. It depends on the applications and the systems you're provided with. You need to look at the systems you're choosing. Be aware of what you're doing."

The question was also raised about the true speed of the connections being offered, and if they really were the 128k or 5MB that was advertised. The answer was 'no'.

"It's probably not always 128k, that's uncontended", said Mr Johnson. "It's there or thereabouts."

"You probably rarely reach the number", agreed Mr Nordstrom. "The system is dynamic, it opens for demand to give you more. As you require more and more, you'll always hit a limit and see degradation. It's the user experience that's important."

How much bandwidth?

One of the main concerns for ship operators was the amount of bandwidth a shipping company really needs to operate efficiently. Mr Li commented that "there will be a need for more data. I think we will need bandwidth."

"But there are different sectors of the market", he added. "The main thing is to have more companies, so as users we can choose."

Increasing technology to support a more technologically advanced workforce was mentioned as being an important issue, something that Mr Nordstrom seemed to agree with. "It's hard to retain good XOs. They have broadband at home, and other technologies."

"As society evolves, maritime is evolving, like it or not", he continued. "On the business side, there are costs. There is a cost in bringing in new people, it can take 6 months to one year for a replacement to reach the level of the person they've replaced."

Mr Johnson also added that "crew retention is very important. We've been doing crew calling for years. The next step is bringing GSM, that's another element that's coming along."

One member of the audience pointed out that increased technology can cause its own problems. "I know a story about a guy who was fighting with his wife on the phone while he was on watch on the bridge, and the ship ran aground. Phones on the bridge, GSM - these are just more distractions", he said.

"Teekay are aware of that", answered Mr Nordstrom, "they have a structure in place for that. You need to create a corporate environment to create value but minimise abuse, and don't compromise safety." Capt Subramaniam also recounted a story where an argument on the telephone had been the cause of $7 million worth of damage to a ship. These concerns caused one audience member to raise the issue of having a global Vessel Traffic System (VTS), which, he argued, could stop people from running aground early.

Concluding with the initial issue of the use of broadband, the current state of play was summed up neatly by one participant from the audience: "The value of high bandwidth is in data - but where are the applications?" he said. "Think about the future and advance the software to benefit the user. This will make broadband good for users."

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3rd Annual Digital Ship Hong Kong Conference - IT Applications

Shipboard IT applications, supporting shipboard computers from shore, and planned maintenance systems and purchasing systems - some of the issues from the afternoon sessions of the *Digital Ship* Hong Kong conference

THE AFTERNOON SESSION of the first day was based around shipboard IT applications, and some of the applications that are out there to make use of the satellite capabilities discussed during the morning. Chairman of the session, Paul Østergaard, CEO, ShipServ, used his introductory speech to express his feeling that the available technology is becoming more and more exciting.

"Technology will change all of our lives dramatically", he said. "There is continuous evolution, and there's a fundamental paradigm shift happening right now, into network computing. Linking ships to broadband, that's part of network computing."

"We cannot imagine the implications", he continued. "It's about creating seamless integration, integrating the whole supply chain - the implications are something we're just starting to feel now. The software is moving from intelligent design to intelligent reaction."

Aswin Atre, NYK Shipmanagement

The afternoon session began with a presentation by Aswin Atre, managing director and chief operating officer, NYK shipmanagement, who opened with the statement that "IT has been the bane of my life."

Aswin Atre, managing director and chief operating officer, NYK shipmanagement,

"I'm a cynic in the matter of IT applications, and a two-fingered computer user", said Mr Atre. "The majority of users are not IT professionals. When IT applications are designed for shipboard use they forget that the master is not trained to use sophisticated IT applications. If it's cumbersome to use they tend to reject the application."

He also thinks that the remote nature of shipping also must be factored in to application design. "On shore we have the luxury of calling an IT professional if there's a problem, and they can resolve it", he explained. "On board, if an error message appears there is no IT expert to fix it. There can be bugs in the system, and it turns out we've been sold another snake juice"

"We need to make sure that people are trained to use the system" he continued. "But these days, with the lack of availability of seafarers, it's easier said than done. I see the advantage of IT on board, but I want applications that can be used by the seafarers on board who are not IT savvy."

"I suggest that the developers use a person with limited knowledge as a guinea pig to check for easy use of the systems", he ventured. "Software companies need to use somebody like me to 'marinerise' the applications."

"Staff on board fall into 2 categories; computer savvy or not, and sometimes in awe of the systems. They shouldn't be glued to the screen for hours neglecting their duties", said Mr Atre.

"These factors need to be thought of when discussing applications. Officers can ill-afford to spend too much time on computers, and crew can't spend time troubleshooting shipboard applications. Stringent requirements and quick turnarounds are important for ships."

There was a comment from one of the audience members, who felt that shipowners must share a large part of the responsibility for any errors that occur. "There's a reality gap", he said. "Suppliers make proposals of what the crew can use. You can have a complex system, but people must understand that they can't play with it."

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Geoff Arnold, IT Maritime

Geoff Arnold, managing director, IT Maritime Pte (formerly manager, fleet management systems, World Wide Shipping), offered his opinions on how to build a better maritime communications system with the next presentation of the afternoon session.

"Are you satisfied that your marine software applications are meeting your need?" he asked. "Most people aren't. There are a few main reasons for this; the wrong application was chosen, it wasn't suitable; incorrect information was given to the vendor - Rubbish in = Rubbish out; maybe the vendor promised more than could be delivered, although this is rare; and finally poor implementation - I believe this one is key."

"Usually there is a combination of causes. There may be a lack of commitment by the user, or a lack of support from the vendor."

"So what are some ways to deliver?" asked Mr Arnold. "I think one way is comprehensive market research. One problem is that different customers have different requirements. Customisation can be advantageous to the vendor, but customisation may lead to bugs. Dialogue between the vendor and supplier is important."

"Another key point is getting regular feedback, and acting on that feedback", he said. "It's also important to have selected users do some beta testing."

"But there are things that the customer can do to improve things, like research. Look at available products and look at the end users needs. Management make decisions alone all too often. Don't rush into a final decision, and ensure that the correct information is given to the vendors."

Conversation during the coffee break

Mr Arnold then talked about the ways to ensure the successful implementation of an IT system. "You need to have comprehensive project management", he said, "where the customers and vendors' interests are addressed. If there is an external project manager, he can devote all of his time. More and more people are doing this." He also added that "the end users need to buy into the project. End users can make or break the project."

Is software overpriced?

The next item discussed was pricing. "Is maritime software overpriced? No way!" he remarked. "Why? Software includes many hidden costs, like initial development costs, marketing costs and the cost of sales. There's also the support and maintenance. An application is only as good as the support supplied with it. Good maintenance ensures continued performance."

In conclusion, Mr Arnold explained what he believes are the basics necessary for success. "We need the correct approach by both the customer and the vendor", he said. "We need the end user to be involved in all stages, and, very importantly, we need proper project management."

When the discussion was opened up to the floor, one software vendor issued a challenge to the ship managers. "This is for the customers", he said. "Can they come forward and say how much their performance has improved with software?"

The challenge met with the response; "Will software producers move to value based costing?" at which point the software vendor commented that "I've proposed to people that our fee be based on value saved, but the reply is always laughter."

Another comment was that "shipowners waste resources trying to create their own versions of something that's already out there" to which Giampiero Soncini, CEO, SpecTec added that "shipping companies making their own software is like Spectec building our own ships for our products."

It would seem that some sections on both sides of the market are still having difficulties communicating their IT wants and requirements to each other.

Dr Panagiotis Nomikos, Danaos

The final session of the day covered shipboard applications, the collection of data, and monitoring ships' performance, and was chaired by Dr Panagiotis Nomikos, president of AMMITEC and business development manager, Danaos. To start off, he referred to the differences between vendors and customers that had been demonstrated during the day's earlier sessions.

"This debate is age old", he began. "My answer is that the industry moves on. We improve the software, and the users expand their needs and abilities. Life goes on."

Moving on to talk about the Danaos system, Dr Nomikos remarked "You can have fantastic software, but if you can't implement it properly you will fail. We deliver a complete working system."

"The oil majors want to distinguish the 'true quality' operators from those operating under the minimum requirements of ISM", he continued. "KPIs and TMSA are important factors in this. We need to accurately measure and report KPIs, and only an integrated software system covering everything can provide a full range of KPI metrics accurately."

He added that "different KPIs require information from a mixture of different software modules. Software can be used to manage KPIs and notify those necessary, when it's required, to fix a KPI. A completely integrated software solution is necessary for KPI measurement and follow-up."

"A single vendor is imperative for KPIs" he continued. "It's impossible to do KPI metrics if you have a system from different vendors. You need the software to measure your own company's information to set against your own KPIs, set against the benchmarks. The company decides its own KPIs, we just give them a way to measure."

With regard to TMSA, he said that these standards should be expanded to other ship types. "It's next to impossible to

do this with Excel", he said. "You must have state of the art IT. TMSA explicitly says you must have computerised vessel maintenance."

"You can also use this system to show an auditor that, although you had a problem, you took corrective action", he added.

Jennefer Tobin, Datatrac

Jennefer Tobin, managing director, Datatrac, gave the next presentation of the day's final session, to talk about some of the further options available in the field of automatic data gathering.

Jennefer Tobin, managing director, Datatrac

"You need it to monitor operational performance, improve efficiency and safety, stop equipment failure and for base line information" she said, speaking to the audience about the importance of data. "You need to capture the best, accurate data. There are two categories; automatically collected data or data with collection initiated by the person."

"Bureau Veritas says it needs 20,000 bits of information to do a hull survey", she continued, "which is an 800 page report. The data has to be collected automatically, or it will be impossible. Digital data is 'live' data, and it can be collected, moved around and exported from the ship. You can collect 'live' data by hand, or you can get it automatically from the equipment."

The future should see easier and more efficient data collection, said Ms Tobin. "In the future, we will collect data just one time, at the source. Then it can be made available on board for other purposes, and it can be analysed and reported from the ship."

"There should be no typing", she continued. "Most people aren't typists but they do it too much, picking up the skills along the way."

"But the most important thing is to be able to automatically convert the data into real information", said Ms Tobin. "We want information, not data, with the data you are just trying to peel off the information. But someone's information is someone else's data. Don't just collect it all and chuck it at some poor chap who's got to make sense of it."

In conclusion Ms Tobin outlined the four main benefits of automatic data collection; saving money, improving accuracy, reducing workload and improving efficiency.

Otto Pedersen, Palantir

"There is always something that doesn't work." These were the words of Otto Pedersen of Palantir, the next speaker to take the podium, with a presentation about monitoring and managing shipboard PC applications.

"Reporting to the management is important" he continued, and mentioned some of the important questions the crew can ask; "Can I report to management electronically? Where is my back-up? Is my anti-virus up to date? Where are my standard icons?"

"People want to keep the standards they are used to", he explained.

Mr Pedersen then expressed his belief that IT outsourcing is essential for shipping companies to operate at optimum efficiency. "Shipmanagement should just run the ship, their skill is not in IT", he said. "With IT departments, it's expensive to run the systems, and there may be a lack of resources available within the company."

"What if the network communication is down?" he continued. "Someone has done something he shouldn't do. But this time zone is bed time in the office, so they call the IT department crying, saying 'We have big gloves and should just run the vessel, we don't want to do paperwork', and the IT manager was sleeping and is woken up and is asked to fix the problem."

Otto Pedersen gives his presentation at Digital Ship Hong Kong

"IT departments never get large enough budgets", said Mr Pedersen. "But then fleet management and accounts complain all the time to the IT department, and don't buy their arguments any more, and they take control."

Costs

The factor of costs alone should convince people that they need to have a high level of technical support for their vessels, Mr Pedersen argued, saying that "three days of onboard costs are greater than twenty days of onshore costs."

"There should be predictable IT costs", he said. "There should be easy upgrades with no IT skills, and one uniform IT standard across the vessels. All systems need to be pre-loaded and tested."

"The quality assurance of the IT system must be auditable", he added. "In Norway, oil companies are auditing IT systems on vessels."

"We want one onshore server as a 'fleet IT master' with an onboard server as a 'slave'", said Mr Pedersen. "And the onboard clients should also be self-correcting. Then whatever you do onshore happens on the vessel server. We can send commands and sources by email, or if it's too big we can send it by CD. We can send a command to the active director on a shipboard server, and get a new user account."

To be successful, he suggested that "we need to manage the process, with analysis (after establishing need), proper proposal, and implementation."

In conclusion Mr Pedersen talked about his own experiences working in shipping IT. "I was in charge of the IT department of an offshore shipowner", he said. "There were 9 vessels when I started, but 27 when I resigned. With this system I wouldn't have resigned. Palantir is installed on 720 vessels. None of them has had support phone calls."

Farzin Karma, Ulysses Systems

Farzin Karma, managing director, Ulysses Systems Singapore, was the last speaker for the first day of the conference, and presented some of his ideas about how to get the most out of shipboard software systems.

"We need to maximize user convenience while minimizing the software life cycle cost", he said, outlining the ultimate goal in optimizing IT systems. "We need to address the 'what's in it for me?' factor."

He suggested that analyzing and comparing efficiency was an important step in appraising systems. "I look at the 5 Cs; Convenience, Commercial advantage (or Cost effectiveness), Compliance, Compatibility, and Capability."

"The convenience factor is important", continued Mr Karma. "A system is only convenient if the perceived effort of using it is more than the actual effort involved."

He illustrated this idea with the equation: Convenience factor = Perceived effort - Actual effort. For encouraged usage the Convenience factor should be greater than zero. "If the perceived effort is 5 minutes but your system actually takes 7 minutes, the user won't think it's convenient. You have to show your system is better than the perception."

"Software functionality is dependent on convenience for users", he explained. "Software cost is not just from installation and maintenance. Error correction costs are an extra cost - our studies show that it's similar to the installation cost. The training cost is similar to the purchase cost per ship, per year. The usage cost is 5 to 10 times the purchase cost."

Mr Karma also mentioned KPIs as an important part of a company's strategy. "KPIs are one of the most useful aspects of marine IT", he said. "You can't go to any meeting of maritime managers without the mention of KPIs. But relatively little attention is given to the convenience and collectability of the data needed. Faulty KPIs can have more damaging results than no KPIs."

"But no-one should need to go and enter data", he added, "it should be automatic. For some KPIs, think about how many people you'd need to have working on Excel to use the data. So be generous to your software vendors!"

Panel Discussion

The day's proceedings closed with a discussion to examining how the audience felt about their software options, in front of a panel that included G.A. Shankar, Otto Pedersen, Geoff Arnold, Jennefer Tobin, Giampiero Soncini, Aswin Atre, and Farzin Karma, with Dr Panagiotis Nomikos acting as chairman.

The first comment of the session came from the floor, saying that "Technology is moving. We want ease of implementation, ease of use. To avoid garbage in, garbage out, you need the seafarer to know that the system is easy to use and that he can use it", which echoed some of the usage concerns mentioned in the earlier session.

Another question that came from the floor concerned the level of software development in the industry. Mr Atre gave his own view; "There is a feeling that software is being put in ships for its own sake, for example, CNGs. Each ship is considered a separate project with separate software."

"We need a standard", he continued. "Software needs to be used and staff needs to be trained very well. But ship staff is not properly trained right now."

"The impression I get is that IT is not considered a strategic investment" added Mr Soncini. "In land based industries it is. It shows that our industry is not reacting to the new technology that's available."

Dr Nomikos explained his thoughts on some of the reasons for this. "It's due to lack of bandwidth", he said. "In the 80s, company branches were not connected, at that time it was hard for IT managers to convince management to increase IT."

"Now, with the internet, people realise the power of IT. Now it seems that the bandwidth problem will be solved, I think it will be mandatory for shipping companies to have highly connected IT systems. A bank today would close down if it wasn't connected."

But take-up of broadband connectivity has been slow, as Mr Soncini pointed out, saying that "I think that broadband is still far away. If 0.5 per cent of ships have broadband, I'd be surprised."

Similarities, or otherwise, with the aviation industry was another issue that came up. "Why doesn't shipping have the same ideas as aviation?" wondered one audience member. "Connectivity has been there for us for 20 years, that's not the problem with our industry. It's a matter of mentality. 9 out of 10 chief engineers don't know what KPIs are."

Mr Atre continued with this theme. "Ships can't put a figure on the benefits of having fast connections", he said. "A fleet might have different systems. Shipowners and managers aren't against IT, but they can't quantify improvements. It's not fair to compare us to aviation either - aviation is very standard (e.g. Boeing, Airbus). I can't tell a captain that with IT his job becomes easier."

Panel discussion on shipping software systems. From left to right: G A Shankar, ship IT superintendent, NYK Shipmanagement; Otto Pedersen, chief inventor, Palantir; Geoff Arnold, manager fleet management systems, World Wide Shipping; Jennefer Tobin, managing director, Datatrac; Giampiero Soncini, CEO, SpecTec; Mr Aswin Atre, managing director and chief operating officer, NYK Shipmanagement

Mr Karma also commented on measurability. "Quantifying benefits is difficult, but you can do a few things", he commented. "One is time trials - usage time. Keep the parameters correct and have constants, and you can have a quantifiable."

Standards and obsolescence

The issue of standardisation and protection from obsolescence was another serious one for many ship managers. There seemed to be differences of opinion between vendors and customers about the importance that should be placed on IT, and the amount of time and money that should be invested.

"Most ships have retro fitted PCs", explained Mr Atre. "Standardisation can't happen easily on a retro fitted ship. We can train people, but then they leave. How do we know the new people will be as well trained?"

"Companies send old PCs from the office to the ship", answered Dr Nomikos. "We need to treat IT as a modern professional strategy."

Mr Shankar also added that "Standardisation is very difficult. Different managers have different requirements."

Mr Atre replied again; "We bought new computers 3 years ago - now they're out of date, and can't use the new software you've designed."

"What percentage of your costs is spent updating PCs?" asked Mr Karma, to which Mr Atre replied that "it's not justifying the return." Mr Karma wondered if Mr Atre had even tried to measure the return.

"Do any shipowners have an IT strategy?" asked Mr Pedersen, changing tack slightly. "You should not just stamp and not change. Most don't have an IT strategy. You should have it, and change it as the IT grows."

Mr Atre argued that there were "lots of different SQLs", which Mr Pedersen agreed was a problem, and continued that "you can't build a product that's beautiful, but I can't use it. You have to make IT for dummies."

From the audience the point was made that "There seems to be a diminished perception of value in IT and software. If you look at what you spend on paint, varnish, etc. - relative to investing in things like planned maintenance, it's very skewed. It seems that there is very little importance placed on important areas."

This idea of a lack of modernisation in shipping was supported by Mr Soncini. "This industry is different", he said. "We're still supporting AMOS D, even though we discontinued it 9 years ago. It's very expensive to run global support."

"When we launched AMOS mail, we sold 5,000 or 6,000, because the communications savings were obvious", he added. "Why don't you measure savings? It should be done - you should measure the cost of your ships. You have been using systems for 10 years - have you ever analysed the data? If we don't come out and do this we can't move ahead."

Dr Nomikos closed the discussion with a positive view of progress in the future. "I believe that shipping will make IT a strategic tool - it's happened in every other industry", he said. "It's impossible to measure KPIs effectively, without hiring 10 more people, unless you use software. The issues are training, and that it's easy to use and install. We can't move into the 21st century if IT is not considered as strategic." DS

3rd Annual Digital Ship Hong Kong Conference – Information Management

Automatic data collection and translation to measurable information, integrating along the supply chain - ship owners and managers are crying out for systems to help monitor performance, meet KPIs and improve efficiency. Captain Vijay Rangroo, Eurasia,opened a discussion of the options.

THE KEYNOTE SPEAKER opening day two of the *Digital Ship* Hong Kong conference was Captain Vijay Rangroo, executive vice president, Eurasia Group and managing director, Eurasia International (Singapore), for a session aiming to explore shipping companies' IT infrastructure, and how they can integrate better with suppliers.

The industry is more hi-tech than people realise.. Capt Vijay Rangroo, executive vice president, Eurasia Group and managing director, Eurasia International (Singapore),

"Digitisation is the only answer for data collection", declared Capt Rangroo as he took to the podium. "The industry is more high-tech than most people realise. IT can be used to spot areas where managers can improve safety, and they can share information with sister ships."

He also talked about how improved technology had changed attitudes in the industry. "Before, the regional office was a separate business unit", he said. "Before, the message 'call office' was always bad news. Today, if you don't hear from the ship, it's bad news. The developments in IT today hold the key to getting the 'bright sparks' that we so desperately need."

"The flow of data improves decision making", he continued. "It creates a more profitable organisation, able to manage resources better. IT is more than just an enabler for business, it creates communities regardless of position, linking information, learning and knowledge."

"The right infrastructure supports knowledge, which moves between people afloat and ashore. The role of the CIO is to leverage information, learning and knowledge to create an environment for innovation."

"Customers demand to monitor ship managers' performance at any time", said Capt Rangroo. "We create a transparent service environment. Trust is a prime factor for building loyalty with shipowners, and transparency is not limited to the relationship with the customer."

Digital Seafaring

Providing for the modern seafarer was another key issue. "The technology which has developed over the last few years is incredible", he said. "We need to harness the IT to build the skills for seafarers. The seafarer today needs skill sets that meet the demands of shipping today."

"Maritime studies need to include IT from the start", he added. "On-the-job training has its limitations, especially in areas like disaster management. CBT can measure the limitations of not only the equipment, but also the seafarer. CBT can also be a motivational tool for the seafarer at sea, allowing him or her to feel like a valued member of the ship management team."

The availability of data was also mentioned once again. "Systems ashore want more and more data, and they want it now", said Capt Rangroo. "But software today is not plug 'n' play. Software today is solving problems that we humans have been able to solve, but transferring data from one software to another is very difficult. The software has to be able to facilitate multi-tasking."

And what of the future of maritime IT? "If we can have processes that add value, then we will be on par with other industries", he said. "In the future ships will expect to be connected to a large community - such as port officials, equipment manufacturers, shipyard, class."

"But ship owners know ships, they don't know software", Capt Rangroo continued. "Can a service provider bear the cost of research and development? Can we sell software to the yard? Can the ship come with 'INTEL inside'?"

"IT is essential in shipping", he concluded. "IT is here to stay and develop. Resisting change will only cause chagrin and blunt the competitive edge."

Captain M.S. Nagarajan, Fleet Management

The next speaker of the day was Captain M.S. Nagarajan, general manager of operations, Fleet Management Limited, who also broached the subject of measurability.

"Quality data is the key to making ship operations more efficient", he said. "You can't improve what you don't measure."

There are a lot of different types of information available. "Information can be in areas like technical reports, fleet personnel, quality and safety, insurance, accounts, operations", said Capt Nagarajan. "The master has to make so many reports, inform so many people. There are cross flows of every kind. We have to help the master to do something correctly."

Capt Vijay Rangroo, executive vice president, Eurasia Group; Capt Sanjiv Sethi, marine superintendent with Unique Shipping; Capt Pradeep Chawla, director quality assurance and training, Anglo-Eastern Shipmanagement

"It used to be paper based, was labour intensive and error prone", he continued. "It was slow, with exorbitant paper costs. Then it moved to computerisation, but it wasn't integrated."

"Crews aren't trained in IT", he said. "There's non-standard equipment, and learning new software takes too much time. In many cases it leads to an increase in work for your crew."

"We sat down and put together our own solution - PARIS", explained Capt Nagarajan. "PARIS is a pseudo web system that runs on LINUX. We have a PARIS server on board which replicates what we see in the office, with two-way synchronisation via email. There's nothing for the master to do except import the file into the system."

The system contains a

myriad of data. "There's a crew list and portage bills", he said, "and you can see a map of all the ships, then open a ship's page and see information about the ship. This page is also available to the owner."

"It also has agents' details, with historic data up to one year", he continued, "and a crew planner to work out how many masters we need on different vessels."

Capt Nagarajan raised the issue of KPIs once again. "Some of them are very important", he said. "Things like PSC performance, stoppages/off hires, crew retention, number of deviations and budget variance. This is a cost driven industry - we need to know how much we're spending on the ship."

"We have a lot of rules in our system", he continued. "For example, a master on a specific tanker must have 12 months on a specific trade. If he only has 9 months, he needs approval from a higher manager and gets a deviation."

Capt Nagarajan also felt that PARIS compares very favourably to other systems. "It's easy to install, user friendly, inexpensive, robust and scaleable", he said. "It's easy to recover and easy to upgrade. It means that the vessels are better managed, it improves operator efficiencies, and customer confidence is improved."

A recent audit by BP also identified the PARIS system as one of the industry best practises.

Mark Haslett, Wallem Shipmanagement

"What Wallem is going to do is generate benefits with suppliers", said Mark Haslett, general manager of procurement with Wallem Shipmanagement, outlining his company's approach to IT integration.

"What are the benefits of IT?" he asked. "It can give a consolidated view of all information, where the information is easily viewed by everyone. We can have internal and external prompts for due or late items. We can have multi-person approval, and a full audit trail for all actions, with published feedback on quantity and quality."

"In 1993, the battle was supplier versus supplier, for example with Drew versus Unitor for bottled gas in Singapore. Then, in 1999, it was buyer versus buyer. What mattered was - am I cheaper than V Ships?"

"But e-commerce has changed the battleground", he said. "Today it is supply chain versus supply chain. You can send automatic messages to suppliers. The buyer doesn't have to wait for the superintendent to say 'where are these spares?'."

"Now the shipowner wants to get involved", he continued. "The Sarbane-Oxley act has put pressure on all shipowners. We have to have a full audit trail for all activities undertaken. A superintendent might say 'I don't care about the cost, fly it in', but then forgets he said this when he gets the invoice."

"We have a full audit trail so a captain can't say something wasn't received when it was received, or that things were of a rubbish quality because he didn't like the delivery guy."

"We publish records of the supplies, and make the payment status available to all suppliers", he said. "This makes suppliers chase us, and stops us having to spend lots of time keeping track. We don't see why we shouldn't make information available to suppliers in areas like line item accrual and invoice matching."

"We have built supplier integration wherever we think there's value", he added. "We integrate with single suppliers

if there's value. We integrate with freight forwarders. It's e-commerce for marine as a concept, suppliers together as an exchange. It's a perfect solution in my view."

"There are many suppliers, so it won't give any one too much benefit. We'll be contracting for a thousand items. I really hope it will make a level playing field, where the value suppliers will succeed."

The overriding message of Mr Haslett's presentation, echoing the points made by his colleague, Patrick Slesinger, on day one, was that value is the fundamental basis for any proposed changes or improvements. "If you introduce cost into the supply chain you're not doing yourself any good", he said. "If you can't see the value - don't do it! If they can't explain it, or you can't see it, don't do it."

"Data has no value, what you do with it does", he explained. "100 years ago, at a port, the key to supplies was planning. E-commerce needs to be used in conjunction with a supply plan. You have to discuss things with suppliers - suppliers aren't the enemy, cost is. Don't move cost around the supply chain."

"Business is still done between people, and I trust my top ten suppliers implicitly. Technology is moving forward, it's getting better, and it may allow a quantum leap in these relationships. Things like integration will become easier."

To conclude, Mr Haslett offered a warning about the problems inherent in supply systems. "The biggest problem is wastage - bad processes and bad planning. More quotes means more costs, for us and the suppliers. We should concentrate on getting cost out of the equation."

Giampiero Soncini, SpecTec

The next presentation on behalf of the suppliers at the conference was made by Giampiero Soncini, CEO, SpecTec, who discussed the challenges involved in creating, selling and supporting an effective IT system for shipping, and some of his personal experiences in the industry.

"IT for maritime - how difficult is it?" asked Mr Soncini. "It should help crews, it should ease the ship-office relationship, it should benefit shipowners and managers. But there are many problems.

The size of the market is about 1/100,000 the size of the land market. There are further problems with customer mobility and market location. There is also an issue of computer ignorance on the part of the users, and a lack of awareness of managers about IT."

"We're all fighting for the first movers in the market", he said. "From a survey we did, there are about 9,000 first movers, i.e. companies with high risk ships (such as tankers and LNG carriers) which adopt modern technologies faster than other, and the majority is at about 22,000.

From that we should eliminate vessels from third world countries (a tanker travelling from one African port to another will not show much interest in TMSA), those over 20 years old and weighing less than 2,000 tons. ."

"Once we apply these filter, there are 3,800 first movers, and 8,200 in the majority of the market.

That means the most "palatable" market is 12,000 ships. This is a very small market, when you consider that in Italy alone there are 20,000 factories.

IT is a niche product in a niche market. This simply means that many small IT companies will simply not survive. But they are all still there, representing a strong competition bigger IT companies are confronted with. But competition is what makes us better."

"Shipping IT is difficult. The customer wants worldwide network, local assistance, easy software that does it all and low cost", he added.

"It simply doesn't match. It's hard enough to offer worldwide support with a small market. If one adds to this the fact that customers are not being selective enough, and often chose on price alone, it is easy to understand why so many IT suppliers in the maritime industry have gone bankrupt in the last 20 years.

And more will become in the future, unless they will accept to consolidate.

We want to provide service, and that comes at a cost. This is not a business where money is easy. Everyone believes we are Bill Gates, that there is a lot of money in IT. We do it for a lot of passion. We have this bloody passion."

"When you build your own software it's like building a ship - the upkeep is a massive part. What's the cost of building the ship compared to keeping it alive for 25 years?

To succeed you need a network and service. The product is important, but not as much as the first two.

That is where shipping companies or managers, who have developed their own IT system, miss the point. Once they'll note the cost of keeping the system updated and serviced worldwide, they'll understand.

For a ship management company or a class to create their own IT system, is equivalent to SpecTec creating its own fleet of vessels or classification company."

Mr Soncini also gave an account of the history of SpecTec, which was purchased by KPN and merged with other 3 companies to form Xantic.

The merger did not work the way KPN wanted, and in May this year it was decided to divest the Amos part of the business.

"I was contacted by Xantic CEO, and performed a carve-out of the Amos business, with the help of some excellent investors.

"Within 2 or 3 weeks we had brought in 25 people. I re-opened the offices in Greece, Hong Kong and Dubai. We rebuilt the company structure.

Now, we have had 20 per cent more business in the last 4 months. I have good news on a daily basis. We have 175 employees and 20 offices, with over 25,000 maritime staff trained and our system installed on 7,000 ships."

"While consolidation is needed, past experience tells us never to buy a bankrupt company", said Mr Soncini.

"We did it in the past because we wanted to grow but we also thought the market would have been thankful, because after all

we were preserving their investment. It did not always work out that way, with some notable exceptions. We inherited quite a large amount of problems. Shipowners don't say 'thank you for rescuing us'; they say 'when are you going to fix it?'.

Installing software in shipping is a coordinated effort, and requires both parties to cooperate.

"There's the IT supplier law - the better the customer, the better the supplier will be", he continued.

And when it comes to upgrade, well, "upgrading is a fact of life. Hardware is a consumable, plan its change every four years and budget for that. Everything gets upgraded - why not software?

"We had so many complaints when AMOS D, a 20 year old piece of software, would not run on a Pentium machine! People change car every two years, but for some, software should remain the same for life..."

While the task is not easy, and suppliers make mistakes, "Customers also make mistakes", he said. "They say 'I can't waste time on this project' - OK, so waste money instead. They say 'we need very simple software from a local company' - it will last for 3 years. They say 'we don't need onboard software' - which simply is rubbish."

"They say 'people onboard will never use it' - wrong, they will be the first to use it. They say 'we want idiot proof software' - well, they should not employ idiots.

"They say 'it should not require training' - everything requires training. They say 'we will build our own databases' - that probably won't work, and then they will end up blaming the software."

"Don't ask us to co-ordinate your company. Assign a unique point of contact, a person with power. People with no power are likely to be frustrated, most probably leading to project failure. Treat the supplier like a partner."

"Identify a 'locomotive' for the project", he said. "1 guy can train 100 others. If the data is not properly inserted, the software will fail. You have to install discipline in your crew - don't expect the software to gobble up a mistake done by untrained staff. Nearly 85 per cent of bugs are due to problems from untrained staff."

So what does he see in the future of shipping IT? "I think you will always need a database onboard", he concluded. "I think there is room for 3 to 5 maritime software companies in the market; the others will disappear." Mr Soncini is confident that SpecTec will be among these chosen few.

Paul Østergaard, ShipServ

Another of the software vendors got the chance to relate their vision of the future of shipping e-commerce when Paul Østergaard, CEO of ShipServ, took to the podium with a presentation about integrating ship systems with suppliers.

"E-commerce is the inevitable next step in technology", he told the audience. "Seamless information flow is a good thing, and we need to start looking at ourselves as departments in a supply chain. In that sense e-commerce is not something completely different."

"The companies that get this right will be the companies who will be successful", he continued, reinforcing the points mentioned time and again during the conference about costs and value. "We need to try to eliminate the duplication of effort. Get the person onboard sitting next to the main engine to con-

nect the part number with the RFQ."

Mr Østergaard mentioned about how outsourcing is about using the expertise of specialists to enhance your own business. "Think outside/in - not the opposite. You have to line up with people in the supply chain. Work should be done by whoever is best suited to do it."

"Think of data as something you're borrowing from the supply chain", he continued. "To have an integrated supply chain, you have to figure out how to exchange information with all suppliers. Our business is built on integrating into all types of systems. One of the biggest problems has been a mismatch between the buyer's and supplier's data systems."

So what are the benefits to be had by increasing shipboard IT and improving supply chain integration? "There are a number of benefits", he said. "You can have more vessels per full time worker. You can have lower cycle times, and save money on costs. You can have standardised processes. Using e-commerce can have the benefit of freeing up resources."

Mr Østergaard also mentioned how the market has been growing most quickly in the far East. "Asia is pulling ahead",

Hot conversation at Inmarsat's evening dinner

he said. "There has been 959 per cent growth in Asia, between Q1 2004 and Q1 2005, versus 125 per cent growth in Europe. There they have fast decision making and a focus on operational efficiency." ShipServ would like to see the walls come down between all of the links in the supply chain to make fast decision making an industry norm.

Torben Brammer, ShipCentric/Vision People

The issue of integrating ship suppliers into the company's systems was also the focus of the next presentation, given by Torben Brammer, managing director of ShipCentric /Vision People, who explained to the audience how his company was working with software giant Microsoft, in an attempt to gain a serious foothold in the maritime applications market.

"Microsoft will do more industry specific software in future", explained Mr Brammer. "They are becoming more focused on the verticals, and will put 50 per cent of their advertising money into vertical industry solutions. They intend to spend $2 billion dollars on marketing in this regard."

"They have added 800 people to support this, and to push it onto the market. They are building tools for the industry."

"They want to put the maritime part of software applications on to Microsoft products", he continued. "Because it's based on Microsoft Windows it's easy to use, and people are familiar with the layout."

Mr Brammer then explained his company's part of the process. "We are training the different partners in the maritime industry", he said. "We have standard products. We can teach them about your industry, take one piece of the industry at a time and move them on to it."

Part of the process will be a localised focus. "We do local language on all software. We're acting local and supporting local. We've looked at the market - and if the demand is there then we'll include it."

"Building our product with Microsoft makes it cheaper", he continued. "The return on investment is then very good for companies, it's just a matter of moving forward. IT is here to stay - you have to put it in your budget."

Mr Brammer then talked about the future plans in their partnership with Microsoft. "In 2006 we will do software for owners, managers and operators", he said. "We're testing it now, and then we'll bring it on to the market. And we'll have online help for every single button."

"With our system, we can connect to ShipServ, MTS and SeaSupplier", he continued. "We will also connect to CC Hubwoo in the future, it's a catalogue management company. Maersk is using it for catalogues, that's a decision they've made already."

Panel Discussion

'Finding the best way to safely and accurately gather data' was the topic for the discussion at the end of the morning session, where the panel consisted of Paul Østergaard, Giampiero Soncini, Captain Vijay Rangroo, Nicholas Li, and Torben Brammer, under the chairmanship of Dr Panagiotis Nomikos.

Dr Nomikos pointed out one of the glaring problems facing the industry in this regard. "The average number of vessels is 2. There are huge inefficiencies", he said. "It would be good if there was consolidation. Charterers are practically forcing shipowners to be efficient. It means using IT. We have to work together to improve efficiency, or they will come back with even harder regulations."

Capt Rangroo mentioned a problem that had been cited by a number of the speakers over the preceding sessions - small market share. "Why are new companies coming in?" he wondered. "What's the driver? Is it something the existing suppliers are unable to fulfil? I'm quite surprised Microsoft didn't come in earlier."

Mr Nordstrom, representing a company that is now just entering this market, replied that "it may be small, but it's a growth market. We think there's a future here. The only way to make money is to bring value to the market."

As a further reference to costs, Mr Soncini said that "70% of turnover is service. Fragmentation of the market means it's difficult to serve the market well. A lot of companies think that in shipping you can be a billionaire."

Advice for suppliers

An audience member asked the panel to give some advice to the vendors among them. "There's a pressure to increase efficiency", he said. "What's your message for suppliers?"

"The user typically looks at stability", added Capt Rangroo. "You need to be sure there will be someone there to service it next year. We need a 'brand' in shipping." It will be interesting to see if the proposed muscle-flexing by Microsoft in the maritime market mentioned by Mr Brammer will go some way towards providing the kind of brand Capt Rangroo is looking for.

The final question came from Mr Li. "There are only a few suppliers, so there's low competition", he said. "Is that bad for users?"

Mr Østergaard answered that "It may not be bad for users. When building a network it's good for users to have a small number of suppliers in the network. We're coming from a phase when there were lots of companies, so there is no standard. When the market is too small and there are too many suppliers, both parties suffer." DS

3rd Annual Digital Ship Hong Kong Conference - Training, Safety and Efficiency

With the importance of cost, value and performance registering so high on the agenda for all involved at the conference, the final session looked at ways to improve training, eliminate errors and increase efficiency. KHK Rangan of Teledata opened the proceedings.

THE FINAL SESSION of the conference began with a speech by K.H.K Rangan, general manager, Teledata Marine Systems, Singapore, to discuss some of the latest developments in education and computer based training for seafarers.

"E-learning is a new concept in maritime training", he said. "Everyone wants to be educated now. Knowledge is power, and everyone wants it."

"So where are we now?" he asked the audience. "We have institution based training for exams (for STCW 78/95). But there's no shore based training for some jobs, like ship superintendent."

"E-learning eliminates some of the barriers to learning. It's a medium for life-long learning. We agreed with DNV to develop course material for a ship superintendent course based on a standard. It's based on e-learning, though they obviously still need to sit exams, to make sure they're not sending a 'proxy' and that they're not cheating."

"No-one can live without IT today", continued Mr Rangan. "With the traffic today it's humanly impossible to handle it without IT. It's about how we harness the IT. If you operate safely, nothing happens. But if there's one mistake, then there's trouble. Don't blame the system, you have to blame yourself if you made bad decisions."

Costs and credibility

The e-learning programme run by Teledata consists of 45 minutes per day for 9 months, with a fee of $4,000 for the General ship superintendent course, $1,600 for the Marine ship superintendent course, $1,600 for the Technical ship superintendent course, and $300 to study an individual module.

Mr Rangan also issued a challenge to the satellite service providers present. "To do this at sea we need broadband service providers", he said. "1,000,000 seafarers are potential customers. We're also looking into offering an MBA in ship management. Any knowledge, anywhere, is power."

To illustrate his point, Mr Rangan spoke of his own experience. "I studied law in the University of London, without setting foot in the city", he said. "We thought this distance learning course for seafarers was needed because there's no program as such existing. This can also go further into other courses."

Dualog sponsored a pre-conference dinner for shipping company IT managers and guests

There was a question from the audience, from a lady who asked "Does this have credibility? Is it recognised by the industry?"

Mr Rangan replied that "We associate with DNV. IMO doesn't concern itself with courses like this, so right now it's in a nascent state."

Bhupesh Gandhi, Transas

Bhupesh Gandhi, vice president of marketing for the Transas group, gave an illuminating presentation about human error, its effects, and some of the ways in which companies can reduce the number of accidents coming from people's mistakes.

"The marine system is a people system", he said. "People are the essential part of the system. And any system that relies on humans is unreliable."

"75 to 96 per cent of all marine casualties are caused, at least in part, by some form of human error. These are usually one of three types; an incorrect decision, an improperly performed action, or an improper lack of action."

"The focus for the last 40 years or so has been to reduce casualties", he continued. "And there have been improvements, there's been a sea change in the way a bridge looks. But still, even though today's systems are technologically advanced and highly reliable, the maritime casualty rate is high."

Mr Gandhi then outlined some of the main factors which lead to human error. "There's fatigue; inadequate communication; inadequate general technical knowledge; inadequate ship specific knowledge; poor design of automation; decisions based on inadequate information; standards, policies and practices; poor maintenance; and the hazardous natural environment."

"Fatigue is the most important issue today", said Mr Gandhi. "It needs a lot of improvement in the shipping industry. There's also inadequate communication - the ships, masters, officers; they all need to communicate well. Some information is not accurate."

"People these days keep changing ships", he continued, "so there is a lack of ship specific knowledge. Then people try to apply knowledge from one ship on another - that's a problem. Information, maybe taken from just one of the sensors, can be inadequate."

"Then there are commercial pressures", added Mr Gandhi. "Standards and procedures are missing, which makes reactions to problems slower."

Zero defects

"So what can we do?" he wondered. "We use quick patches to hope to control it. But can we afford to be only 99 per cent accurate? 99 per cent accurate, in one day, means 2 unsafe plane landings at O'Hare airport, 500 incorrect surgical operations,

and 1 hour of unsafe drinking water. We need to work towards zero defects."

He gave the audience some details about an MSA study on watch keeper collision avoidance behaviour, which mentioned failure to appreciate the limitations of navigational equipment, poor situational awareness, unfamiliarity with bridge equipment, a reluctance to slow down, and distraction as major factors in collisions and groundings.

"Positional awareness is the root cause of many casualties", he said. "But if someone doesn't react after 6 audio and visual alarms, we know what to do with him. There's also a reluctance to slow down, still a cardinal sin with a lot of masters."

"What are we doing to reduce seafarer workload?" he asked. He suggested that technology was already helping. "Planning the route used to take 7 hours, now people can do it in 20 minutes. Many young people think shipping is low-tech. But it's moving and changing, IT is improving."

Mr Gandhi expressed his view that having electronic chart display systems (ECDIS) can make a real difference to ship safety. "Studies have shown that up to 40 per cent of navigation accidents could have been avoided if the ships had ECDIS onboard. One risk assessment exercise showed that a vessel navigating with paper charts would be prone to a failure once every 952 years. With ECDIS, it would be prone to failure once every 29,770 years. That's 30 times less."

While he doesn't claim that it will eliminate accidents completely, Mr Gandhi does believe ECDIS can improve safety. "You can't eliminate human error", he said. "But here you're supplementing the person on the bridge. There's something else keeping track of the ship."

Mark Womersley, Info@Sea

The final presentation of the *Digital Ship* Hong Kong conference was delivered by Mark Womersley, manager of environmental services, BMT Asia Pacific, who explained to the audience about his company's Info@Sea project, which aims to provide information to ships going into Singapore to help them reduce fuel consumption and improve power management.

"One of the key things is the value of information", began Mr Womersley, reiterating one of the points repeatedly discussed during the two days of the conference. "If you're going to fill a data pipe you have to think about knowledge, and there's been a focus on communication. And even if the ship isn't a digital ship, the port is. Knowledge management is required to ensure that the data pipe is filled with intelligent information."

"You have to transform data to information to knowledge", he said. "You'll need always on, because some info must be sent in a timely manner. There could be a gap between the satcom guys, the ship and office, and value added services."

Dharmendra Shirsat, Iridium Satellite's director, Maritime Vertical; A S Maniyar Chief Accountant, Univan Ship Management Ltd; G. A. Shankar, IT superintendent, NYK Shipmanagement Pte Ltd

Mr Womersley explained further about a big part of his company's project, the Digital Tide Atlas. This is a forecasting system for tidal current flow fields and water level forecasts, simulating near to actual hydrodynamic tidal flows. In simple terms, this system predicts the tides to make efficient route planning that much easier. The system is in its early stages right now.

"We have users going to trial", he said, "and they're telling us what they like. It's different for different users. It has a suite of measurements that could be used for value added services, it gives you confidence, and that's knowledge. It can also be used for power management - we know we need to show dollar value, but if we can add to the public interest too, then that's great."

In terms of the general adoption of IT in shipping, Mr Womersley had this advice for shipmanagers. "There are some questions you need to ask; Why do you want it? How do you want it? How much information do you want?"

"As an industry, you know where the digital ship is going", he said. "You need to manage the information. We can't see the future, and that can be scary - but it is inevitable."

Mr Womersley was asked about how the information is disseminated. "By internet, through email", he said. "You can send information for an overall area, using ADCPs to measure the data. It's agnostic to any software system. The back and the front are decoupled."

The future of maritime information exchange will bring even greater technology, in Mr Womersley's opinion. "A paradigm shift in the volume, content and timing of information exchange between ship and shore may be inevitable", he said. "The value of information will focus on efficiency."

Panel Discussion

A panel discussion, featuring Capt Nagarajan, KHK Rangan, Mark Womersley, Capt Subramaniam and Bhupesh Gandhi, brought the *Digital Ship* Hong Kong conference to a close.

The first question asked how people can get shipping companies to become more interested in new technology. Mr Womersley replied that "It's important, we need to be patient, and clear about value and needs. We think you have to engage the masters to engage the companies."

Capt Nagarajan agreed, saying that "if people from the industry talk about safety it pressures the companies."

"Insurance companies can play a part too", added Mr Rangan. "If you can get away with not having something, the tendency is not to have it." Mr Womersley also felt that the industry needed to get people more involved.

"A few US companies' insurance premiums have reduced with ECDIS", noted Mr Gandhi. "This is an incentive for shipowners."

Capt Subramaniam felt that the industry needed to "target the governments. Legislation will solve it, people will fall in line." A member of the audience advised the industry to get one voice together before approaching the governments.

Capt Nagarajan pointed out that it's a regulation driven industry, and Mr Womersley said that "there's an analogy with aviation, they've proven reliability."

Another member of the audience made the point that "if you can improve safety, regulations will follow. UKHO's job is to ensure safety of life at sea, they will follow if you can prove you can increase safety. Governments turn slowly, like big ships."

Capt Subramaniam complained that the maritime industry should follow aviation, in the sense that pilots aren't arrested when accidents happen, but masters are. Capt Nagarajan pointed out, however, that "The airline analogy is a little unfair - we carry cargo, they carry people. There are also only two types of aircraft (i.e. Boeing and Airbus)."

Mr Womersley agreed with this. "Because they're carrying people they did things sooner and quicker", he said. "There are some tools out there that could be transferable."

"How do we get shipowners more engaged?" wondered one member of the audience, to which Mr Womersley responded that "there are different drivers in shipping - different needs, different ships."

Members of the audience also felt that shipping had many unique aspects. "Aviation is totally different", said one participant. "The concept may be similar, but how it's handled will be purely maritime."

"Commercial pressure is the fast track to regulation", noted another audience member.

The final comment was left to Capt Nagarajan. "The tanker industry is driving this", he said. "Fitting ECDIS is best industry practice. If you don't follow, you lose business." In all of the discussions, no matter what the topic, it seems that 'the bottom line' is always the bottom line. Proving value is the fundamental point which will drive the future adoption of technology in the shipping industry. DS

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UK company reduces shore-ship costs

www.setel.co.uk

UK company Setel has embarked on a mission to help shipowners and brokers reduce their costs of calling ships, by setting up its own terrestrial phone network, enabling calls to be made to Inmarsat independent of the normal fixed line operator.

It has a dedicated 2 megabit phone line from its switch in London Docklands to the Telenor land earth centre in Eik. The phone line is also connected to Amsterdam, Greece and Switzerland.

This means it can control the call charges from London, Netherlands, Greece and Switzerland to the Inmarsat land earth station.

It is a well known fact that many terrestrial phone companies around the world routinely rip-off shipping companies when they are calling the ships from their land lines, adding big mark-ups to the cost. Calling the office from the ship is generally much cheaper.

Setel's system enables shipowners to get around these rip-off mark-ups. They can also get low cost phone calls from their mobile phones to ships.

"We're fundamentally a telecom company that knows about shipping," the company says. "We saved companies 40 per cent on costs of calling ships, they didn't even notice it. Many shipowners pay $4 a minute to call the ships - we do it for $1.99."

Scotland VSAT standards meeting

The European Telecommuncations Standards Institute (ETSI) working group about earth stations on vessels (ESVs, more commonly known as shipboard VSAT) met in Aberdeen, Scotland, on Sept 19-21, to discuss technical standards for shipboard VSAT systems.

The meeting was hosted by Caprock Communications and attended by France Telecom, Marine Telecommunications Network (MTN), Boeing, Ofcom (UK regulatory body) and Intelsat.

The objective is to make sure the shipboard systems meet the standards of the EC Directive on Radio and Telecommunication Terminal Equipment and standardize communications devices across the industry.

The working group intends to complete a draft of the European Norm (EN) on the radio aspects of ESVs, to be be presented to an upcoming meeting of the ETSI Technical Committee on Satellite Earth Stations and Systems and, if approved, sent out for Public Enquiry and comments by national standards organisations (NSOs).

Inmarsat starts EPIRB replacement

www.inmarsat.com

Inmarsat has announced an equipment replacement program for users of its EPIRB service (emergency position indicating rescue beacon), scheduled for closure on December 1 2006.

It has contracted US maritime electronics company ACR Electronics to provide over 1,000 of its GlobalFix 406 EPIRBs to current users of the Inmarsat service. The program will start on January 1 2006.

Inmarsat decided to switch off its EPIRB system because it has a small user base and slow growth, and uses specialist go-round infrastructure which will need replacing.

Inmarsat sells INVSAT

www.invsat.com

Inmarsat has sold INVSAT, its VSAT maritime communications company. The purchaser is Nescco Telecommuni-cations, a UK telecoms company. Nescco will relocate its Aberdeen headquarters to Invsat's offices.

CORRECTION

The front cover story of our September issue, "Jeppesen charts for maritime", may have given the impression that Jeppesen intends to compete head to head with the hydrographic offices for producing maritime electronic charts. Jeppesen would like to clarify that it is their intent to fully partner with the hydrographic offices to harmonize the flow of data from its creation to its end use. In doing so, Jeppesen promises to bring technologies and know-how from its long history of doing the same for aviation.

Smartcom Software buys Marine Computing

www.smartcomsoftware.com

UK maritime software company Smartcom Software, owned by Tim Thornton, has purchased maritime software company Marine Computing International.

Marine Computing produces software for Inmarsat -C communications, tide prediction software, tools to put Navtex messages on a PC, and a tool to make sight reduction calculations when navigating by the stars.

It has also developed weather software as part of the European Space Agency MIDAS project.

Magenta develops ocean fleet scheduling system

www.magenta-technology.com

UK company Magenta Technology has developed a software tool, Fleet i-Scheduler, to enable ship operators to manage their vessel scheduling and re-scheduling following delays and cargo changes. They can use it to plan ahead and make better, faster scheduling decisions. The system replaces the manual fleet planning systems which many companies still use.

Magenta points out that many truck fleet operators have very sophisticated software to manage their fleets. Shipowners are just starting to use this technology.

ABS-NS reports 20 per cent client growth

Maritime software company ABS Nautical Systems, part of class society ABS, reports that its number of clients has grown 20 per cent over the past year.

Shipowners are using the software to satisfy their changing operational and regulatory demands, the company says.

One particular driver of software purchases is the Oil Companies International Forum (OCIMF) Tanker Management and Self Awareness (TMSA) program, the company says.

TMSA driving software - Jack Kitchura, president, ABS Nautical Systems

"Regulatory overload and commercial, safety and environmental pressures are driving the adoption of more technically advanced and effective management systems and we are providing them," says ABS NS president Jack Kitchura.

The company's fleet management software is tailored around making fleet operational technical management more efficient and providing better cost control to shipping companies, says the company.

"We have taken on significant additional staff during the last year to manage new projects and prepare for other work already contracted," says Mr Kitchura.

"We are planning to continue this expansion in the coming months, not only in our dominant market in the Americas but also in Europe and Asia where we are experiencing rapid growth."

The company recently held a user conference in Philadelphia, so it could learn from clients what tools and systems it should develop. The conference includes specialist forums for tanker operators, and offshore, inland and government vessels.

Companies attending included Costamare Shipping Company, Canada Steamship Lines, Inc., Crowley Maritime Corporation, Eastern Mediterranean Maritime Ltd., Keystone Shipping Co., Matson Navigation Co., Inc., OSG Ship Management, Southern Ship Management, and the US Maritime Administration.

Use the phone to confirm e-mails - ITIC

www.itic-insure.com

Filing demurrage claims electronically could be costing shipbrokers significant sums of money, according to the International Transport Intermediaries Club (ITIC). While e-mail may be quick, cheap and easy, brokers are being urged to ensure they have a system in place to confirm receipt of not only demurrage statements but all time sensitive documents.

In the past, brokers have used courier services to send claim documentation to charterers. According to ITIC, principals are increasingly adopting a policy for claims to be sent electronically. Although this can save on costs, it can also be unreliable.

"It is not enough for the broker to simply send the message and forget about it," says the Club. "A common suggestion is that if the broker has not received an acknowledgment within 48 hours then the broker should telephone the principal to check that the message has been received. The cost of a call is minimal compared to the amount at stake."

ITIC says that each year it pays claims caused by shipbrokers which could have been prevented by a simple phone call. In some cases, by the time the problem was discovered, the claim had become time barred under the terms of the relevant charterparty. "This is the most common cause of claims against tanker brokers and with high freight levels these can be for significant sums of money," says ITIC.

Faced with the charterer's denial that the claim ever reached them, all that the broker may be able to prove is that its Internet Service Provider forwarded a message. This does not confirm receipt. "The majority of principals who have asked brokers to use e-mail have said that they will acknowledge the claim. The implication is that without such receipt, the principal will not accept that the claim has been delivered," warns the Club.

Lloyd's register wins award for software documentation

www.lr.org

Lloyd's Register has received an award for the documentation supplied with its software packages, presented by the Institute of Scientific and Technical Communicators (ISTC) in the category dedicated to printed delivery of technical matter.

In particular, the judges singled out the User Guide for Lloyd's Register's Interface Toolkit, which enables surveyors, shipbuilders and designers to use their preferred software design tools and transfer their data to Lloyd's Register design assessment applications for analysis.

The content of the User Guide is based around example files, which enables users to follow what is happening throughout all stages of the application.

Helen Tomlinson, Jane Hodges and Amanda Caley from Gazelle Training with one of the event sponsors

Wallem Shipagencies uses FWL software

www.wallem.com

Wallem Shipagencies, part of the Wallem Group (with agency operations in Hong Kong, Japan, Philippines, China, Singapore, Taiwan, Thailand, Vietnam, Malaysia and Indonesia), has installed a software system designed by FWL of the UK.

The software system can be used to manage all agency port calls with a single Oracle database. It can handle quotations, bookings, equipment control, documentation and customs clearance, for both liner (container shipments) and tramp.

It replaces standalone systems, which involved re-keying data from one system to another.

"We are constantly assessing ways of containing costs and improving efficiency so that we are able to provide a better service to our customers," says Wallem. "FWL has developed a multi-principal, multi-country system which specifically met our needs, providing for electronic transmission of data and documentation thereby eliminating duplication of the inputting process."

FWL has implemented other agency systems for shipping lines CMA-CGM, PIL, Yang Ming and China Shipping.

ASBA / IT Marine launches charter party editor

www.itmarine.com

UK maritime software company iTMarine, in association with the US Association of Shipbrokers and Agents (ASBA) has launched a piece of software for editing charter parties (contracts made between shipowners and charterers).

The tool enables different people to work on the same document over the internet, with functionality including adding / deleting / cutting / pasting text, linking summaries to specific clauses, and electronic stamping of forms and printing.

Companies already committed to using the tool include tanker brokers PF Bassoe and newly established Albis Shipping & Transport.

Asba has created a website specifically for the marketing and support of the Charter party Editor, www.cpeditor.com.

Consafe Offshore to install Star software

www.consafe offshore.com
www.sismarine.com

Consafe Offshore, a Swedish-based provider of offshore support services, are intending to install Star IPS information and planning software on three accommodation and construction rigs and in Consafe Offshore's headquarters, located in Gothenburg, Sweden.

This should enable Consafe to access real-time information on their platforms from their headquarters. Implementation of the systems is scheduled to be completed by December.

While the majority of Star's customers are shipping and ship management companies, the company says it sees significant growth potential in the offshore sector for its systems.

Seagull and NewsLink strategic alliance

www.seagull.no

Computer based training company Seagull has formed a strategic alliance with seafarer news and entertainment service Newslink International.

The two companies will work together on sales and marketing, research and development, and developing an English language training package.

The two companies have worked together for several years, with Newslink using parts of Seagull computer based training on its CDs and Seagull using Newslink's research and development centre in New Delhi, India.

They will co-ordinate their marketing resources worldwide and may establish joint sales offices and share agents.

Seagull will be Newslink's agent in Scandinavia and Western Europe, and Newslink will be Seagull agents in Cyprus, Middle East and India.

Seagull will expand its use of Newslink's research and development centre in Delhi with five developers employeed full time for Seagull.

Northern Marine uses Seagull voyage software

www.seagull.no

Seagull has released its new Voyage Planning Program - VP version 1.0. Northern Marine Management, from Glasgow, UK, will be the first customer using this new software on board all of its ships.

The software has been prepared for interfacing ECDIS, weather information and port information, among others. Features include voyage planning, a print report, export/ import of voyage plans between vessel and shore, weather, port and tidal information, squat calculation, and a GPS interface.

The pricing of the Voyage Planning program is following the same pricing structure as CBT modules from Seagull. That means a very low annually software license for each vessels, that includes free of charge future updates.

The chief information officer

Charis Nassis, ICT manager with Greek shipping company Ceres Hellenic Enterprises, explains why every shipping company should have a CIO

THE PRINCIPAL FACTOR that impacts technology in a shipping company is the chief information officer.

Information and communication technology (ICT) is the most important technology for shipping companies.

IT systems are complex, and over the years the role of the chief information officer (CIO) has evolved to that of the credible executive assigned to extract value from the use of technology.

Employing the best CIO makes a big difference in cost and returns, and can accentuate IT to a strategic asset.

Numerous systems support the operations of a shipping company onboard and ashore: e-mail and communications in general, planned maintenance, procurement, inventory, safety, navigational technology and electronic charts, document management, vessel reporting, vessel performance, crewing and administration, chartering, insurance and claims, financial, accounting and management information systems.

Nowadays many of these systems have became mission critical, and companies need several highly qualified professionals to select, install and keep them running.

Maritime technology related to shipbuilding is another high technology field of great interest for shipping companies, but this is mostly exercised by shipyards and not by shipping companies per se.

Is shipping different?

We, shipping people, often feel that this is a unique industry, and that information and communication technology in shipping is very much different from any other industry.

I would generally disagree; tools, challenges and opportunities for ICT are very common across industries, including shipping. CIO's in shipping can benefit a lot by observing other industries.

ICT in shipping is very much like other industries, but some notable differences exist.

Nevertheless, some of these notable differences may be of great importance for a shipping company.

Ships are in remote locations, en route. A great amount of effort and money is required to keep in touch, to close the ship to shore gap.

Safety is of paramount importance, and several systems may be involved in supporting a company with this prime concern.

Reporting requirements are increasing dramatically, either because of international safety and regulatory requirements or because shipping companies have found their way to international stock markets.

Currently the level of IT investment is lower in shipping companies than in other sectors.

Although shipping is generally regarded as a conservative industry, it recognised early enough that information and communication technology may be the definite source for a competitive advantage and embraced this technology, sometimes by being the early adopter, with the notable and relatively recent example of email networks (BIMCOM 1991).

Complex systems

ICT is currently the most complex technology in such wide use by businesses worldwide.

This claim stands with any variation we may use in the definition of a complex system.

ICT systems are, by design and function, difficult to understand and verify. There are multiple interactions between many components. ICT systems constantly evolve and unfold over time.

The fact that vessels are spread around the world is adding to the complexity. In shipping especially, the complexity of information technology systems is becoming a critical factor, since more business areas and more people depend on such systems.

What a CIO does

Within a shipping company, the person that is assigned with the pivotal role to extract value from the use of information and communication technology is the chief information officer.

Despite a somewhat embattled history, the role of the CIO has emerged as a critical executive position in most organizations.

CIO's increasingly sit on firms' executive teams and help them shape organizational strategy.

The CIO's role has gradually increased from being a functional head (delivering promises made) and being a strategic partner (aligning company IT with the business aims), to being a business visionary, driving the company strategy.

The main force influencing the CIO role is the applications portfolio that is always expanding to a greater number of operations and people who are impacted by IT.

Also, the overall attitude of business executives is beginning to recognise the need for strategic application of IT, and they are increasing the available resources (money and people).

IT suppliers are offering a rapidly expanding range of technological solutions and services of increasing quality levels.

The CIO role has evolved in tandem with the following major technological periods: Mainframe era, distributed (PC) era, web-based era. Each of these phases armed the CIO with maturity and credibility.

The future of the CIO role will be largely shaped by new business models in the IT industry changing the nature of computing to utility (i.e. on-demand computing).

Under such models computing is seen as a "utility" that users pay to access on a pay-as-you-use basis, just as is the case with electricity, gas, telecommunications and water.

Strategy

A closer look at IT strategy (John F. Rockart 1999) will allow us to emphasize the added value of IT and the broad tasks of the CIO.

The foundation of IT is as the corporate strategy that defines the firm's key competencies and how the company will deliver them to customers.

The development of IT architecture involves converting the corporate strategy into a technology plan. This will define the key capabilities required from technology, the responsibilities, and where data will be located and how it will be accessed; what is company wide and what is local.

Charis Nassis, ICT manager with Greek shipping company Ceres Hellenic Enterprises

The IT system includes infrastructure, such as equipment, network, and data centre; systems applications, such as enterprise resource planning (ERP) systems; and organisational processes, such as supply chain integration, customer and company linkages, leveraging company learning and experience.

The 5 layers of IT strategy are glued together with partnerships between the IT department and the senior management, vendors, line management and vessels.

The best CIO

Some shipping companies, even today, have not decided whether information technology is something the want to have or just need to have.

MIT researchers (Earl and Feeny 1994) argued that, for all industries, the CIO was personally instrumental in determining whether a company positioned IT as liability or strategic asset.

New research (the Hackett Group, 2005) surveyed over 200 large companies and benchmarked IT departments worldwide to conclude that employees in world-class IT organisations earn nearly one-third more than their counterparts in other technology shops.

The IT shops defined as top performers are measured by efficiency (such as IT cost and productivity), and effectiveness (for instance, economic return).

Over the past three years, according to the survey, companies with world-class IT organisations have significantly increased their spending on outsourcing, farming out 14 percent of the cost of routine functions, such as infrastructure and applications management.

Everywhere else, outsourcing spending has remained fairly stable.

Top IT shops have retooled their workforces to focus on higher-value activities, such as business process management, and on the latest technologies, such as web services. Employees with such expertise typically command higher salaries.

Shipping is a cyclical industry with a relatively high degree of risk that suffers the volatility of international trade. Currently, information technology for shipping companies is in the ferment era, with numerous offerings and companies investing increasingly more effort and money.

IT can be the enabling technology that will allow shipping companies to scale their services in good and bad times, without giving up anything from their wisdom and products portfolio.

During the trough, the shipping CIO will be instrumental in safeguarding the company's knowledgebase in technology, to keep things going and maintain readiness for the next peak.

What are the qualities of a great shipping CIO? Certain qualities are specific to the shipping industry, some are generic to any industry and others are a must-have for any executive.

The following checklist is based on the top requirements from the viewpoint of an executive recruiter:

- Leadership: Visionary, stimulating ideas, getting the best from and giving recognition to all those around them.
- Leverages the technology for the advantage of the company: Expertise on how all the trendy acronyms (ERP, F77, CRM, Web, etc) can serve the business.
- Business savvy: The mental capacity to develop in-depth knowledge of the shipping industry and the company's business strategy, operating model, value proposition, market position and competition
- Builds effective relationships: Within the company, with suppliers, customers and partners.
- Management skills: Be on time and on budget, make good use of resources, prioritise, build and motivate teams.
- Communication: The ability to articulate in a clear and appropriate manner.
- Creates and manages change: Information technology is frequently used as a lever for change and the CIO must be an effective change agent.
- International experience: Because shipping is a global industry.
- Ability to hire, develop and retain high quality IT professionals.

DS

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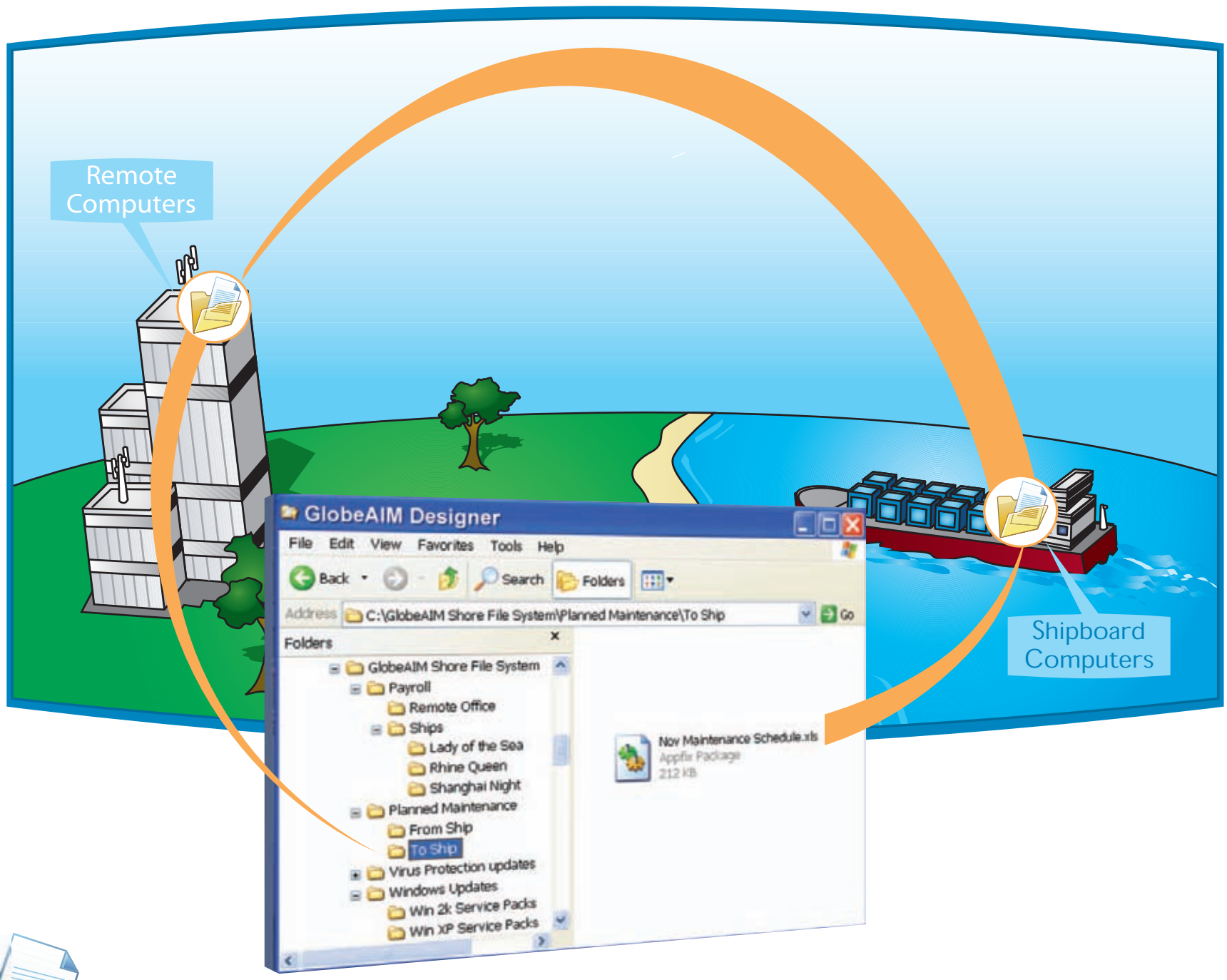

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Maersk and IBM get into container tracking

Maersk and IBM have teamed up to develop an international container tag tracking system - both for security and supply chain benefits. But will they find anyone to pay for it? Barry Parker reports

BEGINNING IN NOVEMBER, Maersk Logistics will be testing a new computerized container tracking device, and, more importantly, trying out a new business model.

Stefan Reidy, manager, Intelligent Trade Lanes with IBM

Maersk Logistics will be testing IBM's Tamper Resistant Embedded Controllers (TRECS), a module fitted inside containers, offering real time sensor readouts and container positions.

The TRECS unit, roughly the size of a cigar box, fits inside the corrugations on a container. There are eight sensors attached, which could measure moisture, temperature, and container altitude for example.

Business model

IBM and Maersk will be validating a business model where real time supply chain information can be sold to cargo interests, with security benefits (which can't pay the freight) available as a byproduct.

By March, 2006 the evaluation will encompass 1000 containers, and wider availability is expected by the second half of 2006.

"The return on investment (ROI) comes from better supply chain information."

So goes the business case for IBM's major thrust into the maritime business, under its newly announced "Intelligent Trade Lane" program, which, in turn, is part of IBM's larger "Global Movement Management" initiative.

"We started looking at security solutions, but realized that the value resided in all of the supply chain information that will now be available in real time," says Stefan Reidy- an IBM Business Consultant based in Switzerland.

IBM, which can afford gambles, is betting that cargo interests will find value (business-speak for "they will pay") in real time data and onboard processing power, as opposed to event driven data gathered at certain choke points- as a passive RFID tag moves near a suitable reader.

Maersk, with its blue ships and IBM, known as "Big Blue", have close ties forged over a long history of cooperation.

About a year ago, in October 2004, MaerskData was sold to IBM for US $414 Million; Maersk Logistics is said to be a major service provider to IBM.

Network systems

In response to questions about why TRECS differs from other container security paradigms, IBM pointed repeatedly to the real time aspect, where the data can be received continually and sent directly to the shipper.

According to IBM, one TREC box could theoretically handle thousands of sensors stitched together in a network.

The TREC can be programmed (using a smart card containing various business and security rules) to send an alert if a container is opened or if an abnormality occurs inside the box.

Transmission of data posed a major design challenge for the team of IBM scientists who built the TRECS prototypes.

Communications out of the container are handled through an antenna on the top of the container that utilizes a three pronged approach to connecting with wireless networks- Zigbee (an implementation of the 802.15 IEEE wireless protocol), GPRS (General Packet Radio Service- a new mobile phone protocol providing "always on" connections), and Iridium's low-flying satellite network.

Zigbee, suddenly compelling in its application to tie TRECS devices together, was not invented by IBM.

According to a presentation at the November 2003 *Digital Ship* conference in London by Steve Harding (who has also written on the applicability of wireless technologies in the maritime context), Zigbee supports Mesh networks that offer greater reliability because of their numerous nodes.

All the redundancy allows the networks to be self healing and self configuring.

Consistent with Stefan Reidy's suggestion that "thousands of sensors could be tied to a TRECS device", Mr Harding describes Zigbee as being scalable to "thousands of nodes."

When talking about TEU's, the number 8000 comes to mind.

According to the Zigbee Association (www.zigbee.com), "ZigBee was created to address the market need for a cost-effective, standards-based wireless networking solution that supports low data-rates, low-power consumption, security, and reliability <and> is the only standards-based technology that addresses the unique needs of most remote monitoring and control and sensory network applications. "

Radio interference

A concern raised by the wider implementation of wireless technology onboard ships is interference.

Digital Ship's radio and datacommunications correspondent Steve Harding, who first advocated and conceptualized the installation and use of 'zigbee' technology in containers for tracking purposes in *Digital Ship* two years ago, does not see this is an issue:

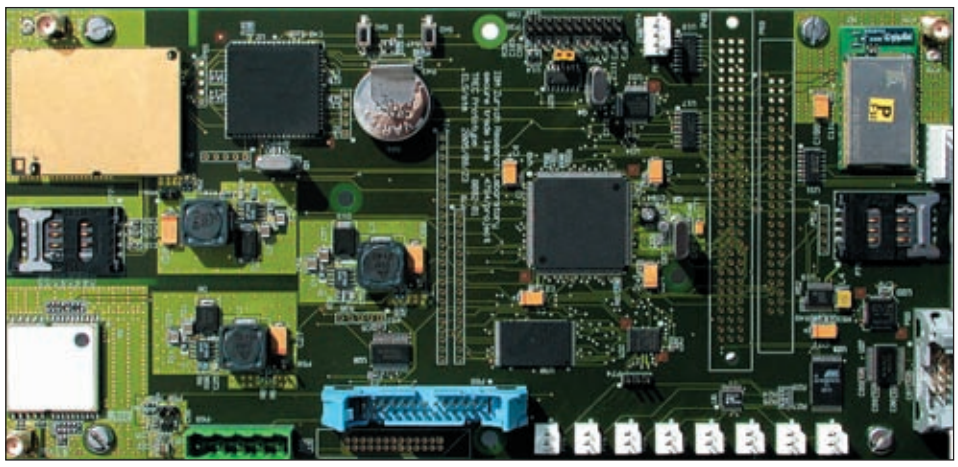
"In shipborne applications it can be anticipated that 'ZigBee' will operate in the 2.4 GHz band, i.e., the globally adopted 'unlicensed' wireless spectrum. There is no safety critical maritime navigation and communications technology using these frequencies that 'ZigBee' could potentially interfere with."

"In terms of potential interference from other onboard systems to nascent 'Zigbee' networks that may develop between containers, these radios are 'intelligent' and dynamically alter their routes to avoid collisions. Wireless interference in its traditional sense does not exist, because it cannot exist."

At least that's the theory that, thus far, no one has disproved; even in highly congested urban environments, the 'unlicensed' spectrum shows no sign of losing its capacity to absorb yet more wireless applications.

Satcoms

Digital Ship asked Mogens Roedbro, a Copenhagen based partner in IBM's Business Consulting Group about the choice of Iridium versus Inmarsat, and he said that Irridium's satellites are worldwide but that a container need not be pointed exactly at the beam of a geostationary satellite in an equatorial orbit.



The container circuit board - takes data from 8 sensors and broadcasts it by Zigbee, GPRS and Iridium

Digital Ship also queried IBM about battery life, another vexing issue for container tracking.

Mr Roedbro commented: "The TRECS unit builds low power consumption into its design, for example Iridium versus Inmarsat- the batteries could go for as long as six years."

Other power saving features mentioned were a low processing speed (in kHz not mHz), and a standby mode when no transmissions were occurring.

Specs for Zigbee (IEEE 802.15.4) show that it utilizes 250 kbps- a fraction of the higher rates of Bluetooth (1 Mbps) or conventional Wi-Fi (54 Mbps).

Bigger benefits

Digital Ship readers who look at the bigger picture may take solace in this major move. IBM has consistently and eloquently emphasized the collateral business benefits stemming from security expenditures.

Indeed, its own internal research think-tank, the IBM Center for The Business of Government, sponsored a report on this subject in May, 2005.

According to the authors, tied to Massachusetts Institute of Technology, asset visibility and tracking provide "constant access to location and product status, which may reduce the uncertainty of shipment arrival…and may give firms a higher level of security by providing a more consistent and predictable flow of materials, making it easier to observe exceptions…that may indicate a security breach."

What's in the box?

But, security issues can also be framed with even broader questions.

Big integrator Unisys Corporation, in its "Secure Commerce Roadmap" White Paper (also made available at the Security show), points out that "Unless there is confidence that containers are stuffed properly, the remaining controls are meaningless."

Consider another finding: "Unisys has tested every major technology group that could possibly be applied to a container…The majority of these devices are not commercially viable in the near term as they do not function properly (at least 99.9% reliability), they do not improve security, or they are too expensive."

RFID tags

Unisys points to RFID readable Container Security Devices (CSD) affixed to container doors (to detect breaches) as being the exception. The CSD is the one technology with the potential to add security and become commercially viable in the near-term."

One example of such equipment, at a booth a few aisles away from IBM's, was being marketed by General Electric. Its hardware, developed originally by Allset AB in Sweden, has now re-emerged under the "Commerce Guard" mantle.

The low powered device, which can be armed by calling from a mobile phone, attaches to a container door and, through a sensor near the hasp, will report if tampering has occurred, when scanned by a proprietary GE RFID reader.

In a real life case study with containers of Starbucks coffee coming from Central America to the West Coast USA, a true picture of the supply chain emerges when readers capture events at locations along

the containers' routes- networked through the internet.

GE's CSD also has the capability to handle additional sensors that may be required by some future regulatory initiative.

Others in the RFID space include Savi Technologies, a leading RFID provider that has teamed up with a group that includes the Thomas Miller organization, on the SIMTAG project.

Savi's Smart and Secure Tradelines (SST) initiative has also been an important proving ground for the application of RFID, albeit a proprietary flavor, to container security.

While the RFID folks are still fighting it out, not yet ready to compromise on a common standard for devices and readers (that will feed the common network), IBM is pro-actively working with the World Customs Organization to gain approval of the TRECS device.

And, as IBM states in its promotional literature, by partnering with Maersk, it gains a testbed at the world's biggest container shipping line.

Market penetration

Nevertheless, there is some common ground between IBM's business model, GE's relatively simpler device, and Unisys's highly realistic prognosis. Unisys comments: "The benefits and/ or penalties <from security> are not in place. Private sector entities do not see significant business advantages to increasing their security…"

IBM's Mr Roedbro indicated that market penetration would begin with valuable or time critical consignments, such as pharmaceuticals, consistent with the Unisys' viewpoints that "it is difficult to generate inventory or lead time reduction benefits on a shipment if the value of the container is less than $70,000," and "for high value or time sensitive commodities such as food and drugs, the benefits and business case are much stronger than for low cost apparel."

Shipowner's role

The good news for *Digital Ship* readers is that very little seems to be required of shipowners, the devices have their own power supplies and do not require the intervention of ships' officers.

In the IBM case, the Zigbee approach obviates the oft cited problems of tracking individual containers positioned somewhere deep in the bowels of an 8,000 teu behemoth.

Likewise, the choice of Iridium rather than Inmarsat overcomes a twin concern- if containers sat "on the top", could they find the satellite. The IBM sales materials talk of "business transformation", highly worrisome to shipping companies. But, post transformation- the maritime links within affected supply chains will not look very different than they do now. DS

IBM was reportedly working on a demonstration project with a major port in the Middle East."

Digital Ship *US Correspondent Barry Parker connects owners, brokers and others together. Based in New York, he can be contacted on bdp1@conconnect.com*

Collision off Denmark

UK and Malta have published a report of a collision in November 22 2004 between Denmark and Sweden. Two vessels were followig the same track - one at 16 knots, one at 6 knots

The following is a synopsis of a recently published report by the UK Maritime Accident Investigation Board (MAIB) and Malta Merchant Shipping Directorate, about two vessels which collided between Northern Denmark and Sweden on November 22 2004.

Both vessels were following an IMO recommended route in the same direction, with one vessel going at 16 knots hitting the back of another one going at 6.5 knots.

Just before the incident, the Ukrainian chief officer onboard the 16 knot vessel, *Cepheus J* (UK flag), had sent the look out to clean the crew mess room, and was listening to radio news of the political situation in Ukraine (just coming up to the Ukraine presidential elections).

He was also manually writing down the temperatures of the 61 refrigerated containers onboard, something he was required to do every 6 hours.

In the hour before the collision, *Cepheus J* could have seen the other vessel, Maltese 4955 dwt general cargo ship *Ileksa* on its radar, but it was under the heading marker, which did not entirely hide the target but made it difficult to see. However AIS information was also on the radar which clearly showed the vessel.

Cepheus J's bow hit the stern of *Ileksa*. There was severe damage to *Ileksa's* stern and a hole in *Cepheus J* above the waterline. Both vessels could continue their voyages with no injuries or pollution.

The collision occurred at 5.19am on November 22, 2004, at night time with poor to moderate visibility.

The chief officer on *Cepheus J* had sent the look out to clean the crew mess room, while he continued doing paperwork, and listening to news on the radio.

He was standing at the chart table on the port side of the bridge, where he had an unrestricted view ahead, and had ECDIS and radar displays nearby. He did not see *Ileksa* until after the collision.

On *Ileksa*, a third officer and master were on the bridge. They spotted *Cepheus J* on the radar when she was 3-3.5 miles away and saw her visually when she was 1.5 miles away.

When the vessels were 0.5 miles apart *Ileksa* contacted *Cepheus J* by radio and received no reply. When the ships were 0.3 miles apart *Ileksa* began to take evasive action but was not able to turn sufficiently in time due to the wind.

Cepheus J was using both UKHO paper and raster charts; *Ileksa* was using a Russian chart. All charts had the identical track on them, since they were both based on Danish charts of the area.

With the visibility restricted to 1.5 miles, *Ileksa* would have been visible from *Cepheus J* for 9 minutes before the collision. *Ileksa* was displaying the lights required for a vessel of her size, which would have meant that *Cepheus J* would have seen at least a single white sternlight. DS

The full report can be obtained from the MAIB Website www.maib.gov.uk

Kronodoc - shipbuilding information logistics

Finnish software company Kronodoc Oy has developed a software tool which can be used by shipping companies to co-ordinate the shipbuilding process

The software, which it categorises as "shipbuilding information logistics software", is being used by both Finnlines and the Finnish Navy, to oversee vessel deliveries and manage documentation during operation and maintenance phases of the fleet.

It is used by everybody involved in deliveries of new ships, including shipowners, shipyards, systems suppliers, consultancies, officials.

Kronodoc believes that up to 20 per cent of the design time related to ships, and 5 per cent of total manpower involved in ship deliveries, is taken up on information management tasks.

Deliveries are getting bigger and bigger; the total number of partners involved is increasing constantly; this means that the amount of information and complexity of deliveries is increasing constantly.

The tool provides owners with real time information into how the building is going.

When the ship has been built, the information can then be used in operations and maintenance, without extra work being needed for searching and organising overhead

Complete technical information related to the newbuilding is instantaneously available in the central information repository for to operations and maintenance without extra information searching and organizing overhead.

Information management

The information management tools look after the documents created during the newbuilding - an estimated 100,000 documents are created in the building of one large cruise ship.

Information includes drawings, administrative information, e-mails, project plans, reports, memos and photographs, generated and shared by hundreds of different companies.

Using the Kronodoc infrastructure, the information can be shared by authorised parties over the web.

The tool helps suppliers, consultancies and shipyards complete their documents in time with the schedules they have agreed, issuing alerts where necessary.

"In our experience about 5% of the manpower related to newbuilding deliveries is spent on managing, finding, circulating and co-ordinating timely information transfer in the partner network," says Outi Peltoniemi from Kronodoc.

"Kronodoc Information Logistics solutions reduces the cost by up to 50% and improve punctuality of deliveries."

Users

The Finnish navy is using Kronodoc Information Logistics solutions to oversee navy vessel deliveries and to manage documentation related to navy vessels during operation and maintenance phases of the fleet.

Finnlines is using Kronodoc Information Logistics solutions for similar purposes.

Aker Finnyards has been using Kronodoc Information Logistics solutions since 1999 to support design collaboration and information management in the massive partner network involved in newbuilding deliveries.

The entire Aker Yards group has selected Kronodoc as the Information Logistics platform that will support yard specialization and strong collaboration of shipowners, yards, systems suppliers, consultancies and officials during ship deliveries.

Deltamarin has been using Kronodoc Information logistics solutions since 2000 to manage and share all design information related to ship deliveries.

Vik-Sandvik has been using Kronodoc since 2003 for similar purposes

Wärtsilä Corporation is using Kronodoc Information Logistics solutions on a corporate wide level to support all business across R&D, systems deliveries and after sales operations related to systems deliveries to the Marine business. ■

Europort Maritime - Preview

Between the first and fifth of November, 700 different companies will display their wares to 40,000 visitors at the Europort Maritime exhibition and conference. We talked to a few of them to see which of their developments they hope will catch the eye of the participants

Transas

The Transas stand this year will display the company's newest generation of integrated onboard systems, including their popular ECDIS system.

There will also be demonstrations of integrated bridge systems, integrated navigational systems, vessel traffic systems, an AIS Base station, a track control system and an S-VDR playback device.

Transas' Integrated Navigational System, on display at Europoort

The company will be running a competition at Europort Maritime, available to all, to win a Transas Pocket Sailor iPaq. Transas says they want to "keep the atmosphere festive" on the occasion of the 15th anniversary of the opening of the company in St Petersburg, Russia.

Kongsberg Maritime

Kongsberg Maritime will be showcasing its new K-Line technology at Europort to demonstrate its approach to subsystem integration. The K-Line was officially launched at Nor-Shipping earlier this year.

Using the same graphical user interface (GUI) throughout the systems should mean that operator training would be reduced. Kongsberg Maritime predicts that the "user friendliness" of the operating system will reduce human error and increase ship safety.

"We have engineered K-Line to provide vessels, large or small, fast or slow with reliable, relatively easy to operate shipboard electronic systems," says Roy Larsen, Marketing Manager, Kongsberg Maritime.

K-Line consists of separate systems for Navigation (K-Bridge), Automation (K-Chief), Dynamic Positioning & Joystick (K-Pos), Prop and Thruster Control (K-Thrust), Tank Gauging (K-Gauge) and Safety (K-Safe). It has been designed to provide fully redundant operation of a ship's major operating systems. The company is keen to stress, however, that K-Line is not a replacement to their existing shipboard systems but a further complimentary option.

Radio Holland

Radio Holland will demonstrate its range of products in Hall 1. Among them will be its line of Furuno manufactured products, which include radar, sonar and echo sounder technology, as well as the latest Universal Automatic Identification System (UAIS) transponders. The company will also display its web-based Ship@Sight vessel tracking system, and a range of S-VDRs and VHF receivers.

Another item on show will be the 3-screen UniMACS BlueLine bridge, a digital integrated bridge intended for short-sea, smaller and conventional craft, and approved for Dutch flag commercial vessels. The company claims that the integration of the BlueLine bridge is a unique new software solution that reduces the number of necessary displays.

Radio Holland distribute a number of communications systems which will also be shown at the stand, such as the Seatel VSAT 4003 always-on broadband internet connectivity system, and the Maritime Infotainment Network Design (MIND), which allows the ICT network on board of vessels can be integrated with the audio-video and telephone system.

The company calls MIND "a unique technological innovation", and says that it allows for video and audio on demand, as well as the control and operation of domestic appliances like lights and blinds. All can be controlled via pocket PC or PDA. An integrated Voice over IP system makes it possible to connect telephones to the same network, and to turn the same pocket PC into a wireless telephone.

SAM Electronics

SAM Electronics Nederland of Rotterdam will feature a range of their latest navigational aids and associated sensors, together with communication, electrical and electronic products for ship operation and control, at their stand at Europort.

One of their main exhibits will be a section of the latest Nacos 5 integrated bridge system, which has recently been accorded a 2005 International Red Dot design award.

Other systems on display include a Debeg 4630 navigation echosounder, with split-screen display functions, the Debeg 4112, an integrated satellite navigation and speed log system with 12-channel GPS, and the Debeg 3270 F77 satcom terminal. VDR and S-VDR systems will also be featured.

The GPM 500, a new microprocessor-based module designed for the protection of shipborne generators and mains supply networks, will be on display at the stand. It is being shown in conjunction with presentations of other related systems covering automation, power supply and propulsion applications, including a remote propulsion control system.

Shiploc

Shiploc will be exhibiting at Europort as an SSAS and LRIT solution, and will be introducing the latest features available on their web site. The site, www.shiploc.com, now offers a dedicated marine chart display, with additional features such as calculation of the ETA, weather information, zone surveillance, and management of alerts.

"We are continuously striving to improve this service", says Shiploc, "and new features will soon be available by the end of this year or at the beginning of next year, especially taking into account the LRIT regulation to be adopted by IMO."

Tideland Signal

Tideland Signal will be showing some different aspects of its range of navigational aids, like their latest AIS system, remote monitoring and control system, and their single diode-based lanterns at their stand at Europort. A video screen on the stand will also show live demonstrations of both Tideland's V-Track 100 AIS system and Navlink network systems.

Other featured products will include two polyethylene buoys for channel marking and similar duties, one of which has just been selected by Trinity House to replace all Class 5 and 4 steel buoys.

Tideland will be launching some new products at the exhibition, including two long-life, low-maintenance LED lanterns, with different lens configurations to meet varying vertical divergence requirements, and a diode-based lantern with AIS identification and positioning and its own solar panels and battery system. The company claims that this is "the first dual-function navigational aid in a self-contained package."

Very busy. Adding new locations in China, The Caribbean, Germany and The United States, the Radio Holland Group now has 54 branches! Which makes us the largest global multi-card electronics company with a network of that particular span. With our worldwide network, we can supply all required maritime electronics, spare parts ánd provide service and maintenance support at any location, 24 hours a day, seven days a week. We are committed to help our customers realize efficient operations of their fleet and maritime business. Providing shipowners, managers, shipyards and other maritime organisations with the best solutions for their electronic requirements.
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Simplified voyage data recorders

With regulatory requirements to fit simplified voyage data recorders starting in July 1 2006, many shipowners are fitting early to beat the rush

BY JULY 1 2010, all cargo vessels over 3,000 gt will have simplified voyage data recorders (VDRs) fitted, recording the position of the ship, the bridge conversations, the radar picture (in most cases) and other information, continually storing the last 12 hours of data.

The first tranche of voyage data recorder legislation applied only to new vessels and passenger vessels, requiring them to fit VDRs by July 1, 2002.

The second tranche of voyage data legislation requires that all ships above 3,000 gt fit a VDR with a slightly reduced requirement, known as a simplified voyage data recorder (or "S-VDR").

Ships above 20,000 gt must fit an S-VDR at their first scheduled dry docking after July 1 2006, and at the latest by July 1 2009.

Ships 3,000 gt to 20,000 gt must fit an S-VDR at their first scheduled dry-docking after July 1 2007, and at the latest by July 1 2010.

The only exemption is for ships which will be taken out of service within 2 years of the implementation date.

The normal performance test requirements are that the units should be tested every year by a competent person independent of the shipping company, checking that all the appropriate data is properly recorded for the last 12 hours.

The designs to make S-VDRs followed complaints that normal VDRs were too expensive.

Both S-VDRs and normal VDRs must record date / time, ship position, speed, heading, bridge audio, communications audio, and radar (unless "impossible" to do so on the S-VDR), storing the last 12 hours of data.

Other data (including echo sounder, alarms, rudder, engine, hull opening status, fire door status, accelerations, hull stress and wind speed) must be recorded on the S-VDR if it is available in the normal interface standard (IEC 61162).

Benefits

The manufacturers are understandably keen to convince shipowners that they have more to gain from installing such systems than just compliance with the rules. This should encourage shipowners to do more than just buy the minimum system at the cheapest price.

The VDR provides evidence of the sound signals and communications made between vessels before a collision, and any observations of approaching vessels, which are all important in any legal dispute.

The VDR also collects data which could be analysed by a shipping company to determine if the engine is running optimally.

The shipowners can use the data to find out if they routinely waste fuel, with vessels regularly being kept delayed for a berth. The vessel could have gone to its destination port at a slower speed if it knew it was going to have to wait.

Shipping companies can find out plenty more useful information from the data if they are clever. For example, what is the incremental fuel cost of taking on an extra truck onboard a fast ferry, when the vessel is going head-on against the waves? It could be more than the amount the truck pays for the transit.

Float or sink

The standard voyage data recorder was designed to sink with the ship. The theory was that this was the best way to ensure that the VDR would be found after the incident. Ships have automatic EPIRBs which can report the precise location of any sunken ship - assuming that she did not move around a bit on her way down, the VDR could still be found.

There could of course be big costs associated with rescuing a VDR from several miles down, including the use of automatic underwater vehicles. The data also needs to be in a very strong capsule, to survive the pressure of the depth, fire, and other incidents such as the ship settling on the ocean floor on its side, with the weight of the ship on top of the capsule.

The logic around making the capsule go down with the ship was linked to possible problems finding a float-free capsule on the open ocean. The capsules can be fitted with homing devices (position indicating radio transmitters, like an EPIRB) which enable them to be found - but what if something goes wrong with it? Finding the VDR data is a long way down the priority list immediately after a serious incident - what if, by the time a team has been organised to track it down, the battery runs out?

With simplified voyage data recorders, the requirements are not so onerous - floating VDR data capsules can be used. The capsules must be designed to float free, meaning that it does not have the same requirements and the cost is lower. It must be able to transmit a homing signal "for at least 48 hours over the next 7 days."

Data recovery

A recent hot topic of discussion at IMO was data recovery, making sure the data can be made immediately available to both investigator and shipowner.

The different VDRs on the market have different systems for data recovery (as IMO did not specify any standard for data recovery).

At a recent meeting of the UK's Marine Accident Investigation Branch (MAIB), Captain Nick Beer, principal inspector of marine accidents, explained that time was often lost after an incident when arriving on a vessel, in determining whether downloading or replay was possible, and how this should be done. A rapid replay of information could provide valuable guidance to investigators as to who to interview before the vessel sailed away once more.

A paper was produced following the meeting for submission at the IMO NAV 51 meeting in June 2005, suggesting a standard for download and playback of data.

Subsequently CIRM, the electronics manufacturers lobby group, advised manufacturers to ensure that after July 1 2006, VDR manufacturers should provide software for investigators onboard, with all the necessary connectors and cables.

It is not likely that many amendments will be necessary to comply with this - voyage data recorders are computers, software can be loaded onto them - and the investigators might need to use their own laptops if the VDR does not have a screen. It would certainly help, however, if there could be standard software for playback.

Choosing an S-VDR

When choosing a S-VDR, there will not be much between the major manufacturers - the devices are broadly designed to do nothing more than required by the legislation, and shipowners will probably want to stick to the manufacturer they already have personal preferences for.

All of the manufacturers are stressing that their products are easy to install and maintain, operate reliably, can be used as learning tools and for accident investigations, and have intuitive software for operation.

A voyage data recorder is ultimately a PC with a special hard drive - and networking and data storage technologies are getting cheaper and cheaper. So with any system on the market, shipowners should be able to explore many different options for storing the data (they never need to throw data away if they don't want to, it won't cost an enormous amount with today's low cost of data storage).

They can display data in different places around the ship, and have many different options for how the data should be played back and who should see it.

There are different installation options, and different fleet agreements that can be made.

Some manufactures have different options for shipboard networking and playback - for example tools that let staff see VDR data from their cabins or monitor it around the ship.

These are standard computer networking issues, and so any shipowner wanting to do this could do it with any VDR system, using off the shelf server, networking and screen technologies, and a small amount of networking expertise.

The Sperry Marine S-VDR has a "save"

Kelvin Hughes gets a certifiate from the Russian Maritime Register of Shipping for its simplified voyage data recodrder

button which will automatically copy the last 12 hours data onto a separate removable hard drive for analysis, without interrupting the VDR's operation.

The Rutter recording module can allow for 30, 60, or 90 days more of continuous recording. It has an Advanced Graphic Analysis Module enabling the data to be analysed for long term trends. There is a multiple video display capture option enabling up to 3 different displays to be recorded.

Kelvin Hughes recently received type approval from the Russian Maritime Register of Shipping and the Ministry of Transport of the Russian Federation for its MantaDigital simplified voyage data recorders. The type approval has been obtained as part of the company's bid to attract more business from Russian shipowners.

VDRs in Japan

Voyage data recorders were used to pinpoint the vessel responsible for the deaths of seven fishermen in a rather surreal hit and run incident off the coast of Japan in early October this year.

Israeli 41,000 dwt container ship Zim Asia, owned and managed by Zim Shipping, hit a fishing vessel off the coast of Hokkaido, Japan, in the middle of the night, sinking it, and immediately fled the scene rather than assisting with the rescue.

Seven of the eight fishermen onboard drowned.

Surprisingly, another fishing vessel nearby had a voyage data recorder fitted. It recorded that the larger vessel immediately changed direction after the collision (proving that the crew must have been aware that it happened) and had a special radar signature unique to Israeli vessels.

Further evidence that Zim Asia was involved was discovered by comparing paint samples on both vessels.

Zim initially denied responsibility, with the seafarers onboard saying they did not feel anything, and, allegedly, initially refused to co-operate with investigators, according to local news reports.

The issue escalated into a serious diplomatic incident between Israel and Japan, with the head of Zim making a visit to the Japanese embassy in Israel to formally apologise. Zim announced an internal investigation and said that the company chairman was going to question the crew and was sending company investigators to Japan to participate in the investigation.

The Japanese Coastguard said it was considering sending investigators to Israel.

"This is an extremely serious incident, and it is extremely regrettable", Japan's Chief Cabinet Secretary, Hiroyuki Hosoda, said at a press conference.

"If you hit a ship in the middle of the sea, you obviously need to help it. We want Israel to clarify why an Israeli ship did not do this."

DS

VDR in practise

The following list of times where VDRs have been used in practise was first published on the www.s-vdr.com website which is sponsored by Kelvin Hughes Ltd.

1. **RO-RO ferry in collision with fishing vessel.**
Radar information gained from the ferry's VDR proved incontrovertibly that the fishing vessel had made a large alteration of course across the ferry's bow moments before the collision, contrary to the Collision Regulations. Unfortunately, bridge audio data which might have given insight to the human factors that lay behind the accident was lost to the investigators due to background noise from a radio which had been playing in the wheelhouse for entertainment.

2. **Near collision between passenger ferry and general cargo**.
VDR information enabled the investigators to establish the true course of events which was contrary to both the masters' accounts. Shortfalls in bridge team management were uncovered to the benefit of the individuals involved, the owners, and training establishments.

3. **Passenger vessel lost power on a lee shore in gale force winds.**
VDR information enabled a detailed analysis of the bridge team's actions in an emergency situation to be carried out. Many shortfalls in performance were uncovered to the benefit of the bridge team, the owners and training establishments.

4. **Vessel berthing at builder's yard for guarantee dry docking hit jetty whilst under pilotage, sustaining $150,000 steel damage.**
When the yard was made aware that the Pilot's actions had been recorded, they paid for repairs without question.

5. **Vessel leaving NW European port hit coaster a glancing blow, sustaining minimal damage.**
When bridge team's actions were reviewed, procedures were found to require modification.

6. **Vessel struck charted rock at speed, sustaining considerable bottom damage.**
Evidence from VDR tape allowed management to review the Pilot's and OOW's actions prior to grounding, allowing remedial action to be taken well in advance of the Flag State report.

7. **Vessel rounding Ushant was in close quarters situation whilst overtaking another vessel.**
Evidence from the VDR enabled management to review the OOW's actions and take necessary remedial action.

8. **Vessel entering continental port was in collision with yacht.**
Evidence from the VDR absolved the Master of all blame.

9. **Vessel dragged anchor in high winds and touched another ship anchored to leeward.**
Evidence from the VDR allowed the management to review action by the OOW and provided the P&I club with the evidence they required to settle the claim.

10. **Loaded vessel outward bound was in collision with inbound vessel in port access, resulting in considerable delay.**
The VDR provided irrefutable evidence of the action of both ships, avoiding the cost of taking witness statements.

11. **Vessel entering port in narrow channel struck an underwater object**.
The VDR showed the ship to be right on track in the dredged channel, thus absolving the Master from blame or criticism.

12. **High speed close quarters incident with warship.**
The VDR provided evidence that clearly confirmed that the HSC Commander had taken the correct action when the warship failed to give way, as required by Collision Regulations.

13. **Vessel berthing in high wind.**
A review of the evidence from the VDR confirmed that, in general terms, the personnel concerned had taken the correct action, but some areas for improvement and training needs were also identified.

14. **Engine room fire.**
A review of the evidence from the VDR confirmed that in general terms, the personnel concerned had taken the correct action, but some areas for improvement and training needs were also identified.

15. **Fire in funnel.**
The VDR assisted Management in identifying a possible design fault in the vessel's fire detection system, which explained the slow response from the Bridge Watchkeepers to initial reports of the fire. A review of the wording of messages from the vessel also helped to explain an apparent over-reaction to the incident by the Coastguard.

A NON-EXHAUSTIVE LIST OF WEBSITES OF S-VDR MANUFACTURERS IS GIVEN HERE:

www.kongsberg.com
www.kelvinhughes.com
www.ruttertech.com
www.jotron.com
www.mcmurdo.co.uk
www.sperrymarine.
northropgrumman.com
www.acrelectronics.com
www.avecs.net
www.sam-electronics.de
www.consilium.se
www.jrcamerica.com
www.tokimec.co.jp
www.maris.no
www.totemplus.com
www.selexmarine.com
(ex Broadgate)
www.ocean-systems.com
(VDR subsystems)
www.svdr.com -
a special website about simplified voyage data recorders, sponsored by Kelvin Hughes

VTS NEWS

AGCL install AIS in Auckland

www.advancedtrack.net

An AIS system has been installed in Auckland, New Zealand, by local company Advanced Global Communications (AGCL). The system can provide audible, SMS or e-mail alerts when a vessel arrives (or is approaching) at a particular destination, meaning that pilots and provedores can have accurate information about vessel arrivals and departures.

It will operate in conjunction with the company's existing GlobalStation PC-based software system which monitors, maps and alerts on vessel movements using HF DSC, VHF DSC, GPRS, CDMA, Inmarsat-C, and now AIS.

It is available as a service running off AGCL's server network or as a stand-alone product.

Norcontrol to supply VTS in China

www.norcontrolit.com

Norcontrol IT will supply a Vessel Traffic Service (VTS) system and Port Management and Information System (PMIS) to the new VTS at Lian Yun Gang seaport, China, with delivery of the systems due to start in December 2005.

The company will supply four operator work stations in the Chinese language, which will be interfaced with Norcontrol's Dual PMIS database, which also has a Chinese language version. The control centre at Jiangsu MSA VTS centre will have a remote display installed, and the two radar sites will receive radar tracking systems and be integrated with a Roboscan CCTV system.

Norcontrol's first system delivered in China was to Qingdao in 1986.

Tideland launches solar lantern

www.tidelandsignal.ltd.uk

Tideland Signal, a UK company producing buoys and lights, has made additions to its long life, low maintenance LED lanterns, the MLED 215 and SolaLED 215.

The lanterns have three different lens configurations - one for a maximum intensity beam in fixed or high stability buoys, a medium beam for channel marking, and a wide beam for short range river and canal use.

The lanterns have long life LEDs and high integrity electronics in a tough UV resistant polycarbonate enclosure. The lantern should not need to be opened during its service life. It can be programmed in the factory or by remote radio.

The LED light output varies with temperature, and so the lantern has a temperature sensing and current compensation program which keeps the lantern's intensity constant as temperature changes. The LED service life is calculated at 100,000 hours.

135 Stolt officers pass shipboard ECDIS course

www.seagull.no

135 officers from Stolt Nielsen Transportation Group have been certified by Seagull's ECDIS onboard training course.

"All of our deck officers working on ships equipped with ECDIS are required to complete a Seagull onboard CBT based course," says Stolt training and develpoment manager, Marcin Wolasiewicz.

"We found this training of great value, as it reflects directly on ship specific equipment, its specific functions and limitations.

"Our experience shows that this onboard training program was well received and appreciated by our officers. In many cases our Bridge Teams worked together with the material, sharing experiences between senior and junior officers"

Several flag states require ECDIS training, including the Panama Maritime Administration.

Course topics include: an introduction to ECDIS, chart accuracy, route planning programming and evaluation and practical use of ECDIS.

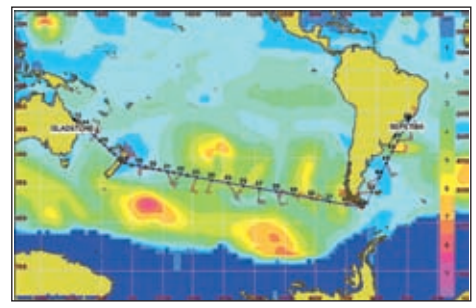
There are practical exercises which will improve the working knowledge of onboard ECDIS system components, such as the alarm and warnings system and steering system, and will outline system limitations and possibilities.

The reports and answers to the questions and exercises are submitted by satellite to Seagull for assessment and certification.

AWT develops ship weather portal

www.weatherrouting.com.

US maritime weather company Applied Weather Technology has unveiled a new online "portal," at www.weatherrouting.com, where shipping companies can check their vessel positions and their weather online.



Check your vessels online with weatherouting.com

AWT currently manages routing for over 1,000 vessels every month.

Ship operators can log in, see where their ships are and when they are expected to arrive, and check the vessel is maintaining the position to keep up with the charter party. They can see what weather the vessel is in and if the weather is delaying the vessel. They can see if the vessel is on the best possible track and check up on any possible tropical storms.

The system has been designed to be easy to understand and not time consuming to review.

Hamworthy electric drive deepwell pumps for FPSOs

www.hamworthy.com

Hamworthy has signed two contracts for outfits of its Svanehøj electric-drive deepwell pumps for FPSOs (Floating Production Storage and Off-loading).

The first, with Bergesen Worldwide Offshore, will be a conversion of the 360,000 dwt ULCC Berge Enterprise in Singapore. The FPSO will operate at one of the oilfields outside Mexico owned by the Mexican oil company PEMEX. Hamworthy will supply 12 CL/DW 250 cargo pumps with 32m-long shaft transmissions. The pump deliveries will take place in July 2006.

The second is for a 600,000-barrel storage capacity FPSO being built by Samsung Heavy Industries in South Korea for the Japanese company MODEC, which will lease the FPSO out to Australian oil company BHP. The contract specifies 12 CKL 200 cargo pumps and two DL 125 slop pumps, each of which is 22m long, also for delivery in July 2006.

A deepwell pump being lifted on board an FPSO

MAERSK use Kongsberg IAS for ROPAX project

www.kongsberg.com

MAERSK has selected Kongsberg Maritime to supply Integrated (Marine) Automation Systems (IAS) for its multiple vessel RoPax project, with the first of the vessels having been delivered in August 2005.

The 34,500 gross tonnes RoPax has a length of 172m and a beam of 28m, and will travel between Dover, UK and Dunkerque in France with capacity for 780 passengers and 70 crew, including 70 cabins and space for about 340 trucks and cars.

Radio Holland CBT for surveyors

www.radioholland.com

Radio Holland group of Rotterdam, working together with the Maritime Academy of ROC Nova College (Ijmuiden), have developed a computer based training tool (CBT) for Radio Holland radio, navigation and VDR surveyors.

The tool can be used by surveyors to test and refresh their knowledge; it should also cut down on the amount of classroom courses Radio Holland conducts for its worldwide surveyors in the Netherlands.

Kongsberg launches bearing wear monitoring equipment

www.kongsberg.com

Kongsberg has launched new bearing wear monitoring equipment, which can be used to detect possible engine damage early.

The system can be fitted to MAN B&W engines. MAN B&W has a product collaboration agreement with Kongsberg.

The benefits are maintenance and regulation cost savings, and the prevention of engine failure.

Class societies require that engine bearings should be inspected every 5 years, which can involve a lot of downtime with 42 bearings on a 14 cylinder, two-stroke engine, and with several hours needed to inspect each bearing. There is also a risk of incorrectly re-aligned parts.

By installing a system such as Kongsberg, the period between class society inspections can be extended - if the class society agrees, inspections can be skipped altogether if the system indicates no damage.

Kongsberg has supplied bearing monitoring systems to MAN B&W and other engine manufacturers for over ten years.

Monitor bearings when they are in action - detect possible damage early

RNLI and McMurdo produce new safety system

www.rnli.org.uk
www.mcmurdo.co.uk

McMurdo Ltd will produce, promote and distribute a new vessel monitoring and man overboard system for the UK's Royal National Lifeboat Institution (RNLI) following an announcement at the Southampton Boat Show. The system will be known as MOB Guardian and is expected to be available from spring 2006.

Whilst at sea the system automatically transmits a boat's position, course and speed via satellite. If regular updates are missed, the RNLI monitoring station automatically transmits via satellite to the vessel to try to regain contact. If the vessel fails to restart sending updates an alert is raised with the relevant search and rescue agencies.

Jim Cullumbine, RNLI business development manager, says the system should "help us take the 'search' out of search and rescue, and enable us to reach casualties more quickly."

RNLI chief executive Andrew Freemantle and Chemring (parent company of McMurdo) PLC chief executive Dr David Price sealing the deal on MOB Guardian

The new safety system also incorporates crew personal safety devices (PSDs) that have been developed to be worn by crew members on their person. In the event of a man overboard incident, search and rescue organisations are typically alerted in less than one minute.

RNLI's man overboard system - sends ship location information by satellite

Originally developed by the RNLI as a confidential position reporting system for fishing vessels in response to the high levels of fatalities in the industry, the system will now also be made available for use on leisure craft by McMurdo.

Kongsberg opens Korean automation training centre

www.kongsberg.com

Maritime electronics company Kongsberg has opened an automation training centre in Busan, South Korea, to train seafarers how to use Kongsberg ship automation systems.

The classroom has capacity for 10 students. The first company was Maran Gas.

Studying the latest ship automation systems

DNV type approves ET Marine's emission manager

www.etmarine.com

The ET Marine SeaNox system for measuring Nitrogen Oxide emissions from a ship's stack has been type approved by DNV as a chemiluminescent analyser, as required under IMO's MARPOL Annex VI.

ET Marine is a sister company of Enviro Technology Services of Gloucestershire, UK, which develops land based air quality monitoring systems. It has a network of fully trained agents and service centres around the world.

ATECMAR appoints new president

www.atecmar.org

ATECMAR, the Association for Promotion of Safety at Sea Technologies based in France, has appointed Joël Branchut as its new president. M Branchut is sales director of radar processing company Sofrelog.

Finland, Russia and Estonia link crisis management centres

www.gofmec.fi

Three crisis management centres in Russia, Finland and Estonia have embarked on an EU funded project to link their crisis management simulator centres.

The purpose is that they can simultaneously train personnel, and share databases and expertise, to work together after a major oil spill.

The centres involved are the Admiral Makarov Training Centre in St Petersburg, the Kotka Vocational Institute in Finland, and the Estonian Maritime Academy in Talinn.

The crisis management system is supplied by Transas. It will supply its Transas Crisis Management System (CMS) initially at the Estonian Maritime Academy. The

Nikolay Lebedev, president of Transas Group, signs the deal with Jorma Laasko, head of SUMMERI project

Admiral Makarov Training Center in St. Petersburg, already has the Transas Crisis Management System available.

The project was developed because of the increase in oil tanker traffic in the Gulf of Finland.

Digital Ship

Radar or wind farms?

How should authorities resolve a tricky question such as whether to allow wind farms, which might interfere with ship's radar? Steve Harding explains a structured decision making method

RECENTLY I REQUESTED an estate agent, (a realtor for those in North America), to offer an opinion on what my house was worth.

Trying not to show my feelings, I thanked her for her time.

I was disappointed, not to say annoyed. Her estimate of my home's value was lower than last year.

Worse, it now appears to be worth less than identical properties a few kilometres distant, notwithstanding these were cheaper than my home in 2004.

As far as my personal property portfolio is concerned, things are amiss.

Was the decline a universal feature or specific to this house?

It couldn't be the former; property elsewhere was holding its value. Meaning, there was no doubt what was having a deleterious impact on the price I could expect to sell my home for: nine million tonnes of coal to be extracted from a mine to be developed 3 km away, it will be called 'Cutacre' if you're interested. What the true impact of the mine will be once operational matters nought. Perceptions are everything in this world.

What options have I to minimize the mine's impact on my home's value? None.

I suppose I could have objected to the mine, but if I'm honest, why should my personal, vested interest outweigh what is best for wider society? Like it or not, the loss of value from my home is trivial in the grand scheme of things. And after all, I'm not George W Bush and I can see merit in the policy, the focal point of which is the removal of the towering mountains of colliery waste which in the 1970s earned 'Cutacre' a place in the Guinness Book of Records as the largest man-made spoil heap in Europe.

Hardly the kind of record a town takes pride in!

And I also happen to be one of those misguided fools with confidence in the political leadership. I must do: I voted for them again this year.

This confidence stems from the publication of impact assessments prior to approving the mine that objectively demonstrated who were the stakeholders anticipated to be the (financial) winners, me as a member of society, and the losers, me as a homeowner. Leaving me with little scope other than to curse my luck.

Which suggests 'good' decision-making always stems from presenting the pros and cons of policy in monetary terms. Hardly.

Nevertheless, there is no arguing that establishing the 'value' of stakes held by effected parties is an essential to transparently managing the balance between competing, and more often contradictory interests.

Put another way, if the legislator fails to assess what stakeholders have to lose or gain as a result of its actions, it runs the risk of losing legitimacy.

To do so, of course, requires it know what the 'value' of things were in the first place.

Valuing navigation technology

It is easy enough to put a value on objects like houses. These are widely traded in a competitive market.

Not so easy, say, to value the different navigation and communications technologies used onboard a ship.

We know how much it costs, but how valuable is a particular piece of kit when compared to another?

Which technology has little or no value at all, other than generating those interminable meetings in five star resorts so beloved of IMO officialdom?

And which system, unlike my home, is so much of a crown jewel that its value can never be impacted upon by an extraneous activity?

Ship navigation - how should regulators work out what is most important? Photo courtesy Kvaerner

But far from impossible either. A functional or task analysis provides a way forward.

Functional analysis

A functional analysis may be used to describe in a systematic way what technology should do in order to fulfill its mission.

By doing this, the salient elements of the system's activities and their mutual dependencies may be determined with the functions described at various levels.

The highest levels describe the main functions that are required to complete the mission. The next levels (sub-functions) describe the various goals that need to be achieved.

The lower levels, if required, merely describe tasks and task elements to be executed, being actions or operations.

In summary, the analysis involves:

A theoretical task breakdown, engaging experts to frame what they think particular technologies do onboard a ship;

Stakeholder consultation, speaking with those who actually use the technology to modify the framework;

Quantification and ranking, establishing the frequency (F) and importance (I) of a particular technology to each task, the product of the two providing a measure of its value.

Those familiar with 'risk', a product of frequency and consequence, may identify certain synergies here.

Not that surprising perhaps when you consider the methodology outlined here was derived from a large-scale formal safety assessment.

Collision avoidance

To explain how 'value' may be established in practice, I will consider one high level task performed on all ships where technology plays a pivotal role: collision avoidance.

The function of collision avoidance is simple: ensure your ship doesn't hit another ship.

In doing so a number of operational goals can be identified:

One: Sourcing dynamic navigational data relating to own ship, i.e., heading and speed;

Two: Sourcing dynamic navigational data relating to other ships, i.e., position relative to own ship, course and speed;

Three: Entering the data into models to establish the probability of conflict;

Four: Where conflict arises, manoeuvre as required in accordance with the International Collision Regulations.

These goals may be further divided into sub-tasks for more detailed analysis, but that is beyond the scope of this article. I will also assume for the sake of simplicity that the frequency a technology is used in fulfilling the goals above is fixed and identical for all, though obviously it is not. Therefore, it is the importance of a technology to the task that establishes its effective value.

Ranking the goals

The ranking above is quite deliberate. Most brouhaha on navigation technology relates to the promotion of value-added (read highly profitable) technologies that focus on operational goal 3, and to a lesser extent 4.

Arguably, little consideration is given to goals 1 and 2. Perhaps that is because most of the technology used has not, fundamentally, altered since the second world war, or even earlier.

In the hype it is often lost, if goals 1 and 2 are not fulfilled first, through sourcing high-quality data, technology applied to goals 3 and 4 is not only useless, it is lethal - as evidenced by the spate of ECDIS/track-control navigated ships hitting the rocks, as reported on elsewhere.

In short, technology that fulfils goals 1 and 2 must always have a higher value than that provided for goals 3 and 4.

And it also follows that the quality of the source data a technology provides establishes its importance, thus value relative to other technologies.

Assessing data quality

How do you assess data quality? Easy: use an existing, internationally adopted standard for safety-critical navigation tasks.

This is how it was developed for aircraft collision-avoidance.

Why should that matter unless you're a maritime standards committee queen and fear redundancy?

The standard I refer to applies the following quality measures:

- Data accuracy;
- Data resolution;
- Confidence that data is not corrupted while stored or in transit (assurance level).
- Ability to determine the origin of the data (traceability).
- Confidence that the data is applicable to the period of (its) intended use (timeliness).
- All of the data needed to support the function is provided (completeness).
- The format of the data meets the user requirements.

Each of the technologies providing source data for collision avoidance, i.e., radar, ships' lights and sound signals and AIS, may be given a score - 1 to 5 - against each of the quality measures above. Add up the numbers and you have a relative measure of their 'value' to shipping.

Do the maths and it should be obvious which technology was, undoubtedly, the last century's greatest contribution to safety at sea and which truly is a 'chocolate teapot'; 'assurance' and 'traceability' are particularly relevant here.

More to the point, with the 'value' of technology assessed it is a triviality to determine what is potentially lost if, say, an offshore windfarm is established; something known to interfere with ships' radar but only a factor if ships' radar has a high 'value' in that area.

Where the boundary of acceptable loss of value lies, set against a policy's wider gains is the political dimension that must remain an essential part of decision-making.

It is incumbent on legislators to effect change that brings greater good. In doing so, those subject to regulation must accept that its 'values' will change too.

What is unacceptable is an arrogance on the part of the legislator's leadership in believing that its diktat can be imposed without objective analysis claiming it is 'all too difficult' to do so; or hiding behind specious concepts driven by a political ideology rooted in xenophobia.

Providing you approach the problem with imagination, such analysis is actually quite straightforward and may readily be applied in any management scenario. DS

Steve Harding served as an electrotechnical officer with Shell Tankers for 7 years, and subsequently worked as specialist investigator for the UK Radiocommunication Agency and specialist in satellite navigation, ship tracking systems and GMDSS with the UK Maritime and Coastguard Agency. He has set up his own consultancy, SUVAN Marine, and can be contacted on steve@3gmarine.co.uk

AIS B for $500

UK company Software Radio Technology has invested £1.5m research to make a design for an AIS B unit which can retail for under $500

UK MARITIME radio company Radio Technology has invested £1.5m into a design for an AIS B unit, which can be manufactured and retailed for under $500, with room for plenty of profit for the manufacturer and retailer.

The company decided to place a bet on AIS B, because it could see many authorities interested in mandating it for use on tracking small vessels as a surveillance device.

The company notes that the US Coastguard, Middle East and South Korea are already showing interest in mandating AIS Class B for smaller vessels, as part of their security operations.

Getting the device under $500 was critical, because the company thought that this was a pricing level where authorities would be comfortable mandating that all small boats fit it.

"The government can't just mandate everybody spends $1500 on this gadget which has no value to you because we're going to spy on you," says business development manager Simon Tucker. "We took a punt and started investing a lot of money in making it very small and very cheap."

"The US Coastguard has said, if there was a device under $600 - we're going to seriously consider mandating it," he says.

Surveillance device

SRT believes that the class B systems will be driven into the market by authorities, who want more information than just a radar blip, when a vessel comes into their waters, so they investigate whether or not it might be something vicious.

"The Korean market have already said that from next year - they will start mandating AIS A or B on all commercial and leisure vessels," he says.

Many maritime authorities have said they believe that untracked ships can be one of the biggest threats to their security. The US Government has around 17 million untracked vessels.

"The authorities, who are very anxious to get this safety device onto vessels, can overcome some of the barriers which the users have brought up - which is mainly cost- having a much cheaper product enables authorities to say its not unreasonable for you to have it," he says.

"There are a number of projects going on around the world now," he says. "Lots of people are actively saying, we have got AIS, we want to use it for tracking every vessel in our waters."

Authorities can send a message to any particular unit, or ask for position reports up to every 2 seconds if they want to.

"It was originally conceived as an anti-collision device - it seems that it's going to be used for something else in a much bigger way than envisaged," he says.

Using Class B as an anti-collision device does not make a large amount of sense, he points out - shipowners can see if they are about to hit something much easier by using their eyes than by trying to make sense of a screen with 1,000 vessels on it.

"The vessels will look like snow on the screen," he says. "Its not going to have any practical use."

Link to AIS A

SRT believes that the Class A has provided a good fundamental to class B.

"It proves that the technology works in a harsh commercial environment. It created an international standard and international marine frequency effectively that everybody wanted to use - and therefore a firm foundation on which to build an AIS mass market on," says Mr Tucker.

This AIS B unit is many times cheaper than the AIS A units, retailing for around $6,000 - and AIS B does not have functionality which is very much different.

So how will shipping companies feel about paying in excess of $6,000 for a class A AIS unit, when a Class B, with almost identical functionality, is available for less than a tenth of the price?

SRT argues that the market for Class A units is much smaller - just 30,000 SOLAS vessels and 180,000 large vessels in total. - it is not possible to justify the investment in any more technology development.

By contrast there are 24 million small commercial and leisure vessels in the world. "It is a completely different market," Mr Tucker says.

SRT believes that the patent holder for Class A AIS, Hakan Lans, does not have any claim over the Class B, because the technology has been changed enough.

"Hakan Lans did approach the committee doing the class B standard - the reaction was that the standard was changed and amended - so that the way the technology worked was entirely different - so it would not infringe anybody's patent," says Mr Tucker.

"We believe - as does everybody in the AIS committee - that there is no real issue there."

The AIS B system has a range of around 25 nautical miles. One base station can see up to 2,000 vessels, each sending a position report once a minute.

The issues of how the system will integrate with Class A AIS have yet to be worked out completely - it is unlikely that SOLAS ships will appreciate seeing the location of all the fishing and recreational vessels in the vicinity on their electronic chart display, and this will not necessarily be of any benefit.

It would be entirely plausible to develop computer systems which only show up other vessels on a possible collision course. Why would a captain want to know about vessels heading away from him?

"Really the function of AIS on the big vessel is to say - that boat there is a concern to you because you might collide," says Mr Tucker.

Design

SRT has developed a design which will enable mass production. It will not manufacture any itself, but license its design to manufacturers.

Critical in the design was putting in some functions which users would perceive adds benefit to them - so they don't feel they are being forced by authorities to pay to install a device which only benefits the authorities.

The system has a distress function ("panic button") and anti-tamper device which can transmit a signal if anyone tampers with it. It can interface with a GPS plotter or portable digital assistant (PDA).

The company produces a "blueprint" for the circuit board, software and the hardware, and the manufacturer builds it and sells it, paying SRT a royalty on each one. SRT has written the software, which can be loaded up on processors on the circuit board.

It charges customers an initial license fee, product development support fees and a per unit royalty on every product manufactured.

About SRT

SRT is based in Somerset, UK, employs 42 people and has a further 32 software engineers in India. It designs its own computer chips. It is also involved in making digital radio communications systems for police, which are encrypted and completely reliable.

SRT has plenty of experience with Class A already; its AIS Class A design is used by Saab, Samsung and McMurdo, among others.

The company is currently negotiating with a number of manufacturers, who will be able to either license the technology and make it themselves, or buy the entire product from SRT.

The first manufacturer is TCB in China. "They can make a first class product with no development risk," Mr Tucker says.

TCB will be licensing the product for sale within China, targeting its 250,000 coastal vessels.

SRT has been developing "fairly complex" wireless technologies for 17 years. The company was originally established by Securicor and was acquired by entrepreneurs in 2002. Their product was designed using expertise and research from Bristol University. DS

Website:
www.softwarerad.com

Don't AIS text in emergency

Use of AIS text messaging to communicate with another vessel is not reliable enough for use in an emergency situation, says the UK Maritime Accident Investigation Board (MAIB), following an incident where time was lost while a text message was sent from one vessel to another and never read

THE INCIDENT was a collision between 74,373 dwt container ship Hyundai Dominion, managed by Zodiac Maritime Agencies of London, and 6,899 dwt Sky Hope. It occured in the East China Sea, south of South Korea, on June 21 2004 at 7.38am.

There were no injuries or pollution; only Sky Hope had significant damage, each vessel could continue passage. Visibility was good.

The incident originally arose due to a difference in opinion between the vessels about who was doing what, and so who needed to take which corrective action in accordance with the Collision Regulations (COLREGs)

Sky Hope incorrectly judged Hyundai Dominion to be an overtaking vessel, which required no immediate avoiding action to be taken in accordance with the COLREGS; Hyundai Dominion considered Sky Hope was a crossing vessel.

Time was wasted because the officer on the watch (OOW) on Hyundai Dominion asked the other vessel to keep clear using the Automatic Identification System (AIS) free text facility, but the Sky Hope OOW said he did not receive it.

In the first attempted communication, the Hyundai Dominion called Sky Hope by VHF Channel 16 and did not receive a response. 2-3 minutes later an AIS text message was sent. 1.5 - 2 minutes later attempted contact was made again on VHF channel 16 and there was an immediate response.

In the VHF communications with the vessels, it is likely that a disagreement took place over the situation and who was who.

Both vessels tried to take avoiding action but too late to avoid the collision, with just 0.2 nautical miles between the vessels.

The starboard bridge wing, lifeboat davit and a container on Sky Hope were damaged; damage to Hyundai Dominion was limited to a slight indent of a breakwater on her port bow, distored handrails and paint scratches.

The invesigation

MAIB found that neither of the AIS systems had an audible alarm set to sound when AIS messages were recieved, relying on the officer of the watch to scan the text display to pick up a message.

The investigation found that the watchkeepers on both vessels had worked in excess of hours permitted by STCW over the previous 2 days.

MAIB found that Hyundai Dominion did not follow correct emergency procedures after the collision; Sky Hope resumed passage 22 minutes after the collision and it is unlikely that it would have made a proper assessment of the vessel's condition in that time.

Also the bridge watchkeepers of Hyundai Dominion lacked a clear understanding of the operation of the engine controls.

Following the collision the managers of Hyundai Dominion, Zodiac, have issued the results of a review of company navigational procedues, and have introduced company specific navigation training for junior officers and deck cadets. They have increased the number of internal and external ship navigation audits.

MAIB has recommended to the managers of both vessels that they should advise bridge watchkeepers to call the vessel's master in the early stages of a developing hazardous situation. Also the importance of making sure watchkeepers receive adequate rest and procedures to be followed in the event of a collision.

Recommendations have been made to the managers of Sky Hope regarding application of the COLREGS and use of VHF and sound signals in collision avoidance.

Recommendations have been made to Hyundai Dominion's managers with respect to familiarisation of bridge watchkeepers with engine controls, the use of AIS text facilities in situations requiring prompt action and the need for OOWs to be able to communicate with other bridge team members.

Similarly, recommendations have been made to the International Chamber of Shipping (ICS) to promulgate to its members the lessons learned from this accident regarding the dangers of using AIS text facilities in situations requiring prompt action.

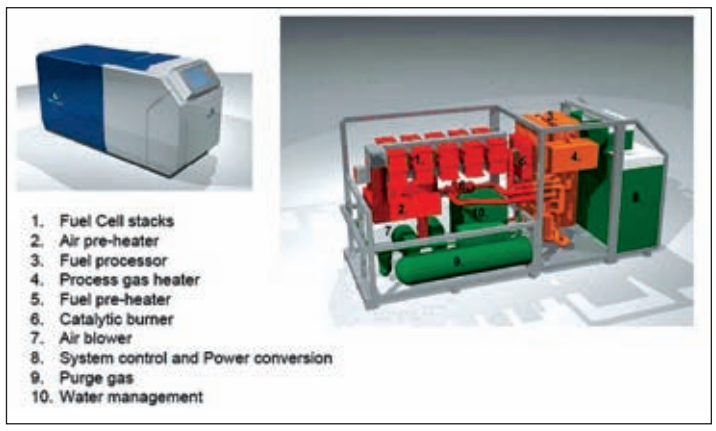
Neither of the AIS units gave automatic, audible warnings that a text message had been received, although the unit on Sky Hope could be enabled to sound an alarm. DS

The full report can be downloaded from MAIB's website www.maib.gov.uk.

Wärtsilä fuel cells - the future for ship energy?

Ship power supplier Wärtsilä is researching ways to generate power and electricity onboard using fuel cells, which have much lower emissions than conventional oil generators

FUEL CELLS that run cleanly on hydrocarbon fuels have the potential to be utilized to power marine vessels, according to Oskar Levander, project manager for marine technology / ship power with Wärtsilä Corporation, speaking during a presentation at the 26th Bunker Conference in Rotterdam earlier this year.



What a shipboard fuel cell might look like. Photo courtesy Wärtsilä

Wärtsilä believes that, from 2010 onwards, fuel cells will take a "significant share" of the energy market for the 50kW (the size of a normal car) to 5 MW power range.

Currently, research and development work is going on for the design and engineering of fuel cells, with plans to develop a 20 kW prototype by the end of this year and a 50 kW power class commercial unit by 2007, with a 250 kW power class to follow by 2010.

The current system price is 20,000 to 30,000 Euro per kilowatt of power for a 1-5 kilowatt system, so a 5 kW system, which could cost as much as Eur 150,000, would only provide enough power to run five small one bar electric fires or fifty 100 W light bulbs.

In the short term, Wärtsilä expects prices to drop to 5,000 to 20,000 Euros per kilowatt for a 5-25 kW system; over the medium term to 1,500 to 3,000 euros per kilowatt for a 25-500 kW system, and over the longer term to 800 to 1,500 euros per kilowatt for a 50 to 100 kW system (at which point it starts to be enough for normal ship auxiliary power).

In other words, the company envisages that ships will ultimately be able to run 100 kW fuel cells, which would be the size of a small truck engine, for Eur 80,000. The system could be particularly applicable to cruise ships and ferries, which have high power generation requirements when in port or close to shore, and have a greater focus on their public image than other operators.

The maritime market sectors envisaged as likely candidates for this technology include auxiliary power (for shipboard power generation, not propulsion) on cruise ships, ferries, and certain cargo ships; harbour power generation for many different ships; and propulsion power for short route ferries (probably those which stay close to shore).

The fuel cells are also potentially much more environmentally friendly than some existing fuels. They run on liquefied natural gas (LNG) rather than conventional oil, and burn much more cleanly, with much cleaner effluents, than running on diesel oil, producing less particulate emissions and no black smoke.

In addition, carbon dioxide (CO2) emissions are reduced by 25 per cent, nitrous oxide (NOx) emissions by 85 to 90 per cent, and there are no sulphuric oxide (SOx) emissions. While selective catalytic reduction (SCR) devices on diesel engines are very good at reducing SOx and NOx, said Mr Levander, they are not so good at reducing CO2 emissions.

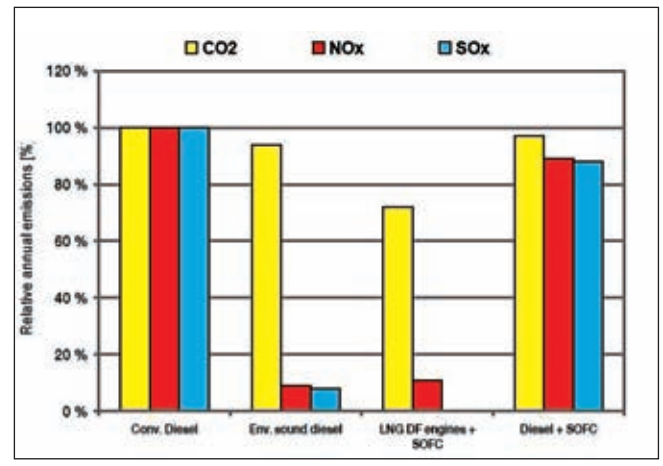
Wartsila is using planar Solid Oxide Fuel Cell (SOFC) technology to further develop this project.

Wärtsilä sees itself taking a role in the design and engineering, manufacturing, systems integration, marketing, distribution and service of the fuel cells once the technology becomes widely available, having started a research program in 2000 to develop and commercialise SOFC fuel cells.

The company has envisaged a system with dual-fuel gas engines for propulsion and SOFCs for auxiliary power generation, with LNG being used as the primary fuel.

Mr Levander acknowledged some limitations that the fuel cell system faces in the current market. There is a high investment cost involved in purchasing the cells, but it also requires a substantial amount of money to install the gas-based system on the ship. The feasibility of operating a fuel cell system in the long run is further dependent on falling LNG prices in relation to those of ordinary diesel, and the LNG machinery itself has special demands like a requirement for a large amount of space.

However, Wärtsilä is hopeful that the changes in expectations and demand in global fuel markets will make the fuel cell system more and more attractive to their potential customers. The research for this project is being done as part of the FCSHIP European Union project, with a ferry concept design by Wärtsilä and Fincantieri.



comparing the emissions of CO2, NOx and SOx from conventional diesel generators, environmentally sound diesel generators, LNG engine plus fuel cell auxiliary power, diesel engine plus fuel cell auxiliary power. Photo courtesy Wärtsilä

DS

Website
www.wartsila.com

Learning from aviation

High quality navigation in the aviation industry is about making sure the infrastructures and systems are right. Is there something the maritime industry can learn here? Dr Andy Norris went to a Royal Institute of Navigation seminar

NAVIGATION QUALITY is a term that we may be hearing more frequently.

It embraces the whole concept of safe navigation, covering the provision of navigation infrastructures, including rules and laws, the performance and design of navigation systems (and the individual equipment and subsystems that form the system), and the actual execution of navigation processes and decisions.

The execution particularly includes the practices and decisions made by the human navigator or end-user of the navigation data, where training and working to appropriate procedures can play a major part in ensuring total navigation quality.

Navigation Quality is a concept that is relevant to all sectors requiring a navigation solution, applying equally, for instance, to in-vehicle systems and personal navigation aids (including special aids for sight impaired people), as well as major marine and aviation systems.

It is this potential interest that caused the Research and Development Special Interest Group of the Royal Institute of Navigation to hold a recent seminar in London directed at this subject, involving both the aviation and maritime industry.

The attention at the seminar was mainly on the quality of navigation data from infrastructure, systems and equipment.

From these presentations it became clear that the aim of the professional aviation industry was really directed at providing infrastructures and systems that give pilots and air traffic controllers effectively 100 per cent confidence in obtaining a sufficiently accurate navigation solution for all phases of a flight.

This is in contrast with the marine world, which is perhaps more directed to establishing when navigation data has become suspect, so that the navigator can be informed and take appropriate action.

The speed, the three dimensions and the required traffic density in the aviation world perhaps dictate this difference. They do not allow time for pilots to make many personal decisions in the navigation of the aircraft. Received information has to be correct and there is great reliance on automatic and semi-automatic processes to ensure safety.

Furthermore, commercial aircraft are normally under the direct supervision of air traffic controllers, who detail the paths and heights of all aircraft. Even flights across oceans and unpopulated areas are under procedural control, even though they may not be observable by the controllers.

Maritime navigation is in some ways more complex. Vessels are independent entities with navigation decisions being made onboard, following rule systems that can never be entirely complete. Present levels of technology could not undertake such a decision making process automatically and safely. It needs the constant attention of a human navigator.

The lower speeds and the 2-dimensionality of the marine navigation process give the human navigator time to make the complex decisions needed. Furthermore, these decisions are generally well suited to the particular abilities of the human brain. The final quality of navigation is therefore very much affected by the decisions of the navigator.

Accuracy and risks

At the RIN seminar Dr Ochieng Washington from Imperial College explained that in quantifying the suitableness of a navigation system for aircraft applications, its accuracy, together with the risks in integrity, continuity and availability of the system were among the important parameters that needed to be calculated.

Such calculations form part of a failure mode effects analysis (FMEA).

Integrity risk is the probability of an undetected failure occurring within the system; availability is the fraction of time that the service is usefully available for its intended use; continuity risk is the probability that the service is interrupted in a non-scheduled way.

Are there any lessons the maritime industry can learn from the aviation industry in how navigation systems are managed?

All these parameters form an important contribution to navigation quality.

The requirements on these parameters have been set by aviation authorities for all the different phases of a flight. The difficulty comes in developing rigorous proof that a particular system will meet these requirements.

The integrity of a navigation system is greatly enhanced if the system can report when it is likely that its navigation system is impaired. For instance, as part of overall integrity monitoring, GPS receivers (both marine and airborne) have a facility known as receiver autonomous integrity monitoring (RAIM).

This is designed to detect whether satellites have failed by comparing the navigation solution using different available constellations. Dr Washington pointed out that existing RAIM algorithms are not comprehensive and can be greatly improved to give a much better estimate of integrity.

Marine use of GPS/GNSS

The marine world today appears to be far more dominated by GPS than is the case for aviation, where at present GPS is mainly used for back-up and monitoring purposes.

Even on extensive flights across oceans, where there is no ground surveillance, GPS is not essential because the aircraft's position and other navigational information are being given by no less than three onboard inertial navigation systems.

However, it can be anticipated that the marine world would be considerably affected if there was a major GPS outage. Most vessels rely almost totally on GPS position, especially for ocean passages. If GPS suffered a major outage vessels on such passages would have to rely on astronavigation or dead reckoning (estimated position) techniques.

Are these skills sufficiently practised by most of today's marine navigators to be effective in such an emergency?

At the seminar Dr Nick Ward of Trinity House, concentrated his presentation on backups to GNSS. He noted that numerous studies had shown the vulnerability of GNSS, particularly to intentional or unintentional jamming.

Although GNSS signal formats can be improved to reduce vulnerability to jamming, Dr Ward considered that mitigation measures are highly desirable as there is a significant risk of losing GNSS. Jamming can take out all GNSS simultaneously, making GNSS-only backup systems inadequate to meet this vulnerability.

Inertial measurement units (IMU) inte-

grated with GNSS would be helpful in maintaining accuracy through relatively short outages that may be caused by jamming or interference. The price and performance of solid-state IMUs are perhaps getting to an acceptable level for commercial marine use.

Clearly, the use of multiple GNSS (GPS, Glonass and/or Galileo) will mitigate in degradation or complete failure of a particular GNSS system. System degradation has been noted when GPS satellites fail and it can take around 48 hours for a GPS satellite fault to be addressed.

In conjunction with visual navigation, radar is effectively the main mitigation system in the case of GPS position failure or degradation. Particularly when supported by radar beacons (racons), radar navigation can be extremely effective in coastal waters.

Unfortunately, GPS outage causes problems to a number of other marine aids that rely on a navigational fix, including AIS, GMDSS and ECDIS, which makes a radar-only fallback less useful.

An 'auxiliary' terrestrial based position fix system, such as Loran C, therefore seems to offer great benefits. Such systems, with appropriate enhancements, now have the capability of providing very good positional accuracy, not too dissimilar to the standard positioning service accuracy of GNSS.

The important aspect of such terrestrially based position fix systems is that their vulnerabilities are independent of those of GNSS.

Marine navigation integrity

John Davis from Kelvin Hughes presented the current thinking on integrity concepts by IMO and IEC.

The IMO definition of integrity is "The ability of a system to provide the user with information within the specified accuracy in a timely, complete and unambiguous manner, and alarms and indications within a specified time when a system should be used with caution or not at all".

The current IMO requirements for integrated navigation systems only call for comparison of two sources of information (if available).

Although two sources will identify an integrity issue it can gives no indication which is the accurate source, unless the errors are gross.

Three systems are required for this - as navigators and marine navigation equipment designers well know.

The revelation that only two systems are recommended for a marine Integrated Navigation System raised a few eyebrows from the aviation experts at the seminar! 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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