MARINER COMMUNICATIONS

A BRIEF INTRODUCTION

Working with us: Neville Smith

- Maritime industry PR – Content and Editorial Specialist with 20+ years of industry experience.
- 16 years as a maritime journalist and previously Deputy Editor of leading industry newspaper Lloyd's List, covering dry bulk shipping, environment and regulation, IT and communications. Founded Mariner Communications in 2009.
- Industry sector expertise: physical and derivative freight markets, digital charts and navigation, classification and regulatory affairs, IT and satellite communications, marine coatings, CSR.
- Career Highlights: Regular conference chair, panel participant on IT, communications and CSR. Managed global MaritimExperts programme for Wilhelmsen Ships Service, completed re-brand and introduced social media channel for Freight Investor Services, retained on PR and media relations for world's largest class society by orderbook.
- Blogging on technology, communications and human factors at maritimeinsight.com, 6,000 Twitter, 1,000 LinkedIn followers

Core areas of expertise

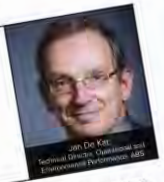
Mariner Communications are experts in PR and communications planning, strategy and delivery.

- Messaging and positioning for global maritime, offshore and shipping clients;
- PR and media relations: working between clients and media, fulfilling planned and ad hoc editorial requirements globally and regionally (Europe, US, AsiaPac, Middle East).
- Press office management: managing contacts and requests. Content generation and management for mainstream maritime media, social media channels, conferences and events.
- Media Training: programmes for senior management and company spokespeople – group training and one to one sessions.
- Live events: planning, management and delivery of live maritime industry events including product launches, media tours, seminars and conferences.
- Social media: management of social media strategy and day to day running of accounts: Twitter, Blogs, LinkedIn.

Our clients

Our client list includes global industry players active in the following sectors

- Classification Services
- Maritime IT and SatComms
- Ships Agency and Services
- Alternative Fuels Lobbying/Public Policy
- Shipping Research and Consultancy
- Digital Navigation Services
- Marine Paints and Coatings
- Freight and Commodity Derivatives/Risk Management
- Professional Examinations and Seafarer Welfare



Jan De Kat, Technical Director, Operational and Environmental Performance, ABS

Supporting The Adoption Of 'Smart Shipping'

ABS is adding value to shipping operations by leveraging data to provide analysis and insight that improves performance and supports environmental efficiency, writes Jan de Kat, Technical Director, Operational and Environmental Performance, Global Marine, ABS

'Smart Shipping' is a concept based on data, connectivity and data analytics and today there is arguably more data available covering a much broader range of shipping information.

This data is collected and transmitted to shore, but the key is how to translate data first into information, and then to knowledge that leads to action. This requires databases, analysis and algorithms. It requires cultural changes, new skill sets, and it can have cost implications.

Client feedback has consistently indicated a mismatch between the desire to improve data quality from the ship and the availability of a single platform that can be used to analyse and deliver information for decision support. Many owners and operators are collecting data but not all have the tools needed to analyse it or make informed decisions.

Vessel performance, environmental compliance and energy efficiency, are areas where data management is critical for both regulatory reporting – such as the European Union's CO_2 Monitoring Reporting and Verification (MRV) programme – and performance optimisation.

ABS has for some time focused on these areas to offer practical solutions which simplify operations and can also add value for operators. Classification societies have traditionally been the holders of vast amounts of data and are working increasingly closely with the industry to help support the transition to smart shipping.

A New Solution for Data Management

ABS is helping meet the industry's needs for optimised operations with its new Vessel Performance service with data monitoring and collection which provide the raw material to drive research and development on fuel efficiencies. By leveraging increased data capture, analysis and reporting supported by ABS Nautical Systems' Voyage Performance software, ABS has taken a significant step in managing data into standard reports whose results can be acted upon without delay.

The ABS Vessel Performance service is a flexible system which enables operators to capture and analyse vessel performance data from multiple sources including hull and propeller, main engine and base loads to generate data for operational benchmarking.

By enabling consolidation of sensor and other input data from the noon report, ABS can transform thousands of data points into meaningful KPIs. Data can include ship data such as speed, power and fuel consumption, voyage information, weather conditions, fuel switching and waste water handling, making it suitable for internal reporting and preparation of data for statutory verification.

By combining dedicated service delivery with a robust software platform, the Vessel Performance service simplifies data entry, enabling the ship to report performance and environmental data only once to operations and technical management staff.

The routines applied and data collected in the course of energy efficiency analysis can be leveraged for compliance with EU MRV. ABS participation at IMO meetings ensures that the Vessel Performance service will also be compatible with IMO's emerging plans for CO_2 emissions monitoring. In future, the system will be further developed to manage other regulatory requirements that involve data collection onboard ship.

By meeting several critical requirements within one system, the Vessel Performance service puts ABS in a strong position to help owners meet their environmental obligations and by extension potentially improve their bottom line.

A multidisciplinary team

The ABS Vessel Performance team is multi-disciplinary, with extensive experience in ship hydrodynamics, numerical modeling, model testing, full scale measurements, design, ship management and operations and regulatory compliance.

Leveraging extensive experience and knowledge enables ABS to provide detailed and in-depth recommendations supported by advanced tools to help owners and operators meet their operational and regulatory needs.

The Vessel Performance team works with clients to analyse hydrodynamic characteristics of hull structures, performance of main engine and ancillary equipment and the impact of optimisation techniques on fuel consumption and overall vessel performance.

By undertaking detailed modelling of vessel components including the main power consumers and machinery systems ABS can assist owners in identifying areas where energy efficiency can be improved.

Clients are able to use the output to undertake operational benchmarking across their fleets, identify performers in need of improvement and where best practices can be implemented to improve operational efficiency on all vessels ■

FUEL EFFICIENCY

EFFICIENCY SEMINAR: Graham Westgarth (left) of GasLog and chairman of Intertanko and Maersk Line engineering director Chris Errington flank Kirsi Tikka, president ABS Europe. Photo: JULIAN BRAY

Maersk efficiency savings of $78m beat $40m target

Many owners and operators are now seeing a culture and skills to ensure ships' fuel efficiency is embedded in operations

Julian Bray **Stamford**
julian.bray@tradewindsnews.com

Maersk Line made fuel-efficiency savings worldwide of $78m in 2012, nearly double its own $40m target, ... its four-year drive to eliminate waste gathered momentum.

Denmark's world-leading container operator outstripped its ... expectations due to fine-tuning operational and technical strategies such as slow steaming, ... by staff absorbing the line's ... fuel-efficient culture.

... crews and operations teams ... understand the concept ... the new culture is part of ... said Chris Errington, director, engineering maritime technical ... at Maersk's US operation ... Norfolk, Virginia.

Maersk's US arm contributed ... to the total saving last year. ... been tasked to save $10m ... from a worldwide total ... says Errington, who has ... of energy efficiency for ... globally.

... has been among the ... driving fuel-efficiency ... in its fleet since it ... programme in 2009, ... response to the im... ... of the severe con... ... recession.

... are now seeing a ... skills to ensure ships' ... being embedded ... says Graham Westgarth ... of tanker owners' ... Intertanko.

..., when I was at ... we found that adding hub-caps to the ends of propellers generated a 4% saving, so we retrofitted the whole fleet. Payback was less than a year," added Westgarth.

He joined Peter Livanos's GasLog in Monaco in January this year as executive vice-president, operations and strategy. "In 10 years' time we will look back and say there was a quantum change then," he said.

Errington and Westgarth were speaking at a seminar on energy efficiency organised by the American Bureau of Shipping (ABS) at the Connecticut Maritime Association (CMA)'s Shipping 2013 conference in Stamford.

Kirsi Tikka, president ABS Europe, said shipowners and operators face three key pressures when dealing with improving vessel energy management: the impact of overcapacity in the freight market; new regulations; and increased fuel costs.

"The really big key to success will be in the existing fleet. There is an unprecedented focus on energy efficiency," she said. "But as many believe they are already efficient, they may find it hard to improve."

Slow steaming has now become the norm across much of the industry in response to both high fuel costs and to absorb some capacity.

Westgarth, whose tenure at Intertanko is due to end in November, admits that when freight markets strengthen from their current low levels, owners will once again accelerate vessels.

"When the good times come back charterers will pressure us for maximum speed. But we will not go back to where we were before," he added.

> Graham Westgarth: There is a realisation now that the cost of fuel is the biggest cost. That applies both to existing ships or new vessels with more efficient engines, better hull forms and other technologies.

Owners will continue to face pressure to make sure their operations are as fuel efficient as possible. "There is a realisation now that the cost of fuel is the biggest cost."

That applies both to existing ships or new vessels with more efficient engines, better hull forms and other technologies.

"New ships are 10% to 15% more efficient," he added. "Existing ships — even if they speed up — will be more efficient."

Errington believes slow steaming will remain in the container shipping market for the foreseeable future, however.

"It is going to stay. It will continue for the next five to 10 years due to volumes of trade and numbers of vessels," he said.

Errington adds that owners have no choice but to be energy efficient. "I doubt that any owner cannot afford to," he said. Maersk has found the most efficient routing is not to rely simply on a lower speed, but to focus on a constant power output, aided by techniques such as weather routing.

While main-engine fuel consumption is the main factor in fuel efficiency, other more humble aspects are significant, such as hull paint, Errington says.

Maersk has so far drydocked six vessels early in their five-year survey programme just to apply new low-friction paint "as we can see payback almost immediately". Errington added: "I would never have believed it was so important."

Improved energy efficiency and high-environmental performance will help shipping attract educated young staff, as well as save cash, argues Westgarth.

"Young people today are much more aware of environmental issues than people of my generation.

"We find they ask questions about what we are doing [as owners]. Of course, it depends on you approach, but potentially energy efficiency is a very good tool for re-

Full speed ahead or steady as she goes?

While prospect of high-throughput satellite (HTS) services is an exciting one, for the time being shipowners would do well to keep their feet on the ground, argues Geoffrey Davison*

The launch of HTS services over the coming decade promises to provide something like communications nirvana for the maritime industry. The potential increases in bandwidth capability and available airtime suggest that where once the maritime industry laboured to do a fraction of what we take for granted on land, it would finally achieve some kind of parity.

In some cases this may be true but it is far from the whole picture. A comprehensive understanding of the maritime satcoms landscape needs to recognise not just the changing dynamics of demand and supply but a clear understanding of customer behaviour and needs.

Do just that and it becomes immediately clear that for the majority of owners and operators, legacy L-band systems will continue to command the lion's share of voice and data traffic over coming years.

That may seem counter-intuitive given the lower per megabyte costs and package deals to be had by upgrading but the fact remains, shipping is only now coming to the end of a seven year ... cycle, with some analysts ... suggesting that anyone imagining a ... to uniform pre-2008 business conditions is likely to be dis...

Shipowners

satcoms adoption are likely to remain focused on a service package that delivers on price, quality of signal, robustness and ease of use and installation.

HTS launches – by Inmarsat, Intelsat and O3B for example – make great news, they capture the imagination and give hope to those users who want to see their ships as an extension of the office rather than a remote branch where no-one answers the phone.

But the fact remains that HTS, exciting though it is, will be expensive to use and far more complex in day to day operation than legacy maritime services. The demand is certainly there and one only need read the pages of the maritime trade press to see that owners of tanker fleets and other specialised tonnage are moving ever closer to full VSAT as a prelude to HTS services when they come on stream.

Unresolved questions

Even so, questions remain. Do the majority of shipowners need a bandwidth pipe that big? Are they prepared for the higher Capex on ground equipment and maintenance? Will these services work as well as L-band in the mobility market?

Even their providers also accept that these services are likely to be attractive to comparatively few high-end users making their penetration small as a percentage of the addressable market. That's despite the users already having in some cases contributed to the cost of their development.

But anyone who has spent time in the maritime industry knows that the leading edge is not always representative of the majority. Shipping's middle ground is a place of fragmented ownership and small to medium sized companies which exist in far lower profile niches than the big fleets and publicly-listed companies.

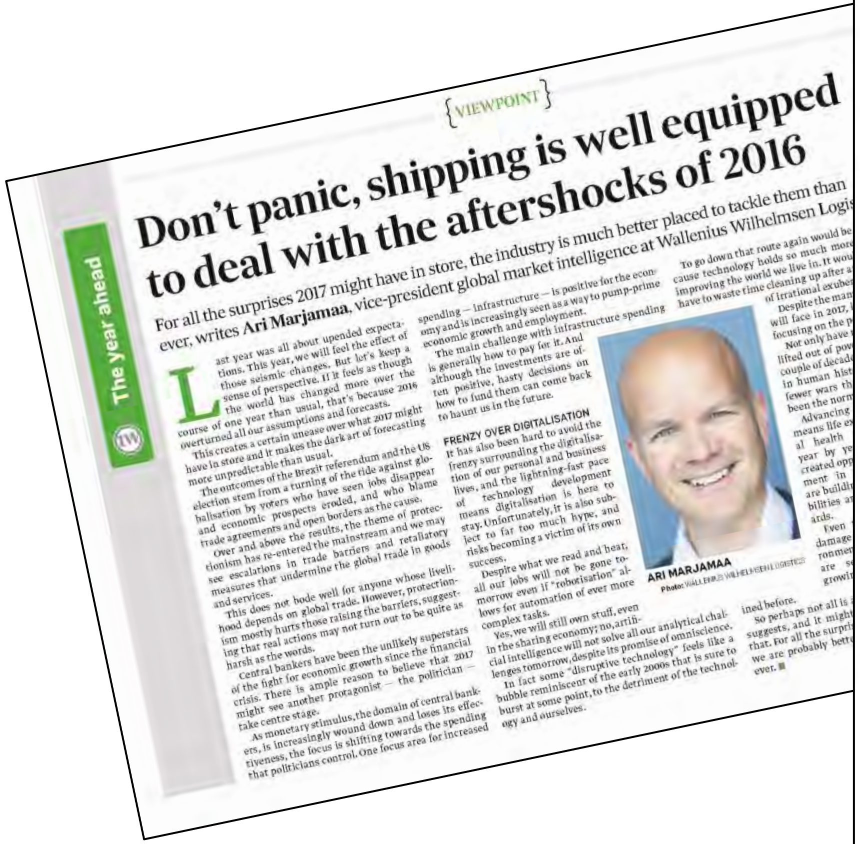
The drivers to adoption of VSAT and higher bandwidth services also need to be examined in more detail. As has been noted by recent research many VSAT vendors are making sales based on the unprecedented demand for crew welfare communications.

This is in part because they struggle to make the case at boardroom level for VSAT or high bandwidth services for business communications and also because the promise of a fat pipe that can keep the crew happy for a fixed monthly fee is almost too good to be true. In some cases it is just that.

Limited reality

Any communications package comes with limits, regardless of what the sales brochures say and providers will build into contracts clauses covering best effort, committed information rates, throttling back and normally some figure covering maximum Mb consumption. Crew use of social media will test all those parameters.

Service partners with a solid package of value-adds are best placed to succeed since even with 'unlimited' packages, the best use still has to be made of the bandwidth and user experience.



The year ahead

{VIEWPOINT}

Don't panic, shipping is well equipped to deal with the aftershocks of 2016

For all the surprises 2017 might have in store, the industry is much better placed to tackle them than ever, writes **Ari Marjamaa**, vice-president global market intelligence at Wallenius Wilhelmsen Logis

ARI MARJAMAA

FRENZY OVER DIGITALISATION

Regional training centre supports global standards

Wilhelmsen provides practical technical and safety training in the Middle East

The Wilhelmsen Ships Service (WSS) regional training centre in Fujairah, United Arab Emirates, has been in operation since 2010. The focus is on training WSS technicians and apprentices in marine safety systems, as well as in product and service management, to a professional technical level.

The centre is equipped with state-of-the-art fire-fighting systems and safety equipment from several manufacturers in order to conduct real-time, practical training. Training instructors include specialists from Wilhelmsen Technical Solutions (WTS) and other manufacturers.

"Wilhelmsen Ships Service engineers make thousands of ship visits every year, going on board to service fire-fighting and other safety equipment and systems on behalf of shipowners and operators," says WSS's business director for regulatory products and services, Andrew Sheriff.

He acknowledges that the low earnings environment is putting added pressure on ship operations and says that increasingly it means companies like WSS must go far beyond their traditional role as a service supplier. "We must support the industry and our customers by ensuring our equipment and systems are certified by multiple classification societies, not just onboard ship but at our safety service centres globally."

WSS is the only supplier that can offer a global service certified by all the International Association of Classification Societies (IACS) members, backed up by five regional training centres for its technicians. Its Safety Service Agreement has the advantage of providing a consolidated, standardised programme for the shipowner. On top of the operational advantages, working this way also gives clients much lower administration and running costs from a management perspective compared to an ad hoc approach.

Apprentices go through a minimum of two years' training to become a junior technician and then go up through the grades to become a senior technician. That takes a minimum of six years and possibly as long as 10 years. As apprentices, they have a mentor and as a technician they will themselves be trained on a regular basis.

Safety service centres work closely with the original equipment manufacturers (OEMs), and when new systems or solutions are released, WSS invites OEMs to train its personnel. "The model for us is to be OEM-neutral. This approach works for smaller OEMs too, since there are some for whom providing global coverage is not a practical option," says Mr Sheriff.

"Owners choosing the WSS Safety Service Agreement run ships that are not just safer but actually more cost efficient as a result. Because WSS can deliver standardised, high quality products and services we have the potential to reduce operational and administration costs for customers."

WSS's Total Safety offer takes a three-strand approach. Its worldwide safety academy programme is backed up by the provision of a wide portfolio of safety products and services, as well as the development of a number of e-learning packages and an online service update system.

In addition to its Fujairah operation WSS has regional training centres in Houston, Antwerp, Shanghai and Singapore. ■

Andrew Sheriff (WSS): "Engineers make thousands of ship visits every year"

Improving air quality

Earlier this year Wilhelmsen Ships Service (WSS) launched an innovative solution to assist shipowners in meeting the requirement in the Maritime Labour Convention 2006 for air quality standards onboard vessels.

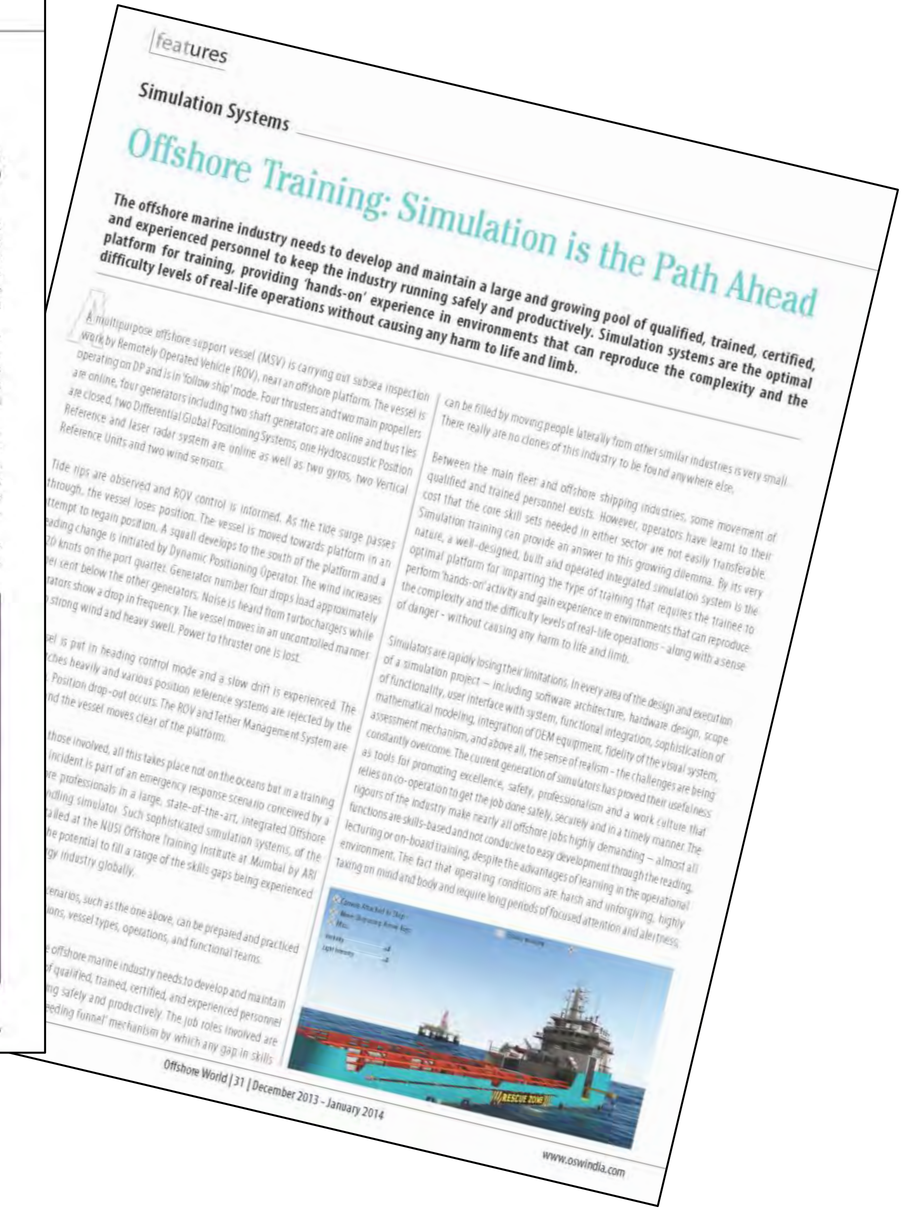
The Duct Air Treatment is an anti-bacteria block which works within HVAC systems onboard vessels to stop the spread of invisible mould, bacteria and viruses. The block works by sterilising and sanitising the entire onboard air conditioning system, including both the air passing through the system and the air handling unit, ducts and diffusers. HVAC systems are ideal breeding grounds for bacteria, viruses and mould and, as such, it is vital that they are well maintained.

WSS key facts

- Over 40 years of Unitor fire and safety experience
- 98 safety service stations globally
- 45 life raft exchange stations, supporting over 1,000 key ports worldwide
- 22,000 rental life rafts of various sizes delivered on vessels since launch in 2007
- 21,000 safety services performed each year
- 10,000 vessels purchase safety products annually
- 7 global class approvals

Globally its service technicians visit 40 per cent of the world fleet every year to ensure their compliance. Locally WSS Fujairah is approved as a service supplier by:

- Indian Register of Shipping
- US Department of Transportation
- National Transport Authority of UAE

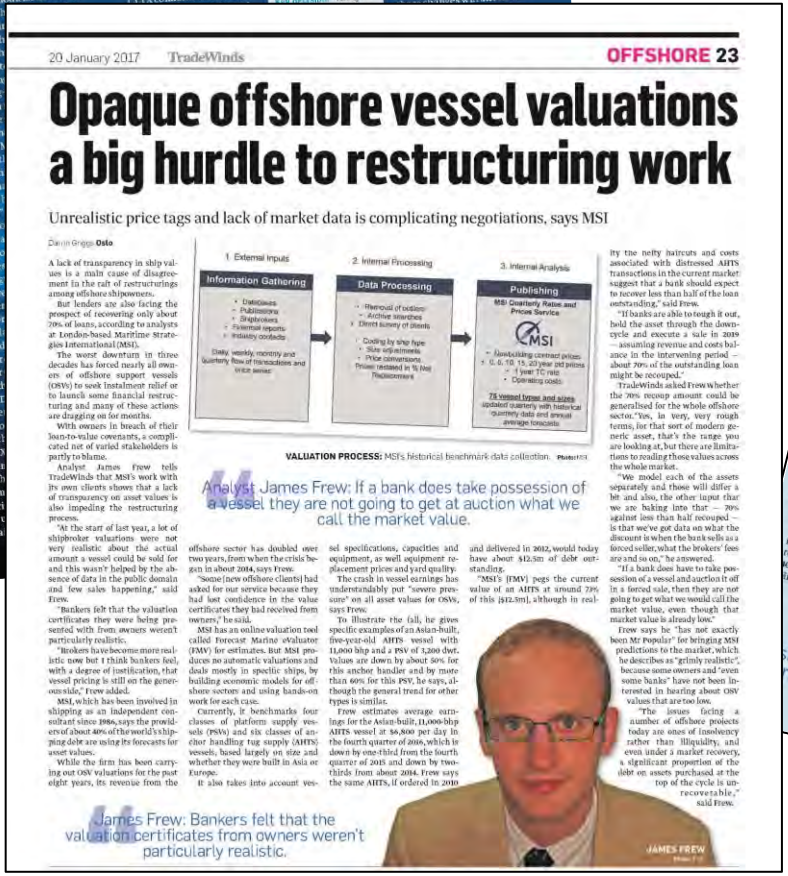


Simulation Systems

Offshore Training: Simulation is the Path Ahead

The offshore marine industry needs to develop and maintain a large and growing pool of qualified, trained, certified, and experienced personnel to keep the industry running safely and productively. Simulation systems are the optimal platform for training, providing 'hands-on' experience in environments that can reproduce the complexity and the difficulty levels of real-life operations without causing any harm to life and limb.


decision-maker
40
Different derivative contracts for commodities offered by CLTX
'Since 2011, we have been busy helping our clients to understand the trade impact and how they need to respond'
Richard Baker decision-maker
A future for futures
Cleartrade Exchange's boss calls himself a 'hungry guy' who trusts gut instinct in addressing FFA regulatory changes. He talks to Savahna Nightingale
> Richard Baker
'Once you can embrace it and figure out what the market is trying to do, it's workable'


20 January 2017 TradeWinds OFFSHORE 23
Opaque offshore vessel valuations a big hurdle to restructuring work
Unrealistic price tags and lack of market data is complicating negotiations, says MSI
1. External Inputs
2. Internal Processing
3. Internal Analysis
Information Gathering
Data Processing
Publishing
VALUATION PROCESS: MSI's historical benchmark data collection
Analyst James Frew: If a bank does take possession of a vessel they are not going to get at auction what we call the market value.
James Frew: Bankers felt that the valuation certificates from owners weren't particularly realistic.
JAMES FREW


SHIP VALUATION
MSI has eyes on the future with new valuation service
UK research company believes it can accurately estimate ship values up to five years ahead and is ready to launch a forecasting service, despite the sceptics who believe forecasting in shipping is a long shot at the best of times
Adam Corbett London
MIKE PAYNE: MSI managing director is confident the new service can deliver the goods.
EXPERIENCE COUNTS
COY ON YARD CRITERIA
Mike Payne: MSI's earnings and asset price forecasts for the leading shipping sectors are significantly more accurate than common alternative methods, such as mean reversion or straight-line depreciation, based on forecasts since 2000.

OUR VISION

公司愿景

To create global full brokerage services in freight and commodity futures broking.

To leverage our international client base and outstanding research into domestic Chinese markets.

To be the number one partner to Chinese and international clients in clearing, financing and advisory.

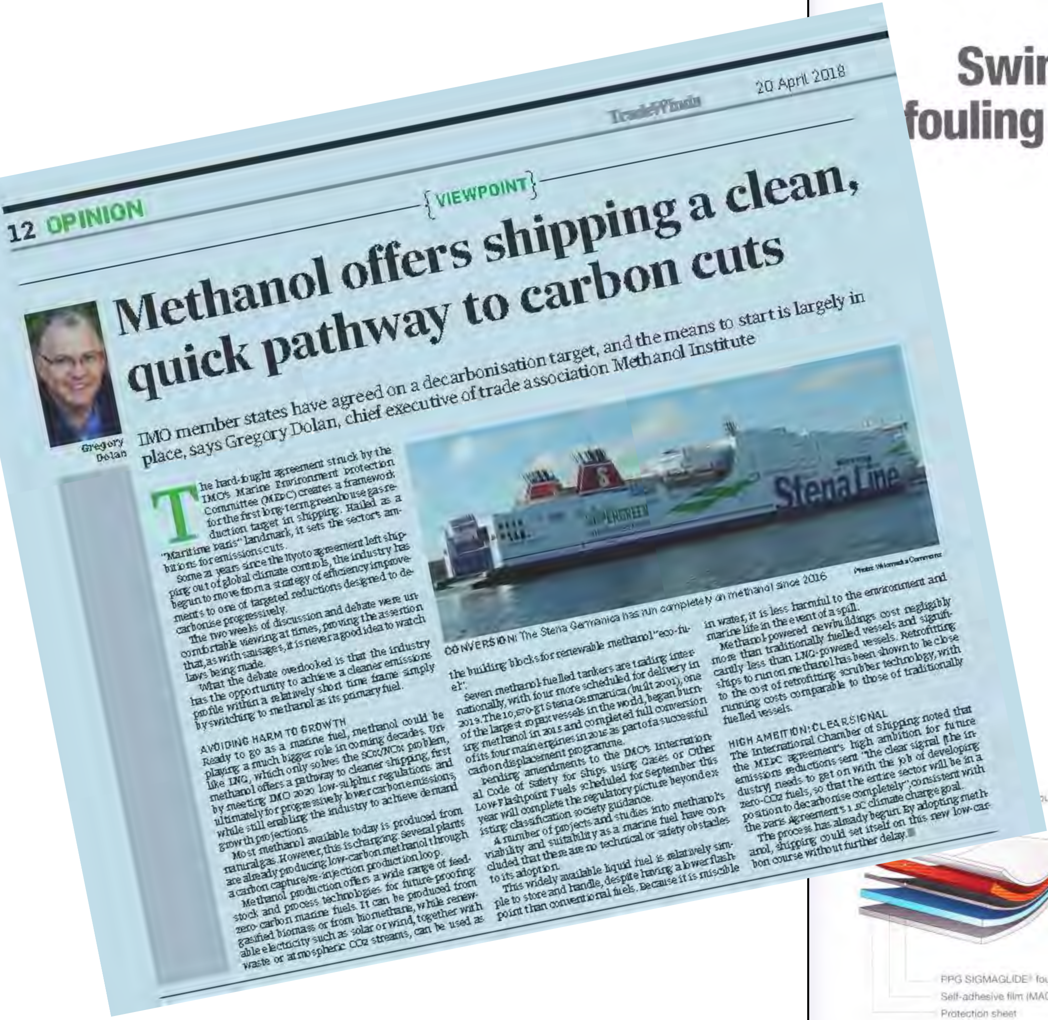
Develop new products and services to generate fresh revenue streams.

创造一个国际化的航运干散货和商品期货经纪的一站式平台

凭借国际化的客户市场以及优质的研究水平深入中国境内市场

成为中国以及全球客户清算、融资和咨询的最佳合作伙伴

拓展新产品和服务以开通新的营收通道。



12 OPINION

{VIEWPOINT}

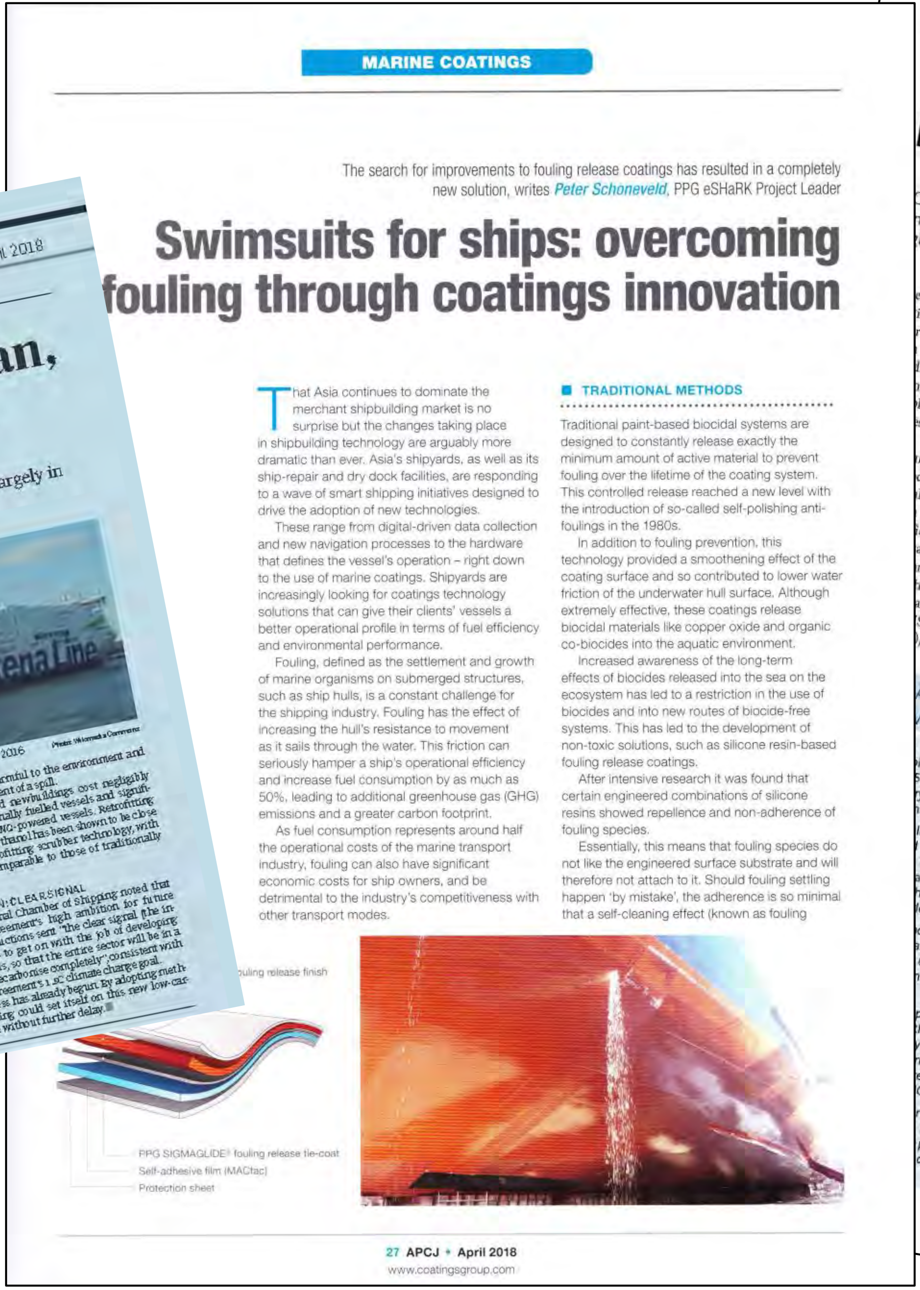
20 April 2018

Methanol offers shipping a clean, quick pathway to carbon cuts

IMO member states have agreed on a decarbonisation target, and the means to start is largely in place, says Gregory Dolan, chief executive of trade association Methanol Institute

Gregory Dolan

CONVERSION: The Stena Germanica has run completely on methanol since 2016



MARINE COATINGS

The search for improvements to fouling release coatings has resulted in a completely new solution, writes *Peter Schoneveld*, PPG eSHaRK Project Leader

Swimsuits for ships: overcoming fouling through coatings innovation

That Asia continues to dominate the merchant shipbuilding market is no surprise but the changes taking place in shipbuilding technology are arguably more dramatic than ever. Asia's shipyards, as well as its ship-repair and dry dock facilities, are responding to a wave of smart shipping initiatives designed to drive the adoption of new technologies.

These range from digital-driven data collection and new navigation processes to the hardware that defines the vessel's operation – right down to the use of marine coatings. Shipyards are increasingly looking for coatings technology solutions that can give their clients' vessels a better operational profile in terms of fuel efficiency and environmental performance.

Fouling, defined as the settlement and growth of marine organisms on submerged structures, such as ship hulls, is a constant challenge for the shipping industry. Fouling has the effect of increasing the hull's resistance to movement as it sails through the water. This friction can seriously hamper a ship's operational efficiency and increase fuel consumption by as much as 50%, leading to additional greenhouse gas (GHG) emissions and a greater carbon footprint.

As fuel consumption represents around half the operational costs of the marine transport industry, fouling can also have significant economic costs for ship owners, and be detrimental to the industry's competitiveness with other transport modes.

TRADITIONAL METHODS

Traditional paint-based biocidal systems are designed to constantly release exactly the minimum amount of active material to prevent fouling over the lifetime of the coating system. This controlled release reached a new level with the introduction of so-called self-polishing anti-foulings in the 1980s.

In addition to fouling prevention, this technology provided a smoothening effect of the coating surface and so contributed to lower water friction of the underwater hull surface. Although extremely effective, these coatings release biocidal materials like copper oxide and organic co-biocides into the aquatic environment.

Increased awareness of the long-term effects of biocides released into the sea on the ecosystem has led to a restriction in the use of biocides and into new routes of biocide-free systems. This has led to the development of non-toxic solutions, such as silicone resin-based fouling release coatings.

After intensive research it was found that certain engineered combinations of silicone resins showed repellence and non-adherence of fouling species.

Essentially, this means that fouling species do not like the engineered surface substrate and will therefore not attach to it. Should fouling settling happen 'by mistake', the adherence is so minimal that a self-cleaning effect (known as fouling

27 APCJ • April 2018
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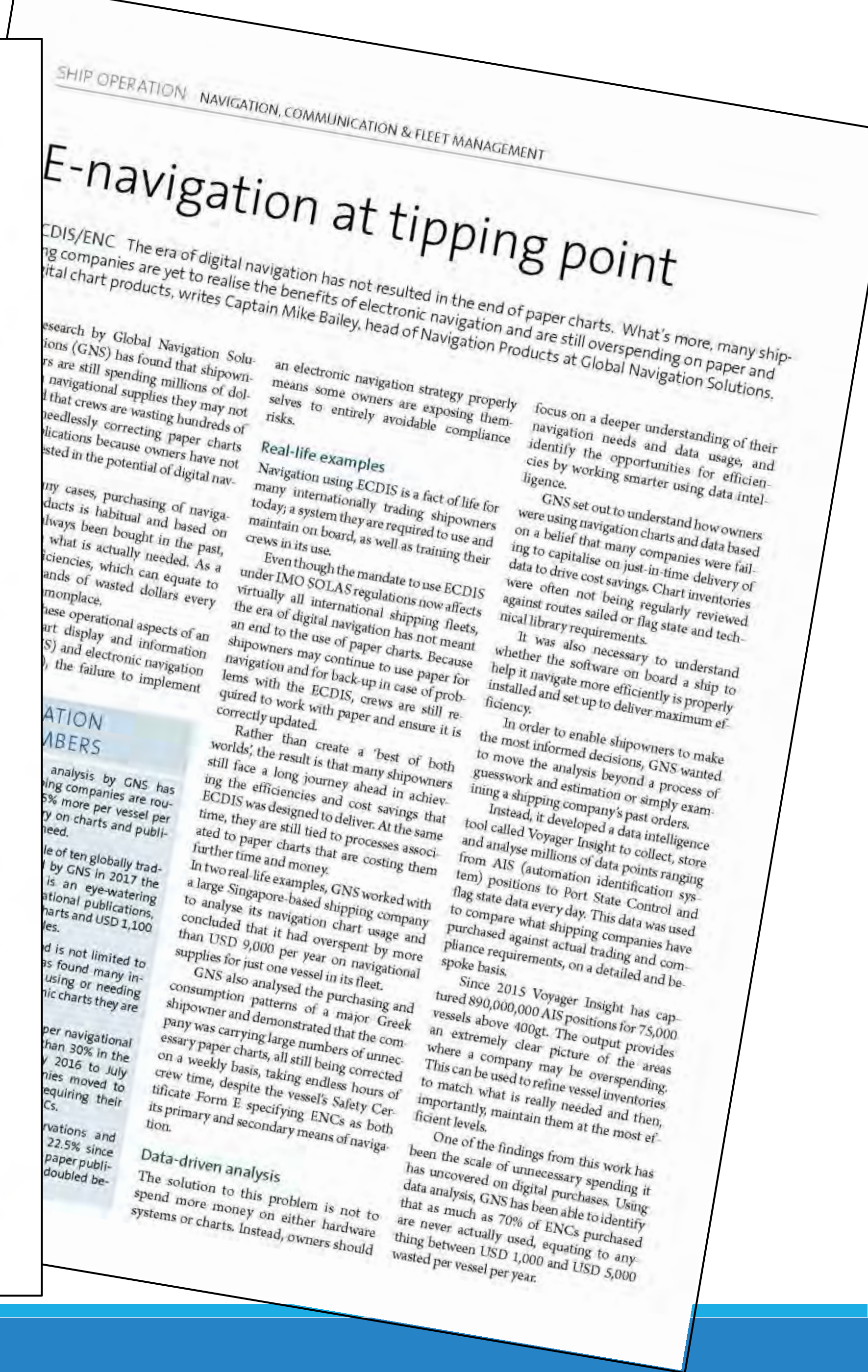

SHIP OPERATION NAVIGATION, COMMUNICATION & FLEET MANAGEMENT

E-navigation at tipping point

...CDIS/ENC The era of digital navigation has not resulted in the end of paper charts. What's more, many ship...ng companies are yet to realise the benefits of electronic navigation and are still overspending on paper and ...ital chart products, writes Captain Mike Bailey, head of Navigation Products at Global Navigation Solutions.

an electronic navigation strategy properly means some owners are exposing themselves to entirely avoidable compliance risks.

Real-life examples

Navigation using ECDIS is a fact of life for many internationally trading shipowners today; a system they are required to use and maintain on board, as well as training their crews in its use.

Even though the mandate to use ECDIS under IMO SOLAS regulations now affects virtually all international shipping fleets, the era of digital navigation has not meant an end to the use of paper charts. Because shipowners may continue to use paper for navigation and for back-up in case of problems with the ECDIS, crews are still required to work with paper and ensure it is correctly updated.

Rather than create a 'best of both worlds', the result is that many shipowners still face a long journey ahead in achieving the efficiencies and cost savings that ECDIS was designed to deliver. At the same time, they are still tied to processes associated to paper charts that are costing them further time and money.

In two real-life examples, GNS worked with a large Singapore-based shipping company to analyse its navigation chart usage and concluded that it had overspent by more than USD 9,000 per year on navigational supplies for just one vessel in its fleet.

GNS also analysed the purchasing and consumption patterns of a major Greek shipowner and demonstrated that the company was carrying large numbers of unnecessary paper charts, all still being corrected on a weekly basis, taking endless hours of crew time, despite the vessel's Safety Certificate Form E specifying ENCs as both its primary and secondary means of navigation.

Data-driven analysis

The solution to this problem is not to spend more money on either hardware systems or charts. Instead, owners should focus on a deeper understanding of their navigation needs and data usage, and identify the opportunities for efficiencies by working smarter using data intelligence.

GNS set out to understand how owners were using navigation charts and data based on a belief that many companies were failing to capitalise on just-in-time delivery of data to drive cost savings. Chart inventories were often not being regularly reviewed against routes sailed or flag state and technical library requirements.

It was also necessary to understand whether the software on board a ship to help it navigate more efficiently is properly installed and set up to deliver maximum efficiency.

In order to enable shipowners to make the most informed decisions, GNS wanted to move the analysis beyond a process of guesswork and estimation or simply examining a shipping company's past orders.

Instead, it developed a data intelligence tool called Voyager Insight to collect, store and analyse millions of data points ranging from AIS (automation identification system) positions to Port State Control and flag state data every day. This data was used to compare what shipping companies have purchased against actual trading and compliance requirements, on a detailed and bespoke basis.

Since 2015 Voyager Insight has captured 890,000,000 AIS positions for 75,000 vessels above 400gt. The output provides an extremely clear picture of the areas where a company may be overspending. This can be used to refine vessel inventories to match what is really needed and then, importantly, maintain them at the most efficient levels.

One of the findings from this work has been the scale of unnecessary spending it has uncovered on digital purchases. Using data analysis, GNS has been able to identify that as much as 70% of ENCs purchased are never actually used, equating to anything between USD 1,000 and USD 5,000 wasted per vessel per year.

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