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MARITIME REPORTER AND ENGINEERING NEWS

MARINELINK.COM

July 2017

Ship Registries
Marshall Islands in Command

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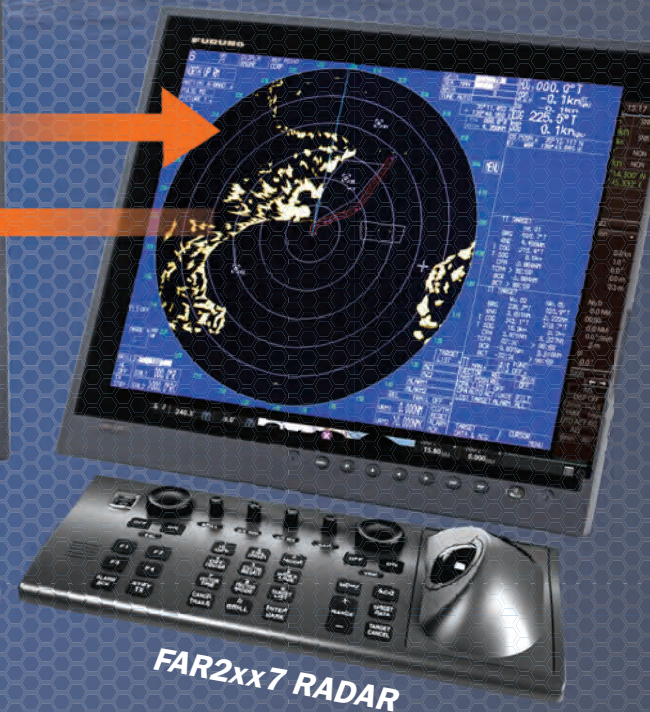

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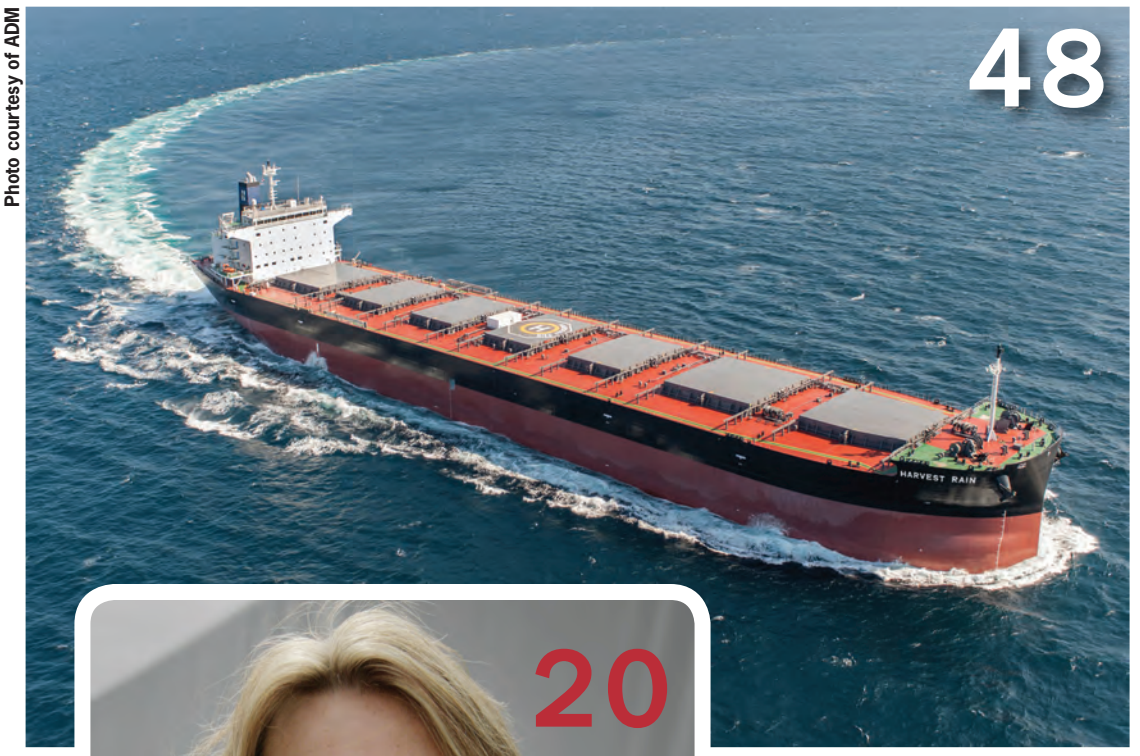

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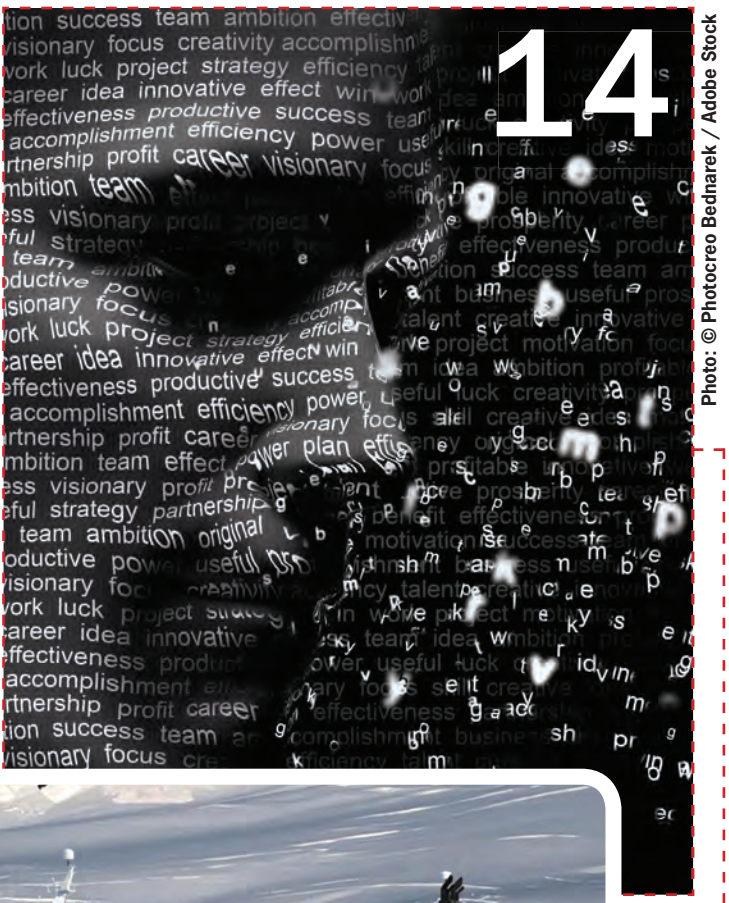

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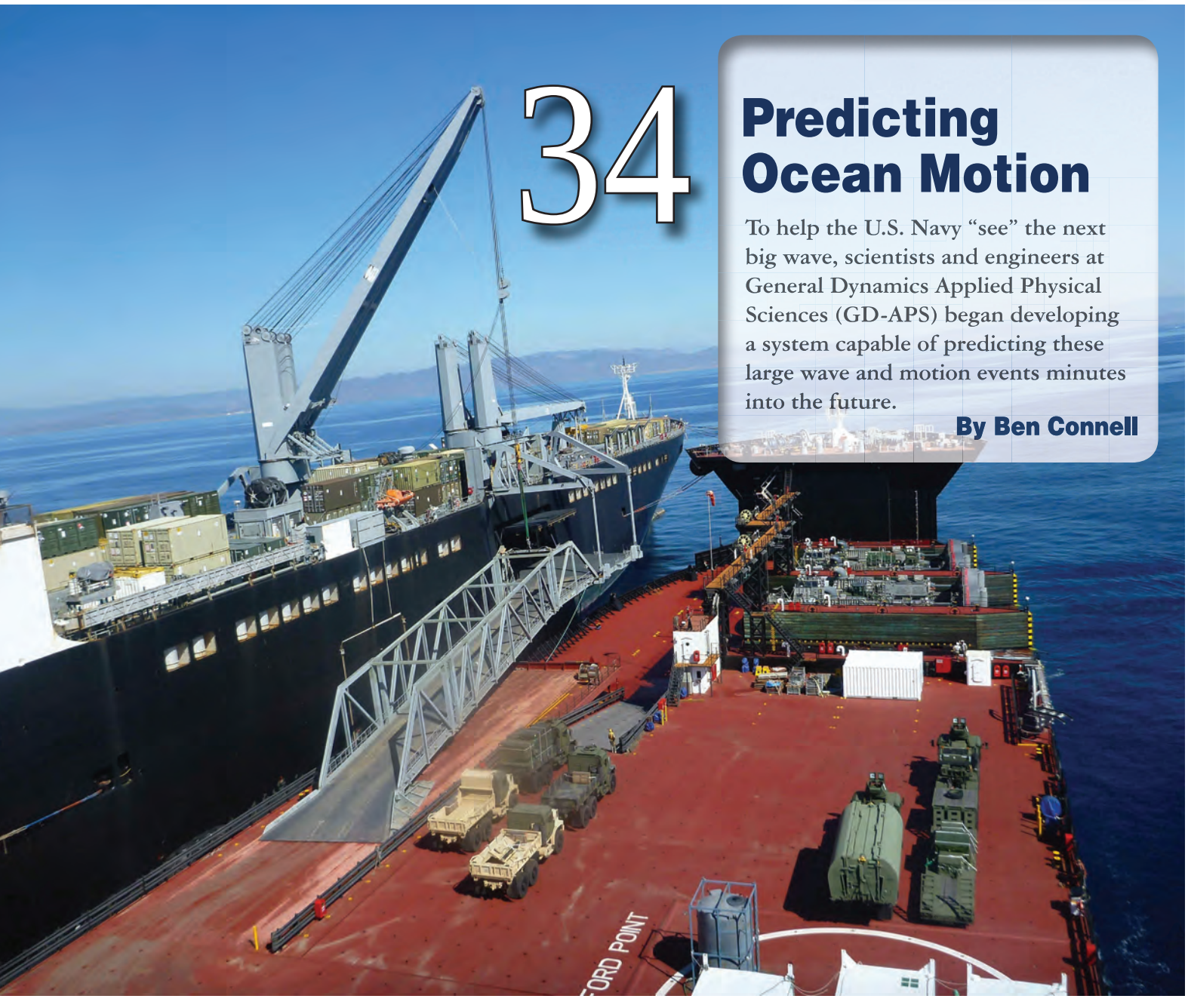
THE COVER

SHIP REGISTRIES:
The Marshall Islands Move to the Head of the Class
Leveraging 27 worldwide offices, the RMI Registry has been gaining market share year-on-year. Surging tonnage and a solid record for safety has pushed the registry to the head of the class. See story starting on page 48.

Photo courtesy of ADM



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Predicting Ocean Motion

To help the U.S. Navy "see" the next big wave, scientists and engineers at General Dynamics Applied Physical Sciences (GD-APS) began developing a system capable of predicting these large wave and motion events minutes into the future.

By Ben Connell

General Dynamics Applied Physical Sciences/US Navy

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Software Solutions

Monitor & Track

Gatehouse founder and CEO Michael Bondo Andersen discusses optimization and efficiency via software solutions.

By Greg Trauthwein

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The Fishing Fleet

Northern Europe

In part 3 of our series on fishing fleet evolution, we find (surprise, surprise) innovation and investment in Europe.

By William Stoichevski

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Photo: World Maritime University

World Maritime University signs MoU with MLS, New Wave Media

L to R: Associate Professor, Michael Manuel, WMU; Greg Trauthwein, Vice-President, New Wave Media; Dr. Cleopatra Doumbia-Henry, President, WMU; Murray Goldberg, CEO, Marine Learning Systems.

GREG TRAUTHWEIN, EDITOR & ASSOCIATE PUBLISHER

In my 25 years serving the maritime market, I have had more than my fair share of memorable personal and professional experiences – far more than I could have possibly imagined when I moved the New York City after graduating from The Ohio State University nearly 30 years ago. Last month at the World Maritime University (WMU) in Malmö, Sweden, I was honored to be a part of something that tops the chart, the signing of an MoU with WMU and Marine Learning Systems (MLS) to produce a global survey on mariner training.

There will be more details of the actual survey in the coming weeks and months, as we will ask executives in shipping companies across the industry and around the world to share insightful information on their company's current and future maritime training regimen.

This endeavor is significant for a number of reasons, mainly as it is an earnest attempt to give size, shape and perspective to maritime training habits and investment, a topic which to date has no cohesive and complete form.

My gratitude for this union starts with Associate Professor, **Michael Manuel**, WMU, who has worked tirelessly on this project from the start to give the survey form and function with the credentials of WMU strongly in support.

Another partner is **Murray Goldberg**, CEO, Marine Learning Systems, a regular contributor to our pages, including a column in this edition starting on page 14. To put it simply, Murray is one of the most tireless executives that I know, a walking, talking educational and eLearning dynamo that is quickly adding maritime industry titans to his company's reference list. Murray is truly a *'glue that binds us'* type of individual, and if your organization needs to get a handle on its training initiatives, I recommend a conversation with him and his growing team at MLS.

Last, but certainly not least, my sincere thanks to **Dr. Cleopatra Doumbia-Henry**, President, WMU. Dr. Doumbia-Henry, as you might expect, has impressive maritime credentials much too long to list in this space, including the development of the ILO Maritime Labor Convention, 2006, something she remained responsible for it until she joined WMU 2015.

The signing of the MoU was my first step into the WMU President's office, and after the ink dried and the photographer exited, I spent the balance of the morning through lunch interviewing Dr. Doumbia-Henry for the August 2017 edition. Suffice it to say that she is passionate about all matters maritime and mariners, and frankly there is no better partner than WMU to spearhead this study.

For our part we offer our full family of media products – in print, online and via social media – including the world's largest audited circulation b2b maritime magazine in *Maritime Reporter & Engineering News*; one of the oldest and most heavily trafficked industry websites in **MarineLink.com**, and the world's largest maritime social media presence, led by our Maritime Network group on LinkedIn with nearly 130,000 members.

Together, WMU, MLS and New Wave media will work hard for the overall good of this industry to deliver – with your help – a unique perspective on global maritime training practices.

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The Switch

‘Mythbusters’ visit The Switch

Jamie Hyneman, best known as a co-host on Mythbusters, was recently in Finland to receive an Honorary Doctorate from Lappeenranta University of Technology (LUT). While in town, Hyneman also had an opportunity to visit several of the region’s top technology companies with origins at LUT, including electrical drive train technology specialist The Switch, who says it has an installed base of over 13 GW of megawatt-class permanent magnet machine and power converter packages within the wind, marine and special industrial sectors.
https://www.marinelink.com/news/mythbusters-visits-switch426634

Columbia Moves to Salvage Treasure from Spanish Shipwreck

Colombia is making progress towards salvaging a Spanish galleon carrying jewels and coins that sank more than 300 years ago, President Juan Manuel Santos said after receiving a proposal from an investor to bring it to the surface.
The ship named San Jose, thought by historians to be carrying one of the largest unsalvaged maritime treasures, sank in 1708 near the historical Caribbean port of Cartagena, and its wreckage was located in 2015. “The discovery of this ship - one of the most important that navigated in our seas during colonial times - begins a new chapter in the cultural and scientific history, not only of Colombia, but of the entire world,” Santos said on national television from Cartagena.
The government will accept further offers to recover the ship and its treasure, Santos said. A museum will be built to showcase artifacts found in the wreckage. Sonar images have so far revealed bronze cannons made specifically for the ship, arms, ceramics and other artifacts. Archaeological excavation and scientific tests on the wreck will continue to ensure it can be properly preserved, Santos said.
https://www.marinelink.com/news/shipwreck-treasure427082

Vigor

U.S.-Built Refrigerated Liquefied Gas Carrier

Vigor launched The Harvest, the first complex liquefied ammonia transport barge built in the U.S. for Jones Act trade since 1982. The vessel was built to support the operations of The Mosaic Company, an integrated producer and marketer of concentrated phosphate and potash. The Harvest will be operated by a subsidiary of Savage Companies as part of an articulated tug and barge (ATB) unit. The first-in-class ship was built to ABS (American Bureau of Shipping) and U.S. Coast Guard safety standards.
https://www.marinelink.com/news/refrigerated-liquefied426584

Metal Shark Wins $54m USN Deal

Metal Shark

Metal Shark won a contract worth up to $54 million from the U.S. Navy to build Near Coastal Patrol Vessels (NCPVs) for U.S. partner nations through the Department of Defense Foreign Military Sales (FMS) program. Metal Shark's proposal was selected by Naval Sea Systems Command from a field of six competing shipyards. Under the terms of the award, Metal Shark will build up to thirteen 85-foot Defiant-class welded aluminum cutters for the Dominican Republic, El Salvador, Honduras, Costa Rica, Guatemala and other U.S. partner nations. Metal Shark will also supply electro-optical infrared sensors, diagnostic equipment, in-country reactivation, crew familiarization and test support to NCPV operators. The new vessels are based on Damen Shipyards' Stan Patrol 2606 design.
https://www.marinelink.com/news/contract-shark-metal426723

Shipping Confidence on the Rise

Shipping confidence reached its equal highest rating in the past three years, according to the latest Shipping Confidence Survey for the three months to end-May 2017 from international accountant and shipping adviser Moore Stephens. The average confidence expressed by respondents to the survey was up to 6.1 out of 10 from the 5.6 recorded in the previous survey in February 2017. Increased confidence was recorded by all main categories of respondent to the survey, which launched in May 2008 with an overall confidence rating of 6.8. In the case of brokers, the confidence rating rose from 4.6 to 6.4, while for owners the increase was from 5.6 to 6.1. Confidence on the part of charterers and managers, meanwhile, was up from 5.9 to 6.4, and from 6 to 6.2 respectively.
https://www.marinelink.com/news/confidence-threeyear426635

SHIPS Act: 355-Ship Navy Gets Legislative Mandate

The push to rebuild the U.S. Navy received a boost when U.S. Senator Roger Wicker, R-Miss., and Congressman Rob Wittman, R-Va., introduced bicameral, bipartisan legislation that would make it the policy of the United States to achieve the Navy's requirement of 355 ships. Under the "Securing the Homeland by Increasing our Power on the Seas (SHIPS) Act," the fleet would be comprised of the optimal mix of platforms, with funding levels subject to annual appropriations. Currently, 276 ships are in the battle fleet.

"We need a strong Navy to project American power and secure our nation's interests around the globe," Wicker said. "The Navy has set a clear requirement for 355 ships – an objective that is achievable in the coming years with prudent planning and sufficient resources. Building up our fleet is a national project and should be a source of national pride. By establishing the 355 ship goal as national policy, the 'SHIPS Act' will keep us focused on this critical endeavor."

Wicker and Wittman serve as Chairmen of the Senate and House subcommittees that oversee the Navy and Marine Corps.
https://www.marinelink.com/news/legislative-mandate-ships426695

Broadband Demand

Satellite-based connectivity has always played a critical role for the maritime sector. As the communications expectations of ship owners, passengers and crews continue to grow, maritime service providers are seeing a transformation in the type and quantity of applications that need to be supported at sea.

Photo: Intelsat

The advent of VSAT broadband services is driving a shift away from traditional, low-level L-band connections that ship operators have relied upon for decades. VSAT services are preferred to respond to the demand for high-speed broadband that can support bandwidth-intensive applications. This satellite broadband enables vessel owners to improve daily operations, increase profitability and improve life onboard for crew members.

With ship operators increasingly investing in big data analytics to enable route optimization, fuel management and new services, the demand for bandwidth is expected to increase exponentially over the next few years.

With efficient broadband available, new applications track the movement of containers and valuable goods in real time. Overall, the digitization of the maritime industry will transform vessels into smart ships, resulting in a more competitive industry.

Industry forecasts tell us that the number of VSAT-equipped vessels will grow from 13,200 in 2015 to 32,700 in 2025. The merchant segment will see the biggest growth in installed VSAT terminals during this period, increasing from 6,000 to nearly 20,000.

This growth in maritime demand for connectivity comes at a time when satellite broadband to mobile VSAT platforms is being dramatically improved. Leading the improvement is the introduction of transformational technology in the form of high-throughput satellites and the development of next-generation ground antennas and modems.

The Advent of HTS

Delivering the required bandwidth to the maritime sector is one of the driving forces behind the high-throughput satellites (HTS) being launched by satellite operators. These next-generation satellites deliver the improved performance needed to power the most sophisticated maritime applications. The improvements in connectivity are delivering benefits across multiple maritime sectors, each with differing requirements and customer demands:

- **For commercial shipping operators,** HTS can keep vessels in constant communication with onshore offices, delivering real-time information on ship operations that can lead to improvements in fuel management or route adjustments to avoid bad weather. Container tracking and even container climate control protects precious cargo, lowering insurance costs. All of these can directly benefit the owner's bottom line.
- **For cruise lines,** HTS is meeting broadband requirements for passengers and supporting the operational data needs of ship owners. The typical family walks onto a cruise ship with up to seven connected devices. Passenger applications include web surfing, email, social media, gaming and video entertainment. Also, an equally capable return link is becoming more important, as passengers are now sending photos and video to social media in addition to downloading entertainment. The same connectivity is also being used by crews, enabling them to stay in touch with relatives at home while keeping up with events of the world.
- **For the superyacht and fishing sectors,** advances in antenna technology are making it easier to deliver this broadband connectivity to smaller-profile ships – delivering the same services enjoyed by larger vessels.

HTS platforms have helped maritime operators stop viewing satellite connectivity only as a necessary expense for crew welfare. Instead, they now view it as way to fully integrate their global fleets with onshore operations. However, not every HTS platform is the same.

The Intelsat EpicNG platform is based on an open architecture and backward-compatible design that allows end users to seamlessly migrate their existing network onto the HTS platform. Overnight, Intelsat EpicNG can bring 165 percent improvement in efficiency. Users can start with their current ground network, scaling incrementally to integrate the latest in satellite and terrestrial technology. This approach minimizes capex investment and operating cost. Combining this approach with flexible user plans enables service providers to deliver bandwidth to maritime customers when and where it is needed. Our experience implementing Intelsat EpicNG and bringing it to our customers on four continents has affirmed our beliefs about the potential of HTS. Our vision of the continuing evo-

Industry forecasts tell us that the number of **VSAT-equipped vessels will grow from 13,200 in 2015 to 32,700 in 2025.** The merchant segment will see the biggest growth in installed VSAT terminals during this period, increasing from 6,000 to nearly 20,000.

lution of our HTS services – with next-generation antenna technology such as that being developed by Kymeta and someday integrated Low Earth Services on the same platform – sets forth a road map to the future. That road map encourages our customers to think about solutions over a five-year or even 10-year investment cycle.

Future of Maritime Communications

In the future, we anticipate the development of more safety and security broadband-based applications – as well as increased access to training and enhanced crew services. Improved communications via HTS will ensure that ships have the same digital tools as their onshore offices.

While the use of cloud-based services is relatively low today, the virtualization of satellite services will enable ship owners to leverage the best technologies in the ecosystem to further improve operational efficiency.

The maritime industry is also adopting the Internet of Things (IoT), which improves transport and logistics, enhances safety and reduces the administrative costs of regulatory compliance. HTS will satisfy the bandwidth demands of IoT, as well. Vessel owners already are using technology to create automated ships, manned with smaller crews, that require robust satellite capacity for operations, navigation and onshore monitoring as they cross the world's oceans.

This is the first step toward the larger, more autonomous ship with minimal crew. For these autonomous vessels, shipping companies will need to be sure that the satellite operator they work with has enough capacity available for all ships on dense shipping routes and has sufficient backup available should a satellite ever fail.

Our technology road map provides visibility well into the next decade, making Intelsat uniquely positioned to advise maritime customers on building networks that support the needs of tomorrow.

It is truly an exciting time to serve the maritime industry. HTS and other advancements remove the limits of communication and help enable rapid advances in the connected and autonomous systems that require secure ship-to-shore communications. It is now up to ship owners to take advantage of these technologies to make their own operations and the entire worldwide shipping industry more efficient.

About the Author

Mark Rasmussen leads Intelsat's Mobility business unit, providing global satellite-based solutions for the maritime, aero and connected-transportation markets. He has more than 20 years of experience in the telecom industry.

Salvage and Marine Firefighting

Salvage and marine firefighting are complex response efforts often undertaken in adverse weather and sea conditions. While no two oil spill responses are the same, the diversity of variation between any two oil spill responses is not near as great as the diversity of any two salvage and marine firefighting responses.

Photo: © Lev / Adobe Stock

As a result, salvage and marine firefighting response providers must plan for and anticipate a wide range of variation in what will be required to address their portion of a marine casualty.

The Oil Pollution Act of 1990 (OPA 90) does not specifically mention salvage and marine firefighting, but it does state that vessel response plans shall "identify and ensure by contract or other means approved by the President that availability of private personnel and equipment necessary to remove to the maximum extent practicable a worse case discharge (including a discharge resulting from fire or explosion), and to mitigate or prevent a substantial threat of such a discharge."

The U.S. Coast Guard advance notice of proposed rulemaking of 30 August 1991 requested comments and suggestions regarding vessel response plans for, among other things, emergency response scenarios, e.g., fires/explosions and salvage operations.

The 19 June 1992 notice of proposed rulemaking stated that the Coast Guard considers salvage and firefighting capabilities to be essential to deal with a worse case discharge. The proposed rule required vessel owners and operators to identify and ensure the availability of, through contract or other approved means, both private salvage and firefighting capability for areas in with the vessel operates. It did not propose specific response times or equipment requirements due to the then-current shortage of such response equipment on a nationwide basis. The interim final rule for vessel response plans was promulgated on 5 February 1993. That rule implemented the salvage and marine firefighting provisions as proposed the previous year, with no specific response times or equipment requirements. So things remained for a number of years. On 12 January 1996, the vessel response plan rule was finalized. Among the various changes from the interim rule, a requirement was added providing that on or after 18 February 1998 the salvage and marine firefighting resources must be capable of being deployed to the port nearest the area in which the vessel operated within 24 hours of notification, but this requirement was suspended three times and never actually entered into effect.

A public meeting was held on 5 August 1997 to address issues related to salvage and marine firefighting capabilities. Participants identified three issues that they felt the Coast Guard needed to address: (1) defining the salvage and marine firefighting capability that is necessary in the vessel response plans; (2) establishing how quickly these resources must be on-scene; and (3) determining what constitutes adequate salvage and marine firefighting resources.

In 1994, the Marine Board of the National Academies completed its Reassessment of the Marine Salvage Posture of the United States. Among other things, that report recommended that the Coast Guard, in consultation with the US Navy Supervisor of Salvage, develop and promulgate a list of active salvors in accordance with the general criteria proposed in the report. The list then should be used to prequalify salvage companies for inclusion in vessel owners' contingency plans for casualty response and may include salvors that specialize in specific aspects of salvage. As a matter of corporate policy, companies needing salvage services should endeavor to contract for salvage services with these professional salvage companies. The report basically endorsed the Coast Guard's program for classifying oil spill removal organizations (OSROs) and recommended that the Coast Guard utilize that program for the salvage and marine firefighting program.

When the salvage and marine firefighting rules were proposed on 10 May 2002, the Coast Guard placed the onus of determining the adequacy of salvage and marine firefighting resource providers

squarely on the vessel owners and operators. No explanation was provided for the agency's rejection of the Marine Board's recommendation in this regard, although it appears that the Coast Guard believed that it did not have the resources to properly evaluate and classify these additional resource providers. It is wholly unrealistic, though, to expect the vessel owners and operators are better situated than the Coast Guard to evaluate the adequacy of salvage and marine firefighting resource providers. Many of these owners and operators are small entities and the burden of determining the adequacy of the resource providers can exceed their capability. In addition, since there are only four national full-service providers of salvage and marine firefighting services and a handful of specialized or regional providers, a classification program for these elements would be relatively straightforward.

In the 31 December 2008 final rule implementing the salvage and marine firefighting requirements the Coast Guard adopted a system of measuring response times in two ways. For casualties off the shores of the 48 continental states (CONUS), response time was measured based on the distance from shore (the nearest point of land). For casualties off the shores of other U.S. locations (i.e., Alaska, Hawaii, Guam), response time was measured based on the distance of the casualty from the relevant Captain of the Port (COTP) city. A comment stating that the proposed response time regime was inappropriate for certain CONUS locations was rejected with the statement: "All continental U.S. (CONUS) coastlines are covered by this final rule and this rule does not impose any additional capital requirements on industry."

While that statement may technically be true, it did not respond to the relevant comment. In fact, there are various CONUS locations that are quite distant from a COTP port or other port where significant salvage and marine firefighting resources may be located. Examples of such distant CONUS locations include, but are not limited to: Crescent City, CA; the entrance to the Strait of Juan de Fuca; Fort Pierce, FL; Bar Harbor, ME; and many portions of the Great Lakes and Western Rivers.

It is therefore recommended that the Coast Guard initiate a rulemaking to amend the salvage and marine firefighting regulations to reflect reality. Among other things, the Coast Guard should adopt the Marine Board recommendation mentioned above and institute a classification system for salvage and marine firefighting resource providers, similar to that already in place for OSROs. It should also revise the response time requirements of CONUS locations so as to measure response times based on the distance from the nearest COTP city. The current regulations, at least in these respects, are highly aspirational and unrealistic.

About the Author

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Step-by-Step Improved Safety & Training

Step #2: Launching a Blended Learning Pilot

Photo: © Photocreo Bednarek / Adobe Stock

Everyone responsible for safety or training in their organization is very aware that everything is changing in the maritime world. The worker demographic has shifted. Regulatory demand is rising and compliance is more complex. Fortunately, it is also the case that maritime safety and training has entered a renaissance period. New tools are available that improve training outcomes and allow organizations to assess the state of training and compliance with a level of insight not previously possible. At the heart of these tools is the practice of blended learning supported by a Learning Management System (LMS) - software to deliver training, assessments, tracking and insights.

This is the second is a series of short articles that provides step-by-step instructions on addressing modern safety, training and compliance challenges with the new and highly effective practice of blended learning. The first article, which appeared in last month's edition of Maritime Reporter, focused on the creation of a minimum viable plan (MVP) for the pilot. This is a two or three page living document which acts as a roadmap for the management of blended learning. With that in place, we now turn to the next step, that of preparing and running a small pilot. The goal of the pilot is to produce a very small blended learning implementation that addresses a small number of trainees and a small number of courses / competencies. This will require minimal time and resources, but produce useful initial results. Let's get started.

Let's Define Success

The overall outcomes we are looking to achieve are improved training results, improved compliance tracking, and the ability to continuously measure the success of our training to inform a process of continuous improvement. The goal of this particular stage, the pilot, is primarily to gain experience. Although there is now a rapidly growing body of experience with blended learning in the maritime industry, each organization and thus each implementation is slightly different. As such, each implementation is a learning experience. Because of this, by far the best approach is to start small, and then grow in incremental stages. The first stage is the pilot.

Best Advice: Keep the Pilot Implementation Small

By definition, the pilot implementation is small. It addresses a limited number of trainees and a limited number of courses or competencies. By keeping the pilot small, we avoid any significant outlay of resources. This allows us to get started without delay. A small pilot also allows us to learn what works (and what does not) very quickly. The effect of any misstep is kept to a minimum and we can quickly apply what we have learned to subsequent stages. This is often referred to as the "fail fast" approach which, de-

spite how it sounds, can be an excellent project management principle. In addition, the successes we achieve in the pilot provide the incentive and resources to deploy the next, larger stage. So there is real benefit in keeping the pilot small.

Implementing and Running the Pilot

There are many valid approaches to running a successful pilot. Below, we will outline the most important activities to consider and provide some basic suggestions for each.

- **Engagement and Communication:** before anything else, it is important to consider how the pilot program will be communicated to the organization and how stakeholders will be engaged in the creation and running of the pilot. As a first principle, it is imperative that stakeholders at all levels of the organization are involved in the planning of the pilot. This will not only ensure that the pilot is based on complete information, but it also will create buy-in. Training, and especially training transformation, is something that everyone should contribute to – not something imposed on the many by the few. Good practice here is to set up a working group with representation from new and experienced employees covering the various departments within the organization. Be sure to include the operational departments, as well as safety, HR, crewing and so on.

Second, communication is critical. It should come from the top, be regular, and be transparent. All members of the organization should understand that the pilot is being undertaken as a product of the organization's commitment to training and safety, that employees from all levels of the organization are participating in the definition of the pilot, and that the results and next steps will be communicated. Be transparent that this is new territory and that everyone will learn as a result; that is the only path to improvement. Remember that any change requires some organizational culture shift and that transparent communication is a necessary component of success.

- **Choosing the Training and the Audience:** We see many different approaches to choosing the pilot training and audience, but arguably the most common is to address new-hire training. Addressing new hires has the advantage that training materials are often readily available and can easily be converted into an on-line format. Additionally, using blended learning to train new hires helps establish the safety and training culture immediately upon induction – a very positive side effect.
- **Structure of the Blended Learning Program:** There are many ways to blend learning, and thus many options. However, arguably the most direct, most effective and most popular is the one deployed by BC Ferries in 2007. Their blended learning approach to familiarization training was part of a safety culture transformation that reduced accidents by two-thirds and reduced annual insurance costs by three-quarters (millions of dollars per year).

Here, we divide the training into three parts: self-study, in-person training, and assessment. The self-study component is fully on-line. Trainees use this resource to learn, at their own pace, the foundational knowledge of the topic at hand. For example, if new-hire training is the subject of the pilot, the on-line resource will teach company organization, company culture, basic safety information, the regulatory framework, and any other topic that all new hires must be aware of. An on-line exam should follow the self-study to ensure that each trainee has absorbed and understood the information.

Next, in-person training, conducted by an expert, is used to train skills, relate personal experience, work through group or individual exercises, and further consolidate knowledge. This stage is made very efficient and effective by the fact that all trainees come to it with a uniform and reliable level of knowledge from the self-study.

And finally, an assessment is conducted to ensure that trainees are fit for duty. Depending on what is being tested, a combination of on-line assessments (to test knowledge), demonstrative exams (to test skills) and oral assessments (to test reasoning ability) can be employed.

- **Implementing the Learning:** The primary effort here is to prepare the on-line materials necessary to support the self-study and deploy those, along with any assessments, on your chosen learning management system (LMS). A good marine-focused LMS vendor can assist with this and advise on best practice. Additionally, the in-class portion of the training should be planned along with final assessments.
- **Running the Pilot:** Once the pilot is set up, it is time to put your first trainees through it. The pilot group should include a number of new trainees alongside some more experienced employees who have been through more traditional training. These experienced employees can provide a comparative perspective.

What's Next?

Once the pilot is complete, we move on to what it arguably the most important phase. This is where we analyze and collect the results of the pilot, and then use those to inform the next and subsequent phases of rollout. It is important enough that we will devote the entire third and final installment of this series to it. So, please check this space next month in *Maritime Reporter and Engineering News.*

About the Author

Murray Goldberg id CEO of Marine Learning Systems, maker of MarineLMS. A researcher and developer of learning management systems, his software has been used by millions of people and companies worldwide.

Big Data & a Level Playing Field

Photo: NAPA

About the Author

Pekka Pakkanen holds the position of Director, Development, NAPA Shipping Solutions. He is responsible for development of ship performance monitoring and analysis related business. Mr. Pakkanen received his Master's degree in Naval Architecture from the Helsinki University of Technology.

"The future is already here – it's just not very evenly distributed," is an observation from William Gibson, the luminary science fiction author, that sums up many of the problems with widespread adoption of technological solutions. This is certainly true of shipping. As we saw at Nor-Shipping this year, it is now expected for most businesses to have a data-driven element, and enthuse about how they are 'embracing digital.' But how much of this buzz around digital solutions results in better decision making on the ground?

While ship owners and operators are fully aware of the value of data-driven decisions, in practice, few, it turns out, have the capacity to fully realize the value of the wealth of data that is being generated through the day-to-day operations of our increasingly interconnected fleet. 90% of the global fleet does not have access to vessel performance monitoring, despite its benefits. On-board performance monitoring systems can give incredibly valuable insights on fuel and route efficiency, cargo optimization and much more. However, the cost of installing the required equipment requires multiple phases of input; pre-survey, installation, training, data validation and analysis. This puts it beyond the reach of many potential users – ship owners, operators and charterers alike.

This means missing out on a wealth of data. However, one key development provided the beginning of a methodology that would provide accurate monitoring without the need for expensive equipment. Around 2015, the satellite network had grown to the point where it was possible to track a vessel's AIS (Automatic Identification System) data throughout its entire voyage. Combined with data on weather and environmental conditions, and the reported draft of the ship, this data can give an accurate picture of a vessel's activities. NAPA realized that, given this goldmine of information, there must be a way to track and analyze vessels' fuel consumption and efficiency with no need for installation of on-board equipment.

The missing link was how to connect this data with vessel performance. Different types of ships will obviously function differently with different profiles. This gap was bridged by making use of NAPA's expertise gained from work in the fields of both vessel design and ship performance modelling. We developed advanced algorithms and hydrodynamic calculations that could predict how a ship of a certain type would perform and consume fuel, given the route and environmental condition data. Any conventionally powered vessel – i.e. using HFO for propulsion – is currently covered by the tool, named NAPA Fleet Intelligence. Reports are accessible instantly through a web browser, presenting the data in an accessible and easily understandable way.

Because the tool is based on publicly available data, users can benchmark their performance against a truly vast database of voyages. When it debuted in May 2017, the tool had 6.5 million voyages in its database – a number that is currently growing by over 10,000 per day. Users can compare performance and efficiency against an optimized speed profile, as well as determining whether the cargo capacity is being used efficiently.

NAPA Fleet Intelligence aims to democratise fleet efficiency monitoring in the here and now, not only by cutting through CapEx barriers, but addressing the misaligned incentives that make effective monitoring difficult. As with so many other efficiency-enhancing technologies, it is not necessarily in a charterer's interest to go through the time and effort to install monitoring equipment on board vessels that do not belong to them, and will only be 'theirs' for a short amount of time. However, owners, facing multiple financial pressures and low freight rates, may find it difficult to assemble the CapEx necessary to install such systems. NAPA Fleet Intelligence breaks through these barriers by providing an affordable, easy to use method of performance monitoring. On-board performance monitoring equipment will still have a role to play – the extra efficiency savings enabled by the more detailed data systems will justify the cost and effort for those who can afford it. However, NAPA Fleet Intelligence makes many vital metrics available for a wider section of an industry that remains under multiple cost pressures in the current financial climate – democratizing performance monitoring, and hopefully distributing the future more evenly.

Bilge Keel Damping

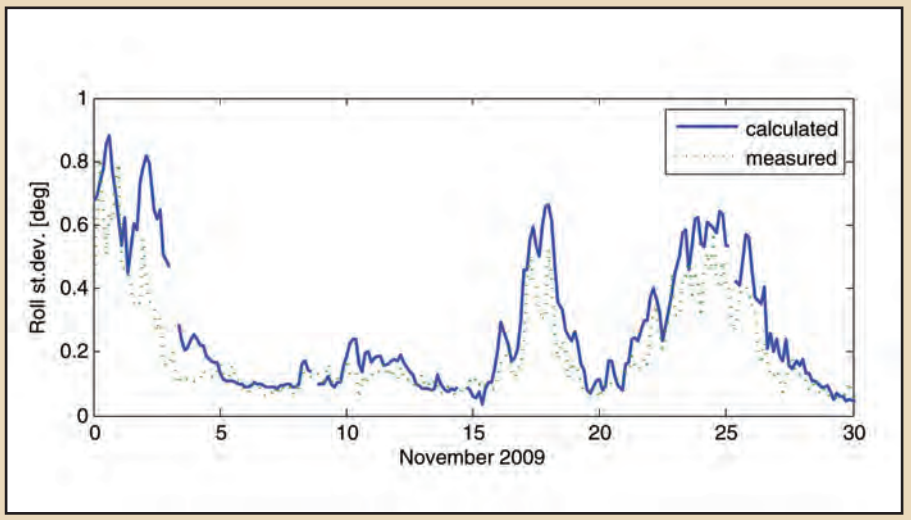
from in-field Motion Measurements

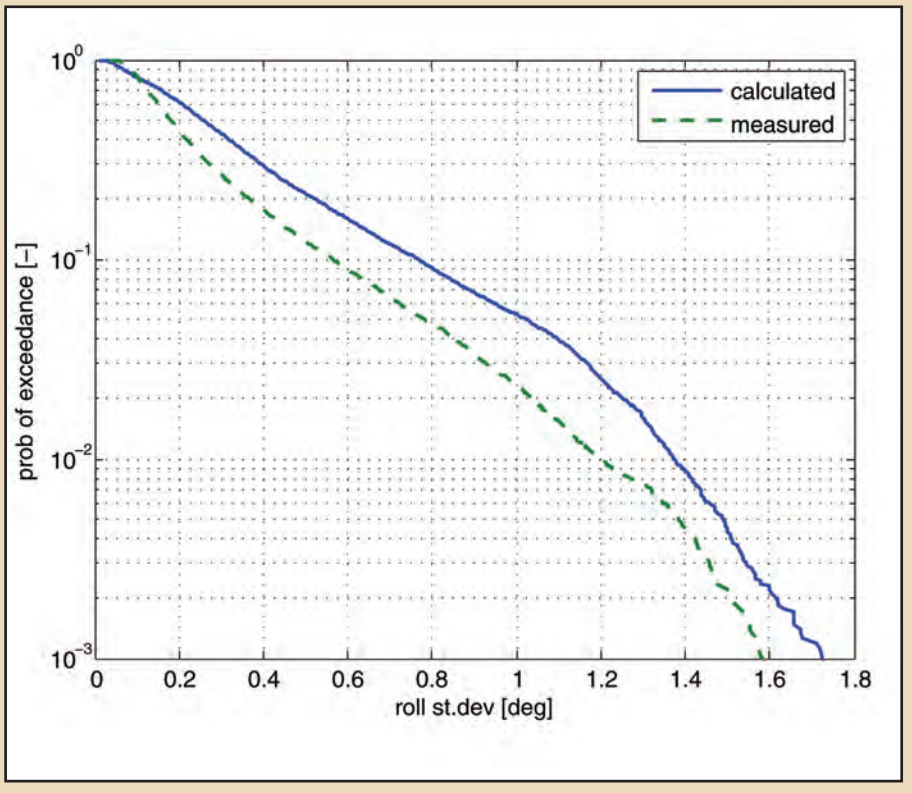
Chevron and MARIN worked together on a novel approach to characterize the actual damping for an FSPO in real world conditions. Results show that using damping from model tests means that roll decay in calm water is conservative and that natural roll periods are less sensitive to the FPSO draft than often considered in the design phase.

Due to the resonance behavior of roll motions, roll damping is an important consideration for vessel motions and the associated extreme and fatigue loading on the hull, topsides and risers of an FPSO. In many cases radiation damping is limited and passive damping devices, such as bilge keels, are installed to spur viscous eddies and hence limit the roll motions.

This contributes nonlinear damping to an already complex problem.

Designers often rely on model tests to assess this damping. Based on test results, empirical and semi-empirical estimation models have been developed, but examples of benchmark validation with real world data are limited. These benchmarks are often hindered by uncertainty in the observed weather conditions, vessel loading conditions and vessel heading with respect to the waves.





Bilge Keel Reduction

In this study, MARIN examined five years of hindcast weather data, along with FPSO heading and roll motion measurements. The studied FPSO is a VLCC sized converted tanker with an internal turret located in an approximate 1,000 meter water depth. The configuration of the bilge keel was modified resulting in an effective reduction of the projected bilge keel area of about 60% since its initial construction. The reduction was completed in a phased effort over a period of several years. Therefore, the bilge keel reduction process was ongoing for the duration of this study; so the results could capture the impact of a progressive reduction in roll damping as it was reduced.

The measured roll response is correlated to the hindcast weather conditions and contrary to the conclusions from the established norms, the FPSO heading appears to be primarily dominated by current, with wind playing a secondary role. Local sea and swell appear to have relatively little influence on vessel heading. Additionally, due to the lack of coherence between the current, wind, swell and local sea directions, the FPSO might be at higher risk of extreme beam swell conditions than was assumed during the design phase. To compare the damping in the field with the damping estimated from model tests, a numerical model based on a roll Response Amplitude Operator (RAO) was set up. The natural period of roll was tuned to match the roll periods in the field. While the draft increases from 10m to 16m, the prevalent zero-up crossing period in the roll motions increases from 12.3s to 13.5s. This 1.2 second change in roll period due to draft change is small, hence the roll RAO, used to calculate the roll response in historic weather, is considered independent of the draft.

Realistic Estimate

With a stochastic linearization of the quadratic roll damping from the model tests, the standard deviation of the roll motions can be evaluated in the hindcast weather. The figure compares these calculated roll motions with the measurements for the month of November 2009. The method gives a qualitative idea about the roll damping available in the field but makes it difficult to quantify since the ratio between measurement and calculation varies over time.

Instead of comparing calculated and estimated roll of the same time periods, a novel method was proposed to study the distribution of roll against probability of exceedance. This distribution is also driving the fatigue life consumption. The measured and calculated distributions are compared in the second figure, which also shows the results with the model scale damping in calm water are conservative.

Both comparison methods indicate that the predicted roll motion is conservative due to the conservatism built into the roll damping estimate. By comparing occurrence probability and exceedance probability of the calculated and measured roll motions, the probabilistic method can be used to quantify the infield roll damping as well. This probabilistic method provides a realistic estimate of the roll damping for full-scale results and demonstrates the effect of the bilge keel modifications.

About the Author

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Fight Fatigue

Photo: © momentscatcher ? Adobe Stock

Fatigue is a well known factor as a cause numerous maritime and non-maritime accidents worldwide. In fact driving while fatigued is considered just as bad as driving while under the influence.

Fatigue is a well known factor as a cause numerous maritime and non-maritime accidents worldwide. In fact driving while fatigued is considered just as bad as driving while under the influence. The requirements under the new Manilla amendments call for vessels and seafarers to log their work or rest hours to meet the standards set out under STCW 2010 or the MLC 2006. Anyone who has ever gone to sea however can tell you that these measures, although a step in the right direction do not necessarily mitigate fatigue anywhere near as well as the IMO and ILO lawmakers expect.

This is especially true when we consider navigation accidents, The 1972 Collision Regulations cover many situations in regards to navigation, but the rules do not cover the state of the watch stander,

In fact Rule number 5 of the 1972 Collision regulations state “Every vessel shall at all times maintain a proper look-out by sight and hearing as well as by all available means appropriate in the prevailing circumstances and conditions so as to make a full appraisal of the situation and of the risk of collision.”

One thing that I enjoy as a mariner is looking through older handbooks and textbooks. Recently I was going through the 1943 edition of the Merchant Marine Officer’s Handbook and what struck me as interesting is the fact that within the first few pages both the Carpenter and the Purser are mentioned. These positions, both of which no longer carried on board, is just proof to the point that we are decreasing crew sizes to the point where certain ship board positions no longer even exist in the industry.

As an industry we are bound by IMO Resolution A1047(27) which lists the factors to be taken in to account when determining what the minimum safe manning of a vessel should be. These factors include the safety of the vessel while underway, at anchor, or in port during navigation and cargo operations. This resolution, too lengthy to be included in this article is the cornerstone

of Minimum Safe Manning.

So, why do we still see incidents and accidents relating to fatigue when there should be enough people to run the vessel, while others rest for their duties later on? What many vessel owners use as an argument for reduced manning is the increased automation onboard.

But this does not take in to account that much of this automation requires maintenance. One great example is the request by a ship owner to reduce manning down to One (1) Chief Engineer on board a vessel when the Engine room is fully manned. No oilers, wipers, QMED's. Just the Chief. What is that Chief Engineer to do when the automation for the Engine Room ceases to work while the vessel is underway?

It is very common item to see on Port state Control forms that either the crew is not getting enough rest as per the rules set out by either the MLC 2006 or STCW 2010, or you will see that the Work/Rest Hours log book has not been properly maintained. A good sign of an overworked and tired crew. Unfortunately there is not a universal interpretation or formula that can be used to determine what the minimum crew size should be.

What we are tending to see in the industry in terms of over reliance on automation Is that vessel owners are placing extraordinary burdens on the ship's officer. An excerpt from the 1974 SOLAS, Chapter IV requiring the carriage of at least one Radio Officer on board a Cargo vessel. That burden now falls upon the shoulders of our Navigation Officers. Where there was a designated person whose sole responsibility was to handle the incoming and outgoing communications, we now have a few officers who handle that as only a small part of their duties.

Pursers were also a common sight on board ships. Tasked with handling crew documents and pay as well as ordering, this job is now the burden of an already over worked Master. One common theme asked after the accident is, "Where was the Captain"? Post Exxon Valdez many are swift to judge that the Master was in their stateroom, feet up, drinking a cocktail. The answer however is much more mundane than that. Most commonly the Master lays below as soon as possible to complete paperwork that piles up. However they are expected to watch the radar and ECDIS relays in their stateroom and listen in on radio communications to ensure that the mate on watch is doing their job. When are they supposed to actually get work done and still be available to assist the bridge watch in times of doubt? What can be done to prevent these near misses and accidents related to fatigue?

1. Consider returning to a four mate ship.

Let the Chief Officer be tasked solely with maintenance and cargo. Do not burden them with having to stand watch. But do not do so by demanding that the other mates stand six and six watches for days straight. By doing this some of the burdensome paperwork can be relieved from the Master.

2. Night Mates allow the bridge officers to rest while in port.

I have had night mates on liner run ships that would call every few days or so in to Tacoma. The night mate would come on so that the mates could rest and the Captain knew that the people on deck were familiar and experienced with the vessel.

3. Riding crews and working gangs

Relieve the engineering department of some of the over abundance of work dedicated to special projects, especially on an aging ship with greater maintenance requirements.

4. Bring back the Purses and Radio Operator

(Now called the ETO). Let them assist the Captain in handling message traffic, taking care of crew paperwork, etc.

Although many will argue that the new age of automation is great for shipping there is a counter argument. As automation increases on ships and crews decrease in size there will be a transition period at which the crew will become severely over worked and over fatigued until automation can completely take over and some operator in a control center ashore takes care of the operation of the vessel, while the crews are forced in to retirement. Until that time comes however fatigue will be an increasing concern for operators and ship Master's.

About the Author

Matthew Bonvento is the Senior Manager for Safety, Security, Regulatory, and Quality Compliance for Vanuatu Maritime Services Ltd. Additionally Mr. Bonvento is a licensing instructor in Long Island. Holding a Masters in International Transportation Management, and an Unlimited Chief Officers License as well as a 1600 ton Master license, Matthew has dedicated himself to the advancement of safety and environmental awareness in the Maritime Industry.

Photo: DNV GL

When Elisabeth Tørstad took the helm as CEO of DNV GL - Oil & Gas in late 2013, the price of a barrel of NYMEX (WTI) crude oil was more than $100. Today, that price has been halved, and the 40-month period between her ascension to the top post and our meeting with her in Houston in May 2017 has been arguably the most tumultuous in the oil industry's history. Tørstad shares with Maritime Reporter & Engineering News her insights on the market going forward.

BY GREG TRAUTHWEIN

With the energy slump entering its fourth year, Elisabeth Tørstad succinctly summarizes this latest trough: "The downturn was steeper than we were prepared for, it came on faster and lasted longer than we expected." DNV GL has arguably weathered the storm well compared to others, owed in part to the fact that just before the downturn started DNV GL was coming through the merger of DNV and GL, meaning that the collective organization had already thoroughly examined its combined customer and service portfolio to eliminate redundancies.

But as every storm cloud has a proverbial silver lining, DNV GL took the astute business approach of looking at the collective energy market – past its traditional role and heavy involvement in the upstream market – with fresh eyes, evaluating how it could leverage its core expertise in new areas.

"We all tend to focus on the upstream market and the oil majors, which take up a lot of space," said Tørstad. "On the other hand, low prices have resulted in a surplus of oil and gas on the market, so that all the mid-stream and downstream markets have been able to produce at a low price and have therefore been busy. So, the part of our business that helps mid-stream to get products out to market has done well." In particular, she notes that the Asian downstream sector has been strong as countries in the region continue adding gas to their energy portfolios.

Think Global, Act Local

The future pace and direction of energy markets is fodder for daily debate, and some of the brightest minds in the sector continue to wrestle to read the combination of demand drivers, geo-political impacts and the impact of 'new' energy, including renewable and shale oil and gas. "The energy market has shifted quite dramatically, and going forward I think the oil and gas market will be more regional," said Tørstad. "You see many of the oil majors contracting back to North America — there is now less of a global environment and there are fewer global projects. More projects are happening onshore, where there are fewer global regulations and more national regulations."

As the market emerges from this watershed moment, it is worthy to note that the strategy that Tørstad and DNV GL put in place when she took the helm in 2013 is still valid, with its focus on cost-efficiency and digitization, in both its own company and the industry. "We are mov-

(continued on page 22)

"Digitization coupled with domain knowledge is essential in helping to manage the information overload and make sense of the data. Digitization is also a core element that will help to better manage the loss of experienced workers going forward. It keeps information, knowledge and experience available to a larger audience."

Photo: DNV GL

World Energy @ a Glance

When asked to identify world regions that are most vibrant today, Elisabeth Tørstad, CEO, DNV GL - Oil & Gas, said:

- **North America** has great potential. You have a competent and experienced workforce; you have the availability of drilling rigs and steel; and you have the resources to pursue the conventional and unconventional plays.
- **Norway** continues to be an offshore upstream player.
- There is still a big question mark about the **European Union's** gas strategy. The EU has a huge potential to have a very cost-efficient energy system with a combination of renewables and gas. However, right now, they are a bit back and forth on their gas strategy.
- In **Asia**, there is big potential for the expansion of gas as a fuel but, however the progress is slow. As a result, you see the continued use of, and investment in, coal.

Voices Elisabeth Tørstad, CEO, DNV GL - Oil & Gas

(continued from page 20)

ing along quite quickly in digitalizing our services and offerings to the market. At the same time, we are helping our customers in their development toward digitalization," said Tørstad.

A Digital Future

DNV GL has been on the cutting edge in driving the digitization revolution in maritime and energy sectors, and today Tørstad sees companies in the energy sector embracing digital solution as a means to reduce costs. "There is an emphasis on cost reductions; companies still keep many projects on the drawing board, but are finding digitalization as one of the key ways to drive the costs down," she said.

With rapidly increasing amounts of data available, turning mountains of date in to actionable intelligence is no easy trick. Tørstad said that one of the key things happening now is an increase in technology that enables systems to speak to one another.

"Where there used to be different sets of data unable to work together, there are now more possibilities to combine data, which offers completely new opportunities," she said. "We see a lot of activity in the digitization of onshore assets, optimizing the performance of wells and specific support elements like safety management."

Creating system and data harmony can go a long way toward closing cyber security holes as well, and in tandem DNV GL today offers a complete toolbox of risk assessment tools to help identify and mitigate vulnerabilities. Looking at the digitization trend in its practical form, Tørstad discusses how DNV GL uses digitization to assist its clients conduct and maintain risk assessments for the life of a project or asset.

"First, it is not magic," said Tørstad. "We all do quantitative risk assessments or safety cases to evaluate a project's risks up front. That's part of the design phase, and what usually happens in these industries is that the evaluations are produced for the design stage as a paper report and put on the shelf."

With digitization, though, this static report and collector of dust can take on a dynamic and useful purpose, updated and deployed to change as the project changes.

"When you come into the operational stage and need

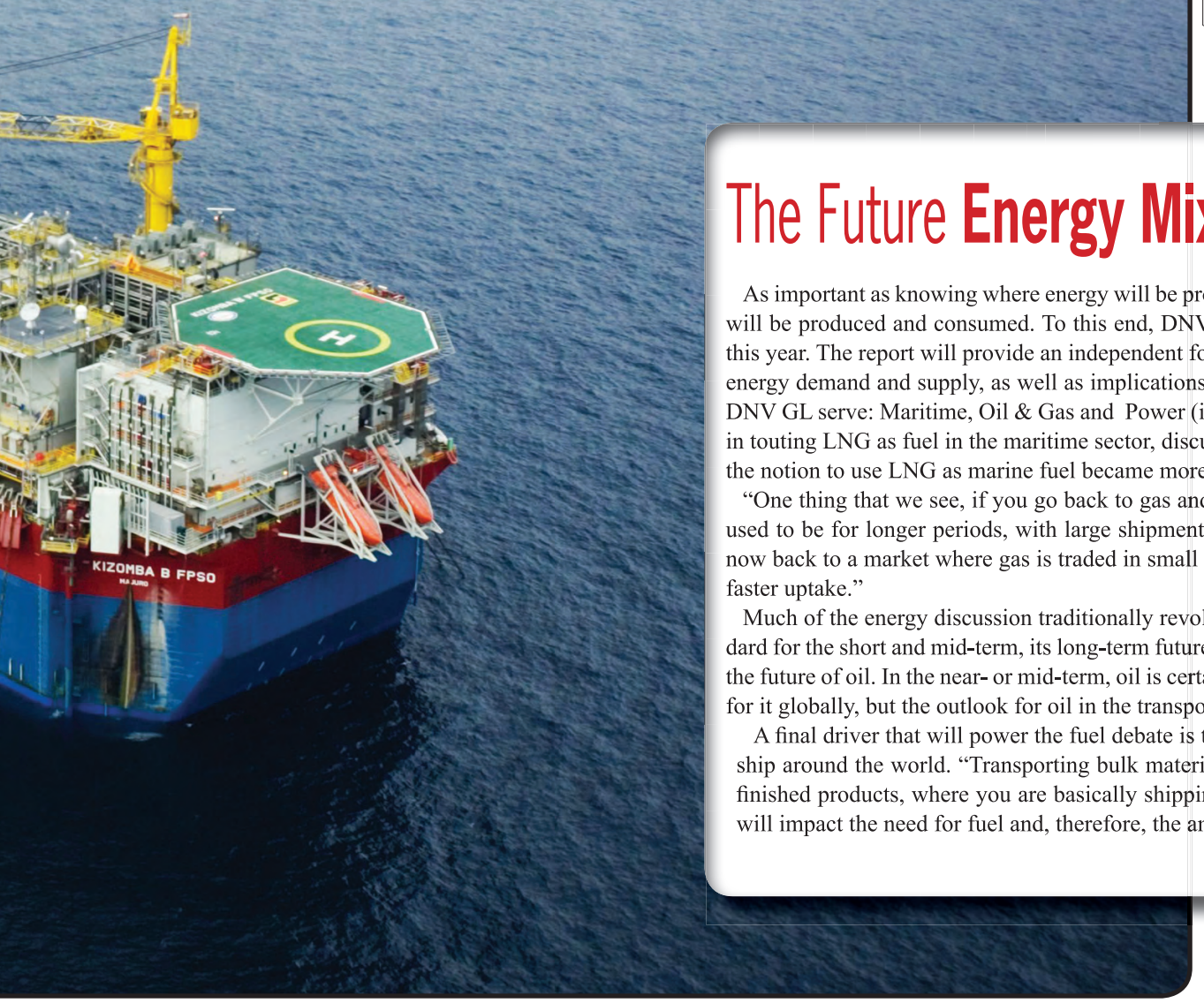
Photo: DNV GL

to modify your asset and have to do the same thing all over again. With myQRA you take the risk assessment and work directly on digital models, importing data and building a model of an asset, doing all the risk assessments on that model, and making all the analytics fully traceable. When completed, we hand this over to our customer as a digital asset, or we continue to host the model and our customer can continue to work on it."

In short, when a project becomes operational, the owner can make direct modifications and see how these changes impact risk, making the model a powerful operational tool. "It transforms the stack of paper report into a digital tool that enables you to manage your risks real-time," said Tørstad.

In stressing the importance of this digital revolution, Tørstad said that digitization is one of the most transformative technologies that she has seen in her career, but was quick to add that "digitization is a tool."

"What (digitization) really does is make information more available and removes barriers between sources of information," she said. "For example, the aging workforce in the maritime and energy industries – all of the competence that goes out the door when people retire (is an ongoing industry issue). Digitization is a core element that will help to better manage the loss of experienced workers going forward. It keeps information, knowledge and experience available to a larger audience. Digitization coupled with domain knowledge is essential in helping to manage the information overload and make sense of the data."



The Future **Energy Mix**

As important as knowing where energy will be produced and consumed is knowing what types of energy will be produced and consumed. To this end, DNV GL will publish an Energy Transitions Outlook later this year. The report will provide an independent forecast of the energy future through to 2050, looking at energy demand and supply, as well as implications of the energy transition for each of the key industries DNV GL serve: Maritime, Oil & Gas and Power (incl. renewables). DNV GL has been a pioneer of sorts in touting LNG as fuel in the maritime sector, discussing likely market drivers and scenarios years before the notion to use LNG as marine fuel became more of a mainstream thought.

"One thing that we see, if you go back to gas and the uptake of gas in the past few years, gas contracts used to be for longer periods, with large shipments and big trades over decades," said Tørstad. "We are now back to a market where gas is traded in small volumes. That is interesting and might enable a larger, faster uptake."

Much of the energy discussion traditionally revolves around oil, and while she said oil will be the standard for the short and mid-term, its long-term future is less clear. "I think there is a lot of uncertainty about the future of oil. In the near- or mid-term, oil is certainly not going to simply go away as there is a big need for it globally, but the outlook for oil in the transport sector is a big uncertainty."

A final driver that will power the fuel debate is the amounts and types of goods that shippers actually ship around the world. "Transporting bulk material for manufacturing is a good thing versus shipping finished products, where you are basically shipping a lot of air around the world," said Tørstad. "This will impact the need for fuel and, therefore, the amount of oil needed."

Photo: Marlink

In maritime satellite communications, an industry sector defined by change, Tore Morten Olsen, President Marlink Maritime is a rock: a model of continuity and a wealth of knowledge. He has 22 years of experience in the satellite communications sector, starting out as a technical product manager in 1994 and moving on to hold several senior management positions with Telenor, Marlink and Astrium Services / Airbus Defense and Space and now Marlink again.

BY GREG TRAUTHWEIN

While various sectors of the marine industry are suffering, communication providers are buffered to an extent in that their collective services are helping to drive many of maritime's efficiency initiatives.

"This year has been by far the largest (in terms of number of vessels) that have ordered from us," said Olsen. "It has been fantastic. We have booked in the first five months of this year the total amount booked for the full year in 2015, a 30 to 40 percent acceleration in the number of companies ordering VSAT solutions."

He said there are several drivers, including the business end of transferring information to and from ships, as well as the personnel end in helping to keep crew connected. "Without connectivity you are nowhere."

Olsen, like his colleagues, competitors and customers, are fully engaged in talk of 'Big Data' and the increasing use of information to make ships at sea more efficient. But he admits that change is slow to come. "There are many that have come to terms with the need for connectivity, but they haven't taken the next step, which is creating a digital strategy to discover how they will maximize the benefits of connectivity for their own purpose, and for their clients," he said. To that end, Marlink itself is changing to better partner with vessel owners and operators, extending its offering and seeking to partner.

"We realized that providing connectivity alone is not delivering enough value to the customer," said Olsen. "So we are moving more to the IT side on the ship. We acquired Palantir which delivers and manages IT networks onboard; we are trying to be the party that helps collect the data and deliver it in a safe, efficient and secure manner back to shore."

Palantir provides IT managers on shore with

Images: Marlink

A Complex Market

The global maritime industry continues to be one that endures hard economic cycles in both directions, rarely floating at equilibrium maintaining balance between supply of ships and demand for cargos. “If you think about the shipping market there certainly is a need for consolidation, as scale brings benefits,” said Olsen. In particular, some of the smaller players increasingly find it difficult to keep up with regulatory mandate, as well as technological advances that allow bigger carriers to leverage efficiencies across a global and diverst fleet.

“If you look at the drivers in the market, when we started it was crew welfare driving demand on connectivity. Now it is more often operational efficiency for the ship owner, but also service delivery to their clients,” said Olsen. “But on all three of those points … from crew welfare to vessel efficiency to service to shipping clients … I don’t think any of them have come close to reaching their potential. So I think we are still in the beginning. Telecom is a constant evolution, and will continue to change and adapt, and continue to grow.” One sector that is particularly interesting for all of the communication sector is the global cruise industry, embarked on a historic growth spurt including everything from the world’s largest ocean-going ships to the luxury yacht cruise sector to the inland river cruising sector. A common denominator among all is the need to provide strong connectivity for the cruising public, provide same or close speed and access to land-based connections. “The sky is the limit in cruise, as people are demanding connectivity when they are onboard, particularly passengers,” said Olsen. “ They are used to having tremendous internet access in their homes, and they expect the same when they come onboard. More importantly, I think some of the cruise lines are beginning to realize that the quality of their internet connection is becoming a key competitive element.”

Digging deeper, the connectivity issue onboard cruise ships is potentially a big win in marketing for the cruise lines, as customers post images and video online, sharing the good times with those on land and providing the cruise lines with a tremendous marketing channel at the same time.

Watch the Video

At Norshipping in Oslo Tore Morten Olsen, President Maritime, Marlink sat with Maritime Reporter TV to discuss “Digitalization: A New Era in Connectivity”

https://www.marinelink.com/videos/video/digitalization-a-new-era-in-connectivity-100129

Photo: William Stoichevski

Stocked Cabinet:
The W2W SIM dashboard.

Ultimate SIM

BY WILLIAM STOICHEVSKI

Ship owners can expect a rich digitalized offering from Kongsberg Group after the merger of its software-producing, oil-and-gas technology division; its maritime simulation (SIM) business and the company's renewable energy department. Kongsberg Digital is the successor to these, and among the new entity's cloudlike offerings are new ways to learn and train, as well as new SIM business models. Behind it all is the ultimate learning academy, one for all the world's SIM and the Internet of Things — their trademarked digital "ecosystem", Kognifai.

Since its recent launch, this analytics "ecosystem" reminiscent of the App Store, to some, is billed as the perfect platform to learn hard lessons from an installation's digital twin; to teach crews or to encourage via the algorithms of machine learning. It's in the background that Kongsberg Maritime's digital learning experts have quietly sped along the development of a series of training academy SIM modules that respond to sector and technology trends, and the resultant hopes of shipping and energy company organizations for easier training and new ways of doing things.

First there's the new walk-to-work, or W2W, SIM for offshore wind operations training that seems to unite the ship's engine, motion compensating gangway controls and the human operator. It is understood that W2W — the SIM — will be available for ship owners, their favorite training academies and wind farm operators in the second-half of 2017. Already, a major contract to deliver Kongsberg's K-SIM simulator tech to Dutch Simwave appears to revolve partly around letting the trainers "lead their own training and research" while marrying ship owners' own "3D mathematical ship and environmental models". Doubtless, all that will be offered, as well, via Kongsberg's cloud-based

Kognifai "open ecosystem". "With the cloud, you have infinite computing power. All you need is internet access and a browser," says Kongsberg chief technology officer, Kristian Moeller, a Ph.D and holder of patents. "The (Kognifai) platform," however, "is not a product."

Kognifai for SIM

Seeking clarity, we next see a set-up of the W2W SIM and note that an electrical switchboard is placed opposite the dashboard screens while the whole machinery of SIM is contained in a room one floor below that appears to mirror via computer power an engine-room, its switchboard and yet another screen. Upstairs, the lively presentation on W2W SIM is unfortunately rushed, as the hour is late, but it's clear SIM is only part of the Kognifai offer being made to fleet or offshore windfarm owners.

"Kognifai can use data from different applications (like those apps already tapping a ship's coms) to keep an offshore windfarm at maximum operational capacity by planning routes for support vessels based on servicing needs," a Kongsberg Web site says, adding that human interaction in future might not even be necessary. So why all the training SIM?

In January 2017 alone, Uptime International, a renter of gangways to the offshore wind and offshore oil and gas sector, rented out its motion-compensating gangways to offshore fleet owners Eidesvik Offshore and Sosltad Offshore, for a combined 32 months of windpark service offshore. W2W gangways — conceived as a way for laid-up offshore vessels to earn a buck on offshore wind farms — are now seen as a way of earning on moving offshore oil and gas crews.

In 2016, Uptime sold to two other offshore fleet owners and to the Damen new-build, Bibby Wavemaster 1, of Bibby Marine Services. W2W is no mere bridge to better times, and it won't be the only new SIM Kongsberg Digital will soon be offering. We learn two new SIM learning modules that use virtual-reality glasses are being explored for the training of engine room technicians and engineers.

One module is understood to be ready, although it might be a while before demand picks up offshore Norway, where 180 offshore service vessels were still laid up at the beginning of April 2017. Nevertheless, the Norwegian Ministry of Transport is sponsoring a re-imbursement scheme for seafarers in need of new skills, like W2W; or refresher courses.

Academia

Yet, Kognifai itself is advanced, analytics "SIM" and appears to now be Kongsberg Digital's main offering, not just to offshore energy and ship owners but to other industries and places of learning. Still, a Kongsberg exec says "owners and seafarers" are the key intended user base.

The Kognifai platform or interface — Kongsberg staff admit they, too, struggle to define it — is also aimed at the preserve of higher learning. "Close cooperation between commercial actors and academia", presumably all happening in the Kognifai cloud, will see academics as "consumers of services" and "contributors of innovation". Research com-

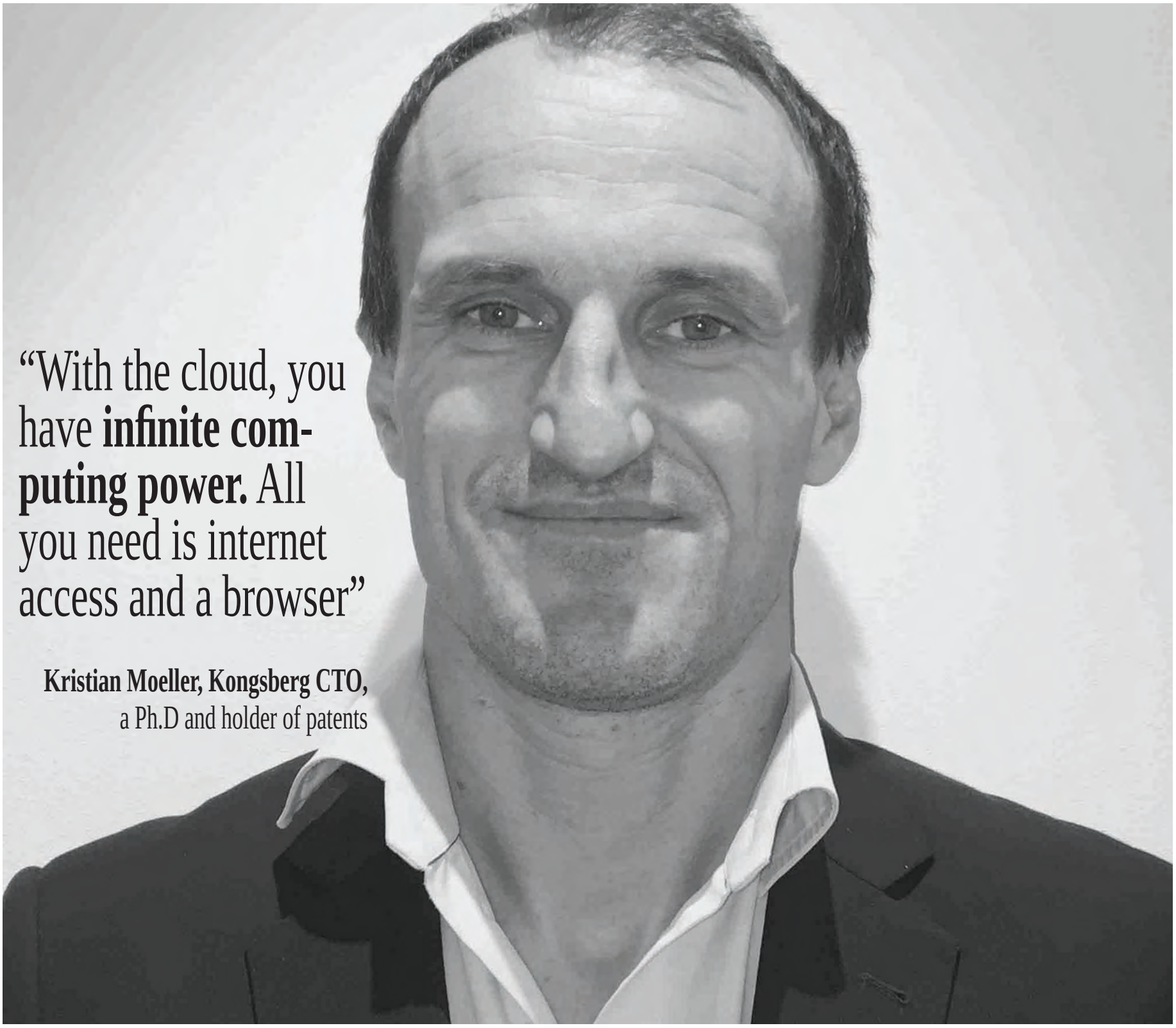


Photo: Kongsberg Digital

munities, too — “public and private” — are seen using, at least, the Cloud “to safely collect data and store them on the platform for further analysis and utilization”. A significant benefit for business and academia is said to be the ability to work out the implications of otherwise costly tactile planning on the “digital twin” of an oil platform, a wind turbine, a propulsion system — or installations ashore. Kognifai’s limits aren’t yet defined. The number and type of potential commercial and non-commercial users seem boundless.

Advantage Kongsberg

While Kognifai includes a catalog of apps, analytical “solutions” and application protocol (or program) interfaces — so-called APIs — vendors, too, are offered “a marketplace” under the Kognifai umbrella. Meanwhile, all Kongsberg businesses and their subsidiaries, too, can “consume (a media term) platform services” or “contribute to the platform development” in open-source operating-system style. The proliferation of learning SIM, for which Kognifai is the ultimate platform, has only been outpaced by the spread of open-source software or operating systems. Above these, the Cloud is the great enabler and key to Kognifai, as it has been for ABB’s Ability platform or others’ design or condition-monitoring. What separates out Kognifai, it seems, is the chance it offers users to “build your own app” or use a choice of others’ coded products to not just design and manage but to teach or analyze third-party data.

For Kongsberg’s brain trust, Kognifai is the culmination of a digitalizing, machine-learning drive that began in 2014, or around the start of a parallel drive by Oslo to revamp industrial policy in search of a digital advantage for its key industries. Part of that strategy includes a focus on autonomous shipping, the first projects of which are about to make their commercial debuts. “Now we can do autonomous ships (and autonomous underwater vehicles) on a grand scale,” says Moeller, who enthusiastically rams home the “front-end loading” possible with the Kognifai Cloud. He’s clearly one of the minds behind Kongsberg’s superlative-sounding learning machine.

“With the Cloud we can manage (and teach others to manage) autonomous operations.”

Photo: Handout

Booming Business:
A W2W gangway from
Uptime International AS.

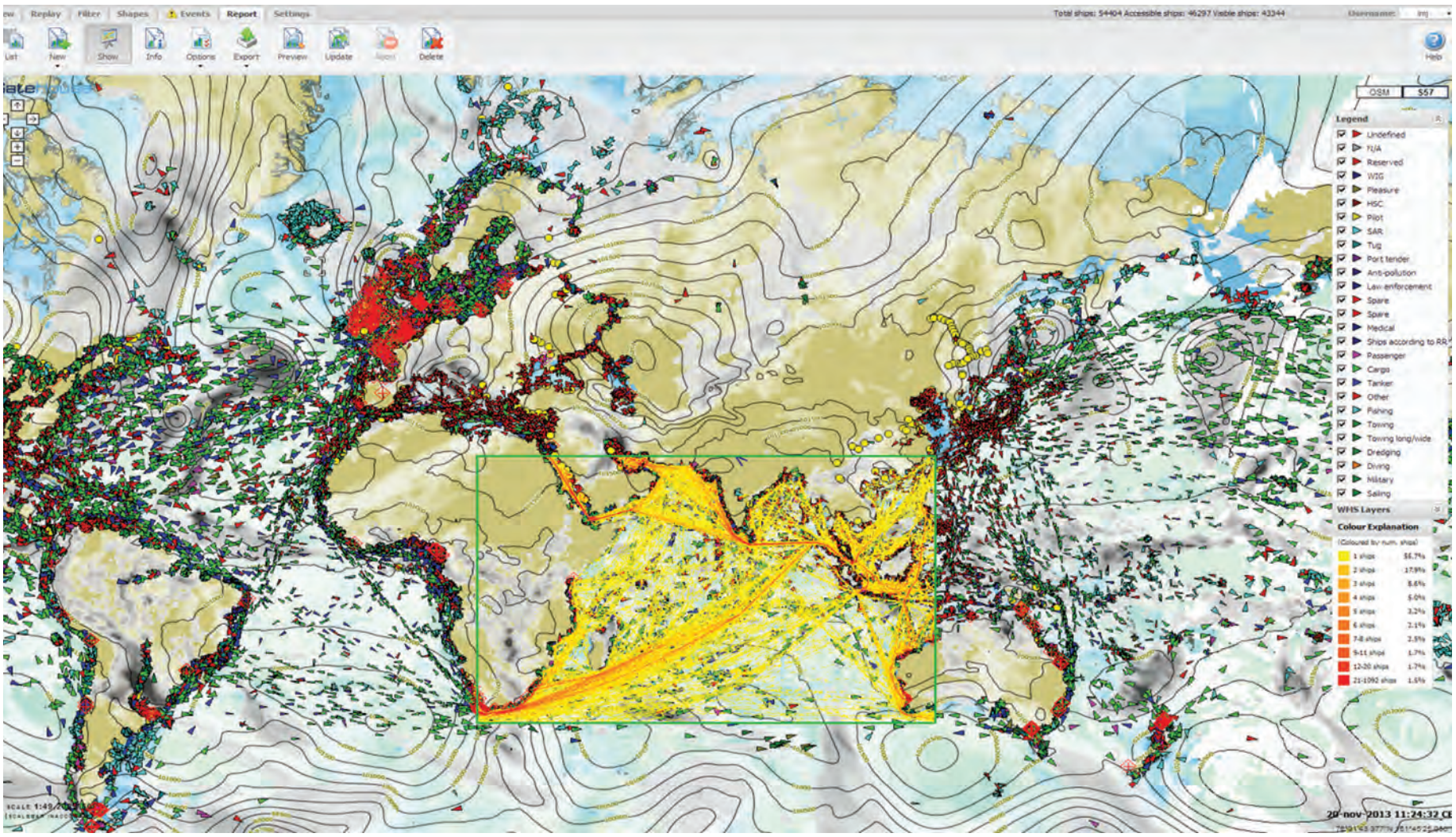


Image: Gatehouse

Monitor & Track

BY GREG TRAUTHWEIN

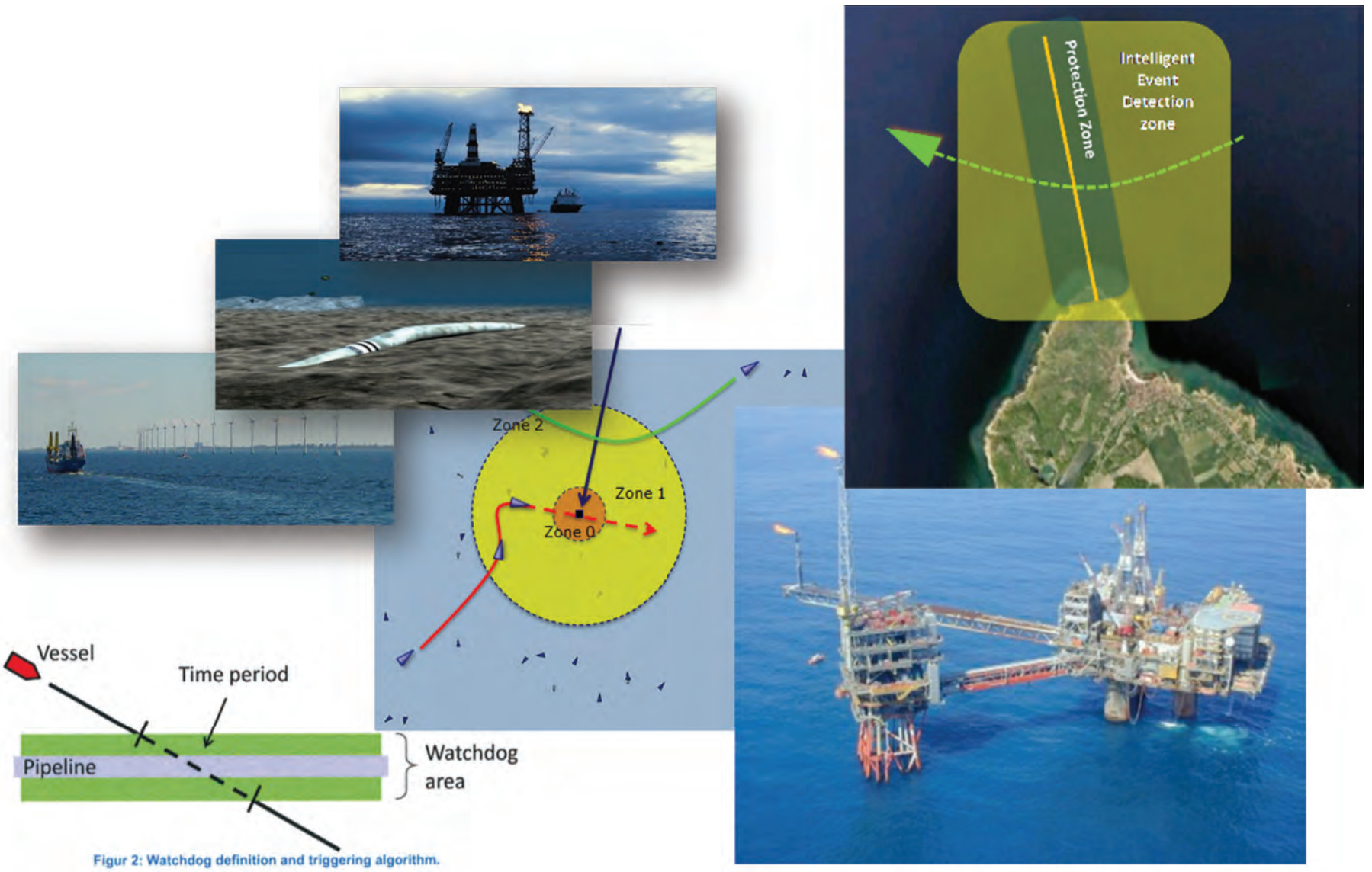
As the maritime industry embraces the digital revolution, companies like GateHouse are poised to prosper. GateHouse in developing software solutions to support optimization, flexibility and mission critical operations for vehicle and vessel tracking, monitoring and satellite communications. We caught up with Michael Bondo Andersen, CEO and founder of GateHouse, for insights on his strategy moving the company forward.

Looking at your maritime unit, Big Data is having a transformational impact on global maritime. Please detail your offering.

Big Data often leads to information overflow if not thoughtfully and competently curated. However, when delivering the right information, at the right time, in a user-friendly format, Big Data can deliver groundbreaking competitive advantages. Managing Big Data lies at the heart of the GateHouse and a main value proposition includes the delivery of open and scalable solutions compliant with the newest standards and built upon the latest technology. These solutions are cost effective and interoperable platform-based, eliminating "silo-solutions" and providing users with the appropriate information to aid in fact-based decision making.

In your experience, what is the key to achieving this result?

The foundation for delivering this value lies in the design of a temporal-spatial database structure and use of Geographic Information System (GIS) database tools to facilitate data integration and information extraction to meet the needs of our clients. Tracking and storing vessel data for more than 200,000 targets per day and fusing data from different sources, provides the basis for continual development of algorithms to identify patterns in data and to provide the analytic results via standardized web services. Through our advanced toolsets, we strive to deliver the required information to clients automatically through standardized web services. These data services can provide all the informa-



Figur 2: Watchdog definition and triggering algorithm.

tion required for a client to make an informed business decision, or integrated with another operational system in support of business activities.

Given that, can you describe the actual GateHouse Maritime product or service … the deliverable?

GateHouse offers solutions to maritime authorities (commercial and military), port operators, offshore and subsea asset owners/operators and vessel operators. To meet the needs of this diverse range of maritime users, GateHouse offers the ghMaritime suite of products and services. These include ghMaritime Monitor, ghMaritime Port, ghMaritime Arrival, ghMaritime Analytics, ghMaritime Offshore and ghMaritime Intelligence. The functionalities delivered by the ghMaritime suite include:

- Tracking, monitoring and control of maritime traffic
- Real-time arrival notifications for vessels and trucks (supply chain logistics)
- Advanced statistical analysis and reports, including risk management tools
- Event detection and WatchDogs in support of asset monitoring and protection
- Routing and Estimated Time of Arrival predictions and notifications
- AIS message creation and management in support of e-Navigation

We understand that AIS data serves as the base source for much of your data. AIS data is free; what value/analytics does Gatehouse bring to the equation?

Yes, AIS data can be received by an entity free of charge. However, there are issues. First is geographic coverage. An AIS receiver usually receives messages from vessels, base stations or Aids to Navigation at a maximum range of 20-25 Nm (depending on the environment). If there is a need for vessel data outside of the range of a terrestrial AIS receiver or network of receivers, satellite AIS is most likely needed. GateHouse can offer this worldwide AIS data coverage in near real-time and has many years of historical data online used for analytics and statistics generation.

GateHouse's expertise is in the management and structuring of this data, so that information can be extracted from it, and this information delivered to the client in an automated fashion. The delivery of timely, appropriate and accurate information is necessary to drive client's decision making processes. GateHouse removes the analysis burden

Photo: GateHouse

Case Study: DanPilot & Optimized ETA

Danish Pilots (DanPilot) has often experienced imprecise and practically unusable ETA calculations. This has meant many hours spent on checking and double-checking the ETAs and unnecessary waiting time due to the imprecise data. Pilots often had to sail further than necessary with a customer ship, because DanPilot lacked precise information on ETAs for manually defined points at sea. Another challenge DanPilot had was how to optimize sailing routes and thereby their time at sea. With limited data on historical tracks, and no statistics on these data, optimizing sailing routes was based on manual calculations. This made planning of sailing routes a time-consuming task. By automatically calculating ETAs for defined points at sea, DanPilot is now able to optimize the pilots' time at sea. They spend less time checking the ships for updated ETAs and the reliability of the ETAs simply enable them to service more ships in less time than before. Use of the near-miss functionality, which identifies pilot vessel boarding instances, enables DanPilot to produce detailed documentation of their daily operations. By having statistics, such as historical data of sailing routes, planning of routes is no longer based on manual operations. Historical tracks and visual statistics enable easy planning and optimization of routes.

from the client and delivers the required information.

Looking at Maritime, who are your customers, and how, primarily, do they use your services?

GateHouse Maritime's customer base is diverse, including coast guards, navies, taxation agencies, environmental agencies, ports, pilots, pipeline and subsea cable owners, power companies and shipping companies. The way that our customers utilize our products and services is also diverse. Here are few examples.

- The **Danish Maritime Authority (DMA)** has a complete GateHouse server system including AIS base station networking, data management, multiple source data integration with target display and vessel monitoring toolsets.
- The **Marine Exchange of Alaska (MXAK)** has also deployed a GateHouse server system in support of 133 AIS receiver stations on the Alaskan coach. The MXAK utilizes our analytics and reporting tools in the provision of services that aid safe, secure, efficient and environmentally responsible maritime operations. MXAK has deployed GateHouse data management tools to supply AIS data streams to its clients so that they can monitor their vessels. The data feed is also provided to the USCG in support of the nationwide AIS program.
- The **Danish Pilots (DanPilot)** was established to safeguard this traffic against accidents, which could have devastating consequences for the transportation by sea and the Danish marine environment. DanPilot utilized GateHouse analytical services to optimize a Pilot's time at sea. (Please see case study above).
- **Maersk Oil and GAS (MOG)** uses the AIS system to monitor all the traffic in the area of its oil and gas rigs in the North Sea. The system includes an automatic watchdog that will monitor all ships approaching any given oil rig in multiple concentric circles. In case a ship is approaching the outer area a notification (e-mail and SMS) is sent to the staff. If the ship approaches the next circle an AIS warning message is sent to the ship and if this doesn't divert the ship and it approaches the inner zone, then an alarm is triggered to activate safety precautions onboard the rig.
- **DONG Energy** uses the GateHouse system to monitor vessel traffic in the vicinity of their oil pipelines. The system included an automatic watchdog that detects when vessels are slowing and drifting near the pipelines. This may indicate that a vessel is about to drop anchor, potentially damaging the pipeline. If the watchdog is triggered a notification is sent via e-mail and SMS to the DONG operations center which in turn triggers their response.
- **The Port of Aarhus** has been using the GateHouse AIS Port Solutions for over a decade. At the core of the solution is GateHouse's Estimated Time of Arrival (ETA) calculator. Using the automatic ETA calculator, port management receives alerts if vessels planned for berths are delayed, and the port management can communicate information about the delay to all the terminal operators and shore side services in the port. The port operators can visually monitor the berthing allocation several days in advance to allow for optimal resource allocation also in terms of port staff required where and when. The AIS system is integrated into the other parts of the port management system using a simple web service.

We understand that you are looking to North America to expand your business. Why here, why now?

We see opportunities with the maritime authorities in both the United States and Canada. In the past six months, it has become apparent that opportunities exist in the management of large volumes of data, analytics and reporting tools within several government departments. Developing areas include the data services in support of River Information Systems and the support of e-Navigation initiatives. Data aggregation in support of supply chain logistics is a great opportunity for GateHouse in North America, with a focus on the maritime/land interface (ports).

Generally speaking, when you look at the world by region or business niche, where do you see opportunities today?

In areas of the world where vessel monitoring and surveillance systems are in their infancy or yet to be adopted, we see opportunities to provide basic data management and monitoring toolsets. Elsewhere we see the opportunities in data services with focus on supplying ETA data supporting supply chain logistics, analytics for security purposes (e.g. anomaly detection) and asset protection. Worldwide it appears there is a growing acceptance of data sharing and the value that can be extracted from large, secure data repositories. Our maritime business is transitioning from delivering complete data management and display systems to providing data services focused on niche information requirements.

"Tracking and storing vessel data for more than **200,000 targets per day** and fusing data from different sources, provides the basis for continual development of algorithms to identify patterns in data and to provide the analytic results via standardized web services. **Through our advanced toolsets, we strive to deliver the required information to clients automatically through standardized web services.**"

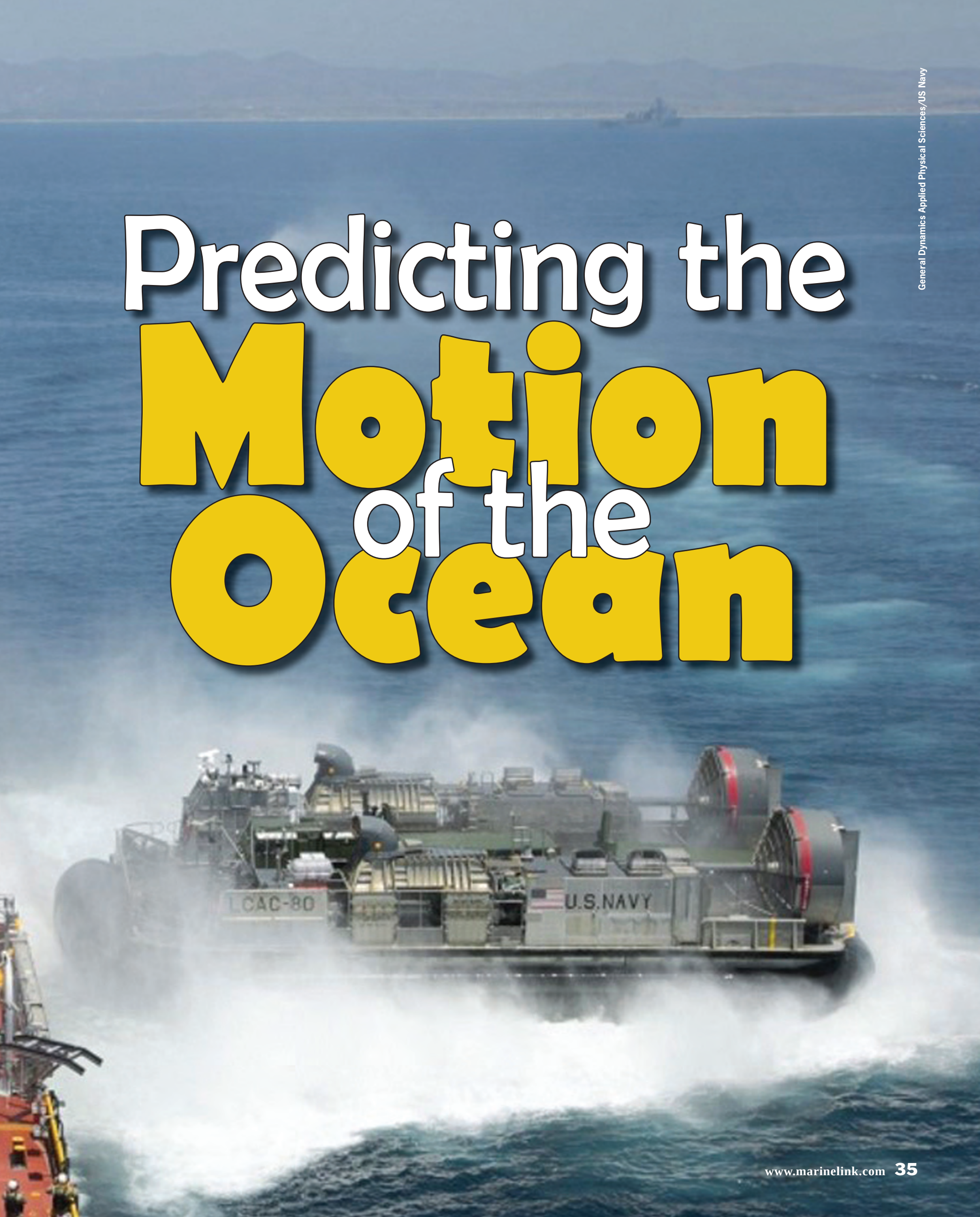
Photo: GateHouse

Michael Bondo Andersen,

CEO and Founder of GateHouse

Marine Science

Predicting the Motion of the Ocean



General Dynamics Applied Physical Sciences/US Navy

General Dynamics Applied Physical Sciences/US Navy

BY BEN CONNELL

For thousands of years sailors have looked out to sea, anticipating the motion of their craft from the waves they see coming. The nature of this constant motion, phasing in and out with the groups of waves, influences the safety of operations, from moving about the deck or rigging to transferring people and materials between craft. Waves and the resulting motions are a key factor in deciding whether to perform an operation. Could you do better than your eyeball for predicting when that next big wave is going to knock you off your feet?

When the United States Navy started asking that question, the scientists and engineers at General Dynamics Applied Physical Sciences (GD-APS) began developing a system capable of predicting these large wave and motion events minutes into the future. The commercial variant of this system, FutureWaves was recently introduced to industry at the 2017 Offshore Technology Conference in Houston. The approach, originally developed under funding from the U.S. Office of Naval Research, uses a custom-designed X-band radar to see waves up to 5 km from the ship or platform where it is installed. With specialized computer processing, the measured wave field can be evolved forward in time, allowing prediction of the precise ship motions over much longer forecast intervals than previously available.

U.S. Navy Seabasing

In order to maintain maximum response flexibility, the U.S. Department of Defense is developing a seabasing capability. A military seabase is a network of ships able to station offshore and serve as a launch point for personnel and equipment to transit to the coast. The seabasing operations necessarily require movement of these personnel, vehicles, and equipment between vessels, a dangerous undertaking in larger sea states. Further, the need for helicopter take-off and landing to support the operations adds additional risk. To promote safety, sea state limitations are placed on these operations. “The Office of Naval Research looked to the defense research and development community to develop a wave measurement and forecasting technology that extends the safe conditions for operation to higher sea states,” said John Kusters, retired U.S. Navy Captain and Program Manager for FutureWaves. “If they know how best to line up their ships for the operation, and then can get a couple of minutes warning for the big waves and motions, they can push those sea state guidelines higher.”

Under this Navy Environmental and Ship Motion Forecasting (ESMF) program, the core system was developed and demonstrated in a series of sea tests, including skin-to-skin seabasing transfer operations. “During these exercises,” said Kusters, “we encouraged the ship operators to interact with the system, and got excellent feedback on how best to tailor and present the system output in the [User Interface]. This was very valuable for system development.” As the Navy research program is now transitioning to installed systems for the operational Navy, the FutureWaves commercial variant of the system is also being rolled out.

How it Works

At the core of the FutureWaves system are several key enabling technologies developed by GD-APS. The first is a customized X-band Doppler radar capable of sensing inbound ocean wave motions out to ranges approaching 5 km. The radar's azimuthal sweep rate and range resolution are set to adequately sample the local wavefield in space and time. Doppler scans are fed into a suite of real-time filtering and processing algorithms that translate the radar data into forecasts of surface wave elevation maps and ship hull forces. The radar-to-wave processing scheme uses an innovative least squares inversion to determine the underlying propagating components of the wave field, and these waves are evolved forward in time according to ocean wave propagation physics. A pre-calculated database of wave interaction forces with the ship is used to produce a rapid prediction of the ship's motion that will be induced by the predicted wave forcing. These continuously updating ship motion predictions can then be used to inform the timing of ship operations. Although maximum forecast time varies with sea condition and vessel speed, the FutureWaves system has been demonstrated to provide accurate, phase-resolved wave and ship motion forecasts to several minutes into the future.

The system also produces a directional power spectrum of the ocean waves, a map of where the wave energy is coming from and at what wave period. This wave spectrum data is fed to the ship motion model to produce a plot of the statistical representation of the ship motions as a function of ship heading and speed, allowing selection of ship orientation to minimize particular modes of motion. This planning tool is continuously updated from the radar-calculated directional power spectrum, and can also be fed wave spectrum forecast products to inform longer term planning.

Commercial Applications

It is not hard to conceive of an array of applications for the FutureWaves product. "The interest in the product at OTC2017 was overwhelming, and from all directions," said Kusters, "from folks involved in offshore construction, production, and logistics support. Again, it comes back to enhanced safety of operations, and expanding the operating envelope." While GD-APS is just now engaging the commercial market for FutureWaves, they are braced for a strong pull from industry. They are managing strong interest from offshore oil and renewables, and starting to engage with the cruise and commercial shipping industries. "As the Navy continues to pull for ever-expanding applications of this technology," says Kusters, "we expect the same from the commercial side. We can envision a future where this technology is a vital component of the navigation tool suite expected on every ship's bridge."

www.APhySci.com

About the Author

Ben Connell is an Ocean Engineer based in Groton, CT, specializing in seakeeping and ship hydrodynamics. He studied Physics at Middlebury College in Vermont and received his PhD in Ocean Engineering from the Massachusetts Institute of Technology. He now works in research and development for General Dynamics – Applied Physical Sciences Corp.

Image: SCOPE

BY GREG TRAUTHWEIN

Later this year a major oil and chemical protection exercise dubbed SCOPE 2017 will be carried out in Norway. A joint project including major European and Scandinavian stakeholders, the simulated response to a combined oil and chemical spill aims to foster clearer communication and coordination of spill response across agencies and physical country boundaries. Stig Wahlstrøm, Project Manager SCOPE 2017, Norwegian Coastal Administration and Johan Marius Ly, Director, Department for Emergency Response, explain.

History suggests that time is of the essence when a marine accident and resultant spill happen, as rapidity of response goes a long way toward controlling the situation and minimizing environmental impact and costs. While speed is critical, coordination of assets is equally important, particularly in regions of the world such as Europe and Scandinavia where land and maritime borders lie in close proximity. "Marine Accidents involving oil spill are complex situations, and they often involve a big area (both sea and shore side)," said Johan Marius Ly, Director, Department for Emergency Response. "It might also involve different countries, regarding oil spill on sea, place of refuge for the accidental vessels, and international law. Quick response is essential, to minimize the consequences of the accident. Therefore it is very important to cooperate and collaborate effectively, both between national and international actors. It is not possible to fight such accidents alone, for a single organization. To be prepared for a real accident we need to train and exercise together, to make it as real as possible."

Enter SCOPE 2017

SCOPE (Skagerrak Chemical Oilspill Pollution Exercise) 2017 scheduled to take place in September 2017 is a joint project between Norwegian Coastal Administration as the coordinator and the Swedish Coast Guard, the Royal Danish Navy, the Environment Agency Island, South-East Police district Norway and Intermunicipal Emergency Response Organization (IUA) in Telemark. The aim of SCOPE 2017 is to conduct a full-scale exercise where participants face realistic challenges as a result of a simulated collision between a chemical tanker and an oil tanker. This includes such areas as oil and gas spill response at sea and on land, combating chemical pollution, crisis management, handling of damaged vessels, and evacuation and place of refuge.

"The EU Grant agreement is total EUR 1.25 million, where EUR 1 million is EU funding and EUR 250,000 is contribution from NCA and the beneficiaries," said Stig Wahlstrøm, Project Manager SCOPE 2017, Norwegian Coastal Administration. "In addition that NCA and other participants (as Norwegian Coast Guard) contribute with man-hours and equipment."

It is a joint project between the Nordic countries and co-funded by the European Union, organized by the Norwegian Coastal Administration with participation from more than 300 personnel and 30 vessels, one of the largest exercises of its kind in European history.

While SCOPE 2017 is being held in Scandinavia, in typical fashion of the region the organizers have encouraged international participation, inviting more than 70 countries to observe. "As per today there are representatives from 24 different countries, such as Algeria, Azerbaijan, Romania, Czech Republic, Jordan, Greece, Georgia and Croatia to mention a few," said Wahlstrøm.

"As the scenario is based on **a collision between an oil tanker and a chemical tanker** there will be both a chemical spill and an oil spill."

Stig Wahlstrøm
Project Manager SCOPE 2017,
Norwegian Coastal Administration

"Marine Accidents involving oil spill are complex situations, and they often involve a big area. It might also involve different countries. **To be prepared for a real accident we need to train and exercise together."**

Johan Marius Ly,
Director, Dept. for Emergency Response

"In addition to the observers program, two vessels from Germany and one from EU will participate."

In general an increasing level of shipping traffic has spurred concern in the local maritime communities, and in particular the accident involving M/V Full City in July 2009 on the coast of Langesund illustrated the need for preparedness in dealing with accidents across national borders. (See box at the right).,

"The exercise will involve resources from Norway, Sweden, Denmark and Germany in addition to vessels and services from EMSA and the EU," said Wahlstrøm. "As the scenario is based on a collision between an oil tanker and a chemical tanker there will be both a chemical spill and an oil spill. The chemical spill is handled by using MIRG teams (Maritime Incidents Response Group), a team consisting of specially trained fire-fighters in chemical protection suits that will be deployed to the stricken chemical tanker by helicopter or vessel. Further the chemical tanker will be towed to a port of refuge assisted by an emergency towing vessel. The oil spill will be handled both at sea and on the shoreline. Vessels will be deployed to tow oil booms and use oil skimmers, and a shoreline response will be organized and personnel and equipment will take part."

Cleaning Up

While cleaning up after ship accidents if far from a perfected science, there have been leaps in capability over the years based on real world experience.

"In general technologies both for mechanical recovery and chemical dispersion have come a long way in terms of efficiency (and impact) over the last 40 years" said Ly. "There are now oil boom systems (like Current Buster) that will collect oil efficiently up to four to five knots, there are oil recovery skimmers able to efficiently recover high viscous oil products."

While mechanical and chemical means to break up and collect spills have come a long way, Ly pointed to spill detection technologies, technologies that allow clean up operations to be conducted in poor conditions and at night, that have been equally crucial in advancing the art.

"In terms of overall efficiency, the development of ship-borne oil detection radars and IR systems has resulted in being able to undertake oil recovery operations also at night and in bad visibility," said Ly. "The use of drones will also make this feasible. There still is a large effort put into improving the technologies, and while there is perhaps not a quantum leap on the horizon, but the continuous focus on improvement of the both mechanical recovery and chemical dispersion driven by both the authorities and the oil companies will give results." In Norway, a country with a long history of environmental sensitivity, Ly said mechanical recovery, using oil booms and skimmers, and chemical dispersion are both employed, and ultimately the decision to use one or both comes down to a net environmental benefit analysis. "In Norway, the offshore oil industry has built up a capacity for both mechanical recovery and dispersants, whereas the NCA in preparedness for possible shipping incidents has mechanical recovery as our primary strategy," said Ly.

MV Full City
Accident Report

Grounding:	**at Såstein 31 July 2009**
Location:	**Langesund/Såstein**
Date:	**31.07.2009**
Category:	**Grounding**
Area:	**Norwegian Territorial Waters**
IMO#:	**9073672**

The Panama-registered cargo vessel Full City received the assignment to ship artificial fertilizer from Herøya in Porsgrunn to Guatemala on 23 July 2009. The vessel was berthed in Newport, England at the time. As early as one week before the vessel entered Norwegian waters, the local Norwegian agent referred the vessel to anchor at Såstein anchorage while awaiting clearance to birth at Herøya. The agent stuck to Såstein as the anchorage site, even though the weather forecasts increasingly indicated that the area would be exposed to strong winds and high waves.

Before the vessel entered Norwegian waters, contact was established between the vessel and the Norwegian authorities (Brevik VTS) in accordance with the international guidelines that apply to permission to enter a VTS center's area of operation. In its communication with the vessel Brevik VTS did not make it clear that the anchorage referred to was outside its area of operation.

Just before midnight on 30 July 2009, Full City lost its anchor hold and started dragging under the impact of strong south-easterly winds and high waves. Because it was dragging in a south-easterly direction quite close to the shore, there was little opportunity to regain control once the vessel had started dragging. The vessel ran aground at Såstein after dragging anchor for 35 minutes.

The AIBN believes that different role expectations contributed to the master's decision to let the vessel lie at anchor at Såstein in strong winds. The input from the agent and the VTS centre influenced the master's expectation that the vessel should lie at anchor. This did not tally with the expectations of the agent and the VTS center that the master had to make his own independent assessments.

In the AIBN's view, the greatest potential for preventing similar incidents in Norwegian waters and for safeguarding Norwegian environmental protection interests can be found in the organization and execution of the authorities' vessel traffic service. If this service is given a more active role, the AIBN believes that both agents and ships can be guided into making decisions that better ensure safety.

(Source: Accident Investigation Bureau: Norway: https://www.aibn.no/Marine/Reports/2013-08-eng)

The U.S. Coast Guard's JMTF Evolves

Coast Guard R&D Center's JMTF is a big part of the nation's environmental research efforts.

In 1972, the US Coast Guard Research and Development Center (RDC) established the Fire and Safety Test Detachment (FSTD), which later became the Joint Maritime Test Facility (JMTF), at Coast Guard Sector Mobile in Mobile, Alabama. As part of the unit's establishment, test facilities were also built on nearby Little Sand Island in Mobile Bay. Since its inception, multiple retired commercial vessels were used as test platforms ending with the State of Maine, which was removed in 2010. These tests included evaluation of vessel and shipping container construction and the use of water for fire sprinkler systems.

In parallel, the Naval Research Laboratory (NRL) moored the ex-USS Shadwell at the island to perform fire research for combat ships. In 1990, RDC built a 50-foot by 50-foot shallow burn pan in collaboration with the National Institute of Standards and Testing (NIST) and several other Federal and International organizations to research in-situ burning (ISB) of oil spills. The pan enabled JMTF to collect burn testing data, including emissions (soot and smoke) and of the properties of remaining residue for crude oil and diesel.

The next facility improvement phase was the building of a larger pan (100 feet by 30 feet test section) mounted with a wave paddle. This test apparatus was used to develop a standard test to evaluate fire-resistant booms and was used for 3 years to test 9 potential boom designs. Using the results from the test, the final American Society of Testing and Materials (ASTM) F2152, Standard Guide for In-Situ Burning of Spilled Oil: Fire-Resistant Boom, was developed. The boom design and ASTM standard proved effective during the Deepwater Horizon (DWH) Response which observed burns lasting over 11 hours. In 2005, the pan apparatus and supporting burn pan infrastructure was damaged during Hurricane Katrina making the system inoperable.

After the Deepwater Horizon Response, work groups were formed by the American Petroleum Institute (API) that were composed of industry, Federal, and state partners. These groups used lessons learned from DWH to develop a number of documents that included operations manuals, personnel qualifications, and guidance to industrial hygienists and safety personnel. These can be found on the API internet site: http://www.oilspillprevention.org/oil-spill-research-and-development-cente. Upon review, the RDC and the Bureau of Safety and Environmental Enforcement (BSEE) recognized that the equipment recommendations following DWH had not been addressed. These recommendations included using ISB in harsher environments (higher waves and wind), developing alternative igniters, and better burn efficiency in order to reduce the smoke plume and the amount of burn residue.

In 2015, RDC repaired the large pan, installed fuel delivery and monitoring systems, and conducted an initial test burn to verify system operations and test procedures. In 2016 and 2017, a series of test burns were conducted to support BSEE-sponsored research to address the outstanding in situ burn efficiency issues. In 2016, RDC hired a contractor to design and fabricate a new wave maker system to support testing in accordance with ASTM Standard 2152. The contractor installed a hydraulic power unit and drive cylinder, lengthened the original paddle, and installed a wave-dampening beach. The initial installation was completed on May 5 of this year; however, some final work still needs to be completed on the system.

Today, the facility is close to returning to its full capability, thanks to RDC partners, BSEE and NRL; and will be open for external researchers later in 2017. At this time, RDC does not have a supply of crude oil, but may be able to obtain diesel fuel for some tests. The RDC expects the need for a burn pan with a wave making ability to continue into the foreseeable future, if government regulations reflect the use of ISB or future research requires this unique capability. Interested parties can contact the Coast Guard Research and Development Center for additional information on the use of this burn pan.

About the Author

Kurt Hansen has worked at the US Coast Guard Research and Development Center in New London since 1993, working on projects dealing with oil spill prevention and response since 1998.

Allianz Safety & Shipping Review 2017

Allianz Global issued its "Safety & Shipping Review 2017" last month, an annual review of trends and developments in shpping losses and safety. Some of the key finding from the report include:

Shipping Losses are on the Decline

Shipping losses declined 16% comparted with the year earlier, and preliminary figures for the accident year show a significant improvement on the 10-year loss average, down 29%. Large shipping losses have declined 50% over the past decade, driven by regulation and a more robust safety culture.

Shipping Casualties are Down ... (a little)

There were 2,611 reported shipping casualties in 2016, down 4%. Machinery damage/engine failutre is the leading cause and was also responsible for driving a 16% increase in the top hotspot, the East Mediterranean and Black Sea region.

Risk is increasing due to ...

Crew negligence and inadequate vessel maintenance. The collapse of Hanjin exposed some industry pitfalls, as trade growth has stalled in the face of record shipping capacity. Bankruptcies are on the rise, and the economic strain is showing on the current care of ships.

Arctic Casualties Drop, Concerns Remain

There were 55 reported shipping incidents in Arctic Circle waters during 2016, down by more than 20%. However, with the number of voyages slated to increase, there remain many concerns, including lack of hydrographic study, extreme conditions and the ability for rescuers and salvagers to respond in a timely manner.

Piracy Drops, Kidnappings Rise

While the number of piracy incidents hit an 18-year low, there has been an increase in the number of kidnappings, particualry in Asia and West Africa.

Balancing Tech with 'The Human Factor'

While safety-enhancing technology is on the upswing, with the potential to help mitigate accidents before they happen, there is a trend where crews have gotten into harm's way with an over reliance on technology, particularly involving electronic navigation tools.

The Cyber Threat Grows

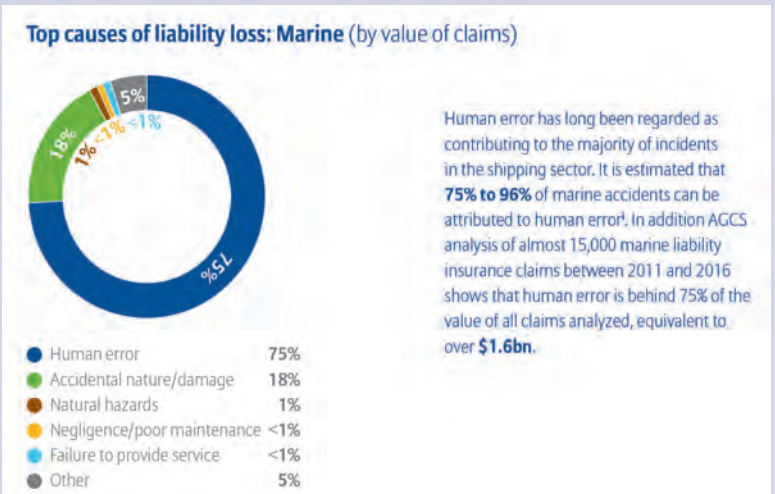
The risk of cyber attacks on ships continues to grow, and much like other shipping incidents, 'human error' is a leading cause, with as much as 80% of offshore security breaches being the result of human error. Cyber Security must be a point of focus, even with training and maintenance budgets under pressure.

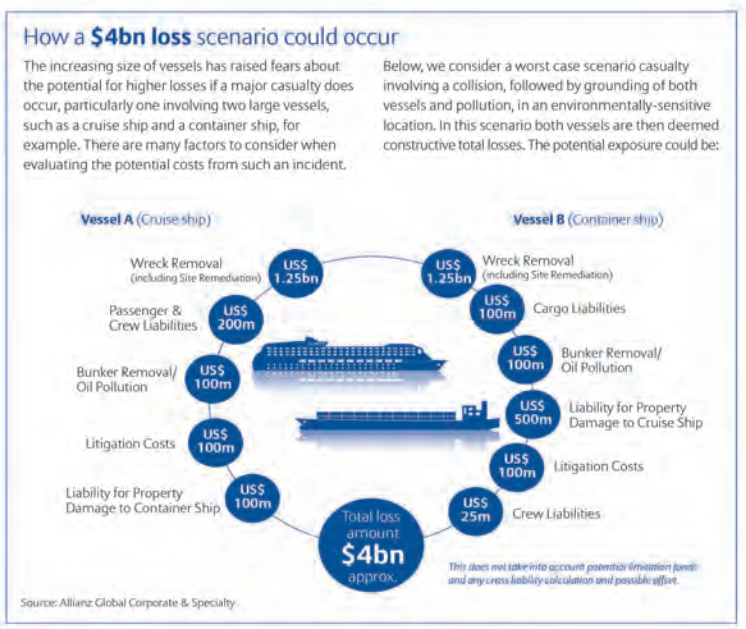
Autonomy Could Cut Risk

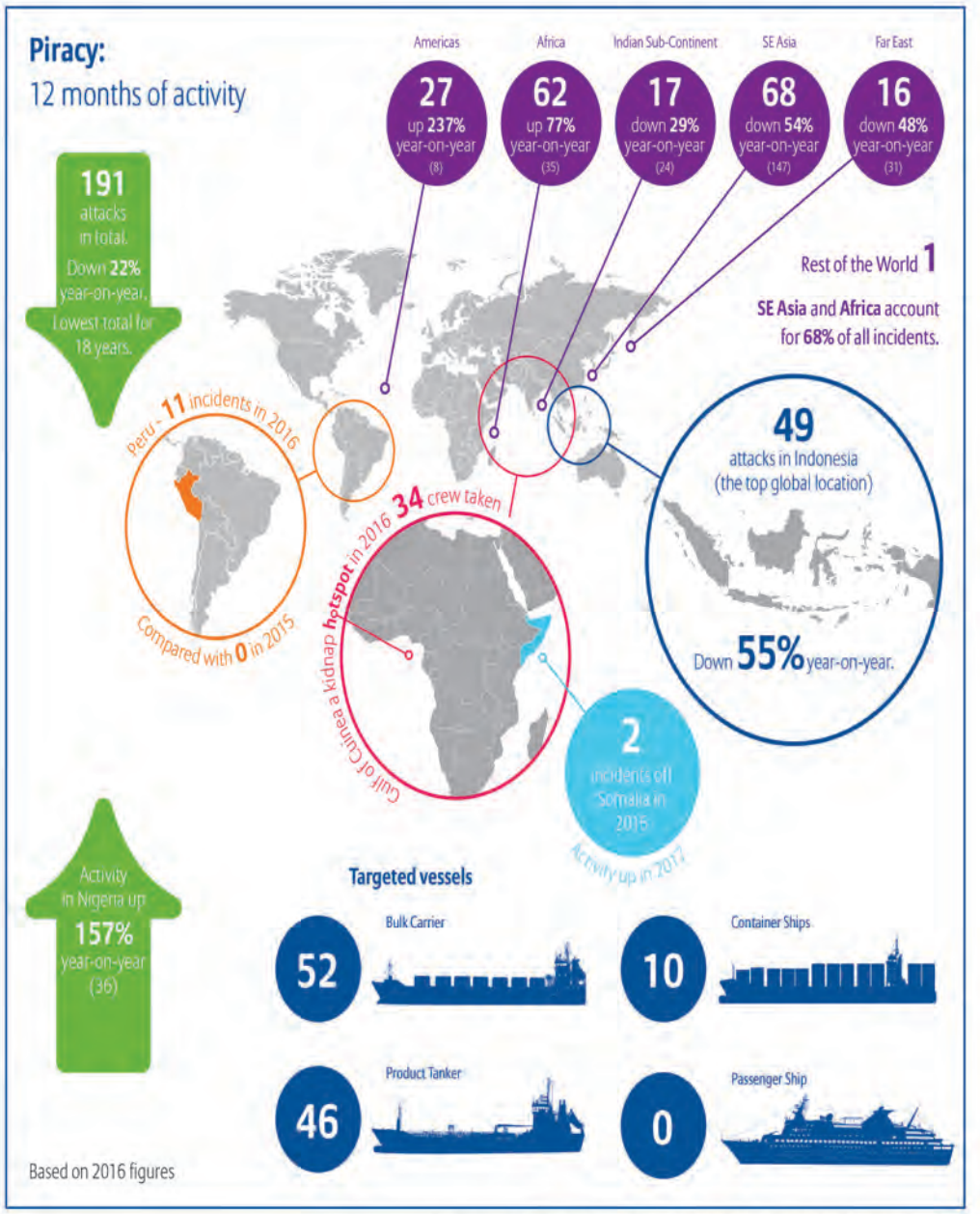
AGCS analysis shows that human error accounts for nearly 75% of the value of almost 15,000 marine liability insurance claims analyzed over five years, or about $1.6 billion. Autonomous vessels could improve maritime safety and revolutionize the movement of cargo on a scale last seen with the advent of containerization.

Beware the 'Cargo' Vessel

Of all vessels lost over the past 10 years, the catagory 'Cargo Vessel' lead the way handily, with 481 of the 1,186 total losses. Rounding out the top five: Fishery vessels (198); Bulk carriers (98); Passenger vessels (68); and Tugs (65).







GEOSPHERE *Mapping-While-Drilling Evolution*

Logging-while-drilling (LWD) technologies have evolved significantly in the past decade. Today they integrate sophisticated algorithms that take advantage of the ever-increasing technical complexity combining mechanical, electrical, and software systems that are implemented downhole. These achievements helps users gain a better understanding of the reservoir while bring drilling into a new area of efficiency and cost savings. Claudio Paschoa, **Maritime Reporter's** *correspondent in Brazil, spoke to* ***Jean Seydoux****, Program Manager for Advanced Reservoir Mapping Technologies for Drilling and Measurement at Schlumberger, regarding its GeoSphere Mapping-While-Drilling Service.*

What were the breakthroughs in this technology's development along the last five years?

In 2014, Schlumberger introduced the GeoSphere technology, the first-ever reservoir mapping-while-drilling service that enables customers to map their reservoirs using unprecedented depth of investigation measurements around the wellbore coupled with a novel mathematical inversion methodology.

Using deep, directional electromagnetic measurements, the GeoSphere service reveals subsurface-bedding and fluid-contact details more than 100 ft [30 m] from the wellbore. This reservoir-scale view provides an unprecedented depth of investigation, enabling operators to optimize landing, maximize reservoir exposure, and refine field development plans. By integrating real-time reservoir maps with seismic surveys, interpretation of reservoir structure and geometry can be refined, revolutionizing field development strategy.

What different fields of research were involved in developing the GeoSphere reservoir mapping-while-drilling service?

Mechanical, electrical, and software engineering that deliver deep directional measurements are at the core of the hardware development. From these measurements, a resistivity map of the reservoir is inverted using a novel stochastic process that allows the drilling team and geoscientists (such as petrophysicists, geologists and reservoir engineers) to first understand and then steer within a geological structure tens of meters away from the borehole—all in real time.

By revealing details of structural dips and fluid boundaries in geological structures, the real-time mapping data provides operators with information critical to avoiding undesired exits into nonproductive layers.

How does mapping-while-drilling system work operationally?

The GeoSphere mapping-while-drilling service follows a standard pre-job modeling, real-time execution, and post-job evaluation that characterize the well placement process but with a much deeper understanding of the reservoir structure.

When it comes to steering, the GeoSphere service detects individual layers in horizontal sections radially—as mentioned earlier—more than 100 ft. [30 m] from the wellbore, exceeding the formation coverage of conventional logging-while drilling technologies. Combined with surface seismic data, this amount of zonal coverage gives geoscientists and drilling engineers the capability to extend laterals—even in the most complex geological settings—within the sweet spot.

As for mapping, the GeoSphere service maps the reservoir top and base, providing data on the presence of lateral heterogeneities, subsurface unconformities, and reservoir geometry. Asset teams can then integrate all data from the service to optimize production and reservoir management. With complete well development plans, operators have a greater likelihood of successfully enhancing recovery techniques and exceeding expectations for the reservoir.

Finally, mapping data from the GeoSphere service can be integrated into 3D reservoir models to optimize drilling operations and completion designs, leading to production improvement and better field development strategies.

What are the main advantages of using the GeoSphere service in relation to traditional pilot drilling?

One of the main advantages of the service is to avoid drilling a pilot hole, which is a costly operation, especially when drilling offshore. Pilot holes are often drilled to evaluate the formation, but that doesn't necessarily mitigate risks in shallow or complex reservoir. Productivity of the well can be impacted by shallow landings, where too much of the section is drilled in the overburden, which becomes a major challenge for completions, or deep landings, causing early water breakthroughs and resulting in more attic oil. By dynamically adjusting the trajectory of the well based on the surrounding geology, the GeoSphere service is much more efficient than the traditional pilot hole operations and allows a more optimum positioning of the well. Due to the extended radial depth of investigation, the service enables the operators to see more than 100 ft. around the wellbore, revealing the reservoir boundaries ahead of time to accurately land the well. This eliminates the need for pilot hole drilling and results in more efficient well construction.

What were the main challenges in developing the mapping-while-drilling service for commercial use?

Well placement poses a wide range of critical issues, such as adjusting to reservoir uncertainties and various drilling risks. To address these challenges, the technology was designed to be configurable and flexible to maximize its envelope of applications. The GeoSphere service is the first drilling technology with the sensors and frequencies that

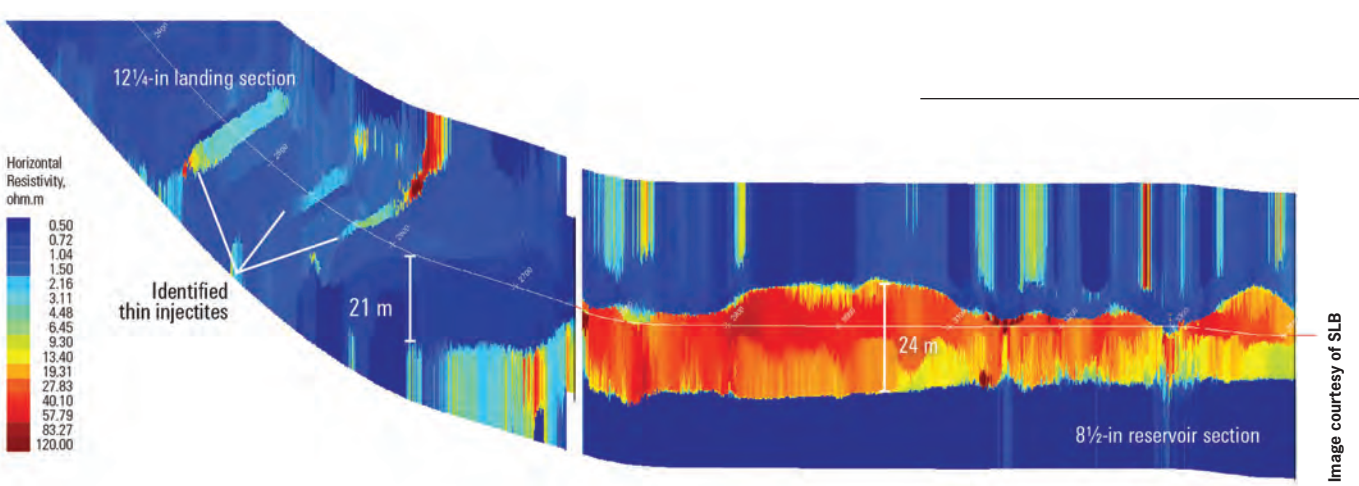
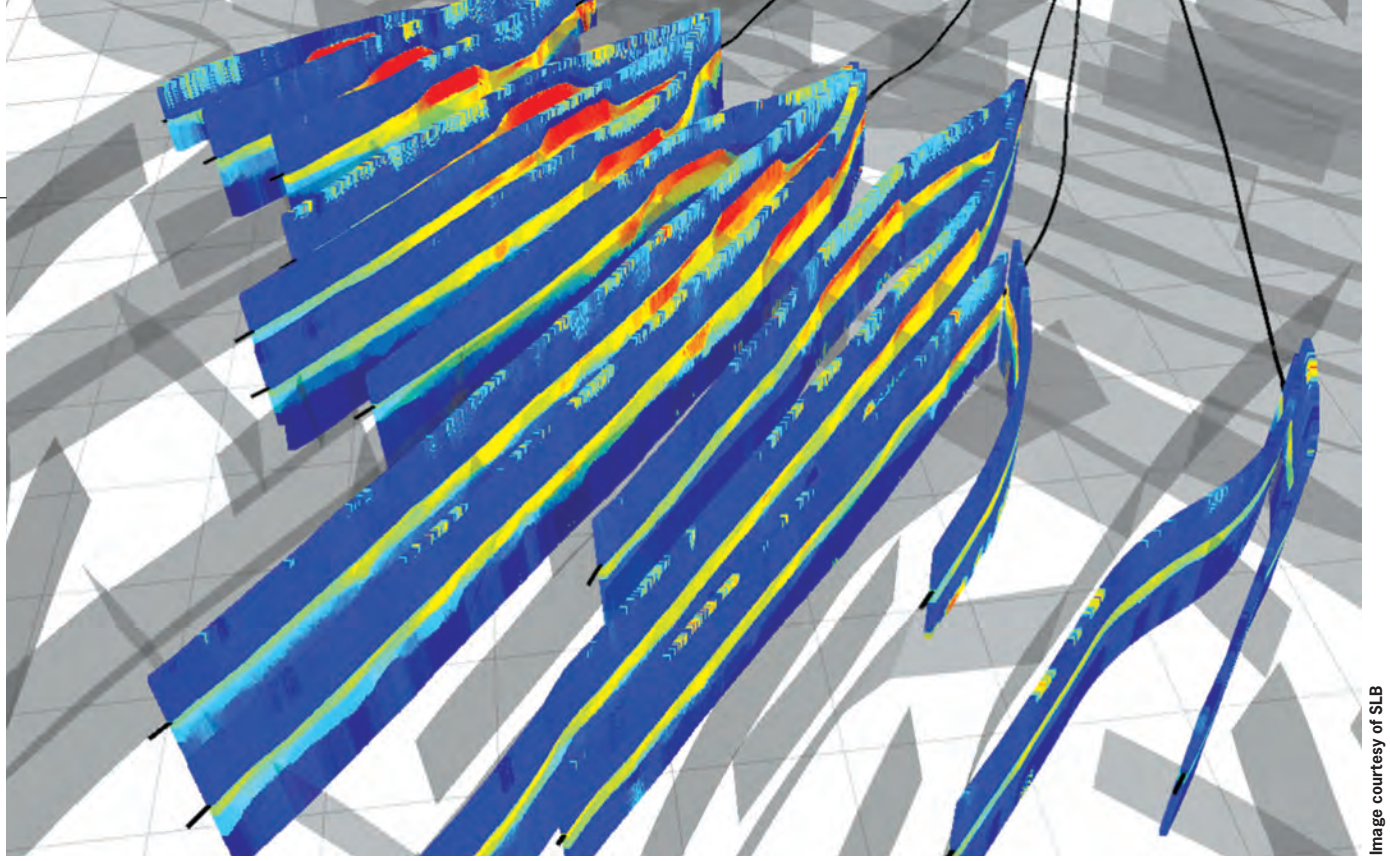


Image courtesy of SLB

GeoSphere service outputs for the landing and reservoir sections of a producer well in the Balder field drilling campaign. During landing, the thin injectite sands were identified and the top of the massive sands was detected at 21-m [69-ft] TVD away. Throughout the reservoir section, the entire oil column—from the top of the reservoir to the OWC—was mapped and the well path was geosteered to maximize production.



GeoSphere data log shows the layered formation structure in the well.

Image courtesy of SLB

can be optimized to a specific application such as landing or navigation within a reservoir in low to very high resistivity regimes. This translates into the maximized reservoir exposure, ability to stay in the sweet spot and the modification of field development plans. The operators now have the right tools to fully understand their reservoirs in an efficient and cost-effective manner.

What are the main components of the mapping-while-drilling service and how is the service deployed offshore?

The main components of the service, which is adaptable to the challenges of the well, consist of separate drilling subs hosting electromagnetic transmitters and receiver configured in a standard bottom hole assemblydrill string. When drilling, the data acquired by the system is transmitted onshore and processed on a high power computer cluster to provide a continuous resistivity map of the reservoir that helps the operator to take well placement decisions in real time.

Two offshore case studies are worth mentioning here. In the Balder field, North Sea, the GeoSphere reservoir mapping-while-drilling service enabled the operator to eliminate the need for pilot holes and improve landing success. The challenge was to distinguish targeted sands from non-targeted sands when drilling through a complex formation to land effectively and optimize production while eliminating the need for costly pilot holes. The GeoSphere service mapped the top of the massive sands from more than 66 ft. true vertical depth above, ensuring a safer and more optimal landing result. Also, the operator was able to detect the oil/water contact while landing the 12.25-in section prior to penetrating the reservoir.

In the Caspian Sea, the GeoSphere service mapped formation boundaries that were located up to 24 m from the wellbore, allowing the operator to geosteer the well with only five trajectory changes compared with an average 15–20 in previous wells. In this project, Schlumberger achieved world record for the new service, logging 4,908 m in one run, 88.5% net to gross.

How does mapping-while-drilling help increase ROP and optimize well placement?

By seeing geological and reservoir features deeper and earlier the wellbore tortuosity is optimized and correction to the trajectory can be smoother and more efficient. The outcome is a higher ROP with a much improved wellbore position with respect to the main reservoir target.

What were the benefits Schlumberger found in using mapping-while-drilling offshore Brazil, in the North Sea and in the Barents Sea?

A close interaction with operators both during the pre-job phase and in real time is paramount. The collaborative approach enables the Schlumberger experts to gain a much deeper understanding of the operator's challenges from landing to reservoir characterization. Previous challenges associated with well placement that were unattainable before— such as drilling in very thin, discontinued, or compartmentalized reservoirs—can now be fully addressed.

The offshore Brazil case study demonstrates how the reservoir mapping-while-drilling service investigated 100 ft from wellbore in real time to detect reservoir boundaries. As a result, the operator accurately landed three wells, each with multiple targets in channel sands, leading to optimized drain trajectories.

In the Balder field, North Sea, the GeoSphere service enabled the operator to eliminate the need for pilot holes and improve landing success.

In the Barents Sea, the GeoSphere service revealed that the reservoir was thicker but more heterogeneous than anticipated—useful information for geosteering and for postwell evaluation activity.

What future uses do you foresee for the mapping-while-drilling service?

The service is rapidly becoming a standard application to reduce drilling risks and understand the reservoir to the fullest. Such a service is needed as operators discover new opportunities and face different challenges in the ever-changing oil and gas environment.

Fisheries Fleets Review:

Part 3: Northern Europe

New Workhorse:
An XWB aquaculture service vessel, part of a concept line that includes a seafood harvesting variant.

Illustrations: Harald Bigset

Playing Catch

BY WILLIAM STOICHEVSKI

Record hauls of wild fish, an unprecedented return on farmed salmon, finance and subsidy garner new orders, new designs and emboldened suppliers. In Scandinavia, particularly Norway, rich, carefully managed fisheries raise just one question for the commercially minded — which wave of business to ride. A growing number of large and small players are in on the action, as historic profits are heralded up and down the supply chain.

For the hardened makers of gear that know tougher times, this is the golden age. "We've sold record numbers of net haulers to boats up to 50 foot," says Hydema Syd stalwart Solbjoerg Solgaard. Sales to the U.S. are soaring, she says, and Canada has picked up, especially for automatic hauling equipment.

People want quality, she adds. "The year's fish'n has been good. Prices for cod are good. The personal finances of coastal fishermen has improved and many want to invest in good equipment."

Proof is to be found at Kleven Shipyard, where seven fisheries vessels — four trawlers, a seiner, two factory vessels and a live fish carrier — are on order. The charterers are German-Faroese DFFU; French Saint Malo; Spanish Pesquera Ancora and DESS Aquaculture Shipping, a Norwegian joint venture of aquaculture giant Marine Harvest and offshore energy's Deep Sea Supply. In shipbuilding, the distinction between fishing boat and fish farming boat is moot. All want in on all sides of the booming fishery. Good prices for wild and farmed fish are being heralded from Greenland to the Baltic Sea and up to the Barents Sea.

The DESS Aqua fish harvesting (or factory vessel) SALT 425 FHV-design due to sail in 2018 is part of a trend toward large vessels (59 m and up) for the booming worldwide aquaculture industry. DESS Aqua has just declared an option to buy another wellboat for delivery in 2Q 2018.

In Norway alone, seafood worth 19 billion kroner was sold in 2016, and the lion's share of those exports are farmed salmon. The big shipbuilders — their roots in the fishery — are supremely well-informed (if understated) of this: "There's a lot of exciting development work happening in the aquaculture industry, and this is a market we wish to be in," says Kleven Shipyard managing director, Ståle Rasmussen, in a note to stakeholders.

New-build Trove

In league with large feed and factory boats are the new 80-plus-meter well boats. Designer More Maritime of Aalesund, Norway, has had two built: their hulls fabricated in Turkey and then kitted out at in Norway at Fiskerstrand Verft for owner Froy Rederi. The Gasoe Jarl and

Illustrations: Handout

Fisheries Fleets Review: *Part 3: Northern Europe*

Gasoe Viking are 84 meters long with holds of 3,200 cubic meters for salmon, fresh water, seawater and circulated salmon-lice-eating wrasse fish.

One well boat owner, NTS, has made been so successful, they've moved to own fish farms themselves in a palpable drive seen elsewhere in fisheries circles to own as much of the value chain as possible. The trend is driving orders of all types, and umbrella group Seafood Norway says the aquaculture supply chain now adds annual value worth $2.7 billion.

Niche boats

As the industry grows, room opens up for niche players like Harald Bigset, managing director of Point Offshore from Ulsteinvik. He's happy to visit Turkey, where he's talking to builders about "extreme wide-beam" Xtreme Work Boats. The trademark Point Aqua 15-10 XWB design is designed to manhandle giant fish-farm nets and launch ROVs and divers for pen inspections.

XWBs have the pull to move entire farming operations behind shelter if seas get rough — or to take on other fisheries roles. Shorter than 15 meters, the Point Aquas don't need a captain trained in DP, although they're envisioned using fixed, bow and stern thrusters and 1,000 HP. Rig-like and getting bigger, fish farms need anchors, and the XWBs act as anchor-handlers with cranes and a stern winch.

"They can carry huge loads on deck and five or 6 persons onboard," Bigset says, adding that his aluminium hull design is stronger and safer in rough seas than a catamaran. "There are a number of tank configurations and one variant is intended for sea weed trawling (a major focus of Norway's new Ocean Space Centre and the targeted researchers at Sintef Ocean)." He even has a variant that moves wrasse.

Small trawl

Sunny, southern Norway — once a base to commercial whale-oil expeditions — is home to a boatyard that packs enormous value onto a hull shorter than 15 m. Skogsoy Baat has produced over 95 boats, but vessels like the Nina Mari pack 600 horsepower, two 32 kilowatt Perkins generators and a Volvo Penta D13 engine. hese "little" Skogsoy boats sleep six in three cabins and provide luxury seating and amenities that say "modern fishing". There's also 70 cu. m of hold for fish caught in a variety of ways, including gillnet and longline. "We have been building fishing vessels of many sizes and shapes since 1984," says Skogsoy manager, Andre Rustad. "Nina Mari is the first of three vessels (of her type) now being built." In all, Mr. Rustad has 150 million kroner in builds on order until the spring of 2019.

"The feedback has been good. The hull has good stability and she handles good," Andre tells us. With so much below the waterline, it's seems a steady seahorse.

Trawler turnover

Replacing a 1980's cod catcher was on the mind of France Pelagique, when they went to Havyard of Fosnavaag, Norway, and Dutch designer ASD to build an 80 m trawler for December 2018. The French and Dutch designed the vessel together, although a blurry illustration suggests a Havyard 535 is being customized, and the Norwegians are on call for more engineering and design help.

Fishing boats orders are supplementing orders from offshore energy Westcon Yards, where a 75 m, Rolls-Royce NVC 331 pelagic trawler for Scottish company Klondyke Fishing Co. is being built. It's due to start work in 2019 with power from a Rolls-Royce Bergen B33:40 engine, a Promas propulsion and hydraulic winch systems. Another Rolls-Royce design, an NVC 306 longliner/gillnetter for Norwegian owners Veidar, is nearer completion at SIMEK shipyard, where Sealord Group's Skipsteknisk ST-118 stern freezer trawler is being pieced together for work-start in 2018.

Polar trawlers

To tap northern waters for whitefish, Denmark-based Royal Greenland has ordered two 82 m Skipsteknisk designs from Spanish yard Astilleros de Murueta in Bilbao.

One will shrimp, and the other will trawl for ground fish. The ST-118 factory fillet trawler and ST 119 shrimp trawler were still being tailor-engineered for the Arctic as we wrote. They'll have 6,000 kW and 7,200 kW propulsion packages installed. Crews of 30 or 40 will be accommodated and holds that freeze 90 t of produce a day have been ordered. Permanent magnet winches will be onboard when they're delivered between December 2018 and May 2019. Royal Greenland is also launching a new pelagic company and could well order more vessels after posting record turnover of about $50 million.

Making a krilling

Among the new vessel types gaining traction in the remote southern seas are specially netted krill trawlers. Norwegian krill fisher, Rimfrost, said in April 2017 it was planning a new vessel. In May, Vard Shipyard confirmed it would build its priciest fishing boat ever — a 130-metre-long, $118 million Antarctic krill trawler for Aker BioMarine.

Danish revival

While Norway might be awash in orders, more business is due Danish builders soon, as Copenhagen recently decided to fund the fishery's modernization. A billion Danish kroner is available over two years for newbuilds, retrofits and aquaculture vessels. Across the Skaggerak in Norway, subsidies aimed at adopting locally available innovation, including energy storage and propulsion systems, are helping some decide to spend. Fortunately for the Danes, big and small Norwegian owners still prefer Danish shipyards for the full gamut of services. An example is the building at Karstensen Skibsv rft of Strand Havfiske's Wärtsilä-powered, 75 m combination trawler and purse-seiner.

This his mini-survey of ours counted no fewer than a half-dozen fish delivery vessels, or well boats, either newly commissioned or just built. Wellboat technology — sorting, sterilizing, cooling and de-licing — is increasingly found aboard fishing boats, including aboard a Danish vessel we couldn't confirm. Fish slaughter equipment has made its way onto aquaculture vessels.

The Norwegian supply chain, according to a researcher at Sintef, has doubled in size in just 10 years. Recently, salmon farming has outpaced the wild catch.

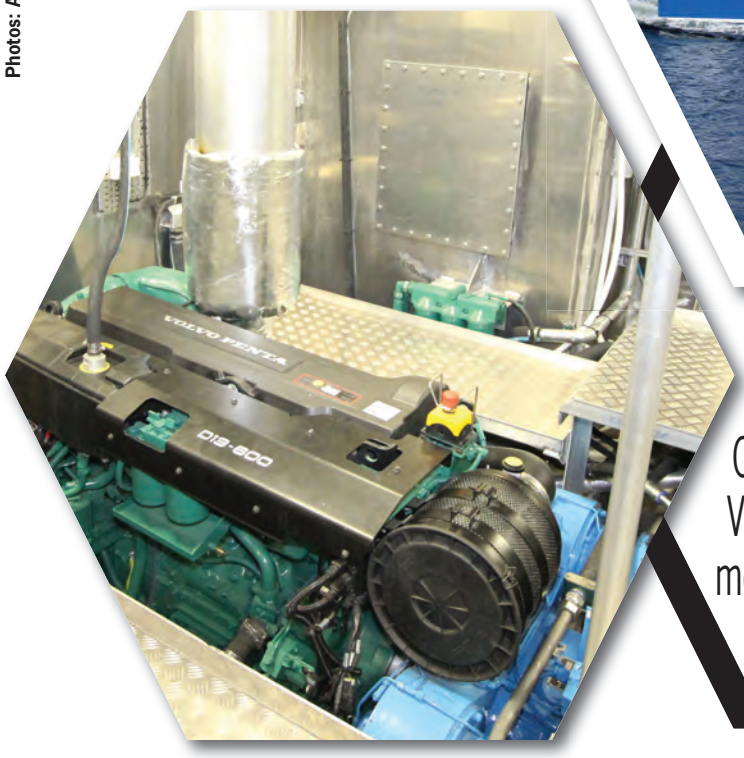
"One's status as a fisherman (or gear maker) is higher now than earlier due to the opportunity to earn good money," says Mrs. Solgaard. "Youth now search out the profession with little or no recruitment."

Race to the South:
Aker BioMarine's krill vessel.

Illustration: VARD

Newly Popular: Fishermen on Rapp Syd net retrieval gear.

Photo: Solbjoerg Solgaard



Big Payload:
One of three “Nina Maris.” Volvo Penta powered (left); modern interior finish (right).

Photos: Andre Rustad

Marshall Islands Registry

The Marshall Islands

Move to the Head of the Class

BY JOSEPH KEEFE

Leveraging 27 worldwide offices, the RMI Registry has been gaining market share year-on-year. Surging tonnage and a solid record for safety has pushed the registry to the head of the class.

When the Marshall Islands Registry announced that it had become the world's second largest – at a whopping 223,262,177 deadweight tons – the registry's leadership was quick to emphasize quality as the leading reason. International Registries (IRI) President Bill Gallagher didn't discount the importance of the deadweight milestone, but quickly moved the conversation towards why it had happened. "How you differentiate yourself from the other flag states is simple – you have to be better," he told Maritime Reporter in late March, adding, "Everybody says they're a quality flag, but you don't become a quality flag unless you have the people, put in the effort, and put money back into the flag."

With as many as 450 worldwide employees – the vast majority of them full time employees – IRI has done just that. Hence, the registry's growth is also reflected in the growing cadre of professionals that IRI has put into place to keep pace. The results speak for themselves. Separately, in another development, the RMI Registry received preliminary confirmation that it will continue its United States Coast Guard Qualship 21 status for 2017. In a nutshell, the Qualship 21 designation means that ships flying the RMI flag are less likely to be detained in U.S. ports, something that ultimately assists owners and operators in keeping their ships on schedule, on charter and making money.

Qualship, for those unfamiliar with the program, is a 3-year rolling average during which a flag state has to achieve a detention rate of less than one percent. "That's a very, very hard mark to make, especially for a large flag state like ours," Said IRI COO John Ramage.

Gallagher explains the IRI philosophy, insisting, "Some people may not see the merits of Qualship, but we certainly do. For example, we added three inspectors as full-time employees in the Port of New Orleans. You have to resource the registry or you're not going to make Qualship – that's the bottom line from our standpoint." To that end, Gallagher gives a lot of the credit to retired Coast Guard Admi-

"We used to send a taxi over to IMO and now we send a bus.
And that's true. We really spend a lot of money as a flag state, sending the right people to IMO. Our regulatory guys say, 'If you're not in the working groups, you're not impacting what happened.' Where you really make a difference is at the working groups. So we're not only just sending a couple guys to sit in a chair; we actually are very active in the working groups."

– **Bill Gallagher**, IRI President, pictured center in the picture to the left,
flanked by **Theo Xenakoudis**, (left) IRI Managing Director, Greece, and **John Ramage**, (right) COO, IRI

ral Robert North. "We're the only flag that's been on Qualship – the only major flag – 13 years running. No one has a record even close to that. And I give a lot of credit to Admiral North, who set the vision of the registry in the right direction," says Gallagher. North helped the RMI set up what Gallagher calls a 'Coast Guard style vetting system.' IRI/RMI flag state inspections occur at least annually. Beyond that, and if it is a ship that they are concerned about, it could be quarterly.

In essence, the registry took the Port State Assessment system and converted it to what North calls the Flag State Assessment. "We did a monthly look at the fleet, the ship managers looked at the ships, and then when we saw a quality problem, we got with the ship manager and explained that to him and tried to develop an improvement process to give them time to take care of the issues if they wanted to remain in the registry," explains North, who added, "If not, then they could go find another registry. It is as simple as that. It's working."

MLC & Security, too

As regulations appear and begin to impact operations, IRI leadership also ramps up to ensure that the fleet keeps pace. Staying on QualShip depends on it, but as Gallagher says, it is also the right thing to do. "We have a former member of a U.S. Maritime Union and officer, who sailed 20 years as a captain, and today, probably devotes 50 percent of his time to looking at MLC issues and complaints," he explained, continuing, "So we do have a mechanism for it. I think the one good thing is now the seafarers have a way to reach out to the flags now. That wasn't there before, necessarily."

At the same time, Ramage concedes that, in certain cases, seafarers are not aware of the complaints procedure. He adds, "Every ship should have a documented complaint procedure available to the crew members and sometimes we get called in when the crew complain to the port state control. And, you know, if they just come to us we could have helped them resolve the issue." IRI also knows that here is more to the human element of shipping than just making sure seafarers are treated right, get paid and fed adequately. Beyond the robust attention given to the new MLC2006 code, Gallagher says that a great deal of attention is given to knowing who is on board the RMI fleet and making sure that they don't represent a threat – no matter what ports they might call at. Gallagher explains, "A lot of flag states don't do what we do. We actually, we have a system where we vet every seafarer – it is called World-Check – and we subscribe to it. It is very expensive but we cannot have an incident, you know, with zero tolerance for anything. It can be tedious, but at least we have comfort knowing that we as a flag state have done our due diligence. Of the major open registries, I know we're the only one doing this."

Making QulShip 13 years in a row also means vetting the owners and the managers to make sure that IRI knows who is behind the vessels. "The last thing our owners want is to have substandard tonnage coming into the registry. So that drives a lot of what we do. You know, we have a lot of blue chip owners and we want to keep it that way," adds Gallagher.

Outside Engagement

There is a saying in Washington, DC: "If you're not at the table, then you are probably on the menu." The IRI has no intention of being on the menu. A regular participant in Washington (U.S. Coast Guard) and London (IMO), the registry has long been a part of the regulatory discussion and provided input through various committees, interaction and in some cases, just making the effort to be there and witness the process. Gallagher smiles and says, "We used to send a taxi over to IMO and now we send a bus. And that's true. I mean, we really spend a lot of money as a flag state, sending the right people to IMO. Our regulatory guys say, 'If you're not in the working groups, you're not impacting what happened.' Where you really make a difference is at the working groups. So we're not only just sending a couple guys to sit in a chair; we actually are very active in the working groups."

Ramage insists that it isn't for 'show.' "It's the responsible thing to do. We really feel that we do a good job of trying to bring in the realities of operating vessels into the regulatory environment and IMO."

On this side of the pond, the registry provides guidance on the flag to the Coast Guard annually. That effort has yielded fruit over time and has evolved in a valuable interactive tool for both sides. Gallagher adds, "When we first went in, it was more of a social interaction. Today, they ask us what we think and there is real give and take."

The Marshall Islands is also a member of the Tokyo MOU and the technical group attends all of the major MOU meetings. That effort is trending towards better relationships with port state control everywhere and the registry hopes that one day, the proactive approach will yield better understanding from both sides, and fewer detentions. Ramage readily concedes, "We're not quite there yet."

Out in industry, the registry engages BIMCO, Intertanko and everyone in between. Gallagher explains why. "It's not just the IMO and it's not just the port state authorities that we're interacting with. Bob [North] taught us that. Bob and I know each other very well – we grew up in the same neighborhood in Baltimore a few years apart – and went to the same high school. When I first met Bob, he said, 'you know, you've only been 25 miles away from me and this is the first time I met you.' So, the message was received that we weren't doing enough outreach." Today, that's simply not the case.

Laura Sherman, Director, Marketing & Communications ensures that IRI delivere the same global message, treating the owners and operators the same way.

Technology 101:
Always on Watch, Follow the Sun

Long a leader in technology for ship registries, IRI and RMI were early adopters of tracking their fleets, geo-fencing in pirate waters and all of it in real time. That much hasn't changed. Today, that has provided an edge on the port control side of the equation, as well. Outside of U.S. waters, the 96 hours pre-arrival notice isn't always given.

Gallagher explains, "We're employing it so we'll actually pay attention. We do a risk assessment of vessels going into different ports. And, the vessels themselves are also automatically notified. That way, we're using that same kind of concept that we used with the piracy, but also on a port state control side."

Across the globe, and leveraging 27 full service offices, someone from IRI is always on duty. From Piraeus to London, New York, on to Houston, Long Beach, CA and now to Korea, marine and technical personnel are watching the fleet.

"We brought in personnel in Korea, which also gives us an extra hour ahead of Hong Kong. So that was where the window was, you know, over the Pacific. Now, when Long Beach is closing down, we're opening up in Korea and Japan, and that's where the handover goes on," said Gallagher.

Ramage and Gallagher both insist that, while the headcount is important, it is more important to have the right guys in place.

At the same time, empowering those people is just as important. Ramage added, "We have people in the Far East and Europe who have the same power to make decisions as our people in the United States. So it is really a worldwide office."

Multi-Cultural Staff
Delivering Standardized Service

At one time, all IRI decisions were contemplated and made in the Reston office. That's no longer the case. For example, the IRI maritime services group is now being run out of the UK. The Director, Worldwide Business Operations, is now based out of Greece. Gallagher says, "This is our largest market so that makes a lot of sense. The old registry was very centralized, but it isn't the decentralization that's important. It's the people that we have, and the fact that these people are equal. We have good people."Bottom line at IRI? You simply can't rely on one region to staff up your registry. If you do, you're not doing a good job.

John Ramage perhaps says it best when he insists, "We don't actually own anything of any substance, do we? But what we have totally depended on is the ability of our staff to be consistent, so that an owner can go to Singapore, Tokyo, Houston, or London and his ship will be told exactly the same thing."

Still, the U.S. headquarters is still the central, key cog in the operation. Housing the Maritime Services Group, IRI brings in key stakeholders from all the different markets at least three times annually to go through all the issues and challenges. That, says Gallagher, produces standardization.

Inspections & Enforcement:
Tough Love

Ensuring quality in a global fleet is 'Job 1' for IRI today. Saying it and doing it, says Gallagher, is another thing altogether. But, he says, the key is training and a uniform approach – no matter where or when an inspection takes place. "We have training all around the world for not only our employee inspectors, but also our contractors. So to try to keep it uniform, we're conducting our own internal seminars for our training. The number of IRI inspectors that are actually employees is simply huge." As a result, it is no accident that the Marshall Islands flag also finds itself in the upper reaches of both the Tokyo and Paris MOU's.

Providing that sort of coverage and remaining cost-competitive with the other flags is a constant balancing act. It also means that some operators won't make the cut when it comes to the safety and performance standards demanded by a robust set of rules, backed up by competent inspectors. Not always one of the largest flags, Gallagher nevertheless insists that the reason that they grew so quickly had everything to do with putting quality (and not numbers) first. "I think the fact that we were a quality flag and we kept that standard is why we've grown."

Theo Xenakoudis is quick to point out that in the early days IRI was turning down at least one out of every three ships that applied for membership. He adds quickly, "Even in the difficult times, we were rejecting one in ten ships. But, it doesn't happen anymore. They don't come to us. They know that we're going to say no."

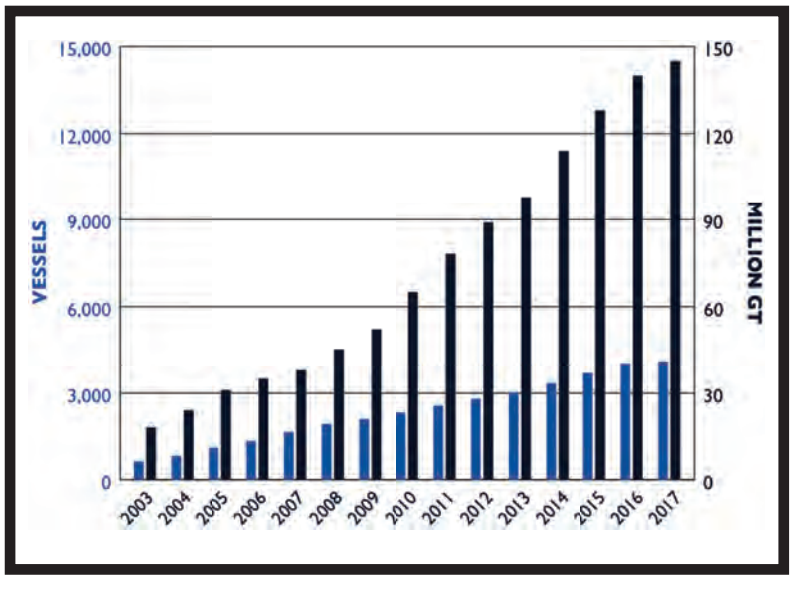
Almost 225 million tons and ~4,100 ships later, it doesn't seem to matter anymore that the IRI standard is a difficult one to achieve and maintain. That, perhaps, is a tribute to the rapidly improving global fleet, no matter where it is housed. Quality, however, doesn't happen 'by accident,' and for IRI and its Marshall Islands flag, this is no 'chicken or egg' scenario.

The quality came first and the tonnage has steadily followed. And, that's the way it should be.

Fleet Types

VESSEL TYPE	NO. of VESSELS	% of FLEET	GROSS TONS	% of FLEET GROSS TONS
BULK CARRIER	1,309	32%	55,783,185	38%
CONTAINER	322	8%	14,997,756	10%
GAS CARRIER	170	4%	11,394,946	8%
GENERAL CARGO	121	3%	3,885,752	3%
MISCELLANEOUS	61	1%	359,910	0.25%
MOU	193	5%	7,707,762	5%
OSV	240	6%	428,482	0.29%
PASSENGER	10	0.24%	343,976	0.24%
TANKER	1,126	28%	50,705,457	35%
YACHT	531	13%	127,667	0.09%
TOTAL FLEET	4,083		145,734,893	

Fleet Growth



WORKBOAT REVIEW

While global shipping and shipbuilding markets remain in turmoil, local workboat markets hold steady. Following is a recap of recent deliveries and technical innovation in the space.

Vigor stood out last month with the launch of the new ATB tank barge designed to transport up to 22,000 tons of anhydrous ammonia (NH3). According to the shipyard, The Harvest is the first complex liquefied ammonia transport barge built in the U.S. for Jones Act trade since 1982, built to support the operations of The Mosaic Company, an integrated producer and marketer of concentrated phosphate and potash. The Harvest will be operated by a subsidiary of Savage Companies as part of an articulated tug and barge (ATB) unit. Savage, a supply chain solutions company, has been steadily increasing its footprint in the marine industry.

Vigor CEO Frank Foti said, "[The NH3 barge project] combines Vigor's capabilities in large vessel construction with decades of experience building complex structures like nuclear containment devices, dam lift gates and bridges." It was built to ABS and U.S. Coast Guard safety standards.

Vigor Built Refrigerated Liquefied Gas Carrier

Photo: Vigor

Eastern Shipbuilding Group, Inc. remains one of the steadfast and busy builders of vessels in the U.S., and recently it delivered the last of four inland river towboats to IWL River, Inc. The four towboats – Impala Soledad, Impala Salgar, Impala Mompox and Impala Cantagallo – will service the inland waterways of Latin America for Impala Terminals. Impala owns and operates a network of terminals that facilitate global trade flows, specializing in warehousing, multi-modal logistics and related port services for essential commodities worldwide.

This series of CT Marine designed 134 ft. inland river service towboats are triple screw with retractable pilothouses. All four towboats were constructed, outfitted and delivered at Eastern's Allanton, Fla. facility.

Dufour, Laskey & Strouse, Inc. represented the owner and provided on-site management team throughout the builds.

Eastern Delivers Four Towboats to IWL River.

Photo: Eastern Shipbuilding

Metal Trades, Inc. (MTI) is a new face on the workboat newbuild market, and it recently launched a shallow-draft push boat for Bald Head Island Limited, LLC. (BHI). The new vessel, Capt Cooper, was christened in late June at the builder's Yonges Island, S.C. facility.

As the first self-powered vessel built by MTI, Capt Cooper signals an expansion of MTI's service offering to include new vessel construction. The 55-year-old company has been active in heavy metal fabrication, barge building and vessel repair for government and commercial customers.

Capt Cooper measures 50 x 24 x 8 ft. with a 5.5-ft. draft, designed by naval architecture firm CT Marine and constructed to ABS specifications.

The vessel is powered by two main propulsion engine/gearsets configured for port/STBD twin screw appl ication. The engines are John Deere 6136 AFM keel cooled marine diesel engines with a 425 hp at 1,900 rpm M-2 Rating Tier 3. The gears are ZF W350 electric shift 3.968:1 ratio marine gears. The vessel's steering consists of four main rudders and four flanking rudders for maneuverability. On deck, Capt Cooper is equipped with two Patterson wire winches.

St. Johns Ship Building in Palatka, Fla. christened the newest Vane Brothers tugboat, New York, in early June. New York is the sixth of eight 4,200-hp, model-bow tugs contracted through St. Johns by Vane Brothers. Vane Brothers, headquartered in Baltimore, Md., also conducts operations from a facility in Brooklyn, New York, and other locations along the U.S. East Coast. More than 50 Vane Brothers tugboats are primarily tasked with towing petroleum barges engaged in the North Atlantic coastwise trade.

Scheduled for delivery later this summer, the tug New York is an Elizabeth Anne Class vessel. The tug Elizabeth Anne, delivered by St. Johns in January 2016, was the first in the series.

MTI Launches Its First Push Boat.

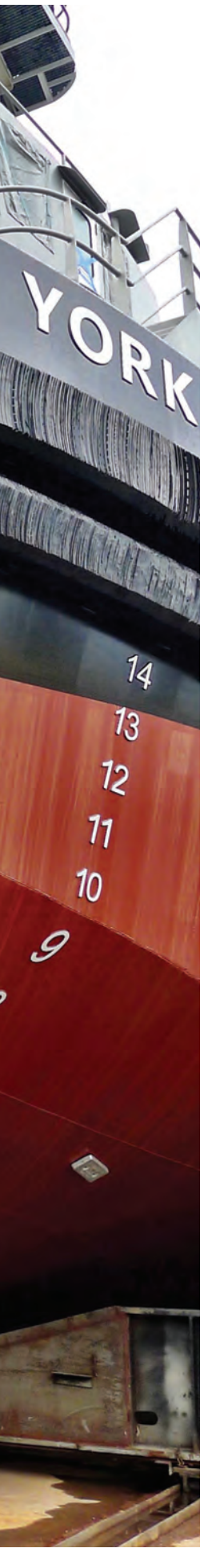
Photo: MTI

Damen delivered to Italian tug operator Rimorchiatori Riuniti a pair of new Damen tugs, an ASD 2913 called Danimarca and an ASD 2411 called Columbia. The delivery of the Danimarca took place in Genoa on June 14, 2017. This new tug will join the ASD 2913 Germania that joined the company's fleet at the beginning of the year. Like her sister vessel, the Danimarca has also been installed with FiFi 1 and an aft winch, in addition to oil recovery and escort capabilities. This extra equipment, combined with a bollard pull of 80 tonnes, means that Rimorchiatori Riuniti will be able to sign these two ASD 2913 tugs up for offshore tasks as well as harbour assistance duties. Delivered at the end of May, Columbia has joined for harbor towage duties with sister vessel Malta in the port of Genoa. At 78.7 x 36.4 ft., the tugs are compact to deployin small port situations, but still pack a 70-tonne bollard pull capacity.

Photo: Vane/St. Johns Shipbuilding

St. Johns Shipbuilding Delivers for Vane.

Diversified Marine of Portland, Ore. christened the tug Dr. Hank Kaplan, a boat which marks a milestone for workboat supplier Caterpillar as the Harley Marine Service owned 80 x 36 x 13.5 ft. tugboat is the first vessel in North America to feature a complete Cat Marine propulsion system with both Cat power and Cat azimuth drives. The tug is equipped with two 3516C marine propulsion engines, each delivering 2,675 hp (1,995 kW) to a pair of MTA 524-T azimuth thrusters. The new Cat MTA 524-T azimuth thruster is the latest iteration of Caterpillar Propulsion's thruster line, optimized for the unique operation profile of a tug. Peterson Power of Portland, Ore., led the efforts on the project, helping refine the spec and eventually supporting the installation and service of these systems. Cat Financial provided construction and term financing, and the boat was designed by Robert Allen Limited.



WORKBOAT AUTONOMY

Rolls-Royce, Svitzer Team for Test

As the marine industry increasingly eyes autonomous solutions, Rolls-Royce and Svitzer earlier this year put some of the technology to the test in Copenhagen Harbor when the 92-ft.tug Svitzer Hermod berthed alongside the quay, undocked, turned 360 degrees and sailed back to Svitzer headquarters before docking again, all under remote operation while the captain was stationed quayside at the vessel's remote base at Svitzer HQ.

Though a captain and crew remained on board throughout to ensure safe operation in the event of a system failure, the remotely controlled maneuvers demonstrated a "world first" for a commercial vessel, according to the project partners.

This is "a genuinely historic moment for the maritime industry," said Mikael Makinen, Rolls-Royce, President – Marine. "We've been saying for a couple of years that a remotely operated commercial vessel would be in operation by the end of the decade. Thanks to a unique combination of Svitzer's operational knowledge and our technological expertise, we have made that vision a reality much sooner than we anticipated."

The Robert Allan designed Svitzer Hermod was built in Turkey at the Sanmar yard in 2016 and is equipped with a Rolls-Royce Dynamic Positioning (DP) system, the key link to the remote controlled system. The vessel features a range of sensors which combine different data inputs using advanced software to give the captain an enhanced understanding of the vessel and its surroundings. The data is transmitted to a Remote Operating Center (ROC) from where the captain controls the vessel.

"Disruption through innovation is happening in almost every industry and sector and technology will also be transforming the maritime industry," said Kristian Brauner, Svitzer CTO.. "Svitzer is actively engaging in projects that allow us to explore innovative ways to improve the safety and efficiency of towage operations."


Photo: Rolls-Royce

Photo: ABB

Supertankers entering POLB use ABB Marine Software

Supertankers entering the Port of Long Beach (POLB) will use ABB's marine software to produce real-time data of the keel-to-seabed clearance. Sensors fitted to Tesoro vessels will send information to a Portable Surveyor Box (PSB), carried by the pilot, which will verify their route to the dock. In this specific case, the system is used to continuously validate (and improve) pre-calculated motions from the online decision support system PROTIDE, which is used to calculate safe transit time windows for large oil tankers to enter the port. The information provided by the PSB validates the PROTIDE outcome, which enables deeper draft ships to enter the port safely. This means that fewer tankers need to lighten their load to enter the harbor or to wait for the appropriate time window. **http://new.abb.com/marine**

Photo: Danelec

Danelec Debuts Remote Management Tools

Danelec Marine helps to bring the Internet of Things (IoT) to the shipping industry with new remote management tools; Hanseaticsoft is one of the first third-party developers to use DanelecConnect platform's intelligent universal data gateway. The second-generation DanelecConnect telematics platform is now fully available and the first ship installations are currently underway.

The company is working with third-party software application providers to use the DanelecConnect application programming interface (API) tool to capture data from shipboard systems and sensors into their specialized software packages. One of the first is Hamburg-based Hanseaticsoft, which is integrating the DanelecConnect API into its suite of Cloud Fleet Manager applications for shipping companies. The API permits shipboard data to feed seamlessly from the DanelecConnect on-shore server automatically capturing a large array of data into Hanseaticsoft's analytics platform.

www.danelec-marine.com

SYNAPSIS NAVAL: A Software-Defined System

Raytheon Anschütz launched its naval navigation and bridge system SYNAPSIS NAVAL. The new technology leverages Raytheon Anschütz's SYNAPSIS Integrated Navigation System and integrates various military system capabilities including: radar video merging and other tactical radar features, integrated situational awareness, ship self-defense capabilities, military surveillance radars, and cyber security solutions. SYNAPSIS NAVAL is a software-defined system built on commercial off the shelf (COTS) technology and open system architecture to simplify maintenance and logistics and to support upgrades and future capability needs. SYNAPSIS NAVAL features an advanced sensor degradation and data distribution management, which provides the base for scalability of system functions and integration with other onboard systems like automation or combat management.

www.raytheon-anschuetz.com

Photo: Raytheon Anschütz

Software Enhances Container Scanning

New container scanning tech is being developed for the CORE European Research Project by Smiths Detection. Smiths is designing both hardware and software for the next generation of container scanners, designed to speed-up throughput and improve detection. New hardware will increase the rate at which containers are scanned, from around 100-150 per hour to between 300 and 500. And, new software will give operators the tools that they need for faster, accurate analysis of images to prevent bottlenecks. Having developed the capability, Smiths Detection is now working to integrate the technology into a demonstrator for factory testing and design review.

www.smithsdetection.com

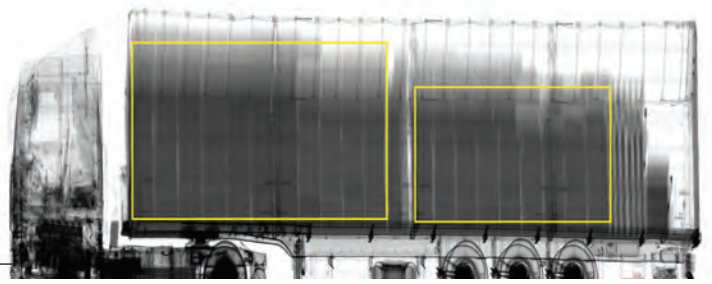


Photo: Smiths Detection

Apilot Autopilot: New Nav Tech for Autonomous Ships

VTT Technical Research Center of Finland is developing steering for the remote-monitored and controlled autonomous ships of the future. The new technology has been developed for navigation systems and ship autopilots, which steer ships automatically. The Apilot autopilot under development by VTT has three modes: track, heading and slow joystick control e.g. for docking situations. In the 'track mode,' Apilot steers the ship along a previously agreed route. If the ship detects another vessel, which must be avoided, the autopilot switches to 'heading mode.' This enables Apilot to avoid the other vessel with a small change in the ship's heading. Autopilot returns to track mode after the other vessel has been avoided. In the 'joystick mode,' control and propulsion equipment are adjusted to low speeds maneuverings.

www.vtt.fi

NaviPlanner: A New Formula for Voyage Planning

Aiming to change the way mariners manage back of bridge systems, Nautisk has developed NaviPlanner, an integrated end-to-end voyage planning solution which utilizes touch-screen functionality and uses cloud technology based on the Microsoft Azure platform.

"NaviPlanner is designed to make the operational task of planning and managing voyages a simpler, more effective process, from start to finish," said Kjetil Bentsen, Head of Nautisk's product development and technical team. "Using compliant navigational chart data and digital publications, NaviPlanner allows bridge officers and shore-based staff to utilize the latest in navigation technology whilst being assured that all data is up to date and compliant. Using big data, crowdsourcing and machine learning we are able to create the most innovative voyage planner to date."

www.nautisk.com

Photo: Nautisk

Real-time Maritime Tracking

exactEarth Ltd. launched exactView RT powered by Harris (exactView RT) – a persistent real-time Satellite AIS service. exactView RT consists of a system of more than 60 maritime satellite payloads, designed, built and operated by Harris Corporation which are hosted onboard the Iridium NEXT constellation of satellites. TInitially, the system is tracking more than 250,000 AIS-equipped vessels around the world including Class B AIS device transmissions utilizing exactTrax technology.

www.exactearth.com
www.harris.com

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HII
Hicks


HII
Shawcross


HII
Southall


HII
Davis


ZIM
Glickman


Liquid Robotics
Nightengale

Leadership Changes at Newport News Shipbuilding

Huntington Ingalls Industries (HII) announced several leadership changes at the company's Newport News Shipbuilding division. Lucas Hicks has been promoted to vice president of construction for the aircraft carrier John F. Kennedy (CVN 79), and Charles Southall has been promoted to vice president of engineering and design. Southall succeeds Jennifer Boykin, who previously served in the role before being named president of Newport News Shipbuilding. Mike Shawcross, who currently serves as Newport News' vice president, CVN 79 and CVN 80 (Enterprise) aircraft carrier construction, will lead the Enterprise and CVN 81 programs. The changes are effective July 1. Southall will report to Boykin; Hicks and Shawcross will report to Ken Mahler, Newport News' vice president, Navy programs.

HII's Davis to Lead Cyber Security

Ron A. Davis has joined Huntington Ingalls Industries (HII) as chief information systems officer (CISO). In this new role, he will lead the company's cyber security program with responsibility for ensuring the early identification of threats and risks and the implementation of controls and other processes and methods to protect information systems for the entire HII enterprise.

Glickman takes the Helm ZIM

Eli Glickman, 56, took office as the new President and CEO of ZIM effective July 1, 2017. Glickman is taking over from Rafi Danieli, who has been President & CEO of ZIM since 2009.

Balthasar President of Thermamax

Dirk Balthasar took over the management of Thermamax Inc., succeeding Markus Pratz who took the decision to leave the U.S.-based company at the end of 2016. The 49 year old will report in to Ralf Grosshauser who, as a member of the Board of Directors, continues to be responsible for the future development of Thermamax Inc. Balthasar joins from MAN Diesel & Turbo SE.

Nightengale CFO at Liquid Robotics

Caryn Nightengale, former Director of Corporate Development for Boeing Defense, Space & Security (BDS), has transitioned from her role at Boeing to join Liquid Robotics as Chief Financial Officer. In her new position, Caryn is responsible for the financial management, information technology, contracts and Global Trade Controls (GTC) departments. She will report directly to Gary Gysin, President and CEO.

Norautron Names Johannessen CEO

The board of Norautron Group AS has appointed Trond K. Johannessen as president and CEO, effective as of June 1, 2017. Johannessen comes from the position as CEO of Hatteland Display AS. In addition to his new role, Trond K. Johannessen will maintain his duties as CEO of Hatteland Display AS until further notice.

Fernback to Lead C-MAP

C-MAP announced that Sean Fernback has been engaged as Chief Executive Officer of Digital Marine Solutions Holding AS and the C-MAP Group.

Baltic Exchange Names Sykes CCO

The Baltic Exchange has appointed a new chief commercial officer; Janet Sykes, former head of communications at shipping services provider Clarksons Platou.

Espino Takes Over Gnostech

Current president of Gnostech Inc., James Espino, has acquired the controlling ownership of the company from Braxton Science & Technology Group (BSTG) on May 19, 2017.

Garry Joins Bouchard

Shawn Garry has joined Bouchard Transportation Co., Inc. as Vice President of Regulatory Compliance and Inspections, tasked with ensuring that the company achieves regulatory compliance and meets SubChapter M requirements.

Kenny to Take the BMT Helm

When BMT Group Ltd (BMT) current CEO Peter French retires in September, he will be succeeded by Sarah Kenny, who joins BMT on August 1.

Fincantieri, Eni Partner on Gas Transport Research

Italian shipbuilder Fincantieri and Italian energy company Eni will together work on projects for sustainable development and support the use of gas for transport. Fincantieri CEO Giuseppe Bono and Eni CEO Claudio Descalzi signed a Memorandum of Understanding (MoU) for cooperative research and development, including possible studies in the field of energy systems, with particular reference to the natural gas transport chain. The companies envisage potential partnerships in Italy and abroad, ranging from the liquefied natural gas (LNG) chain and to the natural gas transport chain, from to the exploitation of gas resources, to floating platform projects for offshore production and the evaluation of energy projects with a low environmental impact.

SCA Names McCreary Chairman

At its annual spring meeting in Washington, D.C. this week, the Shipbuilders Council of America (SCA), the national trade association representing the U.S. shipyard industry, named Richard McCreary of BAE Systems as the new chairman of the association.

Mathewson Joins FarSounder

FarSounder, Inc. announced that Michael Mathewson has joined the company in a newly-created position of Director of Global Sales.

Angelle Named BSEE Director

Former Louisiana state official Scott A. Angelle will head-up the U.S. Bureau of Safety and Environmental Enforcement (BSEE). Angelle, who most recently served as Vice Chairman of the Louisiana Public Service Commission, will assume his new position May 23.

Natoce Joins Marine Jet Power

Marine Jet Power, Inc. (MJP) announced that Douglas Natoce has joined the company as President and Regional Director responsible for the Americas.

Gullickson Joins EBDG

Stephanie Gullickson joins Elliott Bay Design Group's Seattle office as the Marketing Manager. She brings 12 years of experience within the maritime industry including management, marketing, sales, event planning and administrative support.

Dr. Dakuku: Egina FPSO for Nigeria

On a recent visit to South Korea to inspect the Egina FPSO project, an FPSO scheduled to arrive in Nigeria in August 2017, Director General of the Nigerian Maritime Administration and Safety Agency (NIMASA), Dr. Dakuku Peterside said the ongoing construction of the multi-billion dollar Egina Floating Production Storage and Offloading (FPSO) project will increase the knowledge base of NIMASA as a safety administration and enhance its regulatory capacity. The FPSO is being developed for deployment in the Egina oil field, located 150 km off the coast of Nigeria. The field is currently under development and production is scheduled to begin in 2018. The Egina Field when completed is expected to add 200,000 barrels per day to the National oil production by 2018.

HENSOLDT Acquires Kelvin Hughes

Kelvin Hughes has been acquired by HENSOLDT (formerly Airbus Defense Electronics) as a result of an agreement by its owners ECI Partners to sell its investment in the company. HENSOLDT, an independent sensor house, is a provider of radar and IFF systems on airborne, naval and land platforms. It comprises the security and defense electronics activities of the Airbus Group, which were spun off in 2017 and have now entered the market as a new sensor house under the brand name of HENSOLDT. Its flagship product, the TRS series represents a new generation of radar systems for naval and land platforms and offers a detection capability without equal together with AESA technology.

Thustmaster Expands Waterjets Team


Bouchard

Garry


BMT

Kenny


Fincantieri

Claudio Descalzi and Giuseppe Bono


SCA

L to R: SCA President Matthew Paxton with Rep. Hunter and Richard McCreary


NIMASA

Dr. Dakuku

Thrustmaster of Texas announced that Leonard Hill and Jason Hill have joined its waterjet team, bringing with them more than 65 years of experience in waterjet design, manufacturing and sales.

Damen Finalizes Takeover

Damen Shiprepair & Conversion (DSC), a part of Damen Shipyards Group, said it has finalized its acquisition of the Keppel Verolme shipyard from Keppel Offshore & Marine. The Verolme yard, located in Rotterdam's Botlek harbor, with three dry docks – the largest of which measures 405 x 90 meters – and almost 2km of quay capacity, will expand DSC's portfolio. DSC already operates eight repair and conversion yards in the Netherlands and another eight abroad.

LR Verifies BP FPSO Glen Lyon

The Glen Lyon floating production storage and offloading (FPSO) vessel, BP's newest North Sea asset, was awarded full-term classification certificates for service in the Schiehallion and Loyal fields, 175 km west of Shetland from Lloyd's Register.

Fincantieri Buys STX France

Fincantieri S.p.A. said it has signed a share purchase agreement for the acquisition of 66.66 percent of the share capital of STX France shipyard from its current shareholder STX Europe AS. The agreement entails a purchase price of €79.5 million ($89 million).

NorSea, Kongsberg Collaborate

A new company set up by NorSea Group to simplify logistics through digital technology, NSG Digital, has established a collaborative agreement with the Kongsberg Group. The two are now moving the development and deployment of their new product, NSG E2E, to Kongsberg's application platform Kognifai. With its new product, NSG Digital aims to simplify and enhance visibility and information sharing in supply chains. Through digital collaboration NSG E2E (End-to-End) will make cargo logistics more efficient and transparent.

Noble Drillship Gets a DP Upgrade

Noble Corporation plc has selected acoustically-aided inertial navigation technology from Sonardyne Inc., Houston, for its ultra-deep water drillship Noble Globetrotter I. The Marksman DP-INS system is being used to provide a high integrity, independent subsea position reference for the vessel's GE DP3 dynamic positioning (DP) system as it drills exploration wells in water depths up to 10,000 ft.

AkzoNobel Expands Research Facility

AkzoNobel completed the $3.5 million expansion of its U.S. research and development facilities in Houston. Carried out in phases over a period of three years, the investment in the site – which employs around 40 scientists – will support the company's Protective Coatings, Marine Coatings and Specialty Coatings businesses. Part of AkzoNobel's ongoing investments in its global RD&I activities, the Houston upgrade follows an investment of $ 14.2 million in a research and innovation hub in Felling, U.K., announced earlier this year.

Speedcast, COMSAT Partner

Speedcast International Limited signed an agreement with COMSAT to establish a common global service offering of Ku-band very small aperture terminal (VSAT) services for the government and maritime markets. The combined network will leverage Speedcast's greater than 8 GHz of global satellite capacity and COMSAT's security-cleared teleports in the United States to deliver a robust, secure network for customers needing advanced, resilient connectivity for critical operations.

First Wireless Network at Sea

Norway has become the first nation to implement maritime broadband communication on ships and planes in public service, enabling exchange of information that can be crucial in limiting damage when accidents occur. Kongsberg Seatex and Radionor have teamed up to develop Maritime Broadband Radio (MBR), which the Norwegian companies say is, in contrast to previous systems, highly stable and has extensive reach.

Among other capabilities, MBR also enables streaming of HD-video.

MBR does not require an internet connection to connect units in the network, though it is possible to transfer data from the network using Internet.

The Coastal Administration and NOFO (Norwegian Clean Seas Association for Operating Companies) are the first in the world to deploy the Norwegian-developed and produced innovation. The Coastal Administration will install MBR on all its oil recovery vessels, and on 10 additional vessels with oil recovery equipment on board. NOFO will do the same with all its oil recovery vessels.

MBR is already installed on the surveillance aircraft LN-KYV, a joint initiative between the Coastal Administration, NOFO and the Norwegian Coast Guard.

BUYER'S DIRECTORY

This directory section is an editorial feature published in every issue for the convenience of the readers of MARITIME REPORTER. A quick-reference readers' guide, it includes the names and addresses of the world's leading manufacturers and suppliers of all types of marine machinery, equipment, supplies and services. A listing is provided, at no cost for one year in all issues, only to companies with continuing advertising programs in this publication, whether an advertisement appears in every issue or not. Because it is an editorial service, unpaid and not part of the advertisers contract, MR assumes no responsibility for errors. If you are interested in having your company listed in this Buyer's Directory Section, contact Mark O'Malley at momalley@marinelink.com

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Euro Marine Ltd., 1314 E. Las Olas Blvd. Suite 1024, Fort Lauderdale, FL , USA , tel:(954) 663-2821, info@pi-65.com contact: Bill Rigby, www.euromarineltdpatrolboats.com

ANCHORS & CHAINS

Anchor Marine & Supply, INC., 6545 Lindbergh Houston, Texas 77087 , tel:(713) 644-1183, fax:(713) 644-1185, david@anchormarinehouston.com

AUTOMATIC SELF-CLEANING FILTERS

Forsta Filters, 8072 San Fernando Road, Sun Valley, CA , USA

BARGE FABRICATION

McDonough Marine Service, 3500 Causeway Blvd., Suite 900, Metairie, LA , USA , tel:(504) 780-8100, fax:(504) 780-8200, pstant@marmac.net

COMMUNICATIONS

David Clark Company (Wireless Headset Communication Systems), 360 Franklin Street, Worcester, MA 77060, USA , tel:(800) 298-6235 , www.davidclarkcompany.com/marine

CORDAGE

Helkama Bica Oy, Lakimiehenkatu 4, KAARINA FI-20780, Finland , tel:+358-2-410 8700, sales@helkamabica.fi , www.helkamabica.com

CRANE - HOIST - DERRICK - WHIRLEYS

DMW MARINE GROUP, LLC, 1123 St. Matthews Rd Chester Springs, PA 19425 USA , USA , tel:(610) 827-2032, dw@dmwmarinegroup.com contact: Doug Weidner, dmwmarinegroup.com/

CYBER SECURITY

Gnostech Inc., 650 Louis Drive, Suite 190, Warminster, PA , tel:(215) 443-8660, sales@gnostech.com , www.gnostech.com

DECK MACHINERY- CARGO HANDLING EQUIPMENT

Allied Systems Company, 21433 SW Oregon Street, Sherwood, OR 23462, USA , tel:(503) 625-2560, cranes@alliedsystems.com, www.alliedsystems.com

JonRie InterTech, LLC, 982 Whispering Oak Circle, Manahawkin, NJ , USA , tel:(609) 978-3523, bjdme@marinewinch.com contact: Brandon Durar, www.marinewinch.com

DRILLS

Hougen Inc., 3001 Hogan Drive Swartz Creek, MI 48473

DRY DOCK TRAINING

DM Consulting, 12316 Dormouse Road, San Diego, CA 92129, USA , tel:+1 858-705-0760, joe@drydocktraining.com

EDUCATION

San Jacinto College, 8060 Spencer Highway Pasadena, TX 77505

FILTRATION

Harmsco, 7169 49th Terrace Place Riviera Beach, Florida 33407

FIRE FIGHTING

In-Mar Systems, 3011 S Ruby Avenue Gonzales, LA 70737 USA , tel:(225) 644-7063 ext 11, glynn@inmarsystems.com contact: Glynn Grantham, www.inmarsystems.com

FUEL TESTING/BUNKER SURVEYS

Seahawk Services, 1501 Grandview Ave, West Deptford, NJ , USA

FUEL TREATMENT

Advanced Power Systems / Fitch Fuel Catalyst, 18 Hemlock Drive New Hartford, CT.06057 , USA , tel:860-921-0009, info@fitchfuelcatalyst.com , www.fitchfuelcatalyst.com

GLASS

Garibaldi Glass, 8183 Wiggins Street, Burnaby, BC. V3N 0C4 , tel:604.420.4527, fax:604.421.7678, duaner@garibaldiglass.com contact: Duane Rose, garibaldiglass.com

GROUNDING & EARTHING BRUSHES

Sohre Turbomachinery, Inc., 128 Main Street, Monson, MA , USA , tel:413-267-0590, fax:413-267-0592, tsohre@sohreturbo.com contact: Tom Sohre, www.sohreturbo.com

HYDRAULIC SYSTEMS

Bay Ship & Yacht Co, 2900 MAIN ST. #2100 ALAMEDA, CA 94501 USA , tel:(510) 337-9122, rmaguire@bay-ship.com or ndelgavio@bay-ship.com contact: Richard Maguire or Nick Del Gavio, www.bay-ship.com

LIFESAVING EQUIPMENT

CM HAMMAR AB, August Barks Gata 15 SE-421 32 Västra Frölunda (Gothenburg), Sweden , tel:+46 31 709 65 50, info@cmhammar.com , www.cmhammar.com

LIFT EQUIPMENT

Kleeco, 10110 S. M43 HIGHWAY Delton, MI 49046

Lifting Gear Hire, 9925 Industrial Drive Bridgeview, IL 60455 , tel:708 598-4727 ext 111, christina.Czeszewski@lgh-usa.com

Tandemloc, 824 Highway 101(FONTANA BLVD) HAVELOCK, NC 28532

MARINE TRANSPORTATION

Central Boat Rentals, Inc., P.O. Box 2545, Morgan City, LA , USA , tel:985-384-8200, fax:985-384-8455, earl@centralboat.com or gary@centralboat.com

MARITIME TRAINING & SCHOOLS

Chesapeake Marine Training Institute, 3566 George Washington Mem. Hwy, Hayes, VA , USA , tel:(804) 642-0123, fax:(804) 642-1743, information@chesapeakemarineinst.com , www.ChesapeakeMarineInst.com

El Camino College, 13430 Hawthorne Blvd., Hawthorne, CA , USA , tel:(310) 973-3147, psutton@elcamino.edu

MECHANICALLY ATTACHED FITTINGS (MAFS)

Viega, Mountain View Corporate Center Building 1, Suite 395 12303 Airport Way, Broomfield, CO , USA , tel:904-315-3899, fax:888-782-6188, paul.switzer@viega.us contact: Paul Switzer, www.viega.us

MILITARY PATROL CRAFT MANUFACTURERS

Brunswick Commercial & Government Products, 420 Megan Z Avenue, Edgwater, FL 80204, USA , tel:(386) 423-2900, kelsey.nemeth@whaler.com , www.brunswickcgp.com

Tampa Defense USA, 4350 62nd Avenue North, Pinellas Park, FL , USA , tel:(813) 792-2114 / (813) 843-8737, robert.stevens@tampa-yacht.com

MONITORING SYSTEMS

SPM Instrument, Inc., 780 Bailey Hill Rd. Suite #3 Eugene, OR. 97402 , USA , tel:541-687-6869, info@spminstrument.com , www.spminstrument.com

NAVAL ARCHITECTS, MARINE ENGINEERS

3GA Marine, 208-1497 ADMIRALS RD VIEW ROYAL, Victoria BC Canada V9A 2P8

Bristol Harbor Group / The Shearer Group, 99 Poppasquash Road, Unit H, Bristol, RI , USA , tel:(401) 253-4318, fax:(401) 253-2329, gbeers@bristolharborgroup.com contact: Greg Beers, www.bristolharborgroup.com / www.shearer-group.com

Brunswick Commercial & Government Products, 420 Megan Z Avenue, Edgwater, FL 80204, USA , tel:(386) 423-2900, kelsey.nemeth@whaler.com

Gilbert Associates, 100 Grossman Dr. Suite 205 Braintree, MA 02184 USA , tel:(781) 740-8193, jgilbert@jwgainc.com contact: John Gilbert, www.jwgainc.com

JMS Naval Architects, 70 Essex Street, Mystic, CT , USA , tel:(860) 536-0009 EXT 2, fax:(860) 536-9117, RickF@JMSnet.com contact: Rick Fernandes, www.JMSnet.com

PAINTS AND ANTI FOULANTS

Sherwin-Williams, 101 W. Prospect Avenue Cleveland, OH 44115 , tel:(216) 515-4739, klarmstrong@sherwin.com contact: Kim Armstrong

PIPING INSTALLATION AND SERVICES

Tube-Mac Piping Technologies Ltd., 853 Arvin Avenue Stoney Creek, Ontario , tel:(905) 643-8823, fax:(905) 643-0643, sean.kennedy@tube-mac.com

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PROPELLERS

Hale Propellers LLC, 2 Custome Drive Old Saybrook, CT. 06475 USA , tel:860-399-4600, r3@halepropeller.com contact: Randy Hale, www.halepropeller.com

PROPULSION CONTROL SYSTEMS

BAE Systems - HybriDrive Solutions, 1701 North Street, Endicott, NY , USA , tel:(607) 770-2083, carol.gorenflo@baesystems.com

SEALS

Seco Seals, Inc., 1370 Logan Ave. Unit K, Costa Mesa, CA , USA , tel:(714) 546-3478, sales@secoseals.com contact: Jim Scott, www.secoseals.com

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In-Mar Solutions, LLC, 3011 S Ruby Avenue Gonzales, LA 70737 USA , tel:(225) 644-7063 ext 15, toby@inmarsolutions.com contact: Toby Whitfield, www.inmarsolutions.com

The Springfield Marine Company, 1093 N. Cynthia Drive, Suite #1 Nixa, MO 65714

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Blohm+Voss GmbH, Hermann-Blohm-Strasse 3 20457 Hamburg Germany , tel:+49 (0) 40 3119 1400, shipservices@blohmvoss.com , www.blohmvoss.com

St. John's Ship Building, 560 STOKES LANDING ROAD Palatka, Fl. 32177 , USA , tel:386-328-6054, sganoe@stjohns-ship.com contact: Steve Ganoe, www.stjohnsshipbuilding.com

SHIPYARDS

Grand Bahama Shipyard Limited, P.O. Box F-42623, Freeport, Grand Bahama , Bahamas , tel:+1 242-350-4000, enquiries@gbshipyard.com

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Marine Mechanic

Marine Mechanic
Salary: $ $38.37 - $51.61 per hour , Full Time
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Job Location: 60 Washington Ave Bremerton, WA, 98337 United States
Contact
Human Resources Associate
Email: stephaniem@kitsaptransit.com
Work Phone : 360-475-0211
60 Washington Ave Bremerton, WA, 98337 United States
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Contact Tony Fax # (504)328-0470,
Ph # (504)909-4770
e-mail: Tony@transatlanticlines.com

Fleet Manager

Keystone Shipping Co.
Full Time
Job Location: One Bala Plaza East Suite 600 Bala Cynwyd, PA, 19004 USA
Contact
Email: cdoyle@keyship.com
One Bala Plaza East Suite 600 Bala Cynwyd, PA, 19004 USA
Description:
Keystone Shipping Co. is looking for an experienced, self-motivated, and hands-on maritime professional to fill the position of Fleet Manager in their Duluth, MN office. This position is responsible for the overall operational management of 9 self-unloading bulk carriers operating on the Great Lakes.
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Port Enginer

Keystone Shipping Co.
Full Time , Engineer
Category: Engineer / Naval Architect
Job Location: One Bala Plaza East Suite 600 Bala Cynwyd, PA, 19004 USA
Contact
Email: cdoyle@keyship.com
One Bala Plaza East Suite 600 Bala Cynwyd, PA, 19004 USA
Description:
Job Responsibilities to include but not limited to:
• Overall engineering management for the vessels assigned, including operation, maintenance, repair, condition and certification.
• Schedule and manage voyage repairs, drydockings, and winter layup maintenance and repair periods, including requisitioning and procurement of material and services.
• Insure that vessels for which s/he is responsible are fully certificated and documented, and shall coordinate required vessel inspections by regulatory body inspectors.
• Preparation of annual budgets for spare parts, voyage repairs, major repairs and special expenditures and the fiscal management of assigned vessels within the approved budgets.
• Be thoroughly familiar with the operational status, condition of hull and all equipment aboard each of his/ her vessels.
• Overseeing the technical aspects of the engineering operation of assigned vessels. In this capacity, the Port Engineer shall work closely with senior officers and provide technical advice to the vessels and other shoreside departments when necessary.
• Monitor the engineering performance of vessels and make recommendations for improvements and modifications to the Chief Engineers and company engineering management.
• Undertake additional assignments as directed by the Vice President of Engineering.

Chief Radio Electronics Technician

Military Sealift Command
Salary: $ $59,426 , Full Time , Mid Career
Category: Vessel Operations
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Title, Series, Grade (Code) Chief Radio Electronics Technician WM-9995-10 (210)
Base Salary: $59,426 Per annum
Type of Appointment: Excepted Service Career-Conditional
Opening Date: February 29, 2016
Closing Date: Open continuously with periodic cut-offs
Duties:
Able to obtain and maintain a Top Secret Security Clearance. Fully proficient with operating radio cryptographic equipment. The incumbent must be skilled in interpretation of electronics technical manuals, drawings, specifications and schematic drawings. Required to observe all safety rules and take appropriate precautions to ensure personal safety and safety of co-workers. Incumbent may be assigned as the department tag out/lock out coordinator. Proficient in the performance of shipboard emergency drills, and working aloft.
If you require technical support, please use the support tab located in the top right corner of the Start the Process page www.sealiftcommand.com/start-the-process. This will generate an email a message for you to submit your issue. Emails will be responded to during business hours M-F 0800 – 1700 CST. If you have any questions regarding the position or to follow up on an application submitted, please email us at civmar@sealiftcommand.com or call us at (757) 341-4610 or (757) 341-4611, or our toll-free recruitment hotline at 1-877-562-7672 during the hours of 0700 to 2000 EST.

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