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MARITIME REPORTER AND ENGINEERING NEWS

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July 2016

Is maritime ready to leverage the reward while managing the risk of

DRONES

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The 'Paperless' Ship

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Subchapter M Arrives

Panama Canal
Assessing Risk & Reward

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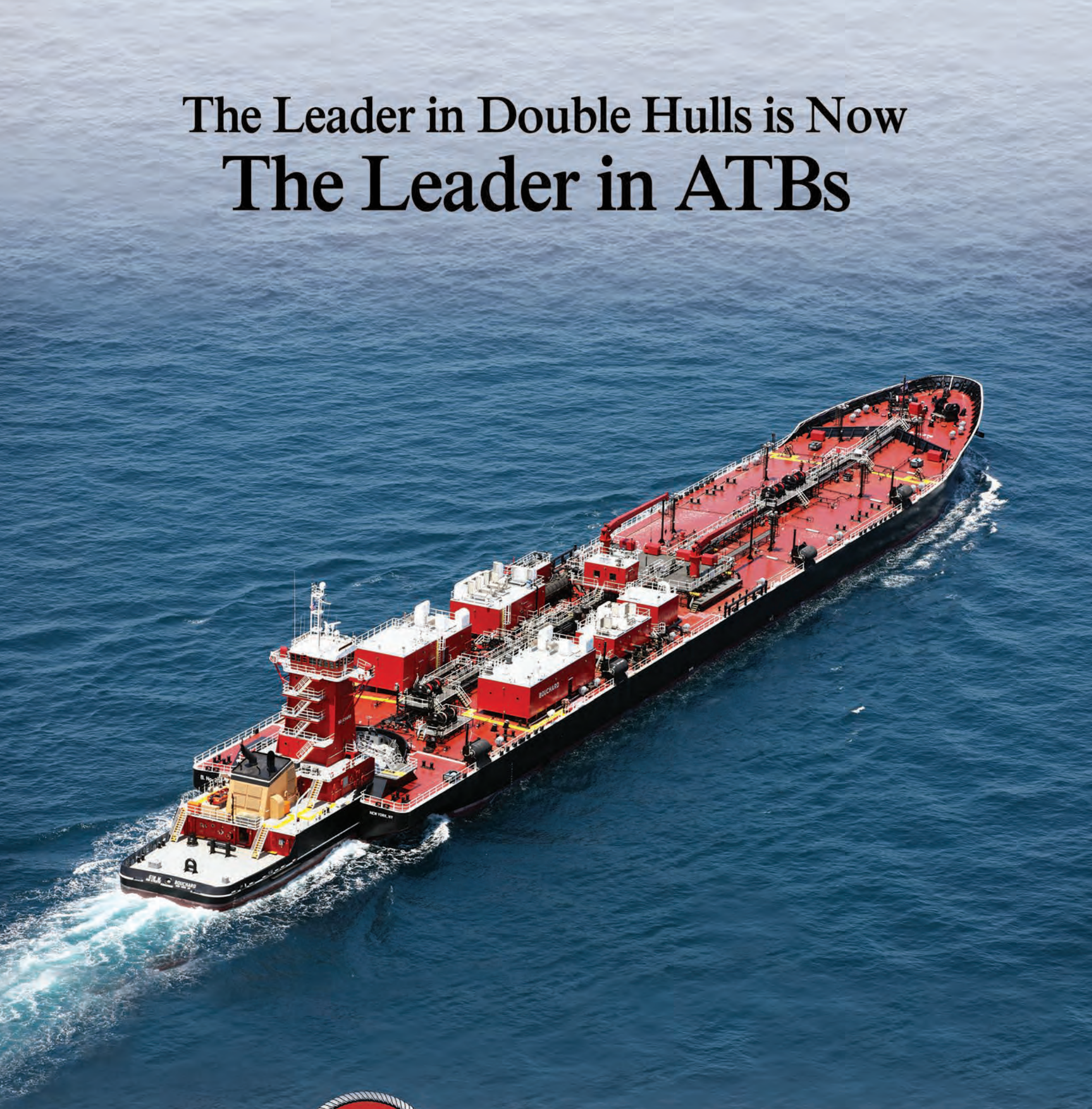

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Canadian Coast Guard

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Panama Canal Aurhority

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(Photo: iStock.com/Bestgreenscreen)

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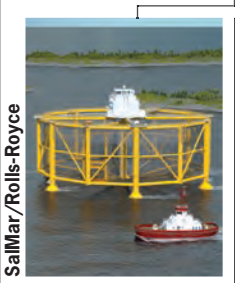
As aerial drone technology matures, everyone from shipowners to shipbuilders to classification societies seek to leverage the rewards. The big question: Is maritime ready to manage the risks?

By Sean T. Pribyl


Credit: Pat Folan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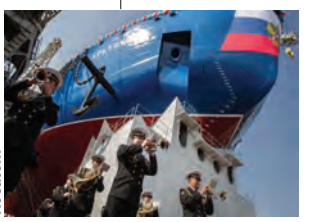
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GREG TRAUTHWEIN, EDITOR & ASSOCIATE PUBLISHER

Ask anyone who knows me, I love to eat fish. Most any variety, most any time, I'll eat fish. Unfortunately though, if you're stuck with me on the water and hungry, I'm not the one you want manning the fishing pole. Despite a lifetime of trips and countless advice from my brother Rick – the brother who decidedly received the majority of 'outdoorsman genetics' in our family – fish basically laugh at me. Perhaps subliminally this is why I was so keen to work to feature innovation and investment in the commercial fishing sector this year, both in this title and in sister-publication *MarineNews*, as I am solidly dependent upon the professional men, women and boats of the world's fishing industry to keep well-fed.

"Give a man a fish and you feed him for a day; **teach a man to fish and you feed him for a lifetime."**
Philosopher Maimonides

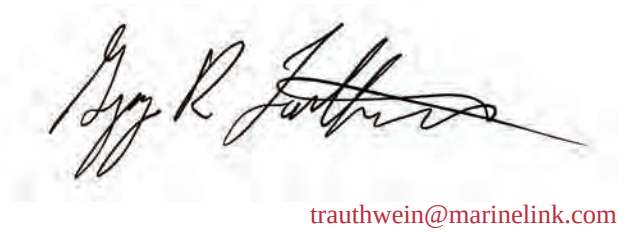
Source: www.brainyquote.com

This month is Part III of our Fisheries Fleet Review authored by **William Stoichevski**, our contributor seated in Oslo. Part of William's mandate this year has been to scout emerging fishing fleet investment from around the world, and as it turns out the July edition is in his own backyard, entitled 'Buying Norwegian,' starting on page 36. Investment and innovation in the world's fishing fleet has been unlike any I've seen since first sitting in this seat in 1992, as there seemingly has been a global mandate invest in new means to catch and bring to market food from the sea. Case in point is the burgeoning business of 'fish farming' and the development of the world's first offshore rig farm (page 38). Also, fishing fleet investment has been the mandate of the Vietnamese government, courtesy of its "Directive No. 67," a mandate which has resulted in significant investment in new commercial fishing tonnage, such as fisherman **Bui Mong** brand new fiberglass boat Ju Mong Truong Sa powered by Cummins diesel engines, featured on page 40.

But innovation in the maritime sector is surely not relegated to the booming fishing vessel market, as the cover of this month's edition will surely attest. Let me start by saying that this certainly wasn't planned to be the "Drone" edition, but in publications as in life, opportunities arise that simply can't be missed. The attorney of Blank Rome have been long-time and valued contributors to our pages, and this month **Sean T. Pribyl** came to us with an article regarding the risk and reward of aerial drone operations in the maritime sector that was an instant hit. Many of my conversations traditionally center on the incorporation of emerging technologies, and while the maritime sector is generally regarded as conservative in its adoption of new technologies, the sector is also quite 'thrifty,' and when it comes to saving money or generating revenue no stone is left unturned. Insights on how drones are starting to be deployed by shipowners, shipbuilders, classification and the offshore industry starts on page 22.

But drones in and of themselves really are just the tip of the iceberg, as in the big picture ... call it what you will, *'Big Data'* or *'The Internet of Things'*... it is the collection, analysis and ultimately the deployment of of actionable information that is the driving force in today's maritime industry.

This edition is packed with articles on how successful companies are using information to make their operations safer, more efficient and more profitable. Information will feed you today; learning to leverage this information to improve your business and open markets will sustain you for a lifetime.



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Bandwidth Supply

Can Bandwidth Supply Keep up with Maritime Demand?

BY CHRIS INSALL

(Credit: Intelsat)

The launch of Intelsat EpicNG 29e in January 2016. This is the first of the Intelsat EpicNG class satellites.

The Author

Chris Insall's responsibilities include complete lifecycle support of Intelsat's maritime solutions. He has more than 20 years' experience in the telecommunications industry.

In the next few years, demand for bandwidth on the high seas will grow, in no small part due to technology that is making operations more efficient and keeping crews and passengers healthy, happy and connected. Just a few years ago, a cruise-going family might have brought a single laptop computer and maybe a cell phone aboard. Today, cruise companies find that the average family shows up with 10 connected devices. And within the commercial maritime sector: crew members, away at sea for months at a time, are hungry for a robust connectivity experience to stay in touch with family and friends.

As our survey of maritime operators with the research firm Futurenautics found, in the next two to three years, there will be a 60 percent increase in ship-to-shore traffic. This demand for satellite bandwidth is being driven by a number of factors:

- The development of VSAT antennas for ships has led to a shift away from traditional L-band connections and to higher-throughput Ku- and Ka-band satellite services. The same Futurenautics survey found that 57 percent of shipping companies have VSAT solutions fitted on their vessels.

- When there is a VSAT solution on board, it always becomes the primary means of communication, with the slower L-band used as a backup.

- Crews are now demanding high-speed Internet connections. In the same survey, 72 percent of crew members said the level of connectivity provided on board is a factor in choosing to work for a ship operator.

- And crews want high-speed connections, with 73 percent saying that the minimum acceptable connection speed for a crew Internet service is 512Kbps.

- Ship operators are increasingly investing in big data analytics to optimize operational efficiencies and cut costs.

- In the future, a network of sensors built into the engines and other operating systems of new-build vessels will enable ship owners to capture a range of information (such as Voyage Data Recorder feeds) as well as on-board equipment and cargo status data – requiring even more bandwidth.

Some have suggested that competition from 4G cellular, microwave connections, "internet balloons" and other technologies that support near-shore activities would eat into the maritime business of satellite operators.

At Intelsat, we have experienced the opposite. The more these alternative technologies are deployed, the more end users exploit the growing range of IP technology. Then, when a vessel or rig moves out of range of these on-shore services, the operator has to support up to demand they had to before – and satellite satiates the need. When it comes to maritime communications, at Intelsat, our primary goal is to provide our customers and their end users at sea with seamless bandwidth throughout their passage, wherever they may be.

To that end, our Intelsat EpicNG constellation and associated network is fully compatible with existing Ku-band hardware, networks and terrestrial technology, and is capable of handling increases and spikes in bandwidth demand as a matter of course. So, can bandwidth supply keep up with all this maritime demand? We certainly think so.

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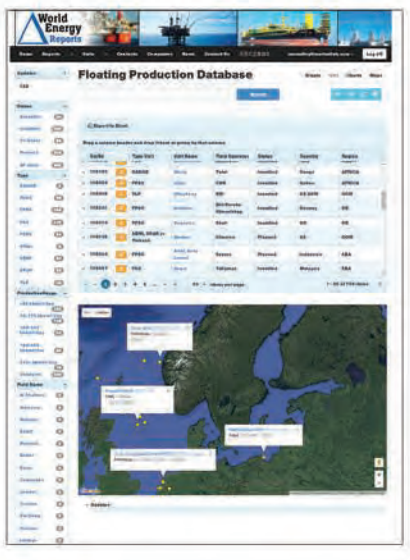

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Apocalypse Now ...

U.S. Merchant Marine Academy Abruptly Cancels Sea Term

JOSEPH KEEFE

I have followed the ongoing drama at the nation's only federal maritime academy for some time and covered those events closely within my publications over the past 10 years or so. Even so, I must admit that I was taken aback when I read that the U.S. Maritime Administration had cancelled the sea term for an entire section of Kings Point midshipmen, just days before these future mariners were about to be sent out to sea.

Standing Down

In a prepared statement, the DOT's maritime arm said simply, "While the Department of Transportation (DOT), the Maritime Administration (MARAD), and the United States Merchant Marine Academy (USMMA) have made consistent efforts to address sexual assault and sexual harassment on campus over the last few years, we've grappled with appropriate means of extending these efforts during "Sea Year" when the Midshipmen are off campus training on working U.S. merchant marine vessels. The safety of these young women and men are our highest priority, and the USMMA is standing down having Midshipmen serve on these vessels until it is assured that their training will be carried out in a safe environment."

I next reached out to the U.S. Maritime Administration itself for comment on the decision to suspend sea training. I received in return, a prepared statement attributed to Marad Chief Chip Jaenichen, who said, "There is no specific incident prompting this action. Sea Year is a unique situation for these young men and women, and we believe there continues to be a need to address the culture onboard vessels to better ensure Midshipmen are in an environment that is both safe and respectful. This is not just about Sexual Assault/Sexual Harassment, but an effort to ensure the Sea Year is an appropriate training and work environment for the Midshipmen."

The one common denominator that I hear from most parties is that "the timing of such a move is curious." Indeed. Why now and why not six months ago? That's the $60,000 question. As Marad plans a June 24th 'Call-to-Action' with the maritime industry to address among other things, the safety of Kings Point students, they also say that they have begun to develop a comprehensive plan that protects the Midshipmen. At the same time, they insist that 'every effort' is being made to ensure an on-time graduation for affected students.

Another USMMA note advises, "Midshipmen go out to Sea Year in waves and the first group of 33 from the Class of 2019 were scheduled to depart by June 25. These students will remain on campus until the resumption of Sea Year activities. Midshipmen currently at sea will disembark when they reach their next port, and return to their homes to complete their sea year project. The Academy will bear the travel costs."

Since that time, MarPro has been advised that not all students are being recalled from all merchant vessels. If true, then apparently, some midshipmen are in danger on certain vessels, while others are deemed safe. And Marad itself confirmed that some students will remain in place, despite the "stand down." It doesn't seem to me that you can have it both ways: they're either all safe, or nobody's safe.

A Broad Stroke

The June 24 'Call to Action' also promises to be an interesting event. It could also be rancorous. If I'm a U.S. shipping company executive and I'm not on the short list of U.S. flag vessel operators taking a subsidy, I think I'd be tempted to tell Marad where they could take their requests for ship billets in the future. That's because any time the issue(s) of sexual harassment, student safety and even assaults enter any discussion, the implication of risk for all players involved – including the shippers themselves – becomes very real. And, if there is one thing a domestic, Jones Act ship operator doesn't need, well; that's another legal issue.

Commercial shipping involves a certain amount of risk. Operators spend much of their waking hours trying to limit or mitigate risk. Better yet, completely eliminating risk is an even more desirable outcome. Off the top of my head, I can think of one way to eliminate one piece of risk from this equation altogether.

The Marad / USMMA decision by default paints the entire domestic shipping industry with a broad stroke; and not a very flattering one, at that. It questions the quality of training given to cadets; it questions the collective safety of these students and it reflects a lack of trust in the professionals who currently sail in a licensed mode aboard U.S. flag tonnage. It also calls into question the future of this training routine, something that has been a staple of countless future American mariners for more than a half century. To be fair, Marad isn't the only entity that's concerned.

Rethinking Cadet Training?

From yet another industry stakeholder, I got the following advice: "Exclusively unsupervised training has been a bad idea from its inception. Perhaps USMMA is straining to get leverage for operating their own training ship. The biggest impediment to effective education and training there has been MARAD. Nonetheless, the disturbance to those cadets on board vessels will be very hard to correct. Not to mention the teaching schedules on campus. Maybe MARAD is angling to shut down the place. This could do it." I found the idea that cadet shipping being equated to "unsupervised training" to be a novel point of view, especially given my experiences as a cadet and the time-honored tenet that cadets who shipped out on merchant vessels get a better education than those who go out on the state maritime academy training ships.

That's exactly what they told us in the late 1970's: Don't you know that those Kings Point kids were going to come out ahead of us when we graduated in 1980. At Mass. Maritime, there were limited cadet berths on real merchant ships back then. We got what Kings Point didn't use (and those we could get to before the other state schools could snap them up). And, they were coveted assignments. MMA doled them out strictly as a function of (a.) grade point average and (b.) disciplinary records. I made the list for my senior sea term only when two deck cadets ahead of me were abruptly dropped from the roster because of Captain's Mast infractions. I jumped at the unexpected opportunity. That summer on a West Coast VLCC running back and forth to Valdez, AK was a wonderful experience. But now, I'm being told that maybe this is no longer a good idea. Go figure.

"… the USMMA is standing down from having Midshipmen serve on vessels as part of Sea Year training until adequate measures are instituted that ensure they can work and train in an environment that is both safe and respectful … Effective learning can only take place when men and women feel safe and secure in a supportive environment." That's what Marad believes. I certainly agree with the last part. That said; I don't think there is any way to ensure that everyone is

safe in every environment, every day, on every ship. It just isn't going to happen, shipping companies can't guarantee it, and they'd be foolish if they did. Here's a wakeup call: It's a dangerous job, performed in a challenging environment. If it wasn't, ships wouldn't need SOLAS, ISM, MLC, STCW, Subchapter M and a dozen other safety-related acronyms.

The academy insists that "Sea Year is and will remain a core element of the Academy's academic program." That may well be. That said; I simply can't imagine what it will look like, on what platform(s) that training will take place, and when that will happen. Because, if anyone thinks that a meeting on 24 June between stakeholders and Marad is going to solve anything in a New York minute, then I want in on whatever brand of Chardonnay they are gulping. If these cadets go back to sea on the same vessels they've just been removed from any time soon, it will be business as usual at sea – for everyone – with one small caveat.

Imagine just one potential outcome for U.S. flag shipping in the wake of the big summit on the 24. The meeting now concluded, shippers and Marad agree: the cadets will be safe and protected. The memo(s) go out, fleet wide, admonishing all personnel to act appropriately and warning of the consequences if they do not. The professional mariners, upon receiving this advice, endeavor to never speak or interact with any cadet, ever again, for fear of being accused of something that they did not do. Indeed, the old preschool teacher rule will now be in place: Never allow yourself to be alone in a room with children unless there is another adult in attendance. Now, imagine how much learning will take place.

Separately, and although only loosely related to what is now transpiring at Kings Point, I also had the pleasure some time ago to attend a Women on the Water (WOW) event at the Academy. There were mentoring sessions and many of the academy's female students attended, along with a fair number of KP alumnae. It was a terrific event; well organized by passionate people and it brought value to the campus. Sitting in on a talk / Q&A on the challenges of going to sea as a woman, I found myself next to a woman who, as it turned out, had graduated from the school, many years before. I asked her what she thought of the program. She paused and then answered carefully after a moment, "I look forward to a time when these events are no longer necessary." It occurred to me today that – at least at Kings Point – she is likely to be sorely disappointed, for a long, long time.

The Apocalypse

Unfortunately, it really doesn't matter what will happen on June 24. The damage – call it net impact if you want to soften the dialogue – has already been done. Meanwhile, don't worry about the dozens of midshipmen confined on campus awaiting the edict of the U.S. Maritime Administration on the future of professional mariner training. That's because, the 'plan of the week' on campus is an eye opener.

On tap for the USMMA educational experience are the following topics: Command Climate, Bullying, Hazing, Retaliation & Reporting, Moral Relativism, Authentic Personhood, and Humanities. These will all come in handy on that day in the not-too-distant future when the 0.2 mile CPA target is moving towards our future mariners at a relative speed of 45 KT. The Peanuts movie and a waterfront bonfire cap the festivities nicely. Yep, the apocalypse is truly upon us.

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Brownwater Vessels

A Renewed Focus on Safety and Preparedness

DAMON VAUGHAN

Weather Channel Forecasters are predicting a "near-average" hurricane season for 2016, but warn that an average season does not mean businesses and residents shouldn't prepare for the worst. While it is unclear whether the season, which began June 1, will bring about a few mild storms or a catastrophic Category 5 hurricane, one thing is for sure: safety and preparation are on the radars of the owners and operators of brownwater vessels.

Although forecasters consider this year's predicted 12 named storms "average", one only has to look back to 1992 when one of six predicted named storms that year was Hurricane Andrew, which left 65 dead and pummeled Florida to the tune of $25 billion, according to the National Hurricane Center.

In this article, we examine how the maritime industry, particularly the brownwater sector, is making strides in the areas of preparedness and safety – whether their risk exposure involves a threatening hurricane on the horizon, an older vessel with specific risk characteristics, or a new crew member, who may be a little wet behind the ears.

In recent years, improvements have been made in all areas of safety as vessel owners and operators have embraced the fact that high safety standards protect not only the lives of their crew and the seaworthiness of their vessels, but also – their bottom lines. Tougher regulatory standards as laid out in the U.S. Coast Guard's recently released final Subchapter M regulation, advancements in crew training, and formalized safety procedures are changing what safety and preparedness mean for the brownwater industry.

A New Regulatory Standard for Safety

Making headlines in brownwater safety is the U.S. Coast Guard's Subchapter M final rule, just released but many years in the making. The regulation, imposes safety inspection requirements on tugboats and towboats.

The regulation stems from a 2004 safety directive by the U.S. Congress to the Secretary of Homeland Security due to accident and injury rates. From 2002-2013, towing vessel accidents were responsible for 18 deaths and 37 reported injuries a year on average, according to the Federal Register notice. Those fatalities, while tragic, also cost the industry nearly $165 million; the injuries led to another $25 million in expenses. Additionally, during the same time period, the industry experienced incidents that led to property damage with a total price tag of more than $50 million.

The regulatory call for a "full safety inspection of towing vessels," was in part the result of two specific unfortunate incidents, which led to 19 deaths. The first incident occurred off South Padre Island, Tex., where a towing vessel hit a bridge causing it to give way and kill five. The following year, another tragic incident occurred when a towing vessel cruising on the Arkansas River hit a highway bridge in Weber, Okla. killing 14.

As a result, the new rule proposed in 2011, and finally refined this June after taking industry comments into consideration, creates a "comprehensive safety system that includes company compliance, vessel compliance, vessel standards, and oversight in a new Code of Federal Regulations subchapter dedicated to towing vessels."

All U.S. towing vessels over 26 feet or those carrying oil or hazardous cargo are subject to the new safety requirements. In addition to the rules for inspection, the regulation also lays out new standards for "design, construction, equipment and operating of towing vessels." The Coast Guard will require retrofits, new propulsion systems, electrical, steering, and navigation systems among other things. Older vessels are given exception to some of these requirements through a grandfather provision. In all, the new regulation is expected to impact more than 5,000 tow boats and initially cost the industry more than $15 to $26 million per year, according to the Federal Register notice.

While the cost of this regulation may seem high initially, it will also lead to cost-saving benefits including: reduced risk exposure to accidents for these vessels, as well as less congestion on waterways and fewer delays, both of which often lead to business interruption and lost productivity. As a result, this uniform safety benchmark for these vessels should greatly benefit tug owners and the entities with whom they contract, not to mention those who insure them as there will be far greater transparency related to vessel condition.

Crew Training in Tandem with a Good Safety Plan

Another aspect of safety on which smart brownwater owners and operators are increasingly focusing is crew training.

Training is key in many professions, but it is of particular importance to those who are in charge of the lives of others. Captain Chelsea Sullenberger has said his training was what he relied on as he piloted Flight 1549 to a safe landing on the Hudson River after a disastrous bird strike.

"We turned to our training, we made good decisions, we didn't give up, we valued every life on that plane—and we had a good outcome," Sullenberger told the Wall Street Journal.

For the maritime industry, crew training and hiring procedures have been garnering more attention over the past decade. In prior times, it was easier for crew members to get a job on a tug or tow vessel. Now, among other things,

It's Hurricane Season.

What's in Your Safety Plan?

If there was one positive outcome to the catastrophic devastation that Hurricane Katrina caused over a decade ago, it is an increased focus by vessel owners and operators on hurricane safety and preparedness planning.

When developing a hurricane safety plan the following should be taken into account:

- Make arrangements in advance for the docking of a vessel at an alternate location.
- Know your plan of action defined by the U.S. Coast Guard
- Name and train those responsible for preparing the vessel for the storm
- Define how crewmembers will be protected in the event of a storm
- Define how crewmembers will monitor the forecast
- Follow a hurricane avoidance plan

As this cover of the November 2005 edition of Maritime Reporter & Engineering News attests, the effects of a hurricane – in this case Katrina –can devastate the marine industry.

these crew members must have strong resumes, relevant on-the-job experience, and undergo drug testing.

One thing marine employers examine closely aside from vessel experience is education. They may look for crewmembers who have completed certain coursework in safety. For example, courses at the Maritime Institute of Technology/ Pacific Maritime Institute focus on advanced navigation, radar plotting, firefighting, first aid and CPR, meteorology, bridge management, and dangerous liquids, among others.

The maritime industry has recognized that one unqualified or ill-equipped crew member can be a liability to all onboard the vessel.

Formal Procedures in Place

These days a formal loss and safety plan and hurricane plan, should be standard aboard any tug or towing vessel. The National Transportation Safety Board recently provided a tip sheet for mariners focused on good preparation and proper use of safety equipment. These tips should be part of vessel formal safety procedures:

- Crew is familiar with an easily accessible weather preparedness plan that reviews low pressure systems and other weather
- Crew is familiar with and regularly practices with onboard safety equipment
- Crew knows the evacuation plan and each crewmember's emergency supply duties
- Crew conducts regular drills
- Crew carries easily accessible emergency position indicating radio beacons (EPIRBs) and/or personal locator beacons
- Crew has been instructed to stay close to each other if abandoning ship for the water

One way vessel owners and operators can be sure they have a strong reliable safety and preparedness plan is to seek the expertise of their insurer's risk management team. These risk engineers are trained to review crew and vessel safety and offer suggestions on how to mitigate any unnecessary risk exposures.

A Benefit to All

In all, these improvements and focus on safety in the brownwater industry will be critical for a few reasons. With the implementation of Subchapter M on the horizon, and a renewed industry focus on training, safety and preparedness, vessel owners are likely to be on top of their game – making sure their vessels and crew are ready for anything that may come their way.

In the end, not only will these initiatives save lives – those of crew members and possibly innocent bystanders – but they will likely improve a vessel's seaworthiness, possibly extend the life of the vessel, and keep the vessel operational with less disruption, thus improving the owner's and/or operator's profitability and peace of mind for the future.

The Author

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Subchapter M

Slow Walking the Inspection of Towing Vessels

DENNIS BRYANT

On 20 June 2016, the US Coast Guard promulgated its long awaited or dreaded (depending on your perspective) final rule regarding inspection of towing vessels. The new regulations, which will enter into effect on 20 July, derive from a 2004 legislative amendment which added towing vessels to the list of 'vessels subject to inspection'. That statute also authorized regulations to establish a safety management system for towing vessels and maximum hours of service and related provisions for individuals engaged on towing vessels. Many of the new regulatory provisions, including the requirement for each covered towing vessel to have a valid certificate of inspection (COI) will be phased in over the next six years. Consequently, this project will be eighteen years between conception and full delivery.

The rulemaking, as promulgated, establishes safety regulations governing the inspection, standards, and safety management systems of US towing vessels of 26 feet or more in length and US towing vessels of any length that move barges carrying hazardous material in bulk. The regulations also authorize the use of approved third-party auditors and surveyors for routine towing vessel inspections.

The Coast Guard has deferred, for now, establishment of new requirements for hours of service or crew endurance management for mariners aboard towing vessels. Those issues will be the subject of a separate rulemaking.

One important impact of the new regulations is that, once they enter into effect, the U.S. Coast Guard will be the principal federal agency overseeing towing vessels. The Occupational Safety and Health Administration (OSHA) will immediately lose its authority over inspected towing vessels. The towing industry has chaffed for years at being subject to the safety regulations of two separate (and sometimes conflicting) federal agencies. In addition, state agencies will lose much of their authority over covered towing vessels. The regulations establish a comprehensive safety system that includes company compliance, vessel compliance, vessel standards, and oversight in a new Code of Federal Regulations (CFR) subchapter [Subchapter M] of Title 46 dedicated solely to towing vessels. These regulations are intended to reduce the risk of such deaths, injuries, casualties, and marine environmental incidents. The Officer in Charge Marine Inspection (OCMI) is provided broad discretion to establish manning requirements for individual towing vessels taking into account their trade, route, construction, and arrangement. Not later than 22 July 2019, each company must implement a health and safety plan, documenting compliance with Subchapter M, including its record-keeping provisions. The company must also ensure that all persons on its towing vessels comply with the health and safety plan.

Organizations operating towing vessels subject to inspection under Subchapter M will be required to elect inspection under one of two options. One option would involve the annual Coast Guard inspection regime, similar to that applicable to most other inspected vessels. The second option would involve development of an acceptable Towing Safety Management System (TSMS). The TSMS, tailored to take into consideration the organization's size, structure, and service, is the one that the Coast Guard expects to be the favored option. It would describe the organization's procedures for ensuring compliance with the applicable vessel and personnel requirements. TSMS compliance would be verified through third-party organizations and documented by issuance of TSMS Certificates. Towing vessels operating under the TSMS option would receive audits and surveys by USCG-approved third party organizations at a designated frequency. In addition, the Coast Guard will conduct compliance examinations at least once every five (5) years, along with additional unannounced compliance checks based on risk. The risk will be determined through analysis of management and vessel safety history.

The Coast Guard will provide direct oversight of the third-party organizations that conduct TSMS audits and surveys through a process of observation and approval. This process, which could be viewed as a specialized alternate compliance program (ACP), will involve review and approval of the organization's application for approval, as well as the individual auditors and surveyors employed. Random visits will be made to their offices and of their actual audits and surveys on site. The Coast Guard will also consider the organization's history when evaluating requests for renewal of their approvals, to occur at least every five (5) years. Approvals may also be revoked for failure to comply with the conditions of the approval.

Certificates of Inspection (COIs) will be issued by the Coast Guard to vessels based on successful compliance with the inspection requirements, as evidenced through either the traditional USCG inspection process or the new TSMS

One important impact of the new regulations is that, once they enter into effect, the U.S. Coast Guard will be the principal federal agency overseeing towing vessels. OSHA will immediately lose its authority over inspected towing vessels.

(Photo Credit: Pat Folan)

option. Subject to subsequent change through rulemaking, the Coast Guard will impose an annual user fee of $1,030 after the initial Certificate of Inspection (COI) inspection. Companies with more than one existing towing vessel are provided with a calendar for COI compliance. By 22 July 2019, at least 25% of the towing vessels must have a valid COI on board; rising to 50% by 20 July 2020; then to 75% by 19 July 2021; and finally to 100% by 19 July 2022. Companies with only one existing towing vessel have a deadline of 20 July 2020. A new towing vessel must obtain a COI before it enters service.

The portions of Subchapter M regarding certification; vessel compliance; the Towing Safety Management System (TSMS); and Third-Party Organizations (TPOs) enter into effect on 20 July 2016. The effective date of the remaining portions of Subchapter M, consisting of operations; lifesaving; fire protection; machinery and electrical systems and equipment; and construction and arrangement, has been delayed for two years, until 20 July 2018, so as to give the newly regulated community an opportunity to accommodate the new requirements. In addition, various 'grandfather' provisions will apply to existing towing vessels. Newly constructed towing vessels as well as those undergoing major conversions will not benefit from the grandfathering provisions. One section of the new regulations, though, will enter into effect immediately on 20 July 2016. Each covered vessel with installed bulwarks must have sufficient freeing ports or scuppers and closing devices must be provided for deckhouse and full penetrations that open to the exterior. This is a commonsense requirement and few vessels should be adversely impacted. Regardless, the cost of compliance will be substantial. The Coast Guard estimates that 1,086 companies and 5,509 vessels will be covered by the new regulations. The initial phase-in costs for the first two years are estimated to total between $15.8 and $26.5 million annually. Subsequent annual costs are estimated at between $19.2 and $56.4 million, with a ten-year total cost to industry of $227.7 million. The benefits, though, in the form of decreased fatalities, injuries, casualties, and environmental damage, are estimated at $325.6 million over the same ten-year period, resulting in a positive cost-benefit ratio. Analysis of five-year averages reveals that towing vessels and tows are involved in 29.8% of all merchant mariner deaths and injuries in U.S. waters; 67.5% of all collisions, allisions, and groundings; and 30.2% of all chemical discharge incidents and oil spills of greater than 100 gallons.

That said, the costs will be spread unevenly across the US towing industry. Some companies already have fully-developed safety management systems, such as the American Waterways Operators (AWO) Responsible Carrier Program (RCP), and many have invested in new equipment in recent years. For those companies for which a safety management system is new and whose towboats are aging, the financial costs and cultural shift may prove daunting, even with the phase-in period and the various grandfather clauses.

Tne portion of the new regulations that cannot be overlooked is the expanded recordkeeping requirement. Each covered towing vessel will be required to maintain, either physically or electronically, a towing vessel record (TVR) or its equivalent. Items that must be recorded include, but are not limited to, personnel records; safety orientation; drills and instruction; examinations and tests; operative navigational safety equipment; navigation assessment; navigation safety training; oil residue discharges and disposals; inspection of towing gear; and fire-detection and fixed fire-extinguishing. Depending on current practice and how this new provision is implemented, the burden of this recordkeeping requirement could be significant. In view of the fact that these will be the first pervasive regulations for the towing vessel industry, the Coast Guard intends to conduct a broad outreach program to acquaint merchant mariners and towing companies with the new requirements. These outreach efforts will include in-person and on-line support, guidance for operators and third-party organizations, dissemination of on-going frequently-asked-questions (FAQ), plan review information, and information regarding compliance options.

The Coast Guard is deliberately slow walking its implementation of the towing vessel inspection regime. The goal is not to drive companies out of business, but rather to assist (or prod to the extent necessary) responsible towing companies in raising their standards over time so as to reduce deaths, injuries, casualties, and environmental damage.

The Author

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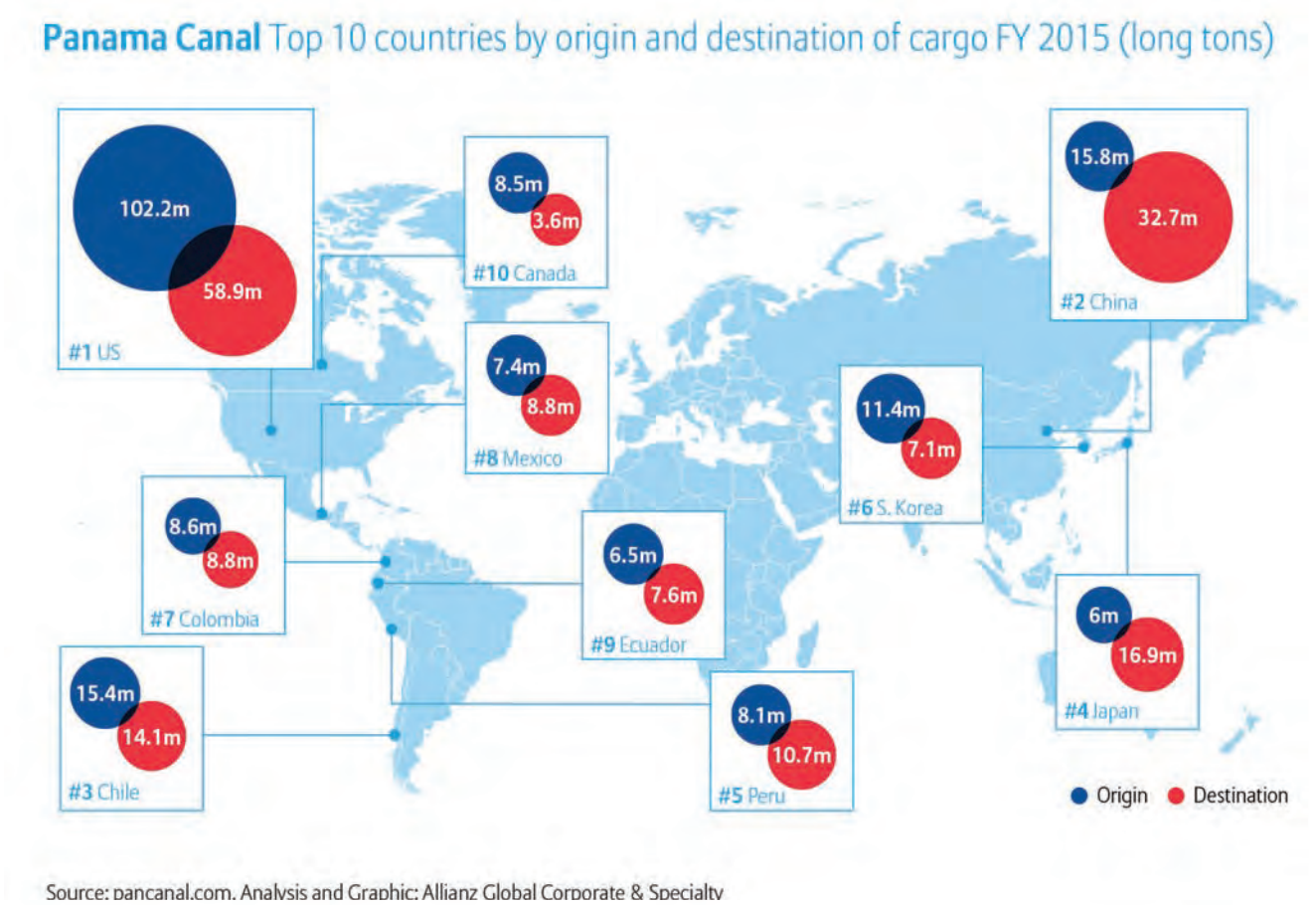
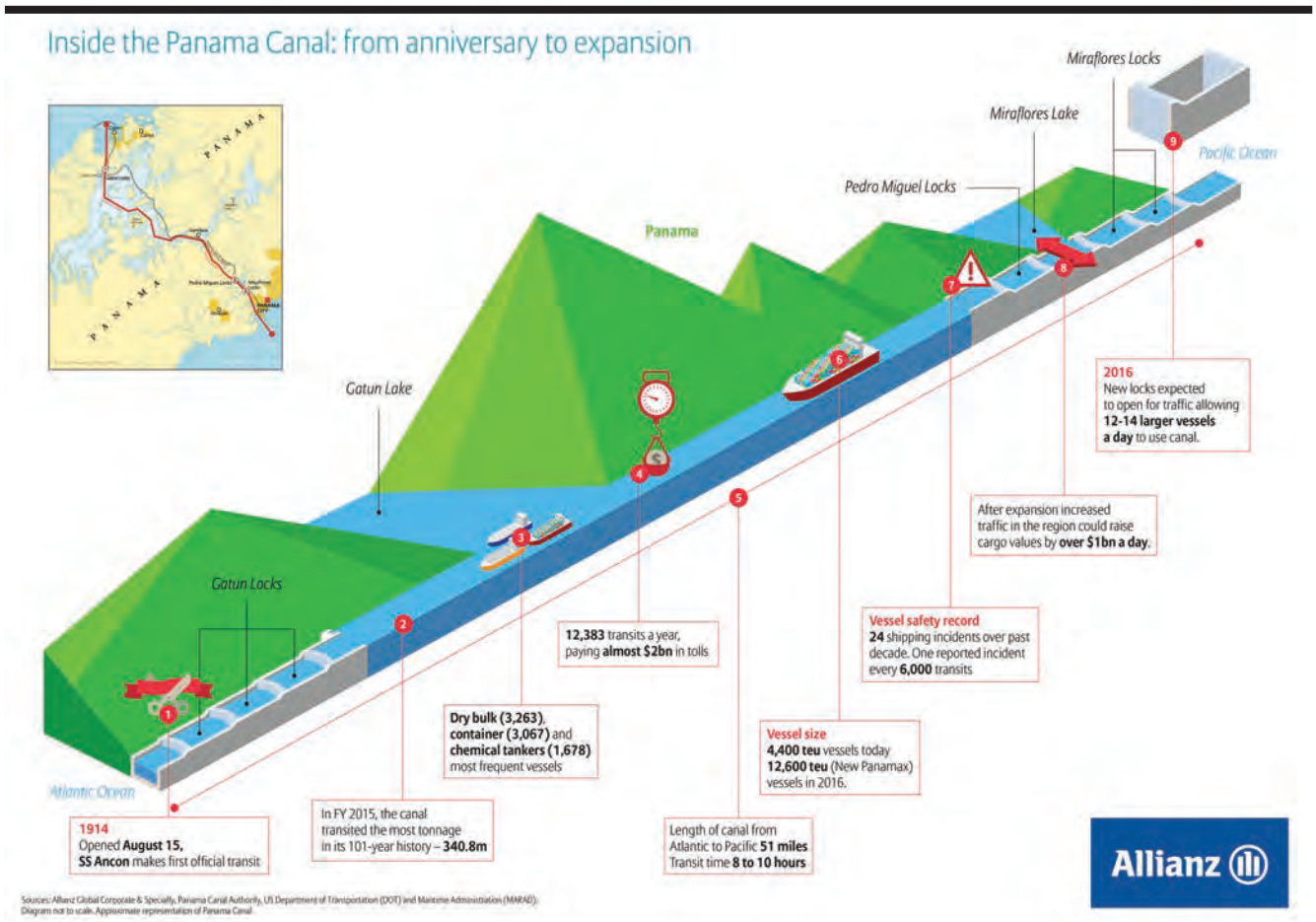
Panama Canal

Assessing the Risk & Rewards of the Project

ANDREW KINSEY



Source: pancanal.com, Analysis and Graphic: Allianz Global Corporate & Specialty



Sources: Allianz Global Corporate & Specialty, Panama Canal Authority, US Department of Transportation (DOT) and Maritime Administration (MARAD). Diagram not to scale. Approximate representation of Panama Canal.

The Panama Canal's impact on shipping routes and vessel sizes since it opened in 1914 is undisputed. This will continue with the opening of a third channel for larger vessels in 2016. This briefing examines the risk management impact of this expansion on the maritime industry.

Why is the Panama Canal Expansion Significant?

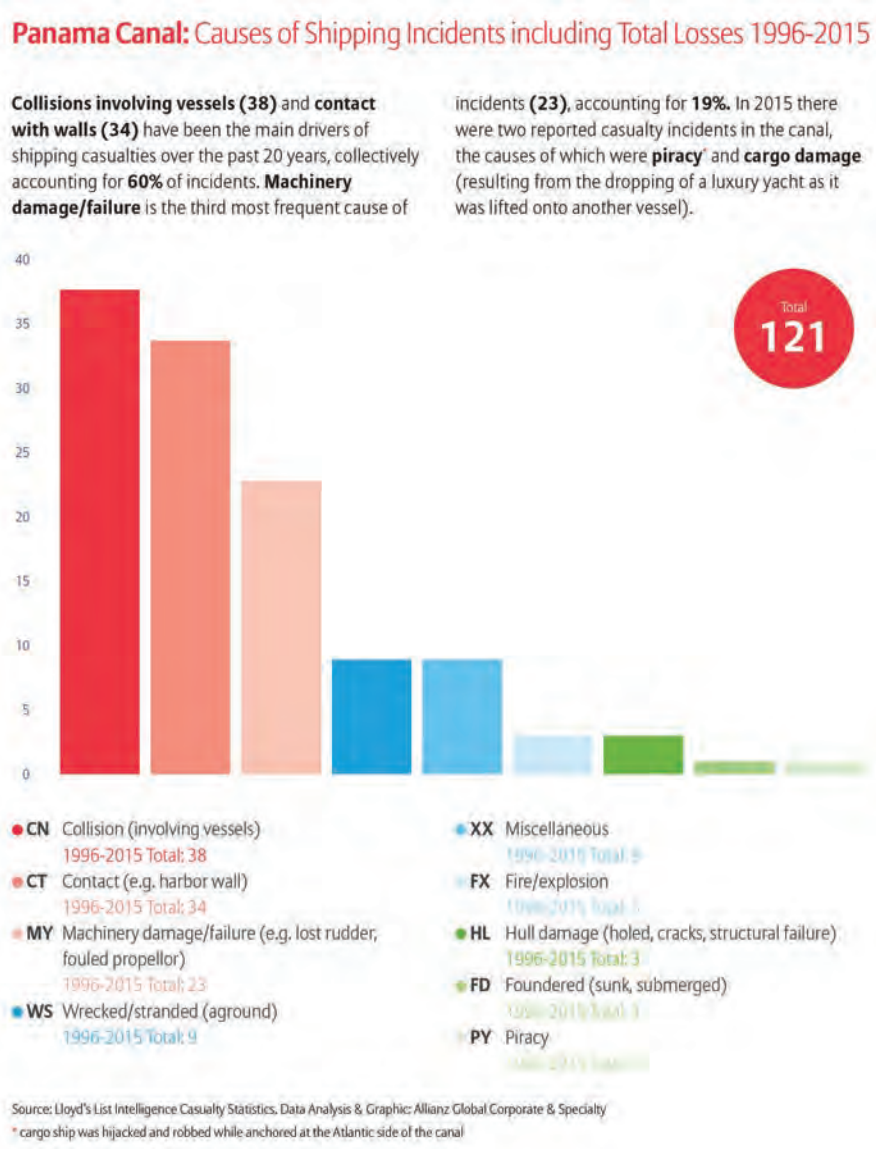
The Panama Canal's $5.25 billion expansion increases the maximum vessel capacity and enlarges the overall volume of transported freight. Existing locks can handle ships up to 106 ft. wide, 965 ft. long, and 39.5 ft. of draft. The new locks will accommodate vessels up to 160 ft. wide, 1,200 ft. long, and 50 ft. deep. Container ship capacities will increase from 4,400 to about 13,000 teus. The new locks create a third lane of traffic for larger "New Panamax" vessels. The expansion is significant because it impacts the size and frequency of vessels that call on the US East and Gulf Coast ports, which presently have to use the Suez Canal coming to the U.S. from Asia.

The Impact

The Panama Canal Authority (ACP) estimates that the combined effect of 12 to 14 larger Panamax vessels per day (an average of approximately 4,750 ships a year) combined with continued smaller vessel transits will double capacity, increasing Canal throughput from 300m tons to 600m tons PCUMS (Panama Canal Universal Measuring System). PCUMS is the basis upon which vessels are charged for use of the Canal: one PCUMS ton is approximately 100 cubic feet of cargo space. A twenty foot long container (teu) is equivalent to approximately 13 PCUMS tons.

Insured Goods

The value of insured goods transported will increase with the expanded Canal, as will the risk accumulation. This is the reason why proactive loss controls will continue to be needed; including tracking of the risk accumulation. This is one of the biggest lessons learned from the Tianjin explosion in China last year. In particular, the New Panamax ships will be impacted.



Panama Canal Fast Facts

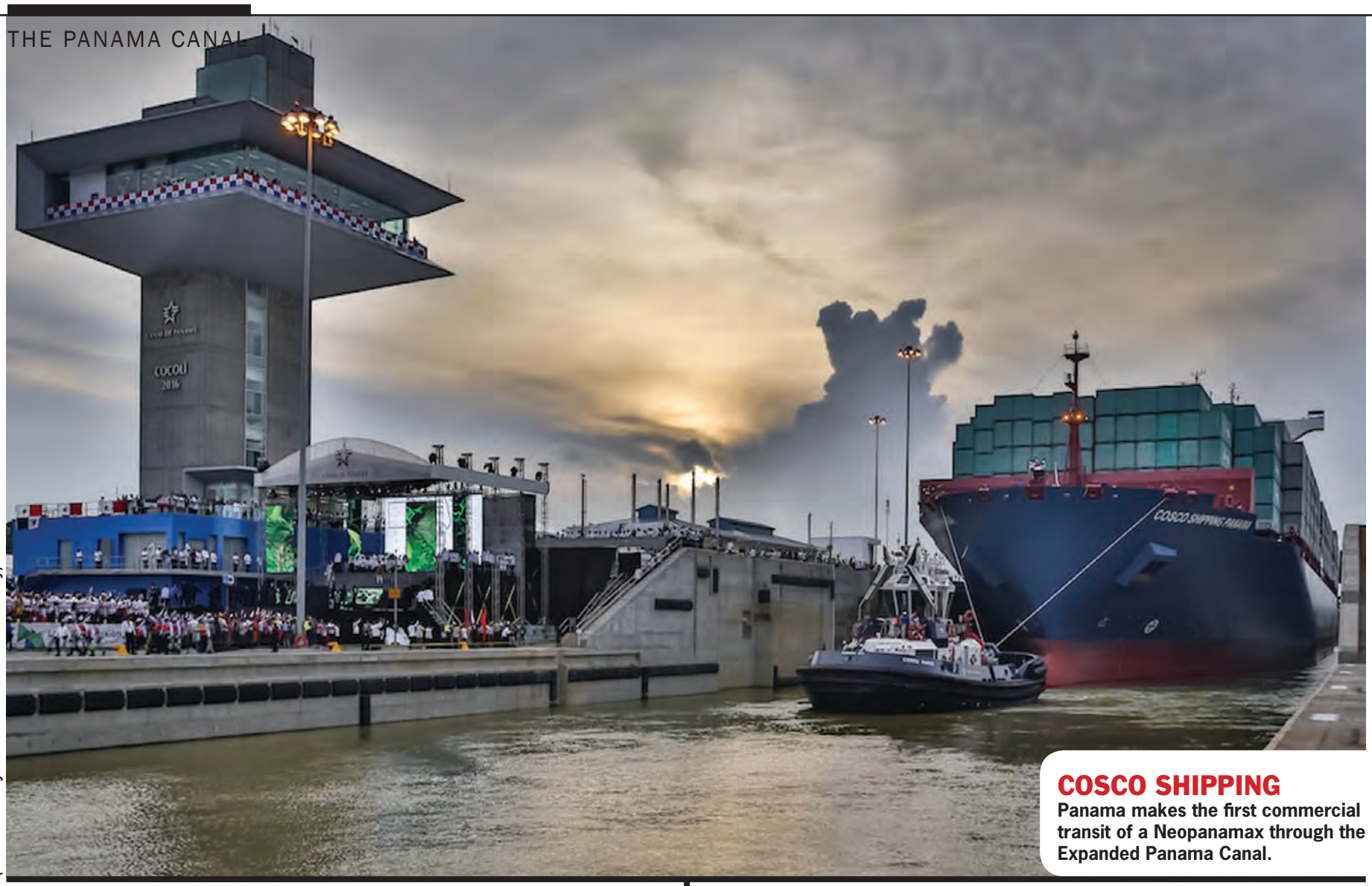
This risk briefing updates, and adds to, information in the AGCS report Panama Canal 100: Shipping Safety and Future Risks, originally published August 2014. The report can be viewed at
www.agcs.allianz.com/insights/white-papers-and-case-studies/panama-canal-risk-bulletin/

- **All gates at the new locks are the same length,** 57.6m, but they are of varying heights, depending on their placement along the Canal, with the tallest 33.04m high (the equivalent of an 11 story building)
- **March, August and December were the busiest transit months** through the Canal in 2015; slowest months were February, September and June.
- To date, the expansion project has generated over **31,000 direct jobs.**
- **Toll revenues through the Canal were $1.994bn in FY2015,** a 4.4% increase from FY2014.
- Revenues from **full container vessels** (fully loaded ships) represented 47.4% of all tolls collected in FY2015
- Since the Canal first opened in 1914, it has provided transit service to more than **815,000 vessels.**

Source: Panama Canal Authority

For example, a fully-loaded 12,600 teu container ship could have an average insured cargo value of $250 million, based on an average value of $20,000 per teu. With the cargo-carrying capacity of ships transiting the Canal having the potential to double following expansion, we can approximately assume this could result in an additional $1.25 billion in insured goods passing through the Canal in just one given day. According to Captain Rahul Khanna, Global Head of Marine Risk Consulting, AGCS, the Canal's expansion may also lead to an increase in the number of vessels waiting to undertake the transit on both the Atlantic and Pacific sides. "This means that with the values concentrated in the surrounding area, from an accumulation point of view, this figure could be even higher," he said.

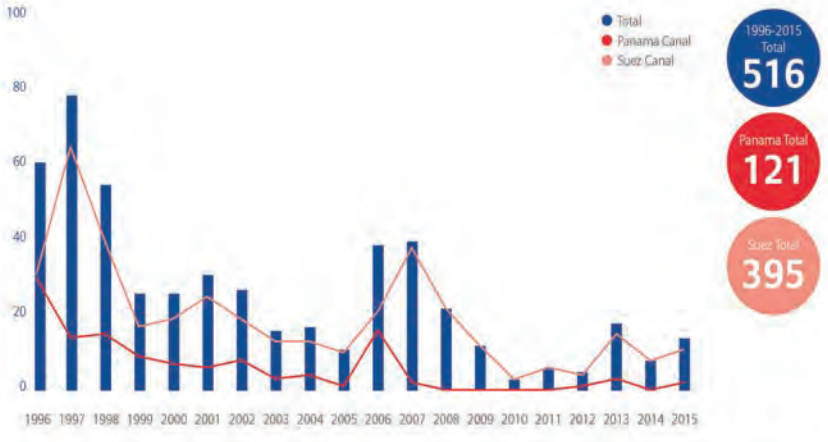
Another potential risk is that higher concentrations of insured goods will be transported on bigger ships, which will call in at U.S. ports and terminals, many of which are exposed to hurricanes. For example, a large portion of Superstorm Sandy losses in 2012 were due to storm surge that flooded ports in the Northeast region. According to AGCS' Safety and



(Photo courtesy of the Panama Canal Authority)

COSCO SHIPPING
Panama makes the first commercial transit of a Neopanamax through the Expanded Panama Canal.

Panama Canal - Suez Canal:
Shipping Incidents including Total Losses 1996-2015



There have been **121 shipping casualties** over the past 20 years (including four total losses) in the Panama Canal with **24 casualties occurring over the past decade.** Just **two casualties** were reported during 2015.

The Suez Canal has seen **395 casualties** over the past 20 years (including 11 total losses) with **143 casualties occurring over the past decade. 12 casualties** were reported in 2015.

Panama Canal has an approximate incident rate of around **1 in every 6,000 transits.**

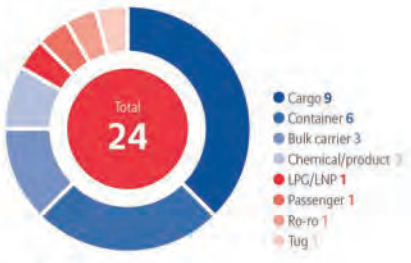
The Suez Canal's is around **1 in 1,450 transits***

Source: Lloyd's List Intelligence Casualty Statistics. Data Analysis & Graphic: Allianz Global Corporate & Specialty

*Panama Canal handled 12,383 oceangoing commercial transits during 2015. Suez Canal handled 17,483 ships.

Panama Canal: Shipping Incidents including Total Losses by Type of Vessel 2006-2015

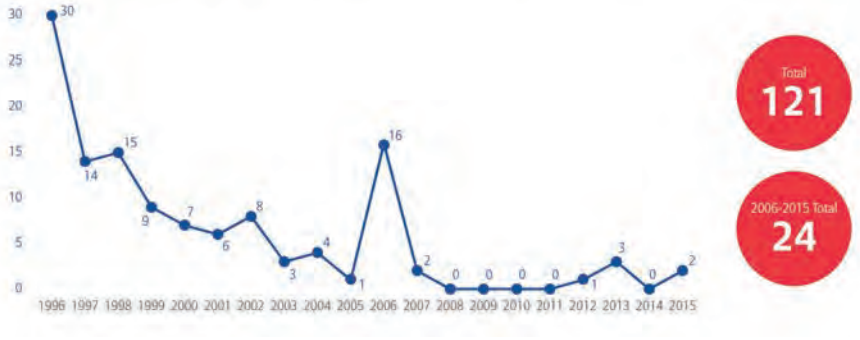
Cargo ships and **container ships** dominate the casualty lists as frequent transiters of the canal, collectively accounting for **over 60%** of all casualties over the past decade. The two reported casualties during 2015 both involved cargo vessels.



Source: Lloyd's List Intelligence Casualty Statistics. Data Analysis & Graphic: Allianz Global Corporate & Specialty

Panama Canal: Shipping Incidents including Total Losses1996-2015

The Panama Canal has seen **121 reported shipping casualties** (incidents) over the past 20 years with its safety record having improved significantly over the past decade in particular **(24 casualties)**. These incidents have resulted in just four reported total losses since 1996.The canal has only seen one double-digit year of casualties this century (2006). Two casualties were reported in 2015.



Shipping Review 2016, meteorological predictions anticipate more extreme weather conditions, bringing additional safety risks for shipping and potential disruption to supply chains. Hurricanes and bad weather were contributing factors to at least three of the five largest vessels lost during 2015.

How will Risk Management be Impacted?

With the increase in size of vessels transiting the Canal, you have a corresponding increase in operational, environmental and commercial risks.Bigger ships automatically pose greater risks in that the sheer amount of cargo carried dictates that a serious casualty has the potential to lead to a sizable loss and greater disruption. Increasing traffic of bigger ships means the amount of diesel and petroleum being transported could also pose a heightened pollution risk in the event of a casualty.

Conversely, the prospect of an expanded all-water route from Asia to the U.S. East/Gulf coasts could actually lead to a risk reduction in another area because containers will no longer need to be moved/reloaded onto trains. The fewer times you have to handle a container the lower the risk of damage.

According to ACP, the Panama Canal has invested heavily in training resources, prevention programs and contingency plans in order to maintain its excellent safety record . Hands-on education, preparation, and training programs will help ensure that both the existing and new locks will run seamlessly. Some of the programs are related to the training of the Canal's pilots and tugboat captains, consisting of simulation and hands-on experience with transit training on a chartered New Panamax vessel. Kinsey describes training as "key to mitigating the risks involved with larger vessels". With such an important emphasis on training, human error is unlikely to be the main cause of shipping incidents in the Canal.

But the risk of grounding remains, either as a result of equipment failure or a casualty on the ship. Insurance companies will need to consider re-evaluating the routine risk to securing and monitoring containers under the new scenario, says Captain William Hansen, Senior Marine Risk Engineer, AGCS. A grounding of one of the larger ships in the Canal will cause severe disruption. Given the fact that the new locks will not be using the traditional "mules" but rather tugs which will be in the lock chamber with the vessel that is locking through there is the potential for increased contact with the lock walls, Kinsey believes. "It is believed that the use of tugs rather than mules provides sufficient control over ships in the lock chamber, but it is a situation that will be monitored closely," he adds.

Khanna agrees that the level of training provided to pilots ahead of opening will be "extremely important" as the expansion of the Canal represents a "new shipping environment for many mariners". However, he also notes it cannot prepare mariners 100% for the live environment. "Although much training will be given it can only be done on a few vessels. But when the Canal is opened for real, a whole host of different vessels with different characteristics will be passing through. That will be a challenge."

Then there is particular concern surrounding the salvage limitations for the latest generation of container ships. In the event of an accident in the surrounding region there may be an insufficient number of qualified, experienced salvage experts available to handle the New Panamax ships due to merger and acquisition activity and economic pressures.

Risk Challenges?

Most U.S. East and Gulf coast ports are being dredged in preparation for the New Panamax ships and are upgrading equipment, although each is at varying degrees of readiness. Larger and more ship-to-shore cranes are required to handle increased container volumes. While Panamax-sized ships can be worked by four or five cranes, larger ships will need to be worked with at least six cranes.

Ports are attempting to get into the game and stay in the game. There is substantial commercial risk on the East Coast with ports expanding their container capacity in the hope of gaining market share.

Ports in the US West Coast have also spent millions to expand their capacity in order to protect a market share that they already have. "Additional infrastructure upgrades will be needed to handle the increase in volume/throughput. Another major challenge is the actual handling of larger vessels. Port operating procedures will have to be reviewed with regard to wind and weather constraints given the tight operating margins that these ships will be facing." This means port and shipping workers must undergo training in order to mitigate any operational risks.

And of course the potential impact of any shipping incident is much wider than just impeding progress through the Panama Canal. With more larger ships on the move in the surrounding region any incident could also impede traffic at major ports in the US and elsewhere, resulting in a potential increase in business interruption losses.

The Author

Captain Andrew Kinsey spent 23 years in the U.S. Merchant Marine and U.S. Naval Reserve, sailing in all licensed ranks, including Master. His sailing experience was primarily with Maersk Lines, sailing as Master of three different Container ships. He also served as Master aboard two Military Sealift Command (MSC), Large Medium Speed RORO (LMSR) ships, the USNS "Sisler" and USNS "Red Cloud." He served in Operations Desert Shield & Desert Storm, Restore Hope, Enduring Freedom and Iraqi Freedom, and received numerous decorations and awards. After coming ashore in 2006, Andrew worked as an independent Marine Surveyor in the Tri-state area and joined the ACE/US Commercial Marine - Marine Advisory Service, in 2009. At ACE he was responsible for providing a wide range of Risk Control services to support its commercial book of marine business, including Cargo, Project Cargo, Hull & Machinery, Terminal Operators, and related Inland Marine LOB's.
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SHIP SERVICE
Maersk Tankers is testing drones for making deliveries to its vessel.

(Photo: Maersk Group)

DRONES

Is the Maritime Industry Ready?

BY SEAN T. PRIBYL

Unmanned aerial systems (UAS), or "drones" in common parlance, are not a part of the historical maritime vocabulary. At least not yet. While the term "drones" may conjure images from science fiction, the reality is that companies are designing commercial UAS for the private sector, and they are gradually permeating our daily life. Henry Ford is rumored to have opined on his invention of the automobile that if he had asked people what they wanted, they would have said "faster horses." In the case of UAS, they are quickly evolving into a useful maritime business tool due to the innovative opportunities they provide.

From the first merchant vessels that plied the seas, technology in the maritime industry continues to evolve, as witnessed with gradual acceptance and implementation of containerization, Global Positioning System (GPS), and Electronic Chart Display and Information System (ECDIS). Now, UAS harken yet another new frontier for the maritime industry. Accordingly, UAS may afford the maritime industry a novel approach to cost and time savings, and clients should be poised to harness the potential advantages UAS offer. In other words, in order to survive and evolve, the maritime industry should not search for "faster horses" for everyday maritime endeavors, and UAS provide an evolving list of potential uses in the maritime, energy, shipping, offshore, and ship construction markets.

While UAS were initially developed for government and military operations, over the next five years, growth in the commercial and civilian market of the UAS industry is generally predicted to surpass that of the defense industry. But, while research, development, and manufacturing for UAS technology continues to rapidly evolve, regulators have been struggling to keep pace. Consequently, the legal issues that surround the use of UAS remain complex, and in some areas, unsettled. And, as with any new innovation, there are benefits and risks, and commercial UAS are no exception. Nonetheless, as the use of UAS becomes more prevalent in the maritime industry, this articles offers an awareness of the practical areas in which unmanned aerial vehicles can have a positive impact across the maritime industry, and provides recommendations to assist clients so they can position themselves to take advantage of the progresses in UAS technology as they navigate largely uncharted waters.

The Cookie Test and What Follows Next

The following is a summary of key developments in particular segments of the maritime industry.

Resupply at Sea

Currently, in order to send urgent medical supplies, mail, documents, spare parts, provisions, and the like to a vessel underway or at anchor, owners and operators must rely on conventional means for delivery, such as boats, barges, or sending the vessel to port to tie-up alongside a pier. However, these options

are time-consuming and expensive, with barges costing at least $1,000. The reality is that resupplying a vessel is a common occurrence, and in some cases, supplies are needed when the vessel is still far out to sea or with a next port of call yet undetermined.

Owners and operators are limited in available options for urgent deliveries to vessels, but those limitations are dissipating. In January 2016, a UAS operated by A.P. Moller Maersk A/S successfully completed an at-sea delivery of a small package to a tanker through the use of an aerial UAS. Maersk conducted this UAS test over a relatively short distance of 247 meters, and the package contained Danish butter cookies weighing a little less than three pounds.

Even though the flight distance in this case was somewhat short, industry should be optimistic that as technology advances, future deliveries could involve longer flight distances, heavier payloads, and a wider variety of uses. As UAS integrate into the maritime sector's supply chain, companies may provide savings of thousands of dollars per vessel each year on small yet essential vessel deliveries In other words, a UAS effectively limits or alleviates the need to pay to hire a boat, crew, and fuel to make deliveries, and also increases safety in dangerous sea conditions as the human element is reduced in the at-sea transfer. Also, the advantages with the use of UAS in shipping extend beyond delivery of supplies to all types of vessels. Other proposed uses could include inspections of tanks aboard tank and cargo vessels, and lashing aboard cargo or container ships. In some cases, UAS may become valuable surveillance tools that enhance vessel safety in ice navigation and surveillance in anti-piracy measures.

Offshore Energy—Oil, Gas, and Wind

Besides resupplying vessels, companies are increasingly utilizing UAS in the energy sector in performing inspection work. Experts suggest that UAS are capable of operating in some the most challenging environments in the offshore industry, and could be used to meet requirements before oil and gas exploration is approved, such as those related to surveys of ice and marine life. UAS can survey and identify elements of a rig or vessel for leaks, damage to piping, structural defects, or other irregularities in locations that are difficult to access or dangerous for human intervention, such as offshore risers, flare stacks, and undersides of offshore structures. Also, UAS could assist in complicated inspection and survey work in circumstances in which a class survey may be required, including hull tank inspections in confined spaces.

To illustrate, over the past few years several companies have already conducted numerous operational tests in the offshore energy sector. For example, in January 2016, a UK-based firm reportedly conducted a UAS inspection in the Gulf of Mexico aboard a drillship. The UAS completed the inspection of the derrick, a heli-deck, and four cranes in two days, more than two weeks shorter than estimates of what would have been required under current inspection options. And, UAS can foreseeably be used for faster gathering of information to detect and quantify discharges or spills in an effort to mitigate environmental impact in times of disaster.

Besides oil and gas exploration, UAS are being tested in inspections of offshore wind turbines in efforts to both decrease the economic losses caused during lengthy turbine inspection downtimes and enhance safety for technicians typically required to climb on the blades for repair or to complete an inspection. As a market, the cumulative global revenue for UAS sales and inspection services "for wind turbine is expected to reach nearly $6 billion by 2024."

Shipyard Inspections and Class Society Surveys

Keeping pace with other maritime sectors, overseas shipbuilders are employing UAS technology during various construction and inspection stages in efforts to save time and money and increase efficiency. Last year, Poland's Remontowa Shiprepair Yard began flying a UAS to inspect internal spaces of chemical and product tankers. During the overhaul, the UAS accessed the cargo tanks to provide a general assessment of the condi-

CLASSIFICATION
DNV GL conducts drone inspection of ship tanks

(Photo: DNV GL)

OFFSHORE
Cyberhawk team operating drones offshore

(Photo: Cyberhawk Innovations)

tion of the hull and bulkheads, and saved time by alleviating some time-consuming tasks such as scaffolding set-up. The shipyard foresees expanding inspections to other areas of the vessel, such as the masts or deck crane jibs. Also, Japanese shipbuilder Tsuneishi Holdings Corporation and Turkish Besiktas Shipyard have been using UAS at their respective shipyards to assist in vessels undergoing repairs.

More recently at the Posidonia 2016 trade fair, Knut Ørbeck-Nilssen, CEO of DNV GL – Maritime, reported that DNV GL had tested the use of UAS to conduct surveys inside ship tanks aboard the chemical tanker MV Apollo. Ørbeck-Nilssen noted that DNV GL was now positioned as the "first classification society to complete production surveys using a UAS to assist surveyors," an accomplishment garnering attention from the maritime industry.

Port and Terminals

As a complement to current available technology, cargo ports and terminals are taking steps to monitor the yards, and vessel operations may consider UAS to enhance management of a terminal. Foreseeably, UAS could be used to augment port security plans. Most recently, Abu Dhabi Ports Company began testing the use of UAS to increase the surveillance at ports in and around Abu Dhabi. And, the Maritime and Port Authority (MPA) of Singapore intends to use UAS in lieu of a boat to monitor oil spills or other marine incidents in the port's waters. Furthermore, Protection and Indemnity (P&I) Clubs could use this same technology in lieu of U.S. Coast Guard overflights for oil spills, resulting in significant reductions in response costs.

Government Contracts and Grants

As UAS capabilities increase, governmental agencies continue to search for additional uses for them in support of various statutory authorities and national security interests. Federal agencies such as the U.S. Coast Guard are actively conducting market research with UAS to support statutory missions such as law enforcement, immigration, fisheries, and counter-drug and smuggling surveillance operations, among others. In fact, the U.S. Coast Guard Research and Development Center has entered into cooperative agreements with several companies to evaluate small unmanned aircraft systems for potential for use in maritime environments, such as the Arctic, and for law enforcement, search and rescue, and maritime environmental response. The Coast Guard has also indicated that a UAS could be used to assist with navigation through ice in the Great Lakes.

Besides the Coast Guard, the National Oceanic and Atmospheric Administration (NOAA) is using UAS to collect data from dangerous or remote areas to survey living marine resources and environmental conditions. Also, the U.S. Navy continues to integrate unmanned aircraft into ever-increasing areas. Notably, in 2014, the Navy successfully took off and landed an unmanned aircraft from an aircraft carrier alongside a manned aircraft. The following year, Navy Secretary Ray Mabus opined that the service's F-35C "should be, and almost certainly will be, the last manned strike fighter aircraft the Department of the Navy will ever buy or fly." Currently, the Navy is trying to build a next-generation UAS that it can launch from an aircraft carrier and refuel in mid-air, recently awarding a $93.1 million contract to a defense contractor for this purpose. The Navy has also established two new offices dedicated to integration of unmanned systems, and will look to all aspects of industry to meet their acquisition needs.

Besides contracts, federal agencies like the U.S. Department of Defense offer financial funding through a grant program, the Small Business Innovation Research (SBIR), related to developing a spectrum of UAS technologies.

Grants may also be available at the state level, such as in New York, related to integrating UAS into commercial airspace.

Overall, procurement, acquisition, and grants related to UAS look to be a growth market over the next decade.

UAS Regulatory and Legal Regimes—Murky Waters or Smooth Sailing?

So, what does it take to operate a UAS in the maritime industry? The short answer: it depends. The location and use of the UAS operations may call into play multiple overlapping jurisdictional concerns, including domestic and international legal obligations. Under the current state of the law, the FAA regulates and has "exclusive sovereignty" over the airspace of the United States and regulates commercial UAS use as "aircraft." The FAA authorizes commercial UAS purposes through what is known as a "Section 333 Exemption" of the FAA Modernization and Reform Act, and grants these exemptions on a case-by-case basis for UAS to conduct commercial operations. An exemption provides permission from the FAA, with several restrictions on variables such as altitude, speed, and airspace, but the application approval process is time-consuming. And, operators may also require an FAA Certificate of Waiver or Authorization (COA), which grants access for specific UAS activity within the national airspace.

Additionally, operators must be aware of potential state and local government regulations in areas not specifically reserved to the FAA, such as trespass, property, privacy, or nuisance laws. Consequently, the enforcement landscape at the federal, state, and local level in many

cases lacks conformity, requiring constant vigilance of developing legal regimes. Given the operational limitations of the 333 Exemption and the potential need for a COA, careful consideration should be given in each case as to what requirements must be met before operating. Additionally, commercial use operators must be cognizant of potential flight restrictions that governments may develop for national security reasons.

Outside of U.S. airspace, operators must be cognizant of the domestic laws related to UAS, which may vary from country to country. To illustrate, the European Aviation Safety Agency (EASA) is currently developing new UAS rules, but acknowledges that civil operators currently rely on basic national safety rules given the current regulatory regime. Adding an additional layer of complexity are international organizations such as the International Civil Aviation Organization (ICAO) and the International Maritime Organization (IMO), which may be applicable to UAS operations in international airspace. By 2018, the ICAO hopes to deliver an unmanned aircraft international regulatory framework to its 191 member states, who would then still need to set their own national regulations. Additionally, the IMO may have a role in recommendations on UAS standards which could have an impact on, for example, use of UAS by vessels at sea for search and rescue, rendering assistance at sea for distressed mariners, monitoring maritime migrant flow, or for use by cruise ships in polar regions to aid ice navigation.

Essentially, innovators outpaced the regulators, and agencies such as the FAA were relatively unprepared for the influx and demand of commercial UAS. As a result, the FAA has been struggling mightily to keep up, but has indicated a willingness to work with the industry on the issue. However, the maritime sector, and other commercial industries, are currently left with a shifting legal landscape in both domestic and international regulatory schemes that may lack clear comity or consistency. And, under the current legal regime, UAS operators who fail to adhere to the various jurisdictional and legal requirements risk license revocation, seizure, and fines among other civil and criminal penalties. But, if the maritime industry cautiously navigates these legal regimes, the benefits could very well outweigh the risks.

Risks and Liability Insurance for Industry

Admittedly, assimilation of UAS into the maritime industry has hurdles to overcome, and liabilities such as collision, third-party damage, and injury are all variables that should be considered. Currently, the full range of data is still being developed on which to measure all the risks that UAS pose in the maritime sector. This presents challenges to the industry as well as to insurers. And, one of the most significant liabilities when operating a commercial UAS is that of cybersecurity (i.e., malicious actors "hacking" or "spoofing" the UAS), a liability topic that is rapidly developing.

In order to meet liabilities, UAS operators should consider whether they have sufficient levels of insurance, such as hull, casualty, loss, and product liability in the event of an accident. Overall, while it is clear that UAS have a number of attendant risks, their wide-ranging uses also have the potential to benefit the maritime industry, but prudence would dictate seeking legal assistance to conduct a due diligence review of UAS risks well in advance of any UAS flights.

Conclusion

In sum, UAS offer flexibility for a broad number of business opportunities that may reduce cost and time in the maritime sector, while integrating into existing maritime safety practices and operations. In view of these developments, industry stakeholders should focus on UAS now, depending on their business challenges, and consider whether now is the time to enter this market, ahead of the curve and in front of their competitors. Given the complex legal and regulatory landscape in which UAS operate, clients should consult with counsel as part of their UAS review to assist in evaluating regulatory, technical, legal, and public policy issues in order to prudently mitigate risk while assisting with business solutions.

The Author

SEAN T. PRIBYL

Sean T. Pribyl, associate at Blank Rome, concentrates his practice in the areas of maritime, investigations, unmanned systems, cybersecurity, and white collar defense. He worked as a licensed mariner for eight years, and spent six years on active duty in the U.S. Coast Guard legal program, serving as the operational legal expert and advisor to unmanned systems. He is a member of the Maritime Law Association Cybersecurity Committee.

NY Power Authority Protects Subsea Cables with Virtual Technology

New York Power Authority (NYPA) had a costly and environmentally charged problem. Twice in a decade (in 2004 and 2014) a commercial tugboat dropped anchor and damaged one of its submerged power cables, a critical 7.5 mile stretch of four cables, part of its Y-49 transmission circuit in the Long Island Sound.

The cables are buried 10 ft. deep under the Long Island Sound, and the repair process is time-consuming and costly, taking an estimated five to eight months and "tens of millions of dollars" to fix, according to Robert J. Schwabe, Director, Asset and Maintenance Management, New York Power Authority. More importantly, the cable strikes pose a significant safety and environmental hazard. Safety because the repair process demands divers in the water to jet out the cable, find the break and bring it to surface; environmental because the cables are filled with DCL 45 low viscosity fluid for insulation.

The most recent anchor strike and cable break in 2014 was a game changer according to Schwabe, as it occurred in the dead of winter, meaning the divers were working in arduous conditions, taking two months to jet out enough cable to find the fault. In the meantime, thousands of gallons of DCL 45 fluid were released into the Long Island Sound. To help avoid future anchor strikes and mitigate the financial and environmental costs, Schwabe and his team sought a solution.

"After this event I started looking around and said, 'We need to have a better system to detect the potential (of a vessel) anchoring in the cable field,'" said Schwabe. For the system to work, it had to be automatic and 'on' 24/7/365.

The Vesper solution is elegant in its simplicity, using two land-based communication towers to establish a set of **'virtual beacons'** on the water clearly marking the cable field, also establishing a wide buffer zone that is seen on a vessel's electronic charts.

The cables are buried 10 ft. deep under the Long Island Sound, and the repair process time-consuming and costly, taking an estimated five to eight months and "tens of millions of dollars" to fix.

Robert J. Schwabe, Director
Asset and Maintenance Management, NYPA

Photo: Greg Trauthwein

Enter Vesper Marine WatchMate Asset Protection.

Virtual Beacons

Maritime Reporter & Engineering News was on the Long Island Sound with NYPA's Schwabe and representatives of Vesper Marine late last month as the new system for NYPA was in its final stage of approval, acceptance and implementation. Integration of the Vesper Marine system is part of NYPA's Strategic Vision 2020 plan to use existing and emerging technologies to make its transmission system more resilient and reliable.

In reality the solution is elegant in its simplicity and customizability, using two land-based communication towers to establish a set of 'virtual beacons' on the water clearly marking the cable field, as well as establishing a wide buffer zone that is clearly seen on commercial vessel's electronic charts. The system from Vesper Maritime is anything but passive, as it monitors vessels 24/7/365, monitoring vessel speed and taking into consideration tide and wind conditions. A set of web-based software rules created by NYPA and Vesper determine if it appears that a vessels is likely to anchor in the cable potential strike zone. The true value of the system comes with the rapidity of the warning, as a safety message is delivered automatically and directly to the bridge of the commercial vessel warning it of the dangers below, and copied to NYPA as well.

"There were other systems that offered notification, but they first notified the Coast Guard and then the vessel, which could take up to half and hour," said Schwabe. "You don't have that much time."

The system comes complete with an information back-up and archive.

Greg Trauthwein

(Photo: Courtesy Kongsberg)

Kongsberg: Blazing a Digital Trail

BY GREG TRAUTHWEIN

Earlier this year Kongsberg launched Kongsberg Digital, a new subsidiary to expand its industrial software offering, a "start-up" with about 500 employees. Hege Skryseth, President of Kongsberg Digital and also the Chief Digital Officer of Kongsberg shares with MR her insights on the size, shape and direction of the new entity.

"You see some opportunities here," is how Hege Skryseth summarizes the potential for the digital revolution to make maritime and offshore operations more efficient. Skryseth, who previously ran Microsoft's business in Norway, is a software industry veteran, with Kongsberg for about 2.5 years now. She is determined to help lead the tide of change in this pair of conservative industries, working non-stop to outfit new ships and rigs with the latest software solutions to assist in ensuring cost efficient and safe operations.

While ambitious to get the new company up and running, Skryseth is a realist regarding current market conditions pervasive in many maritime and offshore oil and gas sectors. Not deterred, long-term (and in fact, short term) she believes companies – with the new generation of internet natives joining the workforce and the real need to cut costs now – are becoming more amenable to leveraging the data at hand.

"We currently see the market conditions impacting the oil and gas and maritime markets, and with that we see a willingness to change, and an openness to new systems," said Skryseth. "But most companies are just at the beginning of realizing exactly what digitalization can really do for their operations. So many of the discussions center on 'how can we join forces to see what can be done' … and I think that is a good place to start."

Kongsberg Digital

Kongsberg Digital was established as a subsidiary of Kongsberg, a new company formed to assess and capture the world of opportunities that are upon the maritime and offshore industries as the digitalization of industrial processes starts in earnest. In announcing the new company, Walter Qvam, CEO of Kongsberg said: "Technologies such as Internet of Things, Big Data, automation and robotics will lead to significant changes for the industry as well as for the public sector. Kongsberg is already a digital group with world-leading products within sensor technology, electronics, software development and big data processing. Through the launch of Kongsberg Digital we take an important step in the group's strategy for developing the next generation of digitalized products and services."

With its breadth of product, service and geographic distribution, Kongsberg is many things to many people. But at its heart is software. "Kongsberg is recognized as a high tech company, and it is a significant software company," said Skryseth. "About 70% of what we do is software" across multiple markets, including maritime, oil and gas, energy, renewable energy, defense and space.

Kongsberg Digital will consist of about 500 employees from existing software and simulation environments within Kongsberg Oil & Gas Technologies and Kongsberg Maritime, and from the start it will have a significant portfolio and revenues from advanced data, software and simulation products. In addition Kongsberg Digital will have a group responsibility for developing new digital solutions and related technology alliances. Skryseth said digitalization is one of the key focus areas in industry today, and it is changing the way we work in explaining the rationale to create the separate company: it's tearing down walls, changing business models … and it's happening rapidly.

The World: Digital & Connected

"Within four years there are going to be 200 billion devices connected to the internet, and the ability to get them to talk to each other, to create value, and to create machine-to-machine communication is going to be one of our focus areas," said Skryseth. The data revolution has evoked a number of catchy names,

"Within four years there are going to be 200 billion devices connected to the internet, and the ability to get them to talk to each other, to create value, and to create machine-to-machine communication is one of our focus areas."

Hege Skryseth, President Kongsberg Digital & Chief Digital Officer at Kongsberg

(Photo: Courtesy Kongsberg)

from "Big Data" to "The Internet of Things." But Skryseth and Olivier Cadet, Vice President – Information Management System, Kongsberg Maritime, contend that the key issue is less about the amount of data, and more about the proliferation of "Smart" data, meaning the ability to take vast quantities of information and put it to good use in your daily business operation.

Make no mistake, Kongsberg has its collective fingers on the pulse of vast quantities of data in this market, with more than 17,000 vessels and 10,000 oil wells today outfitted with Kongsberg equipment and software solutions onboard.

"We collect a lot of data, and it is our job to ensure that we are building the right services and applications to leverage this data," said Cadet, "bringing digitalization to the maritime and the O&G industries."

But in a way, the evolution of Kongsberg Digital transcends data, and truly is in step with the industry's move toward looking at vessels and rigs at sea more holistically, in the view of its role in the transport and energy production chain.

"The boundaries of the industry are drastically changing," said Cadet. He said that a company such as Kongsberg used to be a provider of a single product delivered to fulfill one function. But that is changing rapidly. "That product is now becoming 'smart' with layers of functionality." For example, if you have a pipe laying vessel with a Kongberg DP system, you can have a pipe laying function; you can have a smart and connected next-gen DP system with the ability to remote in from shore. The next step really is the move toward real integrated operations, where the DP system is not simply helping its vessel keep position, but is interacting with the OSV next to it, with the ROV in the water, with the weather impacting your vessel … and the list goes on.

A Fast Start

The creation of Kongsberg Digital, which officially will 'go live' in July 2016, comes in tandem with an overhaul of the corporate parent, no small feat. "We are working on the digital strategy for all of Kongsberg, while simultaneously setting up the new Kongsberg Digital," said Skryseth. As might be expected from a global electronics and software power like Kongsberg, the goals are not modest.

"First and most important is to be the performance and efficiency partner for our customers," said Skryseth. Work ongoing is focused on bringing together the collective competencies of the vast Kongsberg reach, with one eye on the present, the other scanning for future trends and competencies.

"We're all about turning data into tangible, valuable actionable information that our customers can use," said Cadet. To start the Kongsberg Digital team sees three major areas of concern, or as they term them 'Value Creation Levers,' including:

- Condition Based Maintenance
- Performance Management (ie. fuel efficiency), and
- Decision Support

"I think there is currently a good combination between technology push and market pull," said Cadet. "The tech is at a stage where it is ready in terms of communication, data storage and data handling and analytic technique … that is the technology push. The market pull is the ever evolving needs of our customers to improve their operations. While the maritime industry is traditional, don't underestimate the younger generation entering the workforce have grown with these technologies."

the 'Paperless' ship

BY WILLIAM STOICHEVSKI

The cloud is for "device-agnostic young slashers," said Trond Bjorseth, marketing manager, of Oslo-based cloud consultancy, Tieto. His company offers an information management tool for subsea projects and "repositories" for the shipping sector's operations. With Tieto you can get "one big happy project room," although he admits at least three suppliers offer something similar.

For its own future "slashers," Glasgow-based ship manager Norbulk Shipping opted instead for Google Cloud Technology Solutions, the "repositories" or cloud rooms of which are saving mariners the burden of ordering, doing and handling paperwork and saving their home offices the burden of getting the paperwork to them by courier, helicopter or harbor pilot. With 80 LPG carriers, VLCCs, product and chemical tankers, bulk carriers, refrigerated cargo container vessels and RoRo's, Norbulk opted for a cloud solution more for operations than project management, as would be the case offshore.

As with Google's cloud solution for Norbulk, Tieto's cloud for offshore projects puts documents in the hands of those who need them, like suppliers bidding via a cloud room (successor to the internet hotel). For Norbulk, the cloud is purely a management tool and the company points to trade association InterManager's recognition of this type of digitization. This proponent of in-house and third-party ship managers believes "the burden of administrative tasks falling on seafarers in today's shipping industry is significant."

As if the Cloud wasn't enough, InterManager is drawing up a set of guidelines aimed at reducing the amount of paperwork officers and their crew have to undertake while at sea.

Yet, Norbulk offers a taste of what cloud-adoption will look like for other shipping outfits: a pilot scheme was run out of its Glasgow office in much the same way a modern guided-missile destroyer might simulate the destruction of a target (OK, not quite). After running the pilot through parts of the company for two months, the feedback was strong, the company says, and Norbulk's Riga, Saint John, Manilla and St. Petersburg offices ascended to Google's cloud.

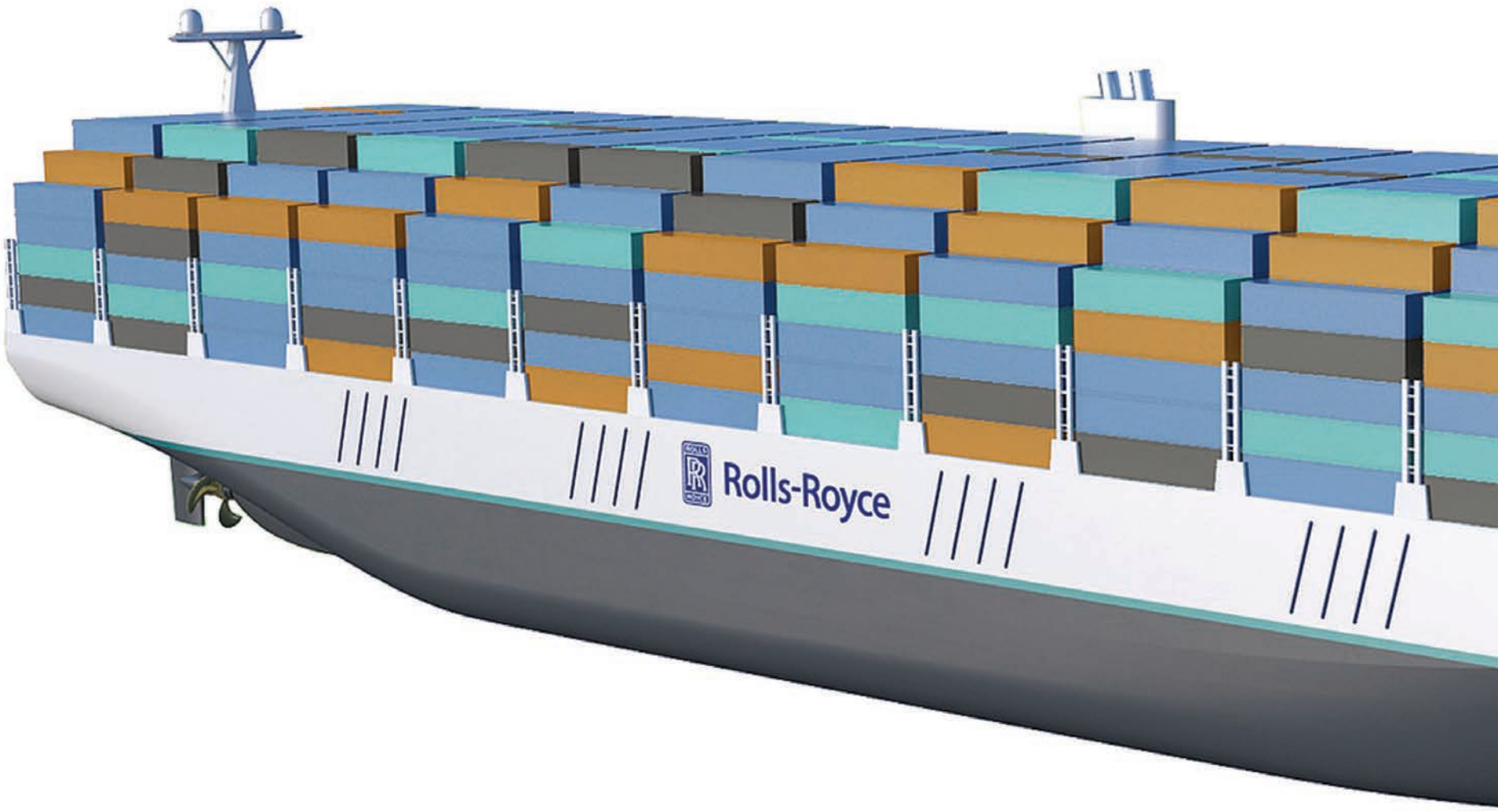
"Cloud-based technology has assisted our goal of adopting paperless systems," says Norbulk director Peter Karlsen, who adds that the better coms and transparency coming out of the cloud made it possible to "access and interpret greater amounts of information".

"The benefits to the company through this change in information flow are very real. Systems do run much more efficiently as a result. Standards have been set so high now and there is a greater emphasis on quality management systems, the environment and competent crew," says Karlsen, apparently in reference to the reams of training data simulators produce when helping crews accrue competence.

Better Comms

The majority of Norbulk-managed ships run electronically and use the cloud-based technology for daily communication. "It's the communications issue that takes time," says Bjorseth and, indeed, Google's cloud migrator moved

Paperless: Artist's impressions of future Rolls-Royce vessels above and below.



(Illustration: courtesy Rolls-Royce Marine)

With **Tieto** you can get "one big happy project room."

Norbulk's email, calendars, contact and appointments from its old mail server to the new cloud-based system. The complexity might be different than, say, cooperating on a new-build vessel in Poland and Norway or a helideck in China, but it's clear cloud solutions generate no modest amount of efficiency

"(Offshore project) Gudrun is already ahead of schedule and on-budget. Other projects in those yards, the same," says Bjorseth. "(Cloud solutions) cut email and improve change management." Tieto's cloud solutions have been adopted by BW Offshore for its FPSO operations and FSO vessel maintenance.

Kongsberg's Data Onion

"I'm always impressed when people come to the office and we are able to show them on a big screen submissions from ships and all the documentation is there in an integrated management system," said Mr. Karlsen, adding, "We have even moved over to paperless purchasing. You won't stay competitive unless you look ahead at advancements and digitisation and how that's going to improve your businesses going forward."

When it comes to connecting offshore service vessels, Kongsberg Maritime's cloud-based big data Information Management System, or K-IMS, also offers data-processing results said to yield safety, operational, cost and life-of-asset dividends. A remote-services CISCO router connects the K-IMS and K-IMS apps to onshore hosting services that are multi-layered for virus and hack protection. "It's (layers are) like an onion. Anything else would not be accepted by the market," said Kongsberg Maritime's vice president of information management systems, Olivier Cadet, a French expat. He said performance management, energy management, fuel optimization and fuel benchmarking offer "tremendous opportunity" for savings. Safety is found in tracking onshore the tension exerted on an anchor handler offshore.

Yet, even for Kongsberg, it seems, adoption of the cloud for big data gathering and processing has been spotty. While smart data processing between onboard performance-related aps and onshore centers is well-documented, Cadet admits a simple app that helps a ship communicate with port is not available. "We have projects in that field," he says, "But we don't have that at the moment." One outfit that does have a cloud solution to ensure a seafarer' documents can be electronically produced at port is travel management company ATP Instone.

(Photo: Courtesy Tieto)

Truly Paperless

Before the truly paperless ship is achieved, it seems other industries will have to make stronger inroads into shipping. In the cloud, Google and Tieto appear to have oceangoing operations, construction and maintenance covered. Kongsberg has performance-related big, smart data processing. Some of the big cruise liners train staffs paperlessly.

"There are still a lot of handwritten forms that need to be filled in, but everything is logged into the system electronically now," says Karlsen of Norbulk.

It seems the only truly paperless ship might be the people-less ship. The U.S. military's sub-hunting autonomous ship Sea Hunter is a now officially a major Chinese and Russian headache. The navy already confirms the Sea Hunter operates "at a fraction of the cost".

Near press time, Rolls-Royce unveiled its "vision of remote and autonomous shipping", it's president, Mikael Makinen, declaring:

"The smart ship will revolutionize the landscape of ship design and operations."

(Original image: MDA; processed by C-CORE)

A cluster of vessels near Gibraltar are vividly seen in this fine-resolution quad-polarized radar image; the more features such as antennae on deck, the more pronounced the tell-tale star-shaped signature.

Is it a Ship or Iceberg?

BY ANDREW SAFER

Developing the capability to discriminate between ships and icebergs in northern latitudes is a common interest shared by Canada's Department of National Defense (DND) and the oil and gas industry. For DND, the focus is on ship detection for maritime security, whereas oil and gas companies are interested in detecting icebergs to ensure primarily the safety and also the productivity of offshore exploration and production operations.

Polar Epsilon

The Polar Epsilon and Polar Epsilon-2 applied R&D projects are focused on improving detection capabilities through the use of synthetic aperture radar (SAR) via RADARSAT-2 and the RADARSAT Constellation Mission (RCM)—three satellites the Canadian Space Agency is scheduled to launch in 2018. A partnership between DND and C-CORE of St. John's, Newfoundland and Labrador is developing the expertise to use SAR imagery to differentiate between ships and icebergs. "This case clearly demonstrates the synergy that exists between the Canadian government and the oil and gas industry," notes Desmond Power, vice-president of remote sensing at C-CORE. He explains that a year and a half ago, C-CORE completed a project in which they developed the capability to provide ice charts for the oil and gas industry, which invested $1.2 million in research. Now, C-CORE is developing further expertise in this area to meet DND's requirements. Power points out that SAR images "are not pretty Google images. They're funky-looking echoes instead of nice shapes." He adds that microwave radiation is a long wavelength, which doesn't reflect back in the same way that the eyes interpret, so it's not intuitive. Vessels show up in a diamond pattern. Bright rings in the image indicate a large supply vessel. "Our people have the experience to be able to look at images and say 'That's an iceberg'," he says, "and they're right 90 to 95 percent of the time."

Small iceberg off the port bow of Canadian Coast Guard ship Louis St-Laurent.

(Photo: Canadian Coast Guard)

The Advantage of Cross-Polarization

When the Canadian Space Agency launched RADARSAT-1 in 1995, among its functions was to provide ice monitoring for the Canadian Ice Service and Canadian Coast Guard, but it wasn't used for surveillance. In 2007 RADARSAT-2 was launched with greater capabilities, not the least of which is cross-polarization. "We noticed that cross-polarization did a much better job differentiating between an iceberg and a ship," observes Power. Cross-polarization provides the ability to transmit electromagnetic waves in a horizontal electric field orientation and receive them in a vertical electric field orientation, or vice versa, explains Dr. Paris Vachon, Defense Research and Development Canada's (DRDC's) scientific and technical advisor to Polar Epsilon-2. Polarized sunglasses provide an example of the benefit of cross polarization. Since reflected light becomes horizontally polarized, sunglasses are vertically polarized to filter out the horizontally polarized light, thereby reducing glare. One of RADARSAT-2's two channels filters out the glare, and RCM will have additional polarization channels. Whereas RADARSAT-1 produced "blobs" in the imagery, according to Power, the polarization in RADARSAT-2 filters out several different images making it possible to determine that a ship should look one way, and an iceberg another. "It organizes the information," says Power. "It separates it out so it's easier for the eye to decipher and interpret."

Icebergs north of Change Islands/Fogo, NL, in a Landsat 8 (optical satellite) image. Mid-sized iceberg astern a vessel on the Grand Banks offshore Newfoundland.

Credit: (Original satellite image: ESA; processed by C-CORE; INSET Photo: C-CORE)

Detection and Classification

For the last year and a half, C-CORE has been collecting data off Greenland, Straits of Belle Isle, Grand Banks, and the Labrador Sea, which they have input into computer vision algorithms to simulate the modes of RCM. They are working towards having the ship-iceberg discrimination capability adapted for use with RCM by the time it is launched, at which point the algorithms will be validated and calibrated. The process involves looking at the image, picking out all of the targets, then focusing on individual targets and providing them to the analyst who classifies them. C-CORE will also be using the algorithms to meet the requirements of the oil and gas industry. Polar Epsilon-2, which is focused on readying RADARSAT-2's discrimination capability for RCM, is a 50/50 co-investment between DRDC, representing Canadian Forces, and C-CORE through a Defense Industrial Research contract. The intellectual property is retained by C-CORE. Each party initially invested $500,000 and an extension added $225,000 for each partner. The project period runs from late 2014 to the end of 2016.

DRDC's Dr. Vachon explains that the RCM ship detection capability is being designed to detect 90 percent of ships that are 25 metres or longer in up to sea state 5, which appear within RCM's Synthetic Aperture Radar (SAR) swath. "Compared to coverage with RADARSAT-2," he says, "RCM with its three satellites will be able to provide more complete coverage of the maritime approaches to Canada on a daily basis." Once RCM is launched, SAR images will be available that almost completely cover the Grand Banks, for example, every day. Currently it takes nearly three days to achieve that coverage. The

cross-polarization available from RADARSAT-2 and RCM, once it launches, reduces backscatter from both the ocean background and the ship target, Dr. Vachon explains. The reduction of backscatter from the ocean background is greater than from the ship. “This can result in the ship target appearing brighter than the background in cross-polarization imagery,” he adds, “which improves the ability to detect the ship.”

Reducing False Alarms

A key objective for the Royal Canadian Navy is to reduce false alarms in ship detection, advises Dr. Vachon who adds that “the challenge is to distinguish ships from icebergs in the wide swath, low spatial resolution modes that will be available from RCM for wide-area maritime surveillance.” Reducing false alarms from the system is a matter of significant interest, he says, because dispatching either an aircraft or ship to the location of the supposed ship only to find an iceberg causes “an undue amount of stress”, both in terms of available resources and cost (an airplane could cost several thousand dollars per hour to operate).

An important region of operational interest, he says, is from Newfoundland and Labrador to the higher latitudes where ships might operate at different times of the year. “It’s no secret that the east coast of Canada is a key area that would benefit from having this type of algorithm available,” Dr. Vachon says, as it would simplify surveillance in that region. If SAR detects an object, that information can then be associated with available AIS data. A match would indicate the presence of a ship that is most likely operating in compliance with regulations, whereas the absence of AIS data would suggest that the opposite might be true, perhaps triggering further investigation.

Polarization and Ice-Infested Waters

Lieutenant-Commander Chad Kabatoff, Department of National Defense (DND), represents the DND operational community who will benefit from the ship-iceberg discrimination algorithms that C-CORE is developing. He differentiates between non-challenging areas where the Canadian Navy’s ship detection capability is currently acceptable, and challenging areas. “Ice-infested waters are very difficult,” he says. “That’s where polarization can help.” He emphasizes the value of global access on a daily basis: “You can’t fly an aircraft to everywhere that RADARSAT-2 has access on a daily basis. The coverage it provides is immense.” Furthermore, space-based systems provide access to areas that would otherwise be inaccessible to Canadian aircraft. Since RADARSAT-2 is always orbiting over the North, images of a particular location can be acquired at least twice a day. He points out that a lot of other sensors are passive and are compliance-based, so if someone is trying to hide and is non-compliant, it would be very difficult to detect them, using any method other than space-based SAR. He adds that icebergs and ships trying to hide would present themselves identically in the imagery. Asked about the collaboration with C-CORE, he said, “C-CORE definitely has a very interesting capability to analyze these problems that require advanced and niche technical knowledge. Having their ability to analyze this problem is immensely useful.

Eye in the Sky Spots Icebergs for Oil and Gas Companies

Tony King, C-CORE’s director of ice engineering, liaises with oil and gas companies that make use of C-CORE’s expertise. Iceberg detection supports long-range planning—up to six months in advance of deployment at a drill site—or shorter-term time frames (days or weeks) in support of ongoing operations. For example, an operator who is planning a project in Baffin Bay would want to know the total iceberg frequency, which would be input into a model that included average circulation patterns and the expected deterioration rate (iceberg melt rate) based on long-term weather forecasts. When RADARSAT-2 and other satellite imagery was used by an oil and gas operator off the Falkland Islands, the objective was to characterize iceberg frequency and the extent of downtimes and input the data into the facility design.

“They see the benefit down there,” King says, “because they don’t have the infrastructure for aerial reconnaissance that is the norm in this part of the world.” Other areas where oil and gas companies have used satellite data include Grand Banks, East and West Greenland, Barents Sea, Beaufort Sea, and Kara Sea. Operationally, King adds, icebergs are more of an issue for an FPSO (floating production storage and offloading facility) than for a GBS (gravity-based structure), even though disconnecting is an option for FPSOs. That said, downtime for a drilling operation can cost several hundred thousand dollars a day. To manage ice risk, Grand Banks operators have a no-contact policy.

If a bergy bit (a piece of glacier ice between 1 and 5 metres above sea level) is detected, depending on distance from the area of interest, it may melt well before approaching the watch circle, so estimating the time to deteriorate is key. King sees satellite data taking a more central role in the Flemish Pass and the newer deepwater Newfoundland and Labrador blocks.

Satellite SAR is very effective for surveilling sizeable areas of the ocean; targets identified in SAR imagery can then be verified by aerial reconnaissance, minimizing unnecessary but costly deployment of aircraft. Desmond Power points to the economic benefit of RADARSAT-2, adding that an oil company engaged C CORE for the first time this year in order to save money. “Satellite monitoring is a way to save money compared sending a vessel out there,” he says. “You can surveil up to 250,000 square kilometers for a couple of thousand dollars.”

In the Arctic, Power continues, increased variability within the seasons is producing anomalous ice environments, which together with increased maritime activity is making ship detection more complex. The technology advances that are being developed through Polar Epsilon-2 to enable increased accuracy in identifying ship and iceberg targets will assist DND in protecting Canada’s Northern waters.

Fisheries Fleets Review: *Part III* *Norway*

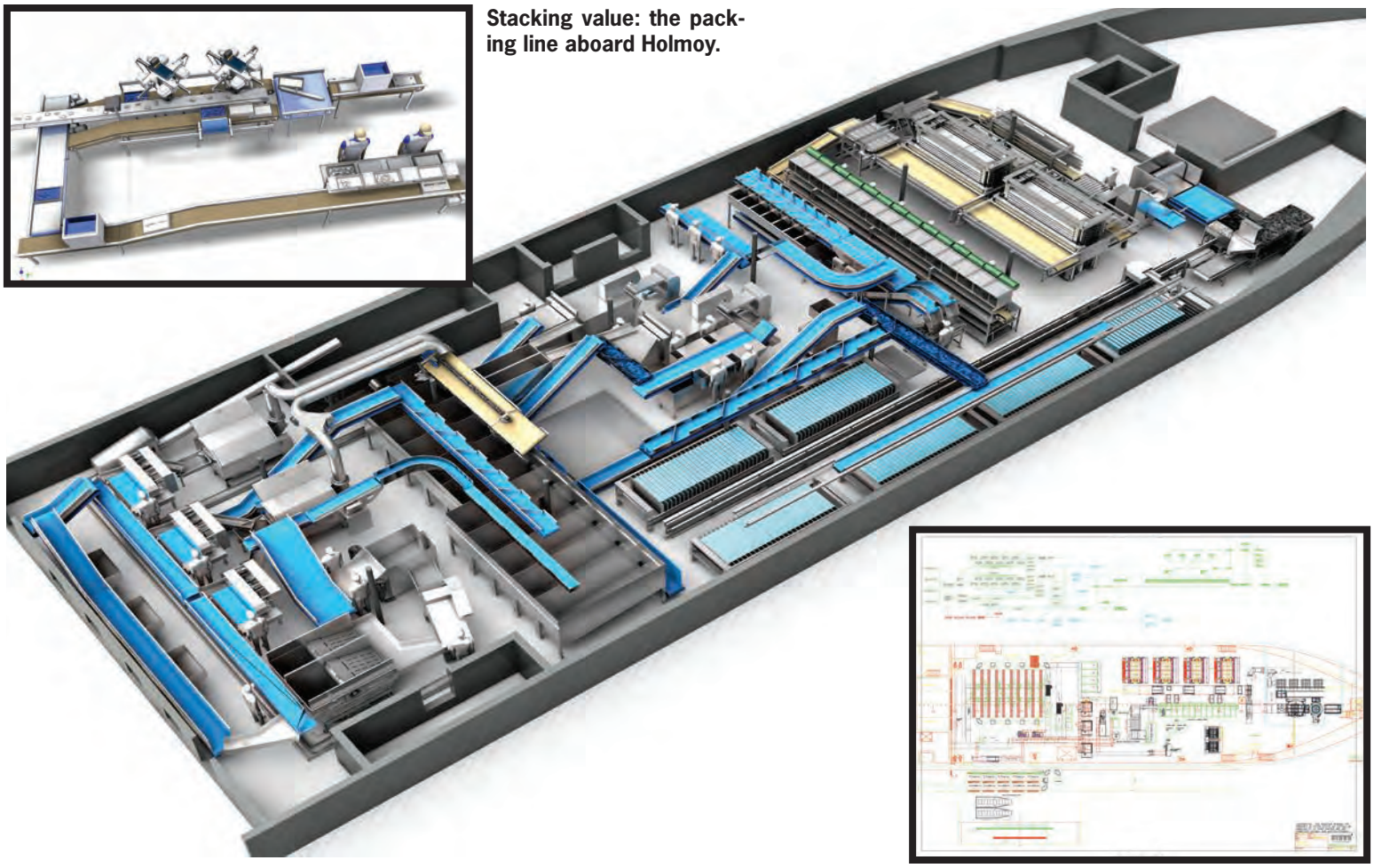
Buying Norwegian

Photos: (start top, go clockwise): Out for more: The Rolls-Royce designed Holmoy, poster boat of the 300 Series. (Photo: handout); On deck: Rolls-Royce gear hauls the Holmoys nets. (Photo: handout) Money machine: The "new" Ramoen. (Illustration: Courtesy Rolls-Royce)

BY WILLIAM STOICHEVSKI

A perfect swell of opportunity is driving European Union orders for Norwegian fishing boats. High prices, health products, Russian-Norwegian whitefish management and new equipment for boat designs that extract great commercial value have the big EU seafood companies buying Norwegian designs. Kleven Shipyard alone has orders for six boats, including "factory" trawlers and seiners for France, Germany and Spain. Other yards, too, are doing first-time EU business, and capacity is sought for the new-builds of Europeans sailing deeper into Norwegian waters in search of a new Norwegian era of oil — fish oil, that is.

Stacking value: the packing line aboard Holmoy.



OPTIMAR STETTE Onboard factory.

Future fishing trawler: layout of Optimar Stette's onboarrd factory.

(Images Courtesy Optimar Stette)

"Cod numbers haven't been this high since WWII," says Lena Brungot, advisor to the Norwegian Fisheries Minister. "The catch of Northeastern cod is up 20 percent due to control cooperation with Russia. Illegal catches are now zero."

For EU fleets with access to Norwegian waters, "The growth (in interest) is down to high prices," Brungnot asserts. Europeans in re-sold and new Norwegian trawlers and purse seiners can be seen in Norwegian ports waiting or Norway's rich fishing seasons. Successive treaties — from the 200-mile economic zone that ended U.K. fishing dominance to the yearly EU-Norway quota talks — let EU fleets share 90 percent of the catch with Norway and other coastal states. They can ply the North Sea from the 62nd parallel on south. North of that, it's the Russians.

EU North

Catching whitefish offshore Norway is best done in Norwegian vessels which are cheaper since the krone's tumble. The catch of cod was up 20 percent in 2015, and Brungot insists Russian willingness to impose catch controls is the main reason (plus the fisheries-protection in and around the Spitzbergen Archipelago; melting sea ice and the flight of other species out-of-area).

Owning mere shares in a Norwegian vessel that can earn USD90 million a year is hard to stomach for some proud EU owners. On top of that, owner equity and crews must be 60 percent Norwegian and the company must have a Norwegian chairman. EU Fleets are, instead, buying Norwegian boats and exploiting EU-Norway rules. The Icelandic owner (Samherji) of Germany's largest ocean-going seafood company, DFFU, has a taste for Norwegian vessels and old wounds from impossibly hard fisheries talks with Norway. DFFU has two of four Rolls-Royce designs being built for the Continent at Myklebust yard. The 80-meter ice class 1A stern trawlers are NVC 374 WP designs due out in February 2018. Two others of the same design are being built for French seafood giant Compagnie Des Peches Saint-Malo & CDP Euronor and Spain's Pesquera Ancora S.L.U. Kleven's Myklebust yard also has a Danish order for a combined 90.5m purse seiner/trawler of SALT 0155 design from seafood company Gitte Henning.

"This is absolutely a first for us, when it comes to the high number of fishing vessels (five) in our order book," Rolls-Royce spokesperson Annette Wollebaek writes in an email. Company design manager, Einar Vegsund, extolls the virtues of the new 300 Series vessels that include an 80m well-boat for bringing live fish to shore.

While factory trawlers were once all the rave, trouble controlling catch numbers lost in transshipment and poor PR ratings produced a wane in popularity. They're back. Vegsund admits, "In numbers, there has been a push." Turning to his own trawler designs, he says there's been a corresponding "pursuit of value". New Rolls Royce handling is complemented by process equipment that offers an ability to earn exponentially on catch byproducts still tossed overboard to ecstatic seagulls.

Processing now includes robot cutters and bone-removers that up catch values, and a new EU "Stop Discards" initiative offers regulatory reasons for extracting value from fish scraps. There are immense earnings to be made on precision-cut fillets, but fish meal prices are high and the price of fish oil is soaring as its health value is understood. So, after stunning, heading, gutting and bleeding, there's a new market in the EU for the omega-vitamins derived from the seagull's feast of trimmings and innards.

The oil-extraction process calls for the removal of meat from bones (or shell from meat, in the case of krill or shrimp) by hydrolysis and enzymes or acid-application and mechanical separation.

Low-RPM Rolls-Royce

"The new vessels are our route to market," says Mr. Vegsund, who can boast 15 new-build projects to 2018. Build No. 1, the trawler Holmoy, was just delivered from Vigo Spain's Freire Shipyard, one of 24 shipyards being upgraded with 240 million euro in public money, as Spain looks to counter an order stop. "(EU Seafood companies) are looking for the same (Rolls) solutions modified to their needs," Vegsund says, adding that orders have come too quickly to line up yards. "We have to find the right shipyards," he concedes. Danish shipyard Karstensto is understood to be in line for a new-build.

The Holmoy, typical of the 300 Series, was built to haul both giant halibut and tiny shrimp aboard with permanent magnet electric trawl winches which, coupled with frequency converters for the shaft, feed energy back to a 5,400 kW Bergen B33:45 engine "designed for" low-rpm trawls. An auxiliary engine provides emergency boost. Noise and pulse reduction claimed to be 25 percent are important when fishing shoals, as are the "15 percent" better turns (due to a "swollen" rudder fixed to the thruster).

The Europeans have also been keen to order onboard pallet-making from Optimar Stette that readies loeds of up to 80 tons per day. "The logistics have to be good," says Vegsund, a nod to Optimar's onboard factory.

Fish and Chips

The 75m Ramoen, an NVC 372 design outfitted at Spanish yard Astilleros Armon for delivery later this year, was designed to fillet in myriad ways and allow its owners to declare a Frozen at Sea brand for whitefish caught in the Barents Sea. The Ramoen will process 100 percent of each fish caught. "Ramoen is a one-vessel company making 14 million euro a year," says its fisherman

World First

(Image:s SalMar/Rolls-Royce)

Offshore Fish Farm Rig

Rolls-Royce signed a contract for the construction and delivery of an eight point mooring system to the world's first offshore fish farm installation being developed for Ocean Farming AS, a subsidiary of the SalMar Group in Norway.

The equipment will be used to secure the installation to the seabed at Frohavet, off the coast of central Norway. The 68 meter high rig will have a diameter of 110 meters and a volume of 250.000 cubic meters.

SalMar decided to move the operation offshore in the plan for additional growth in the industry of harvesting from the sea, as new locations that offer good biological condition for the farming of fish stocks. However moving further offshore also requires new technology.

"This contract win shows how years of experience providing sophisticated mooring and deck machinery solutions in some of the world's most difficult sea conditions can be applied in other areas of the maritime economy today and for the future," said Asbjørn Skaro, EVP – Deck Machinery, Rolls-Royce. "The technical solutions for SalMar's pilot installation is based on the state-of-the-art technology Norwegian industry has to offer from both fields of aquaculture and offshore oil and gas."

The eight point mooring system to be delivered by Rolls-Royce includes monitoring, fairleads, connectors and subsea load sensing system.

Rolls-Royce has signed a contract with the Chinese Institute of Marine and Offshore Enginering, and the new semi-submersible rig will be constructed at Qingdao Wuchuan Heavy Industry Co. Ltd in China. It is designed by Global Maritime in Norway, and the pilot ocean fish farm is planned to be completed by the second half of 2017.

(Photo: handout)

Europe orders: Kleven's Myklebust yard near Aalesund has replaced much offshore new-build activity with fishing boats builds.

CEO, Per Magne Eggeboe. His wholesale U.K. buyer, Smales, buys his entire 7,000 t quota of haddock, cod and halibut. Saithe goes to Germany and Turkey. Catching that much whitefish would seriously challenge Britain's fleet of smaller craft, and Eggeboe has access to the Barents' 894,000t quota. The eight staff in Ramoen's production line will create a range of products that includes 3t of powdered fish meal per hour (at USD1,600 per ton!) for fish farms. The Ramoen is understood to also employ the Icelandic Valka, a machine that "x-rays" then "CNC cuts" and "robotically" debones fillets. "We're one of the first vessels to take it into operation," says Mr. Eggeboe. The precision cuts generate cuttings for fish oil. "Our fish oil is already sold for the next two years," Eggeboe says. While some 80 vessels in Norway generate 108,000 t of aquaculture meal, the much smaller list of those making oil is expected to grow fast.

That list includes the recently retrofitted freezer-trawler Molnes of shipping company Nordic Wildfish (which was celebrating a supply deal with a foreign health products wholesaler when we showed up). "The EU will always want more of our cod," says Brungnot, and according to Danish-owned fish meal and oil producer Vedde, it's increasingly the oil in that cod that the EU wants. Seafood companies are no longer the only customers: "600,000 t of fish makes 120,000 t of protein and 46,000 t of omega-rich oil (and) right now the price of meal is high," a company R&D officer says. The Molnes, equipped with expensive, custom-built plant to process and cool up to 50,000 t of fish oil per trip will use the first ever installation of a protein hydrolyzer and enzymes rather than acid to strip protein from tailings.

"I think this is a trend," the hydrolyzer's humble inventor tells us, as rows of green fish oil barrels tower above us in the background. "It's expensive to be the first. If we succeed, the rest will follow.

The EU, meanwhile, has allowed companies selling omega-rich oil to make "up to nine health benefits claims" about their product. "We're lucky in Europe," says Pharma Marine executive chairman, Leif Kjetil Gjendemsjoe. His company has already started making an olive oil blend with fish oil.

As we tasted it, Mr. Gjendemsjoe declared, "It's historic — you're the first!"

Vietnamese Fisherman Opts for Modern Boat

Vietnam, with a coastline of 3,260 km, excluding islands, claims 12 nautical miles as the limit of its territorial waters, an additional 12 nautical miles as a contiguous security zone and 200 miles as an exclusive economic zone. This adds up to a lot of water to protect as well as a rich coastal fishing area.

In an effort to increase the fisheries production of the coastal fishing area the Vietnamese government has instituted a program to encourage investment in the fishery. Known as "Directive No. 67" it provides low interest loans to assist qualified fishermen to build new boats or upgrade existing boats. Many fishermen who qualified have opted for wooden boats built by the Vietnamese craftsmen. Wanting a thoroughly modern boat, fisherman Bui Mong approached the innovative Institute of Ship Research and Development (UNISHIP) in Khanh Hoa province on Vietnam's central coast. In association with University of Nha Trang the small shipyard has launched several fiberglass vessels this year. Owner Bui Mong demonstrated to the bank that he was both deserving of a boat loan and capable of repaying it. From his birth in 1970, on a farm in Quang Ngai, one of the poorest areas of Vietnam, he ventured out to complete his military requirements and then took a job cooking on a small squid boat. As do many workers new to the fishing industry he learned the trade in "the school of hard knocks." As cook he was the most junior on the boat and had to respond to the demands of the other 20-crew members. He persevered and, when he got the opportunity to assist the boat's engineer he asked questions and learned to maintain a diesel engine. In time he gained the confidence of the vessel owner and, with higher pay, began to save for his own vessel. With some partners he bought a small squid boat. With continued hard work and careful study of the other fishermen he gained confidence. More good fishermen wanted to work with him. As he explained to Cummins DKH (Vietnam) LLC Engine Sales Engineer Nguyen Cam Linh, "He wrote down carefully all information on each of his trips, like location, wind direction, current and others, day after day. The record became a fishing manual and he learned by heart each season, characteristics and areas of Vietnam's sea so that he became a 'walking encyclopedia of the ocean'. By then he owned 100% of the boat."

Moving from the squid fishery to a sur-

(Photo: Cummins/Haig-Brown)

"Directive No. 67"
Vietnam's government has spurred investment in new commercial fishing tonnage – such as Ju Mong Truong Sa powered by Cummins diesel engines – with low interest loans.

(Photo: Cummins/Haig-Brown)

Fisherman Bui Mong approached the innovative Institute of Ship Research and Development (UNISHIP) in Khanh Hoa province on Vietnam's central coast.

(Photo: Cummins/Haig-Brown)

round net, he developed techniques for daytime, as well as night time, fishing. While his successes in fishing grew, he suffered personal tragedy when his wife died of cancer. Her treatment had used all of the family's reserve savings. Then his boat was lost in a storm. After his rescue he found himself on the beach with no more than he had started with. But he had knowledge and a reputation as a successful fisherman. When he applied for a loan under the government's Directive No. 67, he was asked why he wanted to build a fiberglass boat with a big expensive engine, when there were less expensive options available. He explained that, the larger, more powerful boat with a modern reliable engine would enable him to travel further and faster while catching more fish to repay the loan. The use of fiberglass, while initially more expensive, would reduce the cost of maintenance and repairs. Recognizing that Bui Mong had not only his fishing knowledge but solid entrepreneurial skills backed by a solid business plan, the loan was granted. In June of 2016, a proud and determined Bui Mong took delivery of a 24 by 6.5-m fiberglass vessel from UNISHIP. With a molded depth of 3.5m and a 10,000-liter fuel capacity, the new boat, named Ju Mong Truong Sa, is large enough to fish well off shore. The packing capacity of 70 cu. m. in eight compartments will allow efficient use of ice while providing storage for significant catches of tuna and other species. Mong got his powerful and reliable engine, a 12-cylinder Cummins KTA38 MO delivering 800 HP at 1800 RPM through a Dong I marine gear with 4.95:1 reduction. This gives the boat a 12-knot top speed. A power takeoff on the main engine provides for the hydraulic steering. Other auxiliary requirements are met by three refurbished 60 KVA (Kilo Volt Amperes) auxiliary generator sets.

The strongly built vessel features working decks formed with three-layer, sandwich type construction to provide strength and better noise and heat insulation. With accommodation for a crew of 20 the boat is fully outfitted for roaming and fishing throughout the Vietnamese waters.

‘World’s Largest’ Nuclear Icebreaker Launched

Russia has unveiled Arktika, touted as the world’s largest and most powerful nuclear icebreaker, during a launching ceremony on June 16 at Baltic Shipyard in St Petersburg.

The 173 x 34 meter Arktika is the lead nuclear icebreaker ordered by Russia’s Rosatom state nuclear agency for navigation through the Northern Sea Route, and more specifically the delivery of hydrocarbons to Asian markets. “There are no analogs of the icebreaker such as the Arktika in the world,” said Rosatom CEO Sergey Kirienko at the launching ceremony. “This icebreaker is most up-to-date by its parameters; all technical capabilities which have never been used on other vessels are implemented here. The icebreaker Arktika means real new opportunities for our country.”

Designed by Iceberg Central Design Bureau, the vessel is engineered for piloting large-tonnage ships and leading caravans in the West Arctic (Barents Sea, Pechora Sea and Kara Sea) and features a double-draft design for use both in the Arctic and in estuaries of the Polar rivers (in particular, in shallow water of the Yenissei River (Dudinka) and the Gulf of Ob). The icebreaker can also be used for towing in ice and open water, rendering assistance to ships and carrying out rescue operations. This ship, which is being built to the class of the Russian Maritime Register of Shipping (RS class notation: KM+ Icebreaker9 [2] AUT2-ICS EPP), will be able to break ice up to 2.9 meters thick and reach speeds of up to 22 knots. Metal for the body of the icebreaker was supplied by OJSC Magnitogorsk Iron and Steel Works (MMK).

The icebreaker will be fitted with double-reactor electrical power installation with the main steam source from the reactor plant of a new generation RITM-200 with the power of 175 MW being specially designed for this ship. Arktika’s keel was laid on November 5, 2013, and the vessel is set for sea trials in 2017.

Arktika main particulars:

Power	60 МВт (shaft)
Speed	22 knots (at clean water)
Length	173.3 m (160 m as per CWL)
Breadth	34 m (33 m as per CWL)
Depth	15.2 m
Draft	10.5 m/8.65 m
Maximum icebreaking capability	2.9 m
Full displacement	33 540 t
Specified lifetime	40 years

ARKTIKA
The launching ceremony for nuclear icebreaker Arktika took place at the Baltijskiy Zavod in St Petersburg.

(Photo: Rosatom)

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Preparing for New Fire-Fighter Regulations

New SOLAS resolution mandates change to fire-fighting communication systems. Will you be ready?

BY NIELS PETER AGDAL & CLAUS HORNBECH

On November 30, 2012 the Maritime Safety Committee adopted Resolution MSC.338(91) among which, Chapter II-2 'Construction – Fire Protection, Fire Detection and Fire Extinction' is of specific interest to professionals that deal with, and ultimately depend upon fire-fighting processes and technology. The resolution adopts a number of measures designed to improve fire safety at sea, including the mandatory use of specific types of handheld radio. The specific wording in, SOLAS Chapter II-2, Regulation 10.10.4 reads:

For ships constructed on or after 1 July 2014, a minimum of two two-way portable radiotelephone apparatus for each fire party for fire-fighter´s communication shall be carried on board. Those two two-way radiotelephone apparatus shall be of an explosion-proof type or intrinsically safe. Ships constructed before 1 July 2014 shall comply with the requirements of this paragraph not later than the first survey after 1 July 2018

This deadline is critical. The amount of relevant vessels built before 1 July 2014 is approximately 89,000, of which approximately 60,000 – 65,000 are covered by SOLAS and therefore by Regulation 10.10.4. Additionally, as is normally the case, other non-SOLAS vessels are expected to implement the regulation on a voluntary basis. This makes the requirement for new fire-fighter specific radios before the final implementation, approximately 260,000 to 300,000 units. That's how many need to come to market over a period of less than 3 years from now. It's a huge amount of radios of a very specific type to drive through the channel in order for them to be in place. So it's important to understand exactly what you need sooner, rather than later. And do something about it.

Fire-fighter Outfit

The fire-fighter radios required in SOLAS Chapter II-2, Regulation 10.10.4 are additional to the wider remit of the mandated 'Fire-fighter outfit'. The International Code for Fire Safety System (FSS Code), resolution MSC.98(73), Chapter 3, Regulation 2 'Fire-fighter outfit', defines and describes the scope, such as type approved electric safety lamp, rubber boots, rigid helmet, explosion proof electrical safety lamps (for tankers), type approved lifeline, type approved breathing apparatus etc.

According to Chapter II-2, regulation 10.10.2.1 all ships shall carry at least two fire-fighter outfits. According to Chapter II-2, regulation 10.10.2.2 an additional fire-fighter outfit is required for passenger vessels depending on the design of the passenger vessel / cruise ship; i.e. length of passenger spaces, number of decks, number of vertical zones and number of passengers. According to Chapter II-2, regulation 10.10.2.3 an additional two fire-fighter outfits shall be provided on tankers.

The fire-fighter outfit shall be kept ready for use in an easily accessible location. As the Fire-fighter radios as required by Regulation 10.10.4 are additional to the above fire-fighters outfit and intended for the Fire Party, the total number needed on board will depend upon the number of fire parties detailed on the Muster List rather than the number of fire-fighter outfits. Each Fire Party must have at least two of these dedicated radios and as fire-fighters may need to use Direct Mode Operation (DMO) during fire-fighting operations or if the Fire Party consists of more crew members than the actual fire fighters, i.e. incident commander, the actual number of fire-fighter radios will vary from vessel to vessel as more than two radios may be required for each Fire Party.

Fire-fighter Radios

The purpose of fire-fighter radios is to provide a dedicated means of communication between a team of fire fighters entering the space, and the crew member outside the space assigned to control this team. The fire-fighter radio mainly consists of a portable UHF radio transceiver, a battery and an antenna. The radio has various buttons and controls for operating change of channels, adjustment of squelch and a Push-To-Talk button.

To date, IMO has not yet set the performance standards for the above fire-fighter radios but, in order for such equipment to meet the explosion proof or intrinsically safe requirements the radio telephone apparatus must be certified in accordance with relevant standards for equipment and protective systems intended for use in potentially explosive atmospheres, and maintained as such, for example: Directive 94/9/EC (ATEX) – with approval rating such as II 2G Ex ib IIC T4.Temperature rating 'T3' may be accepted instead of 'T4' but the T4 rating will cover all types of vessels including tankers.

Radios tested and certified according to recognised maritime standards have passed comprehensive testing for the specific marine environment as set forth in the standards i.e. EN60945, EMC test, drop test, IP-grade test, Ex approvals from notified test facilities, to mention a few. In addition, accessories for such radios have passed similar tests and therefore are tested and certified to have full functionality with the radio.

Fire-fighter outfits, by their very nature, limit movement so using a handheld radio effectively during a fire-fighting operation can be challenging. However,

the IMO Fire Safety Code does not describe the design of the fire-fighter radio in this regard. From a user's perspective, the radio should be designed for use with large gloves, the possibility of being warn underneath the fire-fighter suit and for smoke divers wearing breathing apparatus, being able to connect to the breathing mask, and for Incident Commanders, being able to connect to the helmet headset.

The housing of the fire-fighter radio should be made from materials which will prevent the radio from damage even in extreme conditions during operation. Fulfilling recognised standards for maritime communication equipment will ensure that the unit has passed sufficient tests carried out by an accredited laboratory. These tests include several well defined setups like durability and resistance to environmental conditions, heat test, vibration, rain and spray, and corrosion to mention a few aspects of the extensive test scheme.

The range of tests to document the performance of the fire-fighter radio is based on international standards and therefore recognised by surveyors worldwide. It is the ship's responsibility to demonstrate that its radios are fit for purpose, i.e. that they are able to work within the environment to be expected in a fire scenario, that their operating range is sufficient and that they are safe.

Radio Frequency

The structure of a vessel is more or less comparable with the structure of a faraday cage – lots of steel construction surrounding the radios in use. In a fire-fighting situation, fire doors and fire dampers will have been activated and closed, leaving very limited, or no penetration of radio signals. UHF radios provide the best available penetration possible within such areas and between fire-fighters and/or the incident commander on deck. Using the fire-fighter radio on the same frequency as the daily on board UHF frequencies will provide the possibility of establishing communication between existing radios for on board communication and the fire-fighter Radio.

Considerations should however be made on the programming of frequencies (channels) for all radios on board. In DMO communication all radios working on the same frequency (channel) will have the possibility to send and receive on this channel. A dedicated channel should be reserved for the Fire Party for use only during fire-fighting operations in order to avoid disruptive interference from other radio communications on board. This will minimise the risk of interruption of communication between members of the Fire Party, but it will not prevent interference from other nearby vessels which may use the same frequency (channel) for daily operations.

To avoid interference from other nearby vessels the fire-fighter radio should be capable of having channels programmed with Continuous Tone Coded Squelch System (CTCSS), which is a frequency code programmed with the channel of the fire-fighter radio. Only radios with this code on this specific channel will be able to communicate. Shifting the fire-fighter radio to any other frequency channel without CTCSS will again open up for communication with all other radios on board or nearby. Using CTCSS is also known as Trunked Mode Operation (TMO) which is also needed when using radio repeaters i.e. for use in confined areas.

The sensitivity of the fire-fighter radio transceiver is of great importance in order to maintain proper communication at the limits of the radio coverage. Additionally, the correct position of the portable radio on the fire-fighter outfit must be considered to reduce the reduction in radio signal due to body loss. Distributed antenna systems are commonly working on UHF frequencies and may therefore by minor reprogramming of the fire-fighter radio extend the indoor coverage in confined areas – a vital improvement to the safety of the Fire Party as well as beneficial for the day to day work radio communication.

Radio Storage

As a fire on board a vessel can spread within minutes it is of paramount importance that there is easy access to the fire-fighter outfit and that all equipment is ready to use. This is typically secured by placing it in permanently and clearly marked locations i.e. lockers on deck or in passageways. Depending on the type or size of the vessel, more fire-fighter outfits may be required, and will typically be stored in widely separated locations.

Fire-fighter radios can be stored together with fire-fighter outfits to secure easy access and availability, instead of wasting valuable time spent collecting fire-fighter radios from a separate location. Fire-fighter radios might be marked or coloured to identify such radios from other on board portable radios to ensure that they are kept ready for use and that they are recognisable to the surveyor during survey.

To secure readiness of the fire-fighter radio, they may be placed in chargers providing constant charge to the radio battery, but considerations should be made since chargers are not explosion proof and must be placed outside hazardous areas. Also, radio batteries will slowly be impaired when being constantly charged and although regular fire drills include checking of relevant communication equipment and also read-out of battery status from the radio display, considerations should be made to have i.e. an emergency back-up power battery pack for instant use during the charging time for the ordinary battery.

Emergency back-up batteries will shorten the time from the outbreak of a fire to the deployment of the Fire Party in case the radio battery for one or more fire-fighter radios is not usable (i.e. not charged). Charging time for a radio battery for a fully discharged portable radio is typically between 4 to 5 hours. Emergency batteries are non-rechargeable but will maintain their capacity for a period of 5 – 6 years if not activated before expiry, making them ideal for storage with the fire-fighter outfit and radios.

Conclusion

While Chapter II-2 'Construction – Fire Protection, Fire Detection and Fire Extinction' is very clear on many aspects, there is some ambiguity on the fire-fighter radio requirements. As it stands, it's important for surveyors and ship-owners alike to know what constitutes a fire-fighter radio under SOLAS Chapter II-2, Regulation 10.10.4.

Choosing or recommending the right radio is vital. But it's just as important to act fast. With the potential of 300,000 new radios needing to be in place by 1st July 2018, getting prepared now is a sensible move. A last minute rush to pick up any radio that might fit the regulations, though saving money from this year's budget, could end up costing you more if it doesn't meet requirements, or indeed the very real possibility that it won't arrive in time for your first survey.

[1] *DMO: Direct Mode Operation, communication between two or more radios on same frequency.*

The Authors

Niels Peter Agdal, Director - Radio, Safety & Tracking at Cobham SATCOM. Following his Master's Degree in International Business Economy from the University of Aalborg Niels Peter´s career has been focusing on working in Communication. Having worked both in Sales, Marketing and Business Development at various international companies, Niels Peter now has 8 years of experience at Cobham Satcom (previously Thrane & Thrane A/S). Being Director and responsible for the full range of SAILOR SOLAS and GMDSS products including VHF, MF/HF, Sat-C, AIS, Navtex, GNSS/DGNSS, Portable Radios and Power Supplies Niels Peter has a key position in influencing the future of communication Products at sea.

Claus Hornbech, Business Manager – Maritime Integration, Cobham SATCOM. Claus joined Cobham SATCOM 2015, as Business Manager – Maritime Integration, and is part of the Maritime Business Development team responsible for developing markets, market input and implementation of products to suit the need of the end-user. He holds a Master Mariner and has been within the maritime electronics business since 1988, working with well-known system integrators and manufacturers inside Sales, Marketing and Business Development towards end-users within Deep Sea Heavy Marine, Offshore Oil & Gas and Deep Sea Fishing.

Effective Maritime Instructors – What are they?

BY RICHARD A.J SLOLY

Poor training can lead to catastrophic accidents both financially and with loss of life, an unavoidable fact. The maritime industry is sadly far behind its counterparts in the aviation industry with regards to the importance placed on good quality, practical, effective training, a matter that urgently needs to be addressed. But where does this start? With the crew? With the ships? With the companies? I believe it begins with the trainers; Good quality training must come from passionate, dedicated instructors who understand their responsibly to the maritime community.

Food for thought: "Is a good maritime instructor someone with good maritime experience or someone with good instruction techniques that can pass on information effectively? Naturally the answer should be both, but from your experience of training schools, how many instructors exist with both attributes?"

Effective training delivery has always been and will always be a deep rooted passion of a good maritime instructor, and one that I certainly refuse to water down under increasing pressure from an industry that often looks to reduce training requirements. Having looked extensively into Cognitive Behavioural Therapy (CBT) as well as Neuro-linguistic Programming (NLP), as an industry we don't need to go anywhere near as far as this to achieve effective training as we strive to deliver motivated crews to vessels. As an instructor for more than 50 HELM courses (at both Management and Operational levels) as well as a number of IMO 6.09 "Training Course for Instructors" and IMO 6.10 "Train The Simulator Instructor and Assessor" courses over the last few years, this has thrown up many questions, but one central/pivotal question continually rears its head.

Modern training centers balance between theory, practical and assessment, with modern teaching techniques.

Question. As an industry are we simply looking for a financial return from sending crew members on training courses as they supposedly reduce marine risk, or, are we actually looking for a tangible improvement in the quality of the seafarer and the industry as a whole?

I would argue that it cannot be our motivation as lecturers to just read out facts and figures in a haphazard fashion, such as the 'tick box' courses of the past. We must inject all our efforts and approach training delivery in a dynamic fashion in order that we expose – as much as humanly possible – students to a concrete learning experience that not only passes skills designed to reduce marine risk, but also make the individual a better seafarer and improves the industry long term as a whole. This approach is summarized by David Kolbs, an Education Theorist.

This is so they will know When, How and Why to apply the principles of their new found skill in a measured – autonomous fashion as opposed to a petulant "That's what the instructor told me to do" mindset.

After all we must never forget we are 'The Guardians of the Standards'for delivery of training packages in the 21st Century.

Qualities to Develop

There is one very important aid that we put in front of all students which can have more impact and influence on the effectiveness of training than any other media ... you, the maritime instructor. We can all recognize what we consider to be a good instructor and that one instructor is very different from another.

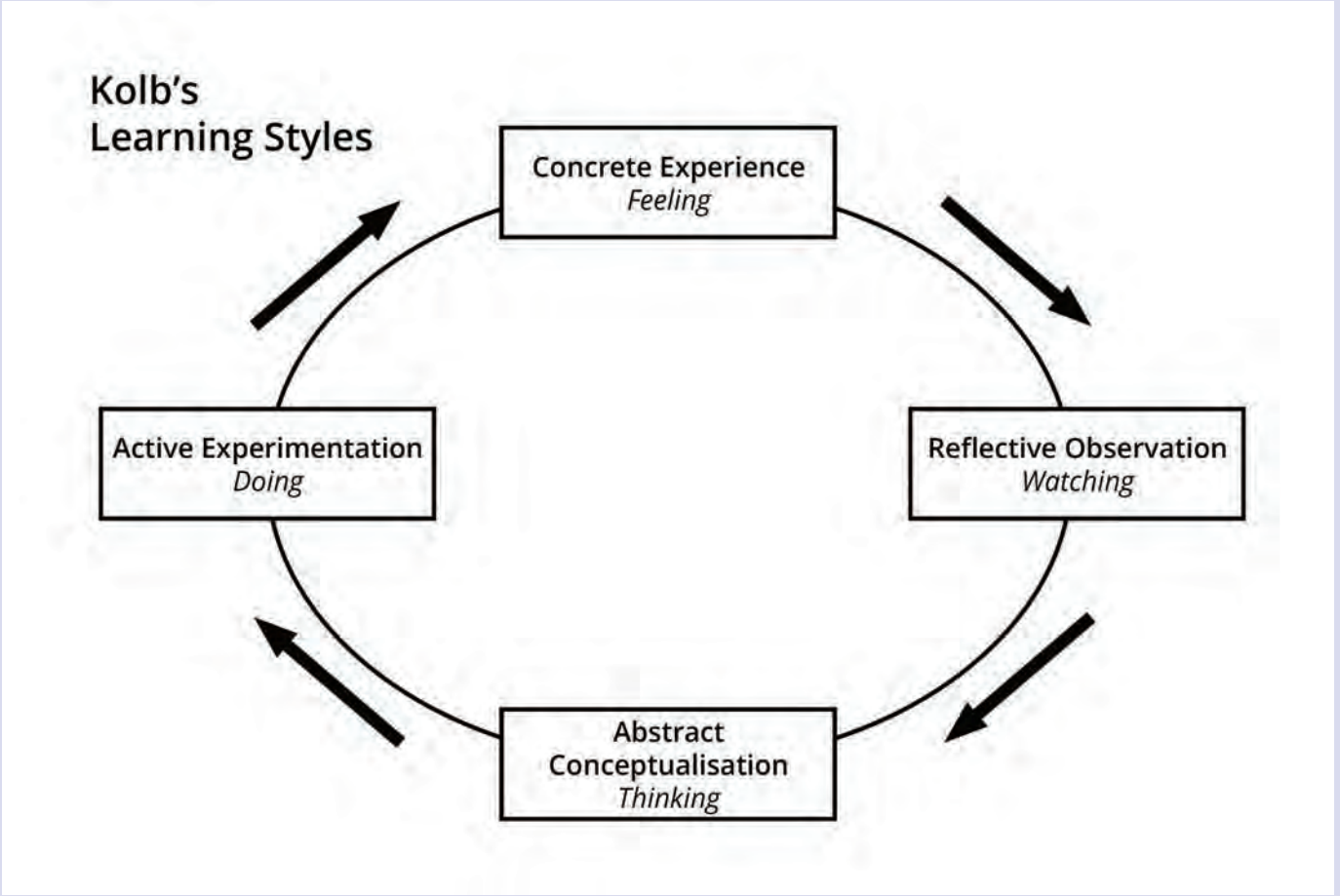
Qualities an instructor should possess:

- **Confidence.** You need to have confidence to be fully effective; firstly confidence with the material that you are instructing and secondly confidence in your abilities to deliver that material.

- **Bearing.** How do you appear to the class? Be aware of your image in front of the class and ensure that that image is not in itself a distraction.

- **Mannerisms.** Avoid anything that could be a distraction to the students. This may be something repeatedly said such as "ok" or "right" or constantly jangling keys or coins in your pocket or pacing up and down over the same area.

- **Voice.** Modulate the voice and use pauses for effect and emphasis. Varying the rhythm, speed, volume and pitch of



Kolbs four stage learning cycle.

your voice will help to keep the attention of the class.

• **Eye Contact.** Eye contact is one of the most important aspects of body language. Making eye contact with your students will help you to gauge whether your message is being truly received and understood.

• **Conduct/Behaviour.** Your attitude is important as this ultimately will influence the rapport you have with your students.

• **Enthusiasm.** An enthusiastic manner adopted by the instructor can have a greater effect on the learning process than any other quality. It has the ability to make a mediocre lesson into a good one and conversely, lack of enthusiasm can turn a good lesson into a poor one.

In conclusion, below is an extract from an interview with a newly qualified assistant Marine Instructor, who has never been to sea or instructed in a professional environment before.

"When I joined the training center I was originally employed to manage and facilitate IT equipment, from basic desktop computers to advanced electronic programs. Based on my computing knowledge I soon found myself assisting the established Maritime Instructors with chart uploads and VRD playback. I was under the impression as I watched other instructors that lecturing was just the process for throwing a load of facts at a student, they learnt it, we test their ability to learn it and then they go back to sea. When I was approached and asked if I felt comfortable delivering part of a lesson (the technical side of the course) I jumped at the chance as I thought that that was all I had to do.... I was wrong! Previous to this I had only delivered training on a voluntary basis within my passion for technology. As a standard course of action, the company encouraged and guided me as I underwent the full remit of train the trainer courses available. I was naturally apprehensive but gained so much understanding of the industry and how it, and more to the point I, can make mistakes as a result of simple complacency. The lessons I have learnt stayed with me and I draw on those skills on a daily basis.

As a result I moved over and started to support the bridge course as the exercise controller and swiftly found myself becoming a Co-Teacher. Having now completing the IMO 6.09 "Train the Trainer" Course, this for me has paid dividends as it pulled all my skills together and assembled them in a more structured form as opposed to a hap hazard order. This in turn allowed me to understand how proper measured training packages are formulated and that instruction is not just a matter of regurgitating chunks of information; there is a whole thought process that goes into it which I was unaware of. The approach to teaching crew members (Adults - Andragogy) is very different to teaching children (Pedagogy). Having studied the differences extensively, I think that this (Pedagogy) is how many training packages have, or are, being delivered in some elements of our industry from my observations.

Looking back at the 6 week training/education package that I received in Whiteley, Southampton, using the process of Andragogy, develop my understanding, skills and the knowledge to become an effective instructor, I am fully aware that my current skill set needs to be nurtured as I move forward as an instructor in our industry, a challenge and prospect that I am looking forward to. I am a non-mariner, and non-conventionally trained instructor, however, in the role of teaching support I can clearly see that the ability to effectively pass information is just as important as the lead instructors maritime background and teaching qualifications."

The Author

Richard (Joe) Sloly, Instructor & Customer Development Manager.
Qualified as an Instructor in November 1996, Richard is qualified further as an advanced instructor assessor with a further one week course which concentrated more on assessing instructors and maintaining their standards in 2003. He has also held seven different maritime-based training positions over 15 years, teaching Deck Officers to Masters. Richard spent 21 of his 28 naval years in management. Richard has also completed a City and Guilds (Graduate ship) Leadership and Management, a City and Guilds (Graduate ship) Human Resources, an NVQ level 4 in Management and an NVQ level 4 in Administration. Richard has also passed Instructor Training Courses, Instruction Techniques Assessors' Course and Simulator Instructional Techniques Course.

David Clark Digital Intercom System

David Clark Company introduced its new Series 9100 Digital Marine Intercom System. Incorporating next-generation technology and simple, intuitive controls, the Series 9100 system is a versatile, reliable and multi-functional solution designed to enhance critical, crew-to-crew communications and situational awareness on board high-speed patrol, law enforcement and military craft, as well as fireboats, workboats, tug and salvage vessels. It features rugged, noise-attenuating headsets in a variety of styles that are compatible with both wired and wireless options, a customizable master station providing high-performance Ethernet/IP versatility and user interfaces including headset stations, wireless belt stations and gateway modules for connectivity from the master station to the headsets. The Series 9100 system is inherently simple to setup and operate, with modular, expandable interface flexibility for connecting to a virtually unlimited number of users and devices such as two-way radios, sat phones and other common ancillaries. Each user is afforded four mode selections and a PTT switch to program to their unique job criteria. All system components are built for all-weather, work-ready reliability in harsh marine environments. Series 9100 headsets include over-the-head and behind-the-head styles with dual ear, single ear, under-helmet and 'talk-through' options.

www.davidclark.com/digital

David Clark Company

U.S. Navy/Bath Iron Works

Allianz Offers New Telemedicine Solution

At Posidonia 2016 Allianz Global Assistance debuted its new Telemedicine and Assistance Solutions, a new service that promises complete medical coverage onboard ships, 24/7/365. Unique is the company's approach: All Telemedicine equipment, a $5,000 per ship value, is offered free of charge, coupled with unlimited medical advice; A globall map of medical facilities and providers; medical and non-medical assistance onshore, in cooperation with P&I Clubs.

communicationaga@allianz-assistance.gr

Furuno Tech on USS Zumwalt

The U.S. Navy launched USS Zumwalt (DDG-1000), lead ship of the all-new Zumwalt-class of stealth destroyers. Furuno was selected as the primary navigation and GMDSS emergency communications provider for the USS Zumwalt. The ship boasts an impressive electronic navigation package that includes two Furuno X-Band and two S-Band FAR2xx7 Radar systems (four navigational Radars total) along with a complete RC1815 GMDSS communications package. Both X- and S-Band Radar systems are installed fore and aft of the deckhouse. Each system combines into a single display presentation, allowing the fore and aft X-Band Radars to provide a cohesive X-Band picture on a single display. The same is true for the two S-Band Radars. Other Furuno equipment onboard includes the FA150 AIS, GS100 Satellite Speed Log, and NX700P Navtex systems, all installed by Bath Iron Works, a part of General Dynamics Marine Systems.

www.furunousa.com

SKF Launches Marine Route Based Kit

SKF introduced its new SKF Marine CM Route Kit, which is designed to cut fleet downtime and improve efficiency through enabling predictive maintenance in applications across the sector. Making its debut in Athens, Greece, at Posidonia 2016, the SKF Marine CM Route Kit, includes all the tools needed to implement reliable condition monitoring techniques onboard ships and allows operators to adopt an integrated approach to condition based maintenance on its entire fleet. The kit, which includes the SKF Microlog handheld monitoring device and dedicated marine software with marine typical equipment models, can be used on all kind of vessels, as well as offshore platforms to collect data on machine and component condition. For each asset it will gauge the overall vibration levels and will be able to identify possible issues, such as imbalance, misalignment, wear, mechanical looseness, and bearing and gear faults. The measurement data is securely transferred via satellite to the SKF One Global Cloud, where SKF's Condition Monitoring (CM) remote diagnostic team can retrieve and analyze the assets data as part of its maintenance consulting services. Furthermore all data can easily be accessed by the chief engineer and fleet manager, closing the loop and involving the crew in the Condition-based maintenance process.

www.skf.com

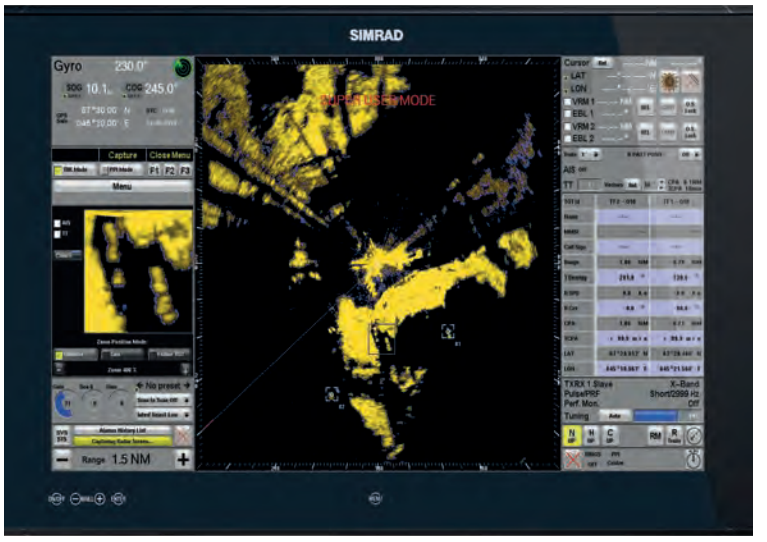
SKF

Simrad Debuts New 27-in. HD Monitor

The new Simrad M5027 optically bonded HD monitor for the commercial marine market is a 27-in. marine monitor designed to meet the color calibration requirements of ECDIS systems and the size requirements of 320mm CAT1 radar systems. The Simrad M5027 monitor has an optical bonded LCD as standard. Optical bonded displays eliminate the "air gap" issues of condensation, overheating and contamination. Reliable touch menu controls and IPX6 rated water resistant flush mounting also contribute to long-life design. When flush mounted, the Simrad M5027 monitor has a low profile (8mm) all-glass design, and complies with IP66 water resistant regulations. HDMI and DVI inputs are standard, as well as auxiliary analog video inputs. Bracket mounting or table top mounting options are planned to be available.

Presenting a viewing area that is 597mm x 336mm, this extra-large widescreen features 20% more viewing area than a traditional 23-in. display. Crisp HD resolution of 1920x1080 pixels and MVA technology provide optimal viewing from anywhere on the bridge or pilothouse. The type-approved monitors in the M-seris now include the M5016 (16-in. WS) and M5019 (19-in.WS) for 180mm radars, the M5024 (24-in.WS) for 250mm radars or ECDIS and the new M5027 (27-in.WS) for 320mm radars and ECDIS display.

www.navico.com



Simrad

Image: Tritex NDT

New Surveyor Thickness Gauge

Tritex NDT launched its new Multigauge 5650 Surveyor thickness gauge. The gauge, based on the original Multigauge 5600, has features including the option to exchange the probe and the gauge automatically switches to single echo mode for measuring GRP, plastic or uncoated metal. The gauge also measures metal thickness through coatings of up to 20mm thick.

The gauge has a large modern color display and an easy to use clear graphic menu. It has been designed in line with Tritex's concept of Simple, Accurate and Robust. For metal measurement, the gauge uses the Multiple Echo technique to ignore coatings up to 20mm thick and just measures the metal substrate. No grinding or removal of the coatings is required. All probes have Intelligent Probe Recognition (IPR), which automatically adjusts settings in the gauge when connected. Also, the Automatic Measurement Verification System (AMVS) used with multiple echo ensures only true measurements are displayed. An optional leather case protects the gauge.

www.tritexndt.com

3D Vessel Performance Management Service

Logimatic expanded the vessel reporting system and dynamic dashboards within its Sertica software package, designed to provide an improved level of visual presentation of shipboard data and move towards a 3D vessel performance management service. The combined system is built on three dimensions – the Planned Maintenance System, Vessel Reporting & Performance Management, and the Performance Management Service Center – hence its description as what we call a 3D fleet management service.

A shipping company running Sertica can "outsource" the task of performance optimization to the Logimatic Performance Management Service Center (PMSC), which can be done for a monthly fee or an agreed portion of documented savings. The PMSC will be able to provide advice on a range of matters related to vessel performance, including fuel consumption, engine adjustments, bunker management, hull and propeller cleanings as well as maintenance schedules and equipment procedures.

www.sertica.com

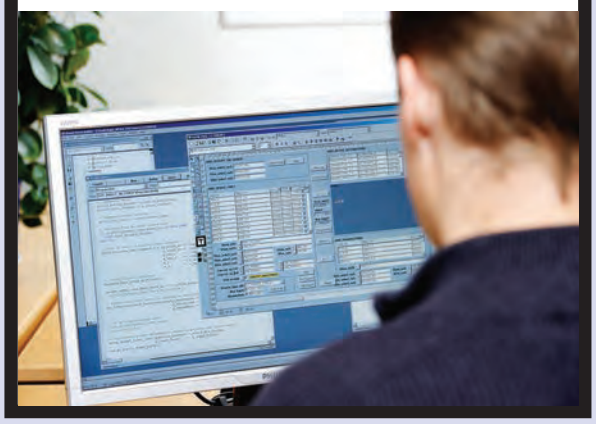


Image: Cortec Corp.

Corrosion Protection for Marine Nav Equipment

As maritime vessels become more dependent on electronic navigation and communication equipment, it becomes critical to keep these controls in good working order Cortec Corporation, which provides VpCI corrosion control technology, addresses this problem with its VpCI Emitters. These small self-stick cups contain Vapor phase Corrosion Inhibitors (VpCIs) slowly released through a breathable Tyvek membrane. When placed inside an enclosed space, the VpCIs spread out to fill the internal area and form an invisible protective layer on all metal surfaces, not interfering with electrical, optical, or mechanical surface properties. VpCI Emitters are good for electrical wire ways and terminal boxes, scientific and measuring instruments, telecommunications equipment, and remote electronic devices. They are non-toxic, safe to handle, and quick to install, providing continuous multi-metal protection for up to 24 months in polluted and humid environments. The VpCI-105 Emitter protects metal components in enclosed spaces up to 5 cu. ft. The VpCI-111 Emitter protects in spaces up to 11 cu. ft.

www.cortecvci.com

SKF Tech on World's Most Powerful LNG Carriers

A series of SKF innovations in the propulsion units on ice-breaking LNG tankers help out in the harshest conditions.

SKF is helping to enhance the reliability and reduce the life cycle cost of propulsion units that will drive the most powerful liquefied natural gas (LNG) carriers in the world. The Azipod propulsion units, developed by ABB, are being installed on the 170,000-cu. m. ice-breaking LNG tankers that will be used as part of the Yamal project to open up gas from the Yamal peninsula and transport it to Asia and Europe. The project, which will see the first vessels commissioned in South Korea in 2016, is expected to produce 16.5 million metric tonnes of LNG per year. However, this does not come without its own unique set of challenges as the Yamal peninsula is located inside the Arctic Circle and is locked in ice for most of the year. ABB Marine chose to work with SKF on the development of its Azipod propulsion units for 10 LNG carriers because of its application engineering expertise, particularly in demanding applications. Included in SKF's offering are custom made thrust bearing arrangements, which incorporate housing and seals, and high performance self-aligning CARB toroidal roller bearings for the propeller shafts. In addition, SKF is providing assembly and installation supervision in the ABB Marine factory. In addition to the bearing arrangements supplied for the Yamal vessels, SKF has also delivered Turbulo Bilge water separators and SKF BlueMon, an environmental monitoring system for recording and mapping ship emissions.

www.skf.com

Malikai TLP Float-Off in Malaysia

InterMoor completed its involvement in the Shell Malikai Tension Leg Platform (TLP) float-off operations. The TLP was loaded onto the Dockwise Heavy Lift Vessel White Marlin at Malaysia Marine and Heavy Engineering (MMHE) shipyard in Pasir Gudang, Malaysia, and transported to a float-off location in the Singapore Straits. Contracted by TMJV, a joint venture between Technip and MMHE Shipyard, InterMoor Pte was responsible for the marine aspects of the float-off and tow of Shell's Malikai TLP through the Johor Straits into the Singapore Straits and to a float-off location for various nearshore commissioning tasks to be performed, prior to return to the shipyard. The work scope also included engineering analysis and procedures, project management for the nearshore operations, management of chartered vessels, provision of offshore personnel and various ancillary services. InterMoor also subcontracted Acteon sister company UTEC to provide survey and positioning for the TLP and marine spread. The offshore operation was completed safely and without incident in April this year.

The TLP will be installed at the Malikai field in a water depth of approximately 600 m.

PPG gets EU Funding for project aiming to produce a new fouling protection system for commercial vessels.

Industry Group Developing New Hull Coating System

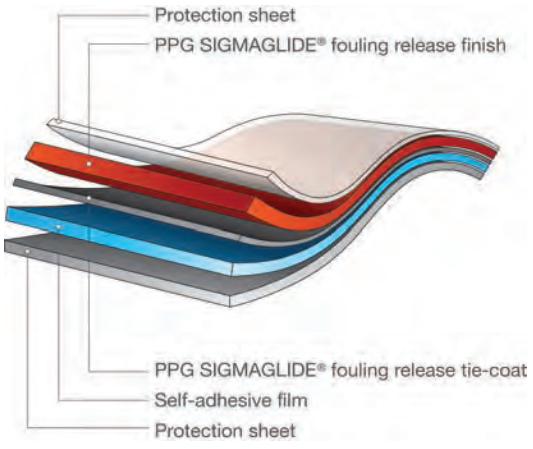
A project development group including PPG, MACtac, Meyer Werft/ND Coatings, VertiDrive and Hamburg Ship Model Basin HSVA are working to establish an automatic application process for allowing a self-adhesive/fouling release film to be used on commercial seagoing vessels. The process would allow shipowners and operators to enjoy fouling release properties and drag reduction capabilities of the PPG SIGMAGLIDE self-adhesive film.

"The eSHaRk (eco-friendly Ship Hull film system with fouling Release and fuel saving properties) project aims to bring to the market a fouling protection technology which not only maintains the current state-of-the-art fouling protection standards but is superior to existing paint-based solutions in terms of eco friendliness, easiness of application, robustness and drag reduction effects, all of which will lead to fuel savings and the reduction of GHG emissions," said Christophe Cheikh, PPG Product Manage.

The system incorporates a fouling release system, based on PPG's 100 percent silicone binder technology, and a self-adhesive film specially designed by MACtac for underwater use.

As part of the eSHaRk project, new, robotized application technology is being developed by VertiDrive which will be used to apply the film on large commercial vessels in an automated way. Furthermore, the surface morphology of the film will be optimized to enhance drag reduction, fuel savings and emissions reduction benefits to a level previously unattainable.

After laboratory testing, including flow channel drag reduction experiments conducted in a state-of-the-art flow channel at HSVA, several small scale in practice applications have been conducted and PPG is now looking for full scale testing and validation in operational conditions before market entry with the support of ND Coatings/Meyer Werft.



(Image: PPG)

Composition of the PPG SIGMAGLIDE self-adhesive fouling release film solution

Advantages at the newbuild stage can be grouped under two categories: productivity improvement with an easier and faster application of the fouling release system without the traditional constraint of overcoating intervals; and minimum impact on environment, health and safety requirements, waste reduction, no VOC emission, minimizing the need for safety equipment at time of application.

The PPG SIGMAGLIDE fouling release film solution under development within the eSHaRk project has a targeted launch date of 2018.

New Multiphase Test Facility Under Construction

Through the STW 'Perspective Program' a major public-private cooperation named SLING has been created. The SLING consortium comprises the technology foundation STW, four top Dutch universities, representatives from the LNG, shipping and shipbuilding industry, engineering companies and MARIN. SLING aims to plug the gaps in the industry's knowledge about new technology for LNG tanks with crucial cost saving potential.

The key to designing cost-effective LNG tanks is a shift to a first-principle approach to assess the dominant design loads, i.e. sloshing impacts. The current design method relies on sloshing model tests and requires a calibration based on operational feedback, which however does not yet exist for new applications.

This prevents new tank designs which maximise use of the ship's capacity by optimising tank geometry, and minimising Boil-Off-Gas by optimizing the strength of the tank.

SLING brings together an unparalleled, multidisciplinary team to draw-up a first-principle approach to assess sloshing by disentangling the complex sloshing physics through advanced experiments and numerical simulations.

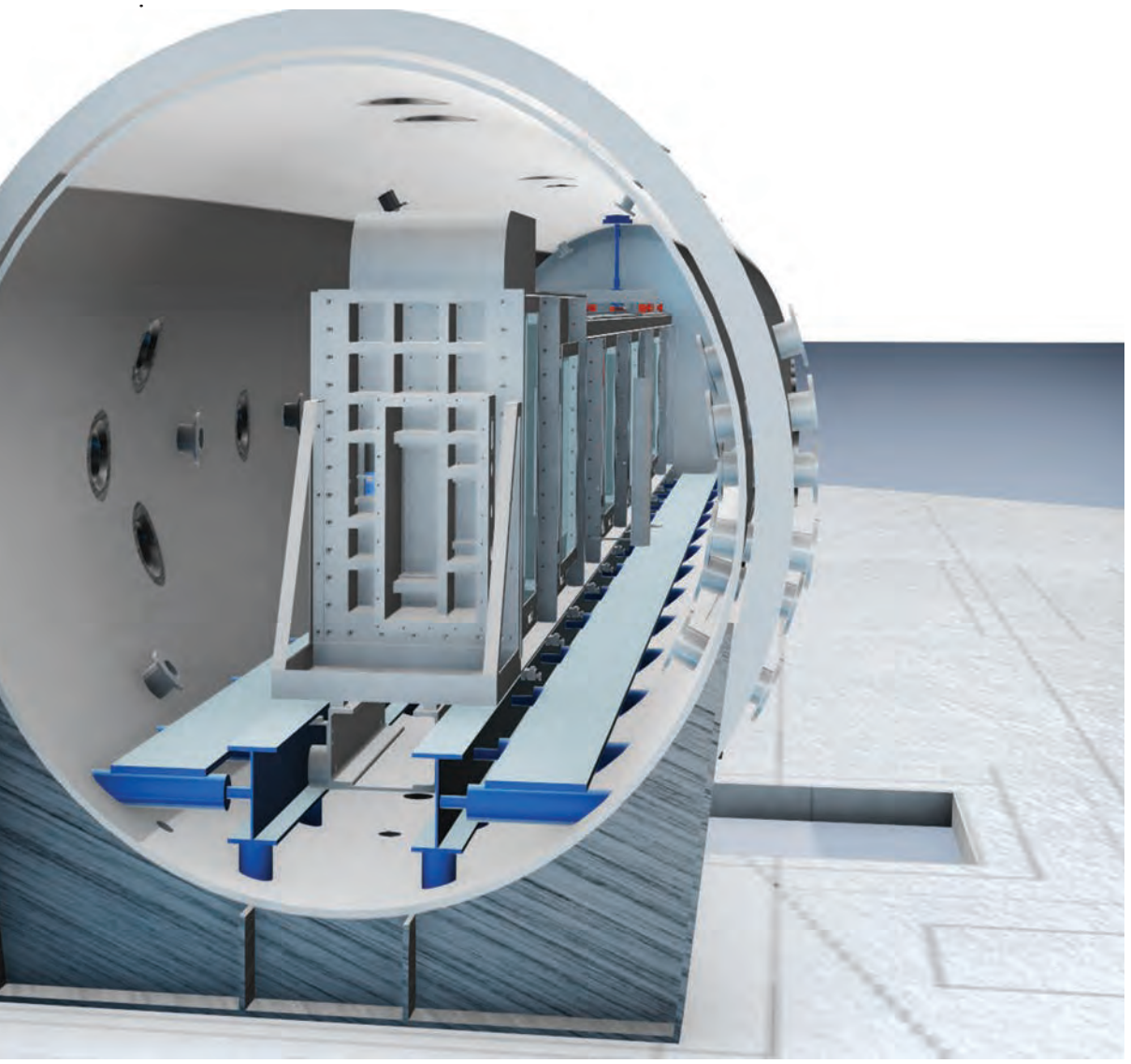
Multiphase Test Facility: A World First

The research requires a multiphase facility, which consists of a controlled environment with multiple test setups installed inside, i.e. a flume tank with a wave maker installed on one end of the flume and an instrumented, transverse wall at the other end and a large flat impactor and a small disk impactor.

The controlled environment consists of a 15 m long x 2.5 m diameter autoclave with observation windows; a gas and liquid supply system; and a heating/ cooling system for the autoclave and test setups, facilitating testing in the vicinity of the water- vapor boundary for a large range of temperatures (5°C to 200°C) and pressures (5 mbar to 10 bar).

The test facility will be located at MARIN in Wageningen, the Netherlands and due to open late 2017.

A unique multiphase test facility is being established by the Sloshing of Liquefied Natural Gas (SLING) research project to examine sloshing impacts in LNG tanks.



The Author

Hannes Bogaert is head of the Hydro-Structural Services team at MARIN, the Maritime Research Institute Netherlands. MARIN offers simulation, model testing, full-scale measurements and training programmes, to the shipbuilding and offshore industry and governments.

e: h.bogaert@marin.nl

Scrubbers

Image: Unique Shipping

Oriental Jubilee: World First with "SCRUBBER READY" Notation

DNV GL welcomed the Unique Shipping Group's new vessel Oriental Jubilee into class when it was christened in Ulsan, Korea recently. The 84,000 cu. m. LPG carrier was built by Hyundai Heavy Industries (HHI) in Ulsan and is the first vessel to be awarded the DNV GL SCRUBBER READY notation.

The SCRUBBER READY notation is an important development, as making space for new technologies and equipment onboard commercial ships is a conundrum for shipowners as they decide which technology to implement to reduce emissions. This notations takes into account all the relevant factors for the installation of scrubbers, ranging from space and stability requirements, to fire safety, piping, corrosion resistance, and the effect on the main engine. This helps to reduce off-hire time and retrofitting costs if a scrubber system is fitted in the future. DNV GL also offers scrubber advisory services to support customers, from building the business case, to risk assessment of the design, installation, commissioning, hardware-in-the-loop testing of the control system, right through to the system entering into operation.

Designed for global operation, the Oriental Jubilee took its maiden voyage to the Persian Gulf in the middle of June.

Main Particulars:

Length, o.a. ..... 225.131 m
Breadth ..... 36.6 m
Depth ..... 22.2 m
Draft ..... 12 m
Class ..... DNV GL
Capacity ..... 84,000 cu. m.
NotationsScrubber Ready (H, MI, MISC), +1A1 Tanker for liquefied gas, BIS BWM (T,E(s)), COAT-PSPC(B) and EO NAUTICUS (Newbuilding) Recyclable TMON

Van der Velden BARKE Rudders for ATB

Van der Velden Marine Systems (VDVMS) in conjunction with the U.S. representative Ships Machinery International, Inc. (SMI) announced the launching of a new state-of-the-art Jones Act Articulated Tug Barge (ATB) with BARKE high-lift flap rudders for coastwise service in the USA. This ATB will have enhanced maneuverability and course keeping stability. The efficiency provided by this rudder solution will reportedly result in significant savings over the life of the vessel.

"We are pleased that our client selected this state of the art rudder system for their new vessel" said Arthur Dewey Vice President of SMI. "We are confident that their faith in Van der Velden rudders will be rewarded." There is no other vessel like this one in the US at present time. It has an exceptional maneuvering system with two independently controlled and operated hydro-dynamic Van der Velden BARKE rudders. Independent Proportional Steering will allow the rudders to be actuated either independently or synchronised.

The key driver behind the BARKE rudder is its innovative and sophisticated progressive high lift design, offering unsurpassed maneuvering and course keeping performance as well as smooth operational comfort. The progressively operating flap linkage system is contained in a fully enclosed, grease-lubricated BARKE housing. This results in minimum wear on the linkage components and eliminates the problems caused by contact with floating objects.

The complete tug (the future M/V Sea Power), which is under construction at BAE Systems' shipyard in Jacksonville, Florida, will be handed over to its owner Sea-Vista ATB I LLC, in the summer of 2016. Another set of BARKE high-lift rudders will be installed on another ATB before this summer. Van der Velden is happy to make a valuable contribution to the world of ATB tugs.

Main Particulars

Type ..... ATP
Designer ..... GPA, Inc
Length ..... 43 m
Breadth ..... 14 m
Draft ..... 6.75 m
Main engines ..... 2 x 4640 kW
Generators ..... 3 x 250 kW
Emergency generator ..... 150 kW
Classification .....
ABS Under 90 m Rules, Maltese Cross A1 AMS ACCU Towing Vessel, SOLAS, USCG Subchapter I.

BAE Systems Shipyard

Gondan Launches first Dual Fuel Tug Built in Europe

Gondan Shipyard in Figueras launched the first Dual Fuel tug ever built in Europe – and the first of a series of three currently under construction for the Norwegian shipowner Østensjø Rederi.

Designed by Robert Allan, the new escort tug measures 40.2 x 16m, beam, and will provide tug services to Norwegian state-owned energy company Statoil, at the far-north terminal located at Melkøya. Built to withstand freezing cold, the vessel is shaped specifically to grant full operational availability at temperatures of 20ºC below zero and combines environmental sustainability trough the use of LNG in most of its operations, with the flexibility of diesel power to ensure a high level of operational security.

For the next few months, this new vessel will be moored at the Yard´s quay while being outfitted according to the best shipbuilding standards, until completion, when she will be ready for the thorough sea trials and her following delivery in 2017.

Gondan Shipyard

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Stevens


Schottel
Laheij


Conrad
Wolbrink

Aegir-Marine
Aegir-Marine

Thygesen Named CEO of Svitzer

Henriette H. Thygesen, currently Damco CEO for the Americas, has been appointed CEO of Svitzer with effect from September 1. She holds a Master of Science, a PhD in Applied Mathematics, and an Executive MBA from Columbia University, New York and London Business School. Svitzer's current CEO, **Robert M. Uggla**, will leave A. P. Møller - Mærsk A/S to take over as CEO of A.P. Møller Holding – the fully owned Holding and Investment Company of the A.P. Møller Foundation – starting September 1, 2016.

Deegan New President of Gibbs & Cox

Gibbs & Cox, Inc. appointed **Chris Deegan** as President and Chief Executive. Deegan, previously Vice President of G&C's Engineering Group, will replace Rick Biben, who is retiring but will remain on the G&C Board of Directors. Deegan spent nearly 28 years in the Navy's acquisition and cost engineering communities, leading nuclear submarine, ship and combat systems programs prior to joining Gibbs & Cox in 2013.

NOL Appoints New CEO, CFO

Amid a takeover by France's CMA CGM, Neptune Orient Lines (NOL) named **Nicolas Sartini** as new chief executive officer and **Serge Corbel** as new chief financial officer. .

Moulin Named InterMoor MD Brazil

InterMoor, an Acteon company, has appointed **Cleiver Moulin** as managing director in Brazil. Moulin will be responsible for overseeing InterMoor do Brasil's business in the region.

Seaspan's Whitworth Honored

Seaspan said that its CEO **Jonathan Whitworth** has been named Business in Vancouver's 2016 BC CEO of the Year. Seaspan's Jonathan Whitworth has been named the winner of the Enterprise Category (revenues of $500 million and above), the largest of all the awards.

Parrott New Foss Maritime President

Foss Maritime Company chief operating officer **John Parrott** will take over the role of president of Foss Maritime, assuming responsibility for the day-to-day operations of the company as of August 1, 2016. Current president and CEO, **Paul Stevens**, will remain CEO of Foss until the end of 2016. He will then move to Foss' parent company, Saltchuk, where he will serve as senior vice president and managing director.

Laheij Named VP at Schottel

As of September 2016, **Hans Laheij** will take over as Vice President Sales & Marketing at SCHOTTEL GmbH, assuming the responsibilities of **Dr. Jens-Erk Bartels**, who is retiring.

Conrad Forms LNG Business Unit

Conrad, builder of North America's first LNG bunker barge scheduled for 2017 delivery, said it continues to actively pursue other LNG opportunities, including developing designs for additional transport barges, dual-fuel powered towboats and other research and development projects. Conrad Vice President, **Brett Wolbrink**, who has served in a number of management positions with the shipyard, has been selected to lead the new business unit.

AEGIR-Marine Beach VBall Team Qualifies for Olympics

AEGIR's beach team VanderVlist-VanGestel won the Continental Cup in Stavanger; the prize: a ticket to the 2016 Olympics. AEGIR-Marine has been this Dutch team's sponsor for eight years. "We recognized their ambition. It resembles ours," said Ruud Muis, general director AEGIR-Marine.

Blackmer Fundraiser for USS Gerald R. Ford Crew


Blackmer

Blackmer, a company in positive displacement and centrifugal pump and reciprocating compressor technologies, has a relationship with the U.S. Military that dates back to 1914. One of the more significant contracts Blackmer has earned was when the U.S. Navy selected the company to supply sliding vane pumps for use on the USS Gerald R. Ford (CVN-78), which would be the lead ship in a new class of supercarriers. The USS Gerald R. Ford was christened in November 2013 and will be officially commissioned later this year with its first deployment set for 2019.

Gerald R. Ford was raised in the Grand Rapids area and represented its congressional district from 1949-73 in the U.S. House of Representatives before serving as the 38th President of the United States from 1974-77.

Blackmer's commitment to the USS Gerald R. Ford and the well being of its crew goes far beyond supplying the carrier with pumps. Working with the USS Gerald R. Ford Commissioning Committee, the Naval League and the Gerald R. Ford Presidential Foundation Library & Museum in Grand Rapids, Blackmer's Cultural Team held a fundraiser and raffle, with all of the proceeds benefitting the carrier's crew. Among the items on the carrier for which the funds will be used include a Learning Resource Center/Training, Ship's Chapel, Crew Library, Ship's Tribute Room, Ceremonial Quarterdeck, Commanding Officer's Import Cabin Complex and enhancements to the Foodservice Division.

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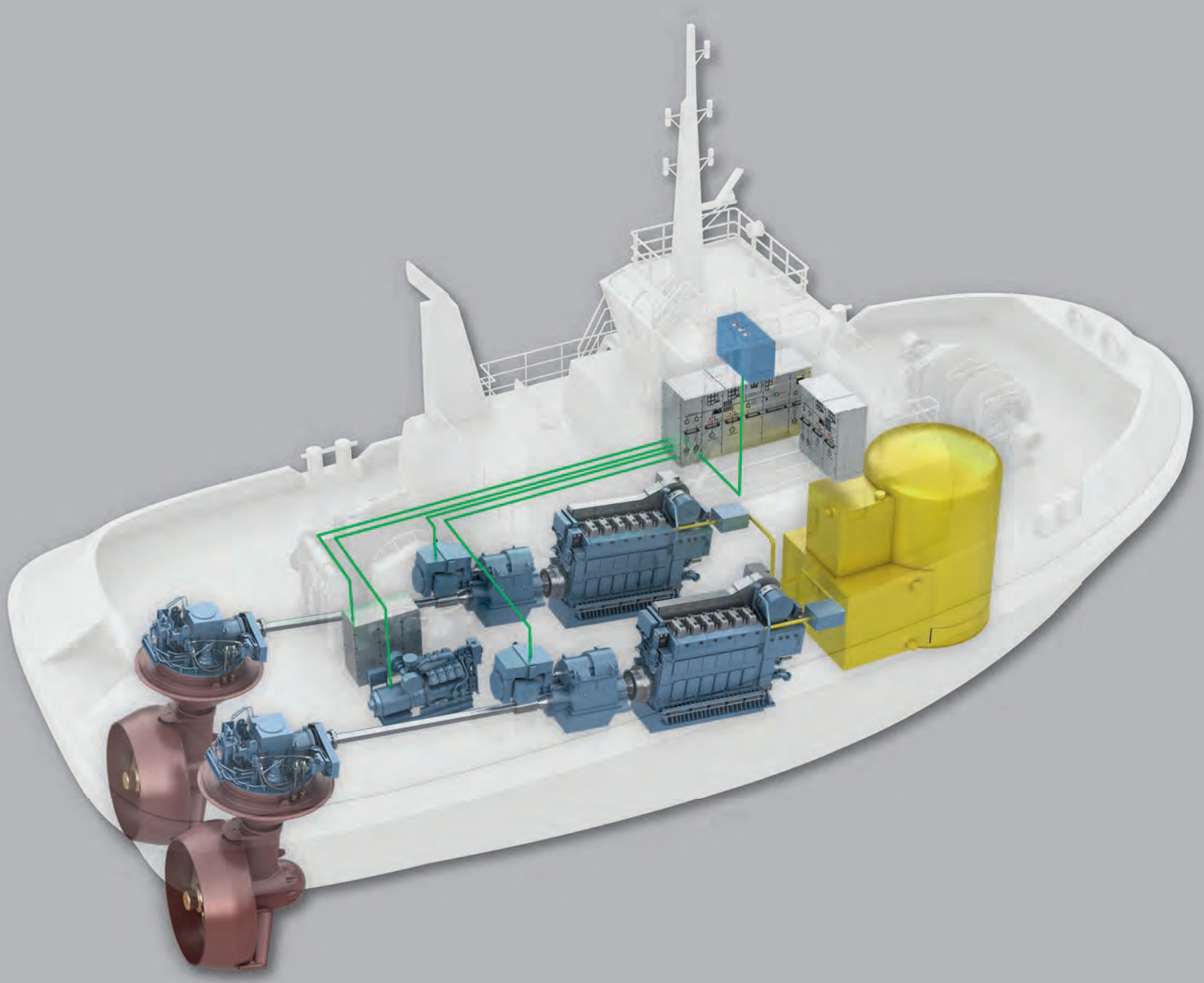
Rolls-Royce

Powered by natural gas

Rolls-Royce is widely recognised for its system solutions for a broad range of vessels. Systems comprising propellers and thrusters, engines, stabilisers, deck machinery, rudders, steering gear, automation and control systems. Rolls-Royce supply gas-powered propulsion solutions that reduce emissions significantly. Compared to diesel engines that meet IMO Tier 2 emission levels, Bergen gas engines give E2 weighted emission reductions of 92% NOx, close to 22% in CO_2 and virtually eliminate SOx and particulates, already meeting enforced IMO and EPA Tier 3 requirements and are subject to EPA Tier 4 certification. Clean efficiency by Rolls-Royce.

Trusted to deliver excellence



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