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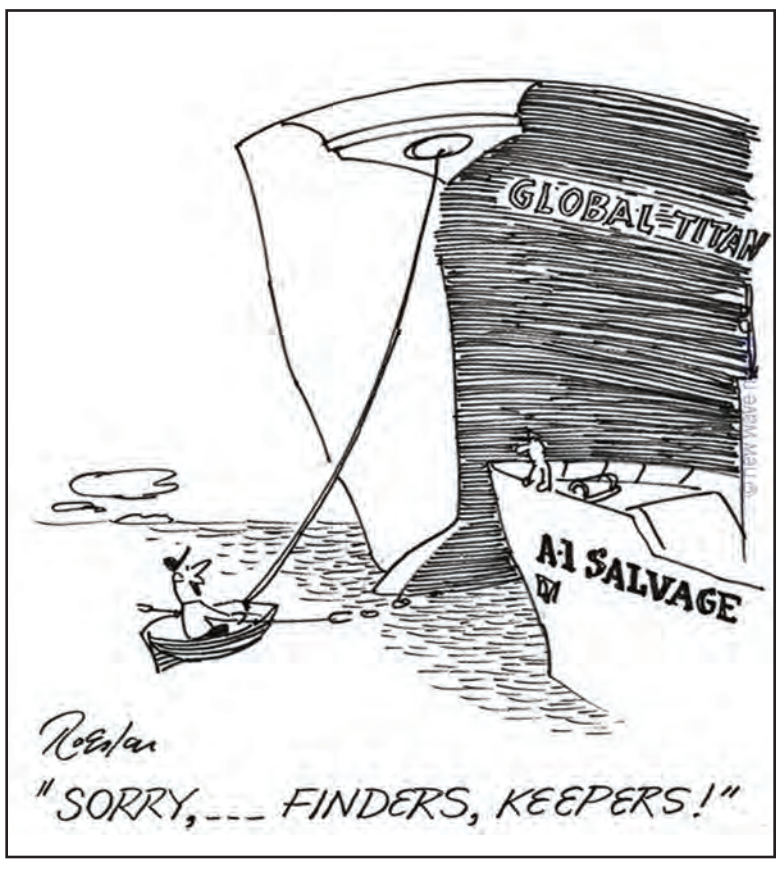

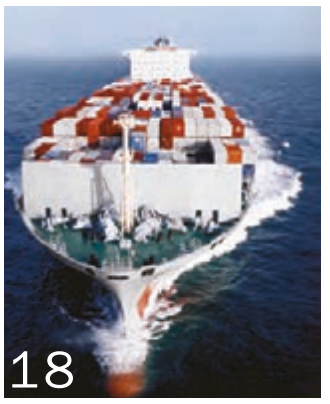

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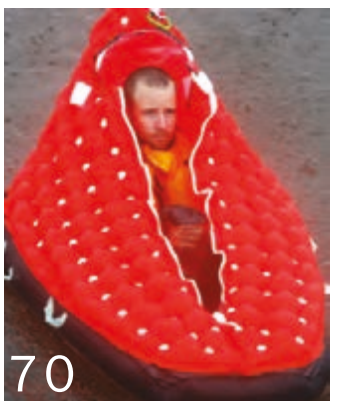

THE COVER

(Photo: Danny Cornelissen)

June is the Yearbook edition of MR, and the image simply captures the essence of all that is maritime. The cover below was a strong runner up with support from our Florida crew! Read all about the MR T-Ball success on page 12.

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... 2014 ... and the story continues ...

GREG TRAUTHWEIN, EDITOR & ASSOCIATE PUBLISHER

Having sat in this seat for more two decades I am sometimes asked if I'm tired of the job and ready to move along. *(Thankfully, though, that question has never come from my boss.)* Unequivocally the answer is "no." While the maritime industry is often erroneously labeled as conservative and behind the technological times, it is in fact a vibrant and multi-faceted transport niche, a literal cast of characters with a liberal mix of international, national and local interests, power, innovation, money and greed. It's like reading a good book that never ends, with ever-evolving plots and story lines.

As this is our Annual Yearbook Edition, it affords me the opportunity to take a broader perspective, identifying the trends that will define your business and our editorial properties in the coming months and years.

It is hardly a surprise at this time that energy, or more specifically the proliferation of shale oil and gas finds across the U.S. and increasingly around the world, will continue to have a profound impact on all things maritime.

The shale gas story is a bit more mature but interesting nonetheless, as the mass quantities of cheap energy is literally changing the country before our eyes, from sparking renewed interest in manufacturing businesses setting up shop here, to the billions in investment in new potential LNG export terminals. To put in perspective the "year of LNG" we spoke last month to **Edward Scott**, COO of Excelerate Energy, which is a compelling story of how the company – which literally was created to import LNG into the U.S., changed its business model nearly overnight and is positioned to prosper.

On the flip side, the abundance of cheap oil and gas found onshore is starting to have an impact on offshore oil and gas developments, as the oil majors are digesting rapidly rising production and crewing costs and slashing E&P expenditure. **Jim McCaul**, our long-time editorial sounding board, encapsulates the trend concisely in his Offshore Floating Production report, starting on page 52.

Continuing our "75th Anniversary" series of articles again this month is veteran business journalist **Patricia Keefe**, who's story *Disasters at Sea* starts on page 40. While there are plenty of pictures of broken and sinking ships, the article is not designed to exploit the failures of the industry, but rather to highlight the positive changes that have come about, driven by legislative mandate and technological innovation. While I know "legislation" is a 'four-letter-word' in the minds of most ship and boat owners, ship and boat builders, it is arguable that the good legislation has outweighed the bad, and in the end we have an industry which provides to the world the safest, most efficient and environmentally benign means to move cargo from point A to point B.

So there you have it in a nutshell: Energy & Legislation. The story continues with perpetually changing characters and plots.

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By Joseph Keefe

No Middle Ground

When dealing with the environmental lobby, there's really only one thing you need to know.

The nautical definition of middle ground is a length of comparatively shallow water having channels on both sides. In everyday language, we might call it a position of compromise between two opposing views or parties. That's typically what reasonable folks try to achieve when resolving disputes or discuss a particular issue and come to a reasonable agreement about what should be done. In the case of the typical environmental activist, however, there will never be enough done by their corporate 'opponents,' no improvement in performance will ever suffice and nothing short of complete capitulation of anyone and everyone in their collective way will be tolerated. And, if along the way, this brings peril to those which they target for protest, well, that's just the way it is.

For some in the environmental lobby, however, there's no such thing as middle ground. And, there never will be. The sooner the maritime industry and its oil & gas cousins wake up to this reality, the better.

I must admit that I am increasingly not a fan of the environmental lobby. That's not to say I don't support some of its collective goals and missions. I do. I'm just not a fan of their increasingly militant and dangerous methods. Just this week, oil major Statoil is reporting that Greenpeace activists had boarded the Transocean Spitsbergen, a drilling rig positioned about 300 kilometers offshore in the North Sea. The appalling photos of protesters dangling via ropes and wires off the side of structure left me wondering who and what they might have endangered as they "peacefully" boarded the rig.

This high profile event follows another attempt to disrupt the marine delivery of Russian oil in the port of Rotterdam, where, in this case, they were eventually foiled by local authorities. And, of course, there is the heavily reported case of the 'Arctic 30' which involves a group of Greenpeace protesters that were charged with piracy after their ship, Arctic Sunrise, was seized by security forces after a protest at a Russian oil rig.

Reasonable people can sit down and

The irony of the three incidents chronicled above is that in each case, it wouldn't have taken much to have created a casualty that would have resulted in far more serious environmental or safety consequences than the protesters themselves hope that their actions will avoid. That a casualty did not occur is a tribute to the professionalism of all of the rig and tanker crews involved. In the ongoing case of the drilling rig Transocean Spitsbergen, Statoil reports that about one-half of the activists have now given up and left the rig voluntarily. As of this morning, Statoil was literally bending over backwards to be gracious in their treatment of the seven activists remaining on the rig, while also expressing great concern for the safety of the rig and all on board. It's unfortunate that they cannot expect the same in return for their uninvited 'guests.'

In a prepared statement, Statoil said, "We are pleased that some of the activists have given up and have chosen to leave the rig voluntarily, but we are still concerned for the safety of those remaining on the rig. Greenpeace has gained the attention they generally seek, and we have encouraged them not to challenge safety any longer. Statoil respects the right for legal protests and believes it is important with a democratic debate on the oil industry. Statoil has had a dialogue with Greenpeace over the last few months. We have informed about our exploration plans in the Barents Sea and the emergency response setup for the operations on several occasions, and Greenpeace has been given the opportunity to explain their views and ask questions."

The statement went on to say, "For Statoil the safety of people and the environment is the first priority, and we do not want activity that can increase the risk level. Greenpeace has been explained the risk associated with actions against a rig in open waters. When they still use this form of protest we believe they act irresponsibly and illegally." And, while Statoil has followed all of the legal steps necessary to carry out their business, it is clear that the protesters have not.

Closer to home, other activists often point to the poor performance of a domestic oil and maritime industry, while conveniently forgetting that this same business sector has improved its environmental footprint measurably, with oil spill volumes from tank vessels into US waters reduced by 99% since the early 1970s. In the last decade alone, spillage has been reduced by 76%. All sectors of the marine and oil & gas sectors continue even today to improve on that enviable performance. Not good enough, the activists will say.

A good bargain can be defined as one in which both parties come away from the table, each a little bit unsatisfied. That doesn't mean the perfect solution can't be a part of that equation. It's just very unlikely when we are talking about the realities of modern commerce, logistics and the requirements of a demanding global society. In a perfect world, engines would put out no emissions whatsoever and not even a single drop of oil would ever be spilled. But, even protesters have to burn fossil fuel on their way to work.

Statoil's actions and statements in the wake of the latest attack on their operations are admirable, responsible and measured in their delivery. Taking the high road, they're also firmly anchored in the ideal position of compromise. In this case, however – and I suppose that they already know this – there's no middle ground to be had. And, there never will be. From my chair, it is futile to negotiate as long as that's the case. Beyond this, negotiating with someone who routinely puts your people, assets – and yes, the environment itself – into grave danger, is out of the question.

Excerpted from a May 28, 2014 post by Joseph Keefe on MaritimeProfessional.com

Keefe is the lead commentator of MaritimeProfessional.com. Additionally, he is Editor of both Maritime Professional and MarineNews print magazines. He can be reached at jkeefe@maritimeprofessional.com or at Keefe@marinelink.com. MaritimeProfessional.com is the largest business networking site devoted to the marine industry. Each day thousands of industry professionals around the world log on to network, connect, and communicate.

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OFFSHORE

Simplifying Float Over
Versatile Ballast System

Mammoet recently introduced its Versatile Ballast System, something it says is an improved ballast system that simplifies and combines ballasting for load-out and float-over operations. It is a sophisticated, yet simple, fully modularized system that is easily installed and fits any barge without the need for modifications. The system uses one equipment set-up that is able to perform both ballasting operations. This significantly shortens the period for installation and decommissioning of the system on the barge, ultimately saving on barge rental time. Depending on other float-over preparations, it can accelerate the installation time to get the platform in production up to one week earlier. The Versatile Ballast System eliminates the need to convert the ballast system after load-out. This time-saving can speed up the platform production date by up to one week (depending on other float-over preparations). It can be installed within two weeks, using a minimum of equipment, manpower and space. The main part of the installation can be performed on the quayside. This can save up to five weeks of barge rental time. Decommissioning of the system is also faster; adding a further two – three weeks of time-savings.


Image: Mammoet

30,000 TONS, 4,000 NAUTICAL MILES, 23 DAYS

Offshore Float Over Installation

An offshore installation method that is more than three decades old is generating renewed interest from many operators who are challenged with designing heavy-lift crane installations. Float-over installation has become a cost-effective alternative to lift installation for offshore construction, as ever-increasing size and weight of decks constantly exceed the lifting capacity of floating cranes.

Exploration of oil and gas in more remote offshore fields is driving the increasing demand for larger offshore units along with float-over installations. In the coming four years, an estimated 660 offshore production platforms are expected to be constructed worldwide of which 180 weigh more than 12,000 tons.

Dockwise has a track record transporting and installing 15 topsides and with five in the backlog. The SHWE topside installation in 2012 was one of the world's largest and heaviest topsides transported to date, weighting 30,000 tons (including the deck support frame–DSF) and transported for more than 4,000 nautical miles over a period of 23 days.

Bigger and heavier decks are on the horizon, installed in more remote locations.

Float-over Strengths

Float-over installations have innate benefits due to the installation approach. One of the key strengths of the float-over is the lack of rendezvous risk, which is the schedule risk resulting from the need to have the crane and vessel in the field at the same time. In principle, float-over installations do not have a weight limitation as today's heavy transport vessels (HTVs) are capable to transport and install mega sized topsides. In addition, integrated platform installation eliminates extensive offshore hook-up and commissioning resulting in limited overall offshore exposure.

Float-over Phases

There are several phases involved when installing a deck with a semisubmersible HTV. The first is the standby phase where the HTV is at a safe distance from the jacket but connected to the mooring system. Last minute arrangements such as preparing the vessel's ballast system or the hydraulic jacks are under way.

The second is the docking phase where the vessel carefully enters the jacket slot, the distance between the jacket legs. Winches or tugs are used to pull the HTV carefully into position.

In the third phase, pre-mating, the vessel positions the deck directly above the jacket. Once positioned, the HTV ballasts to match the leg mating unit (LMU) with the receptors on top of the jacket legs. During this phase, it is critical that the vessel motions be limited to suit the chosen LMU geometry. No weight transfer yet occurs.

For a successful float-over operation, countless hours of preparation come down to the exact moment when the deck makes contact with the jacket. The fourth phase is the most critical point of the installation leaving no room for uncertainty in the functionality of the load transferring equipment.

In the mating phase, the deck is lowered onto the jacket by the vessel's rapid ballasting system where large quantities of water enter the ballast tanks, which enable the HTV to submerge. During this phase, the deck's weight is completely transferred from the vessel onto the jacket. Custom engineered elastomer is used in the design of the LMUs to dampen the friction during load transfer.

In the post-mating phase, the deck sits secure on top of the jacket and a gap is created between the deck support unit (DSU) and the HTV to ensure vessel motions will not cause contact between the two.

In the exit phase, the vessel departs from the jacket slot on its own propulsion or with assistance from tugs. These five phases may slightly differ depending on equipment and installation approach.

Float-over Requirements

There are three essential specifications required for an HTV to perform a float-over. The first is the HTV's width being the right size. The vessel must be narrow enough to fit inside the jacket slot. Secondly, the vessel must be designed with an open stern and equipped with movable casings. The open stern enables the HTV to exit the jacket slot during the last phase of an installation. To ensure the deck is perfectly positioned onboard the vessel, casings, which facilitate balance and ballasting, can be moved to best accommodate the cargo. Lastly, HTVs must have sufficient strength and stability to carry and transport heavy decks.

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W. Palm T-Ball Flies *"Maritime Reporter"* Flag

AFTER 75 YEARS ANOTHER FIRST: AN MR-SPONSORED 6U T-BALL TEAM

Left:
The Maritime Reporter 6U T-ball team.

Above:
First baseman Robert Howard has "a glove like a gillnet."

West Palm Beach - The boys of summer are now proudly wearing the red & black of *Maritime Reporter.* With this publication's backing, a 6U T-ball team is setting course for a championship.

This fleet of tiny titans drops anchor at Phipps Park in West Palm Beach each weekend, followed by a flotilla of fans. The boys, some of whom have played together for three seasons running, are seeing their hard work pay off.

New to the squad, first baseman Robert Howard is formidable at the plate and has a glove like a gill net. Anything but an ordinary average guy, pitcher Joe Walsh holds down the center of the infield, while shortstop Yampiel Chavez provides speed, range and power. Utility man Gus Doskey has never seen a base he didn't want to slide into. Simon Fox comes from a long line of baseball-playing brothers and can play any position on the field, and Brian "Big B" Fowler provide depth at second and third, while free spirit Harrison Warwick handles the catching duties. In the outfield it's brotherly love when Angel Perez and James Perez-Gomez hustle to the ball. To be fair, they've also been known to fight over it. The family affair continues with Bud Miller, Walsh's cousin, who is the resident roughneck, and has the scars to prove it. Rounding out the group is Mr. Nice Guy Samuel Mojica, a gentle soul and man-child of few words who lets his bat do the talking. The Maritime Reporters are managed by Dan Doskey, who would be lost at sea without assistant coaches Rob Howard, Joe Walsh & Roger Warwick. However, the real captain of this ship is team mom Tracy Mojica, who keeps the dugout running on plane at all times. Big Red's championship aspirations fell just short in mid-May, but the ensuing team party at a local restaurant buoyed the young slugger's spirits, and presumably left the staff of the restaurant scarred for life.

AN INNOVATIVE WALKING JACK-UP PLATFORM

WaveWalker Wins

An innovative walking jack-up platform WaveWalker 1 was presented with the Product and Equipment Innovation Award at the Ground Engineering (GE) Awards ceremony in London last month. WaveWalker 1, developed by Fugro and Van Oord, is an eight-legged 'walking' jack-up barge (self-elevating work platform - SEWP) designed especially for marine operations in rough seas, surf zones, beaches and other intertidal locations where operation of traditional SEWPs is uneconomic. As well as operating safely while elevated, its bi-directional movement allows it to move and relocate without floating. WaveWalker 1 can considerably boost productivity in tasks such as geotechnical site investigations, drilling, trenching, pipeline and cable-laying, blasting and other marine and underwater work. In January 2013 WaveWalker 1 began its first project, where it undertook drilling and rock blasting works in the outer channel to the port of Suape in Brazil, and more than proved its worth.

WaveWalker 1 is currently on location in the UK preparing for her next contract due to start in July 2014.

SOFTWARE

Image: DNV GL

DNV GL Revamps Port Clearance Software

DNV GL released its new Navigator Port 2 software, an overhaul of DNV Navigator. The new port clearance software aims to achieve a new level of usability, with a new and intuitive structure and interface. Navigator Port 2 offers increased usability to save time in the actual port clearance process, and save resources in terms of training new users and implementation. Navigator Port is used on more than 2,500 vessels worldwide, DNV GL said, reporting customer feedback shows that Navigator reduces paperwork by up to 90%, simplifies and speeds up ship-to-shore reporting, ensures smoother port clearance, reduces delays and possible penalties in connection with port calls and leads to safer navigation.

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DELIVERIES

8% Fuel Savings at Sea Trial

MERS Equipped Ship Enters Service

The push to outfit commercial vessels with energy saving equipment continues, and news out of Japan says that a Mitsubishi Energy Recovery System (MERS) supplied by Mitsubishi Heavy Industries Marine Machinery & Engine Co., Ltd. (MHI-MME) was installed on a VLOC (Very Large Ore Carrier) for the first time. The system is designed to enhance power generation efficiency by maximizing recovery and utilization of exhaust gas waste energy from marine diesel engines, and demonstrated significant fuel consumption improvement compared with existing ships during at-sea trial. MERS ability to reduce fuel consumption and environmental impact has already been confirmed through installation and testing in containerships that consume large amounts of electricity, and the latest installation broadens the vessel range.

In the current instance, MERS was installed on an ore carrier of Mitsui O.S.K. Lines, Ltd. (MOL), which was built by Namura Shipbuilding Co., Ltd. MERS is the system that optimally controls exhaust gas turbines and steam turbines, designed to enhance fuel efficiency by recovering waste heat at a wide range of engine load. The latest MERS enables even greater waste energy recovery by incorporating shaft motors that delivers surplus power back to the main engine. As results, the new MERS was able to reduce fuel consumption by approximately 8%. Going forward, MHI-MME will continue to propose various innovative energy-saving and environmental solutions to enhance seagoing energy efficiency and environmental preservation efforts.

METALCRAFT MARINE DELIVERS FOR THE PORT OF HOUSTON

Houston's New FiFi Fleet

Photo: MetalCraft Marine

The Port of Houston Authority's firefighting team recently received the third and last in series of high-performance emergency response vessels, a fleet of new vessels designed to keep one of the country's busiest and strategically important waterways safe: The Houston Ship Channel. The Port of Houston Fire Department operates three fire stations stationed along the 52-mile-long Channel, and emergency professionals respond to marine and land fires and other emergencies along the upper ship channel. The three new vessels – the Firestorm 70 command center and high-speed response vessel built by MetalCraft – is a central piece to completing its missions safely and efficiently.

The new Firestorm 70 has quad diesel inboard engines to propel the boat to a top speed of 45 knots, versus the port authority's current fleet which clocks in at 14-16 knot range. When selecting the new boats, the improvement in speed was deemed important to providing fire protection for the ship channel. But the vessels are not simply fast, as they are designed to be highly maneuverable, able to make quick stops and direction changes within three boat lengths.

Part firehouse, part boat, the vessel enables the crew to stay on station for extended periods. The cabin includes a primary care berth with four secondary berths in the cuddy. Portable berths can be positioned in the aft equipment cabin to handle injuries during incident.

Four firefighting pumps can produce flow meter results of 13,600 gpm at 150 PSI and 17,000 GPM at 130 PSI and stream up to 450 ft. with a roof-mounted Stang monitor, which is a stark improvement to the Authority's current fleet and is three times the discharge rate of any of the Port Authority fireboats being retired. As a shore hydrant, the FireStorm 70 can pump 7,000 GPM at 70 PSI through 1,000 ft. of hose from a 5 in. Storz outlet before staging pumps are required.

Each fireboat is 70 ft., 10 in. long with a breadth of 22 ft., 10 in. and a draft of 34 inches. Funds for these vessels come mostly from federal grants to replace the three aging fireboats commissioned in 1973 and 1983.

MetalCraft Marine is a fully integrated designer and manufacturer of custom high-performance fire, rescue, patrol, research and other specialized work boats. The business was established in 1987 has emerged as a leader in the design and manufacturing of aluminum water-jet propelled craft with more than 550 hulls built to date.

History

In 1924, a fire in the hold of a steamship carrying cotton prompted the Houston Fire Commissioner to declare that the Port of Houston needed adequate firefighting apparatus to attack fires from water as well as land. A bond election to pay for the city's first fireboat passed with a wide margin. This election occurred just one day after a fire along the banks of the Houston Ship Channel spread to oil on the water and burned for more than two hours, with flames as high as 40 ft. As a result, the fireboat Port Houston was built in 1925 and delivered the following year to the delight of thousands of spectators watching its arrival. The following day, another 4,000 citizens turned out for a demonstration of the fireboat pumping water. In 1950, a new replacement fireboat, the Captain Crotty, was purchased, christened and put into service. The crew fought five ship fires and six refinery fires in the boat's first year of service. In fact, at a fire at the General American Tank Storage Terminal, the fireboat spent 44 continuous hours at the scene, pumping for 36 hours nonstop.

Houston Ship Channel industries began to install manifolds on their docks in the 1950s to ensure that water would reach incidents at their facilities. The Channel Industries Mutual Aid group was also formed at this time. In 1971, the state legislature gave the Port Authority specific duties that included providing "for the prevention, detection, control and fighting of fires and explosions on and adjacent to the waterways, channels and turning basins within its jurisdiction."

With such increased responsibility, fire-fighting capability had to be improved. The fireboat Captain W.L Farnsworth was acquired in 1973. In 1981, the decision was made to retire the Captain Crotty and purchase two newer fireboats, the J.S. Bracewell and the Howard T. Tellepsen.

Paul “Chip” Jaenichen, Acting Maritime Administrator weighs in on

Title XI

While maritime industry trends are often unexpected and rarely coincide with the Federal budget cycle, MARAD currently holds sufficient funding to support $735 million in Title XI loan guarantees and we fully intend to use it.

As a reader of Maritime Reporter & Engineering News, you’re probably familiar with Title XI shipbuilding loan guarantees and the program’s importance to the U.S. Maritime Industry. The Title XI program—administered by the Maritime Administration (MARAD)—has long provided full faith and credit loan guarantees by the Federal Government of private sector debt acquired to build vessels in U.S. shipyards. While the Title XI program’s principal objective is to promote the growth and modernization of the U.S. Merchant Marine and U.S. Shipyards, it also enables our nation to maintain a presence in our waterborne commercial and military supply chains—serving as an essential component of sound U.S. economic and security policies.

Today the program is represented in almost every maritime market segment and geographic region, and I think most maritime stakeholders recognize its value to our industry.

In a large part driven by our country’s continuing natural gas boom, the U.S. maritime industry is currently seeing robust shipbuilding activity, the most in over three decades. Over 20 large, self-propelled, oceangoing Jones Act-eligible tankers and containerships are under construction or are on-order at U.S. Shipyards and MARAD wants to ensure that the Title XI Program continues to support this trend. To that end, MARAD recently issued a Federal Register Notice to propose that the criteria used to grant Title XI loan guarantees include vessels powered by alternative energy sources like liquefied natural gas (LNG) should be considered.

While maritime industry trends are often unexpected and rarely coincide with the Federal budget cycle, MARAD currently holds sufficient funding to support $735 million in Title XI loan guarantees and we fully intend to use it. And with the surge in shipbuilding we’re experiencing, MARAD is working overtime to improve our management of the program.

I’m happy to announce MARAD’s recent installation of Owen Doherty as Associate Administrator of the Title XI program.

A longtime MARAD employee (most recently as Director of our Office of Security), Owen brings a solid work ethic, decades of maritime industry experience, and a U.S. Merchant Marine Academy and Naval War College education to the Title XI program.

Our new Associate Administrator isn’t the only Title XI-related change in personnel at MARAD. We have also increased our in-house financial expertise by incorporating additional staff into the Office of Marine Financing. This includes an on-site financial analyst to assist with efforts to develop a new risk-assessment model and timeline for credit watch reports. Additionally, MARAD increased the number of firms conducting independent financial analysis (IFA) under contract with the government to ensure more industry-knowledgeable analysts are available to speed the Title XI process and provide competition for the work. This move will help us determine best practices to structure loan guarantees, and in the long term, it will save taxpayer dollars and expedite quality financial reviews.

MARAD has also been targeting aspects of the program that can be simplified and made more efficient. On this front, we have engaged the services of an external consultant to obtain an independent review of the program and help identify areas for further improvement. For example, to increase the efficiency of the review process, MARAD now requires that we receive all information before we will consider an application complete.

Having all information submitted at the outset will considerably cut down the average processing time to approve loan guarantees.

Furthering the effort to make the analysis process timelier, we now directly complete the IFA contracting process. This has already had a substantial effect on our procedures, cutting months off the time to award the IFA contract.

At MARAD, we understand the importance of Title XI funds to our industry. Our recent efforts can be just the “nudge” that some fleet- and/or capacity-building initiatives need to move ahead, and they can be a major boon to both vessel owners and shipyards.

To ensure that the program continues to have a positive impact on our nation’s ships and shipyards, we are forging ahead with our evolution of the program’s management—so regardless of any potential flux in funding, applicants will be able to timely capitalize on the opportunity that Title XI offers.

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Freeware for Speed/Power Trial Analysis Released

EEDI IMO-Approved Method

The new STAIMO software for Speed/Power Trial analysis and reporting on board was released last January for use by the worldwide maritime industry free of charge. MARIN, which assisted the STA-Group in these efforts, also offers a dedicated course (June 16- 20) for EEDI Verifiers and other stakeholders to allow them to get fully conversant with model tests, Speed/Power trials and the use of STAIMO.

Available via a dedicated website www.staimo.org, the STAIMO software package is the result of the implementation of the new ITTC Guidelines for Speed/Power Trials, which have been approved by the IMO's MEPC for evaluating the ship speed for the Energy Efficiency Design Index (EEDI), which is now effective for most newbuild ships.

STAIMO has been developed by the STA-Group, comprising 38 leading ship owners, operators, yards, class and institutes, which have been cooperating in this field since 2002. With dedicated research on subjects such as measurements, analysis, wind and wave corrections and the conversion of results from trials on ballast draught to design draught, this group led the way to a new industry STA standard introduced in 2006.

Over the last two years the STA-Group has cooperated with the International Towing Tank Conference (ITTC) to develop this method and the underlying approach and models were scrutinized by the world's leading hydrodynamic experts. The resulting ITTC Guidelines for Speed/Power Trials have been accepted by the IMO as the method to conduct and process speed trials in line with the EEDI rules. Subsequently, the STA-Group decided to develop the STAIMO software and release this as freeware in order to harmonize the EEDI and speed trial procedures worldwide. For use on board, the software, which has been certified by ABS, carries out analyses & reports can be downloaded from **www.staimo.org**. The Speed Trial Report produced by the STAIMO software can be verified by anyone via an Internet authenticity check.

The Author

Henk van den Boom is manager at the Trials & Monitoring department of 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.

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BY PAUL MICHALICKA, SKF USA INC.

Maintenance

Advances in Tech Boost Equipment Reliability

Machine reliability is a top priority and continuing challenge in marine applications, which operate in harsh conditions and at remote locations far from port and repair facilities. Ship operators can help keep machinery running efficiently by equipping their maintenance departments and crews with a full complement of new-generation maintenance tools. These tools, which range from high-accuracy alignment systems to precise automatic lubricators, can help avert premature failures and reduce the need for repairs at sea.

Tanker Operator Improves Pulley Alignment

Many ship operators have modernized their maintenance practices and tools as part of overall reliability efforts. A case in point is a major tanker operator with a fleet of 55 ships, based in the U.K. One pressing area of concern for the operator was pulley alignment. Belt failures in key machines had caused costly downtime and sometimes reduced a vessel's operating efficiency. The root cause was usually misalignment.

The company decided to upgrade its existing alignment practices, which were cumbersome and lacked the necessary degree of accuracy.

The operator evaluated several advanced alignment systems and eventually opted for a laser-equipped belt alignment system consisting of a laser-emitting unit and a receiver unit. The two units are securely positioned in pulley grooves during operation, allowing the alignment of pulleys having varying widths and dissimilar faces. Users can detect horizontal, vertical and parallel misalignment and adjust belts and pulleys accordingly. The system's design is intuitive, requiring minimal training for ship engineers.

After the upgrade, company officials reported an immediate improvement in alignment accuracy. The end result was more reliable machine operation across the entire fleet.

Matching Solutions

Different types of rotating machines have varying operating parameters and maintenance needs. Assembling a set of solutions that match the requirements of key application platforms prior to leaving port is a best maintenance practice. For example, new-generation maintenance solutions, such as single-point lubricators, can help optimize vibrating screen performance and cut the risk of failure. Vibrating screens are employed to sort the catch on fishing vessels and to transport certain bulk materials. In addition to harsh conditions, the screens experience high temperatures, acceleration and speeds ranging from 1,000 to 2,000 rpm. Common causes of failure include fretting corrosion on the shafts and lubrication and bearing cage problems.

Single-point lubricators attach directly to bearing positions in screens and supply a precise, regulated flow of lubricant. One popular type consists of a transparent canister filled with up to 125 milliliters of lubricant. Once activated, a built-in piston propels lubricant per the user's pre-determined setting from the canister. Depending on the application and flow rate, lubricators can function for six months or more without a refill. This long shelf life can help avert the need for re-lubing at sea, which takes time and can introduce contaminants to the screen bearings.

Vibrating screens are typically driven by and coupled with electric motors and gearboxes. Like pulleys, they must be properly aligned with coupled machines for efficient operation. New hand-held shaft alignment tools generate real-time alignment values, enabling users to gradually adjust coupled machines until they are correctly aligned.

During screen operation, vibration-monitoring devices and electrical discharge detectors allow workers to assess machine health in real time. Vibration devices typically gather velocity and enveloped acceleration vibration data, compare it automatically with preprogramm`ed guidelines, and give early indications of conditions that may cause failure. Discharge detectors monitor operating electric motors, such as those driving vibrating screens, and identify potentially damaging electrical erosion. A similar set of maintenance solutions can be utilized for other marine applications, including refrigeration and ice-making equipment, conveyors, cranes, pumps and fans.

Mounting/Dismounting

Ship maintenance departments can benefit from the ability to mount and dismount rotating components at sea. Applications with large components can be designed beforehand to accommodate oil injection mounting/dismounting. Oil injection employs a thin film of pressurized oil to drive components onto shafts or safely remove them. For smaller components, portable induction heaters are ideal for on-board use. One ship operator in the Middle East, for example, acquired 20 high-frequency induction heaters for mounting bearings in small motors. The heaters weigh only 10 lbs. and are easy to handle and store. They heat bearings in bore sizes from 0.8 to 4 inches and weighing up to 11 lbs. An added benefit is that the heaters do not magnetize bearings while heating them. This reduces the risk of small-particle contamination and makes a demagnetization cycle unnecessary.

The Author

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Photo: SKF USA Inc.

Hand-held electrical discharge detectors can help assess the condition of operating motors.

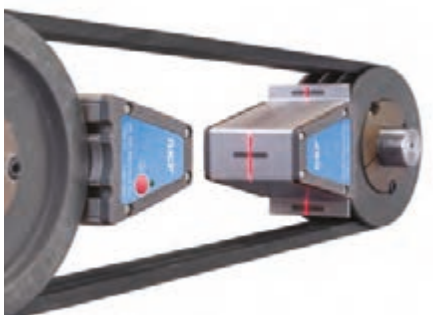

Photo: SKF USA Inc.

Laser-equipped belt alignment tools accurately align belt-driven machines, including pulleys of different widths.

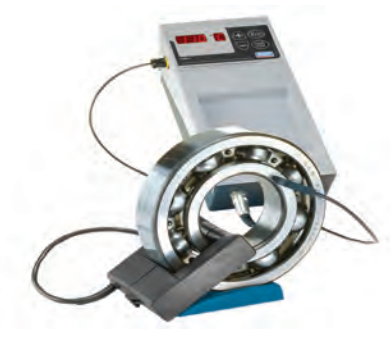

Photo: SKF USA Inc.

Lightweight high-frequency induction heaters are easy to store aboard ship and can heat small bearings for mounting without magnetizing them.

Photo: SKF USA Inc.

One popular type of automatic lubricator supplies a regulated flow of lubricant directly to bearing positions, reducing the need for frequent relubing.

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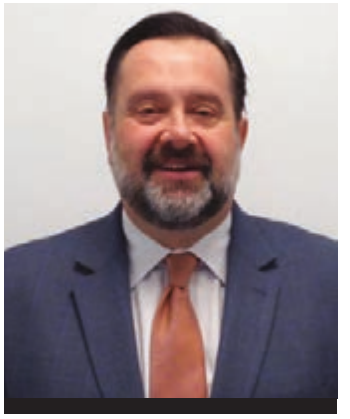
U.S. Bunker Market

Seizing Opportunities in a Rapidly Changing Market



BY ADRIAN TOLSON

The global shipping industry is no stranger to challenge or change. With responsibility for delivering 90% of global trade, it has had to continually demonstrate an ability to adapt. Now, with the implementation of increasingly stringent environmental regulations, which will increase operating costs and alter the dynamic of fuel procurement, the industry will once again need to evolve.

In successfully responding to the introduction of the North American Emission Control Area (ECA) in 2012, shipping has jumped a significant hurdle, but this is just the beginning. The bunker market in the U.S. will encounter further change on several fronts, each with its own challenges. However, with the right strategy and foresight, there are opportunities for all parties.

Energy Independence

The U.S. is moving towards increased energy independence much faster than most opinion formers had initially anticipated, with national energy self-sufficiency a realistic prospect in the near future, maybe even by 2020. In the main, this is due to the exponential growth in shale oil production, which will affect the market for fuel oil, and alter the bunker market dynamics in the region. Given the improved capabilities for shale oil extraction and transportation, as well as a rapidly growing domestic market for shale, the pattern of energy consumption, and indeed energy import and export to and from North America, is changing.

North American refineries are unlikely to invest in the production of fuel oil along the U.S. Gulf Coast, as it would not be as profitable in terms of operating expenditure and returns. Shale oil crudes are lighter in nature and when refined will produce less fuel oil from domestic production, which could reduce availability in what is already a limited domestic market. For shipping, this raises important questions about the future supply and demand balance of required fuels and what this means for ensuring compliance when the ECA sulphur emissions limit drops to 0.1% in January 2015. Fuel distributors must be cognizant of these market changes and need to work closely with their customers to implement an effective plan that determines their fuel requirements both in North American waters and internationally, and source quality products accordingly. With the right strategy and forward planning a fuel procurement strategy can be implemented for customers that ensures compliance, and supply, and also protects the bottom line.

Widening of the Panama Canal

While there are well-reported challenges with the construction project that will widen the Panama Canal, once completed, the changes to vessel traffic passing through the canal may also impact the bunker market in the US. The third lock will increase the draft capacity of the canal significantly to allow for Post Panamax vessels, meaning the amount of cargo passing through the canal will increase. However, the number of vessels transiting along the canal may reduce, along with the level of congestion at ports and canal entrances, which currently fuels a large part of the demand for bunkers in the U.S.

Upon the project's completion, we may see increased demand for fuel at East Coast ports, which are being dredged and expanded with new berths to cater for larger vessels. Fuel distributors here may benefit from the increase in feeder traffic from the larger vessels at both sides of the canal as well as those operating from ports that have invested in dredging and expanding berths to cater to larger vessels. The West Coast bunker market, in comparison, will have to adjust and create a competitive offering to maintain traffic, which is of course beneficial to customers. West Coast ports would argue that it is cheaper to land in the region and then transit containers cross-country by land or rail. Along both coasts fuel distributors must work with their customers

to determine their fuel requirements once the expanded canal opens for business to ensure product availability. For those fuel distributors with the resource, infrastructure and financial strength, there are many opportunities to develop their operations to meet the future needs of customers in the region.

Significant Operational Costs

While changes to the energy and transportation infrastructure will impact upon supply and demand for fuel across North America, there is one ongoing challenge that the bunker industry must address; the increase in operational costs for ship owners and operators at a time of continued lack of liquidity.

It is well documented that bunker fuel accounts for the majority of operational costs. It is therefore up to fuel distributors to take responsibility for working in partnership with their customers to minimize the impact as much as possible. For OW Bunker, as a physical distributor (as well as a reseller), cost-effective fuel procurement is delivered by looking beyond just the price of fuel. It is about implementing solutions that focus on driving savings and increasing operational efficiencies within every element of the distribution process. This takes commitment to providing the highest quality service, investing in the fuel supply chain, processes and infrastructure, as well as working in partnership with ship owners and operators to ensure that the products, means of distribution and management of risk are right for the needs of each customer's business.

For example, in the Gulf of Mexico, OW Bunker's aim in establishing an offshore physical distribution offering was to ensure that every element within the fuel supply chain is designed to increase efficiency. We operate two of the most modern and versatile fuel distribution tankers in the market. The Elisalex Schulte (16,000DWT) and Wappen Von Hamburg (8,000DWT) are ideally suited to provide a full range of quality products to all types of vessels. Both vessels are operated by experienced lightering and bunker crews, and are correctly sized for the offshore business. Pumping rates approach 1000 mts/hr, which also maximizes the speed and efficiency of supply. This saves our customers time through providing quick product supply at location, and because they are offshore, customers do not have to deviate from their course to bunker in port, saving them valuable time and associated calling costs.

While providing offshore services is a skill and niche OW Bunker has developed particular expertise in, the savings for customers quickly add up. On a global basis we look to utilize the latest technologies on our distribution vessels to guarantee the quantity of fuel supplied, such as Coriolis Flow Meters, and through providing additional testing procedures prior to delivery, customers can also be assured of the quality of fuel they receive. Such measures are important ways of creating overall operational savings and protecting customers against undue, and costly risks. It is the hallmark of a value-driven fuel distribution model that meets the demands of ship owners and operators in a changing market.

Opportunity in the Face of Change

Despite the evolution of the market, an effective fuel distribution solution can provide ship owners and operators with a competitive advantage. That is why at OW Bunker, we are focused on proactively ensuring that we adopt the right strategy and are well positioned and equipped with the resources, the expertise and the agility to meet the new market dynamics and the increasingly complex demands of ship owners and operators.

From a North American perspective, we are implementing a controlled expansion of both our reselling and physical distribution operations to ensure we have a presence where our customers need us. We've added offices, further expanded our state-of-the-art vessel fleet, entered into strategic alliances to guarantee supply of high quality products and recruited skilled and experienced teams with real industry knowledge. Most importantly we are driven by building transparent, partnership-based relationships with our customers that are founded on trust, a fundamental understanding of their businesses, and a mutual commitment to improving efficiencies and performance within their operations.

It is through this determination to evolve that we can be on hand to help ship owners and operators manage this transition and thrive in the face change.

The Author

Adrian Tolson is General Manager, North America, for OW Bunker, one of the world's leading independent distributors and resellers of marine fuels and lubricants. Tolson joined OW Bunker in October 2012 to oversee the company's new physical division in the North America.

www.owbunker.com

Maritime Comms

Richard Simonian is the President of Maritime Solutions, a business unit within Harris CapRock Communications. MR picked his brain for insights on the shape and direction of maritime comms.

By Greg Trauthwein, Editor

We understand that you recently unveiled your Advanced VSAT solutions at Satellite 2014. Can you give us a brief on exactly what this is?

The problem increasingly being faced by ship and rig operators is that their communication needs are dynamic, yet the traditional buying approach is static. They have had two choices. First, pay for use on a per minute or per megabyte basis, which can lead to unpredictable monthly costs that are difficult to manage, or second, sign up for a committed information rate for bandwidth, which provides flat-rate predictable costs but is difficult to change on short notice or for short periods of time.

Our customers are also looking for bandwidth capacity increases and support for a variety of different voice, data, and video applications.

Harris CapRock launched its Advanced VSAT platform at Satellite 2014. By partnering with equipment providers and making technology investments, we have developed a dynamic network architecture that provides a secure, cost-effective way to allocate and reconfigure bandwidth dynamically based on changing operational requirements. This allows us to deliver better efficiencies and resiliency, while improving network performance and reducing field site visits. (In short) real-time bandwidth upgrade requests will become easier and more efficient.

For example, imagine 4,000 passengers onboard a cruise ship – each with multiple communications devices, posting, pinning and journaling their vacations on social media to everyone back home.

Imagine the rising demand for entertainment sites, such as Netflix and YouTube, where passengers can download or watch streaming video from their cabins. In "steady state" this is a challenging problem to solve.

Furthermore, what happens when the ship additionally has a special charter on part of the itinerary, a short-term need for a video-teleconference to the crew, or a need to enable a telemedicine session for a passenger?

Harris CapRock's dynamic bandwidth management (dSCPC) architecture will provide the maximum bandwidth available, with significantly more flexibility for short term changes.

We hear that the ability for communication providers are available to significantly increase and enhance the onboard experience of crew, passengers and for the purpose of business efficiency, but that quite frankly shipowners are simply too cheap to buy in. Is this what you hear, and if so, how are you positioned to rebut?

It's very interesting, in working with different clients, to hear how they treat their spend on communications and more broadly on IT. The merchant shipping industry is still recovering from a very brutal period of overcapacity and necessary cost cutting coupled with new fuel regulations. Many are just trying to survive for now and are not interested in anything but spending the bare minimum on IT. Certain customers, however, are seeing a market discriminator if they invest in IT, as this will provide them with a more stable, safe, and better trained crew, better operational efficiencies, and better services that they can in turn offer their clients. But overall in the shipping and service/supply vessel market, we see a continuing changeover from traditional MSS L-band service to always-on VSAT service, and a continuing increase in average bandwidth consumption for each VSAT-equipped ship. Two years ago a typical merchant ship would have a 64Kbps link. That has now doubled and if the trend continues, that will double again in the next two years.

In the passenger and leisure market, the large ships are already equipped with VSAT and have more experience in using always-on connections for guests, crew, and operations. But again the approach to forecasting usage and budgeting for communications varies with different companies, whether the IT departments or the revenue departments hold the budgets, and whether IT in general is seen as a cost of doing business or a potential competitive differentiator. More so than the shipping and supply vessel market, the passenger vessel market is being overwhelmed with bandwidth demands from guests who are looking for a hotel-like experience at sea. This is in addition to the drive for ECDIS, operational connectivity to all elements onboard, and crew welfare. Doing simple math would say that a cruise ship with 1,500 guests and 600 crew ought to have a link over 20Mbps. With WAN optimization applied, that amount of bandwidth can deliver a service that is somewhat acceptable to the percentage of people trying to connect at any one time. But it's a big change from the current average of 2Mbps! The higher capacities, with support for unique high-priority services within the link, is the kind of solutions that Harris now offers.

The communications business, on land and at sea, has gone through a tremendous transformation over the past two decades. What do you count as the biggest technology driver which has allowed you to expand your business?

IP convergence is the biggest change over the past 10 years that has changed the face of managed communication services. IP standardization has driven improvements in many areas that we have taken advantage of. The cost of the telecom infrastructure required to process and move traffic from vessels to corporate headquarters has reduced significantly and reliability has increased significantly as we can now leverage the huge investments from companies like Cisco, Riverbed, and Juniper. Being able to move voice, video, and data as just different services within an IP stream has simplified the hardware approach onboard, and moved the complexity back to the shore where skilled network engineers can manage it more cost-effectively. Constant IP connectivity expectations of passengers and crew are due to incredibly powerful phones and tablets that provide a multitude of IP-enabled functions. On the ships, we're seeing an increasing trend where every electronic device and even many currently non-electronic devices are becoming IP enabled, sending their health and status back to ship owners shoreside, allowing them to deliver greater operational efficiencies for the fleet, and driving the business case for increased and more reliable communication links.

Competitively, how do you measure and differentiate your company, your services against others.

We measure ourselves with typical metrics such as market share within each of the segments we serve, customer satisfaction, and renewal rates.

ECDIS, paperless charts, electronic manifests and ship tracking will drive bandwidth quantity & quality

By several third-party measures, Harris CapRock has continued to increase market share in both energy and maritime markets, demonstrating our corporate commitment to these customers. As a Fortune 500 company specializing in communications, one of Harris' differentiators is the enormous breadth and depth of expertise we offer our clients in all forms of communications, not just satellite. We have helped many customers architect their entire end-to-end service, inclusive of terrestrial, WAN, LAN, satellite, and other wireless links.

We also bring unique innovation to the market, both technical innovation and business innovation. Examples of technology innovation include the previously mentioned Advanced VSAT offering. We have also stood up the largest global mobility network running the latest generation of TDMA satellite technology using iDirect. We have recently installed the very first O3bMaritime antennas and service for Royal Caribbean, offering an unprecedented 500 times the bandwidth to a single ship than has typically been available. Our direct involvement with putting hardware on new satellites such as Inmarsat Global Xpress and Iridium NEXT, communication packages on drones, and innovative long-range network radios ensures that we are very familiar with new communication technologies. This knowledge allows us to make the "best fit" recommendations to customers based on their needs and usage trends.

Looking at the Legislative arena, are there any issues on the horizon that could be good or bad for your business? Please be specific.

Some legislative changes are clearly driving higher bandwidth requirements and higher availability requirements. For example, MLC2006 will be incrementally implemented by companies around the world, but generally it will provide for more access to communications to the crew. The requirements for ECIDIS, paperless charts, electronic manifests, and ship tracking will similarly increase not only the bandwidth consumed by each ship but also the need for a highly available service rather than a "best effort" delivery that some vessels currently experience.

As a service provider we also closely track, and influence where appropriate, the regulatory changes affecting communications in different jurisdictions around the world. There are ongoing conflicts and pending battles at the next World Radio Conference regarding usage of C-band on vessels near shorelines. Some jurisdictions already limit or proh ibit such transmission, and without a coordinated argument from both satellite operators and service providers, there is threat that access to this valuable service could be further limited. The usage and licensing approach for Ka-band service globally is being broadly considered. Usage of unlicensed spectrum from shore links is another topic of frequent discussion with the various communication ministries. As a communications provider, Harris broadly tracks and represents our customers' interests in these regulatory discussions.

Richard Simonian is the President of Maritime Solutions, a business unit within Harris CapRock Communications. His group specializes in managed communication systems and services for the global commercial maritime market including cruise and passenger vessels, shipping, service, and supply vessels and subsea communication systems and engineering.

Staying Connected

The maritime industry is at a crossroads, with a dearth of next-generation talent willing and available for a life at sea, yet increasing demands for efficiency and clarity of operations. At this crossroads lies modern communication technology, the connective tissue that can help to cure many of the industry's ills, as Frank Coles, President of Inmarsat Maritime, contends.

By Greg Trauthwein

Commercial shipping will always remain a pivotal link in the global transport chain, but the very nature of the industry is changing rapidly as the current group of mariners age and there is a decided lack of ample replacements available. Quite simply, the "millennials" are a generation more enamored with the computer screen than the operation and management of ships at sea.

While technology is part of the problem, it also is potentially a part of the solution, as increasingly ship owners – whether they like it or not – are providing mariners on commercial ships and boats a more dynamic and robust internet connectivity, allowing for an experience closer to shore side solutions and providing mariners the means to stay in touch with friends and family, as well as broadening entertainment options.

"When I go out and talk to seafarers and ship owners, what I hear is 'we don't want to give them internet because they will use it when they are on watch. We don't want to give them movies because they'll watch them into the middle of the night.'

So they (ship owners) put controls around it or they restrict it all together," said Frank Coles, President of Inmarsat Maritime. Obviously it is in the best interest of Inmarsat and Coles … and for that matter all high-end suppliers of maritime communication solutions … that those attitudes change.

"First, don't put internet access on the bridge. Second, if you give them access to the internet, and you give them tools and treat them like grown adults, then they will behave like grown adults. The moment you try to restrict it, they will abuse it."

Coles is determined that Inmarsat stay on the forefront of connectivity matters for mariners, and was a driving force in the in the creation and recent introduction of Fleet Media, a new service to debut in July 2014.

Fleet Media will allow the latest films, as well as television programming, sport and news, to be viewable by the world's shipping fleet. A globally-exclusive, five-year agreement allows for the content's digital distribution via Inmarsat FleetBroadband.

A selection of movie and television packages will be offered every month, beamed directly to participating vessels over the Inmarsat network for 'offline' viewing on PCs, laptops and tablets.

Fleet Media will be available to all

Clarksons Research estimates that by 2020 the convergence between IT and shipbuilding will be worth $35 billion.

Inmarsat broadband service subscribers and content will be securely downloaded and stored on the vessel's Inmarsat iFusion box. The service is transferable with any upgrade from one Inmarsat service to the next – such as FleetBroadband to XpressLink.

Market Drivers

While new rules such as the Maritime Labor Convention 2016 (MLC 2006) are touted to help the mariner, Coles is skeptical of its impact.

"The Maritime Labor Convention (MLC) requires ship owners to supply some internet connectivity," said Coles. "Because the convention is so loosely drafted though, just giving access to internet, or just giving access to email, it does not quantify the cost or quantify the quality of the connection.

So you see everything from the (ship owners who are) leaders and innovators that are providing a (communications) pipe that is high quality, to the other end where it is a very poor connection, worse than dial up. But they have the check box."

"The new generation (of mariners) are internet natives, they take the communications part of all of this for granted; they don't think about how the internet gets into your house, they just expect it to be there," said Coles. "The trick with the ship owner is to just expect the comms to be there. They do expect it to be there, they just don't want to pay for the cost of a $400m satellite. But as we provide this new communications pipe, the crew benefits and the price will come down as well."

Apart from crew connectivity, Coles sees the increasing flow of data, specifically data to and from onboard machinery and systems, as the second big driver in the maritime communications market. "CISCO estimates that by 2020 there will be 50 billion 'things' connected to the internet, all providing information. There's already 12 billion," Coles said.

While 'the automated ship' has long been theorized and debated, Coles said increasing the level of automation starts in the shipyard. "Hyundai and other yards are building ships with equipment that is all sensored" Coles said. "Hyundai themselves are selling ships on the basis that you buy the ship and you can buy a contract so once the ship has sailed it will continue to monitor, maintain and look after the ship.

Clarksons Research have estimated that by 2020 the convergence between IT and shipbuilding will be worth $35 billion. The convergence between sensors and things that are connected to deliver data and creating a smarter way of operating will be put on ships."

In Coles estimation the remote monitoring is the bigger piece, citing research from ESRG that estimates that just looking at today's fleet, there is $20B of value that can be created by remotely monitoring and putting sensors on ships.

"That means pulling the cylinder before it fails, arriving to port on time, it means that just getting all of this information and running your ship smartly from shore," said Coles. "They (ESRG) think you can save up to $1m per ship per year if you input remote monitoring of a smart ship with sensors and analytics, and using algorithms to come out with smarter business decisions. None of this is possible in shipping without a robust, industrial grade communications platform."

U.S. Navy

Ship construction programs move ahead, but it's not smooth sailing.

By Edward Lundquist

Navies and Coast Guards everywhere face budgetary pressure, even in the U.S. which has the largest Navy in the world. The balance between desire for capacity and capability and pressure for affordability has never been more acute with the precarious budgetary issues presented by declining defense budgets, sequestration, continuing resolutions and government shutdowns. Even so, there are ongoing major construction efforts to include large nuclear aircraft carriers and submarines, amphibious ships, destroyers and smaller combatants, albeit with compromises in quality, quantity and capability.

To prepare the Navy's program within the fiscal constraints, Chief of Naval Operations Adm. Jonathan Greenert set the following six priorities. "Number one is the sea-based strategic deterrence. Number two, forward presence. Three, the capability and the capacity to win decisively. Number four, the readiness to do that. Number five, to sustain our asymmetric capabilities and our technological edge. And number six, to sustain a relevant industrial base. Using these priorities, we build a balanced portfolio of capabilities within the fiscal guid-

The littoral combat ship Pre-Commissioning Unit (PCU) Coronado (LCS 4) is rolled-out at the Austal USA assembly bay. Coronado is scheduled to be christened Jan. 14, 2012 and will undergo sea trials later this year.

(U.S. Navy photo courtesy Austal USA/Released)

Ship	Hull #	Remarks	Location
USS Nimitz	CVN-68	Conducting flight deck certification in the Eastern Pacific.	Everett, WA
USS Dwight D. Eisenhower	CVN-69	Began 14-month DPIA at Norfolk Naval Shipyard in Portsmouth in September 2013.	Norfolk, VA
USS Carl Vinson	CVN-70	Preparing for overseas deployment.	San Diego, CA
USS Theodore Roosevelt	CVN-71	Preparing for overseas deployment.	Norfolk, VA
USS Abraham Lincoln	CVN-72	Commenced three-and-a-half year RCOH at Huntington Ingalls Newport News Shipbuilding in March 2013.	Norfolk, VA
USS George Washington	CVN-73	Commenced a three-month SRA at Fleet Activities Yokosuka.	Yokosuka, Japan
USS John C. Stennis	CVN-74	Commenced a 14-month DPIA at Puget Sound Naval Shipyard and IMF in June 2013.	Bremerton, WA
USS Harry S. Truman	CVN-75	Deployed to the 5th and 6th fleet areas of operations, in support of maritime security operations in July 2013. Relieved by the USS George H.W. Bush (CVN 77) in the Gulf of Aden in March 2013.	Home port: Norfolk, VA
USS Ronald Reagan	CVN-76	Conducting Tailored Ship's Training Availability (TSTA) off the coast of southern California and preparing for deployment.	San Diego, CA
USS George H.W. Bush	CVN-77	Departed Norfolk on deployment to the 5th and 6th fleet areas of ops in support of maritime security ops on February 14, 2014.	Norfolk, VA

Aircraft Carriers Under Construction or Proposed

Gerald R. Ford	(CVN-78)	Christened at Huntington Ingalls Newport News Shipbuilding in November 2013. Scheduled to be commissioned in 2016.
John F. Kennedy	(CVN-79)	Initial "cutting of steel" at Northrop Grumman (now Huntington Ingalls) Newport News shipyard in February 2011.
Enterprise	(CVN-80)	Scheduled to be commissioned in 2025.

Submarines

PCU NORTH DAKOTA	SSN 784	Delivery Yard - General Dynamics Electric Boat Percent Complete - 93% Contract Delivery Date - 31 August 2014 Est. Delivery Date - Summer 2014
PCU JOHN WARNER	SSN 785	Delivery Yard - Huntington Ingalls Industries - Newport News Percent Complete - 81% Contract Delivery Date - 31 August 2015 Est. Delivery Date - Spring 2015
PCU ILLINOIS	SSN 786	Delivery Yard - General Dynamics Electric Boat Percent Complete - 69% Contract Delivery Date - 31 August 2016 Estimated Delivery Date - Fall 2015
PCU WASHINGTON	SSN 787	Delivery Yard - HII - Newport News Percent Complete - 62% Contract Delivery Date - 28 February 2017 Est. Delivery Date - Summer 2016
PCU COLORADO	SSN 788	Delivery Yard - General Dynamics Electric Boat Percent Complete - 52% Contract Delivery Date - 31 August 2017 Est. Delivery Date - Fall 2016
PCU INDIANA	SSN 789	Delivery Yard - HII - Newport News Percent Complete - 45% Contract Delivery Date - 28 February 2018 Est. Delivery Date -Summer 2017
PCU SOUTH DAKOTA	SSN 790	Delivery Yard - General Dynamics Electric Boat Percent Complete - 34% Contract Delivery Date - 31 August 2018 Est. Delivery Date - Fall 2017
PCU DELAWARE	SSN 791	Delivery Yard - HII - Newport News Percent Complete - 27% Contract Delivery Date - 28 February 2019 Est. Delivery Date - Summer 2018
Unnamed	SSN 792	Delivery Yard - General Dynamics Electric Boat Percent Complete - 0% Contract Delivery Date - 30 June 2019 Est. Delivery Date - TBD

U.S. Navy Ships on Order

Name	Hull	Class	Status	Commissioning (Est.)
America		LHA 6	Christened Oct '12	October 2014
Billings	LCS 15	Freedom	–	–
Daniel Inouye	DDG 118	Arleigh Burke	–	2018
Detroit	LCS 7	Freedom	Under Construction	2016
Elmo Zumwalt	DDG 1000	Zumwalt	Christened April '14	2015
Gabrielle Giffords	LCS 10	Independence	–	–
Indianapolis	LCS 17	Freedom	–	–
John Finn	DDG 113	Arleigh Burke	Under Construction	2015
John P. Murtha	LPD 26	San Antonio	Under Construction	–
Little Rock	LCS 9	Freedom	Ordered	–
Lyndon B. Johnson	DDG 1002	Zumwalt	Under Construction	2018
Manchester	LCS 14	Independence	–	–
Michael Monsoor	DDG 1001	Zumwalt	Under Construction	2015
Milwaukee	LCS 5	Freedom	Launched Dec '13	2015
Montgomery	LCS 8	Independence	Awarded	–
Omaha	LCS 12	Independence	Ordered	–
Paul Ignatius	DDG 117	Arleigh Burke	–	2018
Portland	LPD 27	San Antonio	Under Construction	2017
Rafael Peralta	DDG 115	Arleigh Burke	Ordered	2016
Ralph Johnson	DDG 114	Arleigh Burke	Ordered	2016
Sioux City	LCS 11	Freedom	Ordered	–
Thomas Hudner	DDG 116	Arleigh Burke	Ordered	2017
Tripoli	LHA 7	America	–	2018
Tulsa	LCS 16	Independence	–	–
Wichita	LCS 13	Freedom	–	–
[Unnamed]	DDG 119	Arleigh Burke	–	2019
[Unnamed]	DDG 120	Arleigh Burke	–	2020
[Unnamed]	DDG 121	Arleigh Burke	–	2021
[Unnamed]	DDG 122	Arleigh Burke	–	2021
[Unnamed]	DDG 123	Arleigh Burke	–	2022
[Unnamed]	DDG 124	Arleigh Burke	–	–
[Unnamed]	DDG 125	Arleigh Burke	–	–
[Unnamed]	DDG 126	Arleigh Burke	–	–
[Unnamed]	DDG 127	Arleigh Burke	–	–

ance provided. We continue to maximize our presence in the Asia-Pacific and the Middle East using innovative combinations of rotational, forward-basing, and forward stationing forces."

U.S. naval shipbuilders are components of large defense companies. General Dynamics own Electric Boat in Groton, Connecticut, which builds SSNs; Bath Iron Works in Maine, currently building Zumwalt and Arleigh Burke class DDGs; and NASSCO in San Diego, California, where they are building the mobile landing platform (MLP). Huntington Ingalls Industries owns yards in Newport News, Virginia; Pascagoula, Mississippi; and Avondale, Louisiana, and are building aircraft carriers (CVNs), attack submarines (SSNs); guided missile destroyers (DDGs), amphibious assault ships (LHSs) and amphibious landing platforms (LPDs).

Two second-tier yards which are subsidiaries of larger foreign-owned companies are also building ships for the U.S. Navy. Italian shipbuilder Fincantieri owns Marinette Marine in Marinette, Wis., where the Freedom variant of the littoral combat ship (LCS) is being constructed; and Australia-owned Austal USA is building the Independence variant LCS platform in Mobile, Alabama, along with the joint high speed vessel (JHSV).

Submarines

The U.S. Navy announced a $17.6 billion multiyear buy of Virginia-class submarines on April 28 that will keep General Dynamics Electric Boat and Huntington Ingalls Newport News shipyards busy for a decade. EB was selected as the sole source prime contractor for the $17,645,580,644 fixed-price incentive multiyear contract, with Huntington Ingalls as the largest sub-contractor. Together, both companies have delivered 10 Virginia-class submarines to the Navy, with eight more already under contract.

The newest Virginia-class SSN, North Dakota (SSN-784), was christened Nov. 2, 2013 at Electric Boat, but her commissioning, which was scheduled for May 2014, has been rolled back until some design and material issues are resolved. It is still on track to deliver prior to its August 31 contract delivery date. North Dakota is the first Virginia-class boat with a redesigned bow which features a pair of Multiple All Up Round Canisters (MAC) for Tomahawk land attack cruise missiles.

Aircraft Carriers

The newest nuclear aircraft carrier, Gerald R. Ford (CVN 78) was christened Nov. 9, 2013 at Newport News Shipbuilding. Two others, John F. Kennedy and Enterprise, are underway in the construction pipeline.

The Navy budget says it continues to support a fleet of 11 aircraft carriers, but Sen. Carl Levin (D-MI), chairman of the Senate Committee on Armed Services, says, "The budget in Future Years

The Military Sealift Command mobile landing platform ship USNS Montford Point (T-MLP 1) is floated out of General Dynamics NASSCO shipyard.

(U.S. Navy photo courtesy of General Dynamics NASSCO/Released)

Defense Program, the FYDP, includes a plan to retire rather than refuel the George Washington. To follow through on the 11 carrier fleet, the administration would have to add almost $4 billion to the FYDP to refuel and retain George Washington."

Expeditionary Warfare Ships

The Navy has a total of nine amphibious assault ships (LHAs and LHDs). HII is building America (LHA 6), designed to transport Marine Expeditionary Units and their equipment. At 257m long with a 32m beam, it displaces 44,854 tons. It has crew of 1,204 and can transport up to 1,800 troops and their equipment. It has been built to operate the V-22 Osprey and F-35 Joint Strike Fighter.

The final three of the 11 ship San Antonio-class amphibious transport docks (LPD) are being built by HII (both the HII Avondale and Pascagoula yards have been involved in building the LPDs). The San Antonio-class replaces the Austin-class LPDs, the last of which, USS Denver, is 46 years old.

The oldest of the Navy's 12 Dock Landing Ships (LSDs), USS Whidbey Island, was commissioned in 1985. Notionally the Navy wants to have 11 expeditionary strike groups, each with an LHA or LHD, an LPD and LSD. The Navy is currently evaluating options for replacing the LSDs.

HII's Pascagoula yard is also building the national security cutter for the Coast Guard. The company's fourth U.S. Coast Guard National Security Cutter, Hamilton (WMSL 753), was christened last October. A total of eight are being built to replace the aging Hamilton-class high endurance cutters. The 418-ft. Bertholf-class cutter is designed to operate independently on extended patrols.

LCS

LCS is a new type of fast, modular, focused mission combatant concept designed and built to counter the asymmetric threats of mines, submarines and surface vessels in the littoral regions of the world. With LCS 1, most of the ship is steel, but the superstructure above the main deck is aluminum. To avoid cross contamination, the structures are built in different facilities. LCS 2 is all-aluminum. Both variants use waterjet propulsion and are the largest waterjet combatants built anywhere. While LCS is unlike other ships in the U.S. fleet, it is the numerical replacement for the frigates, mine warfare ships and coastal patrol craft.

LCS will employ a 3:2:1 manning concept. Three crews rotate between two ships, one of which is forward deployed for an extended period, while the other ship is stateside for workups and training.

The first variant, USS Freedom (LCS 1) is a semi-planing monohull design built by a team led by prime contractor Lockheed Martin at Marinette. The second, USS Independence, is a trimaran design built by Austal USA.

LCS is reconfigurable, with a large amount of empty space inside for containerized mission packages for mine countermeasures (MCM), antisubmarine warfare (ASW) and surface warfare (SUW), as well as a large flight deck and hangar for both manned and unmanned aircraft. The ship has a core capability to perform a wide variety of operations, while the mission packages can be readily changed as required to give the ship an entirely different capability.

The first Structural Test Firing (STF) of the 30mm gun mission module for the SUW mission package was conducted aboard USS Coronado (LCS 4) off the coast of Southern California April 30. Already tested and proven on the LCS Freedom variant, the test was the first for the LCS Independence variant. Critics have said LCS is too lightly armed, and less capable than frigates or destroyers. Although the Navy planned to acquire more than 50 of these ships, the Navy was directed not to buy more than 32, and established a Small Surface Combatant Task Force to study alternatives, including a ship that is more "frigate-like."

DDG 1000

The guided missile destroyer USS Zumwalt (DDG 1000) being built at Bath Iron Works in Maine is more than just a revolutionary new concept. It is a highly capable surface combatant and strike platform. From its shape, materials and propulsion, to its sensors, weapons and small crew size, Zumwalt incorporates a significant amount of transformational technology introduced in a single new ship design.

The Navy had originally planned to buy several dozen of these 14,800-ton ships. As costs rose, the numbers were reduced. Now only three will be built. But they are an impressive trio. At 14,800 tons, it is a big ship—the largest destroyer ever built. The superstructure and hangar for DDG 1000 and 1001 are fabricated of composite and represent the largest composite structure ever built. The third ship, DDG 1002, will have a steel deckhouse because the Navy says there is sufficient weight margin that the more expensive composite structure is not required.

The ships are being built in modules. The deckhouse structure is one of nine "ultra units" making up DDG 1000. Zumwalt will be the first ship to carry the Advanced Gun System (AGS), which

fires the new long range land attack projectile (LRLAP). DDG 1000 has two of these 155-mm gun mounts to provide all-weather volume and precision fires in support of joint forces ashore, and DDG 1000 has two of these 155-mm gun mounts to provide all-weather volume and precision fires in support of joint forces ashore. The 2.13m long, GPS-guided, rocket-assisted LRLAP round has a range of up to 100 km, the longest range of any naval gun, and can engage targets with an accuracy of a few feet.

The 80 peripheral vertical launch system (PVLS) missile tubes can carry a variety of missiles, including the Tomahawk land-attack cruise missile. These missiles can attack fixed targets with great accuracy, but can also loiter around a battle field and get instructions from friendly forces on the scene. Those tubes can also carry the Evolved Sea Sparrow Missile (in quad-packs that load four missiles into a single PVLS cell) for air defense and AntiSubmarine Rockets that are tipped with torpedoes.

This ship looks different, too. The large composite superstructure and distinctive "tumblehome" hull — which slopes inward toward the center of the ship as it rises up from the waterline — results in a reduced radar cross section and acoustic signature, making Zumwalt one of the stealthiest surface combatants ever. The Raytheon SPY-3 X-band active phased-array radar detects the most advanced low-observable antiship cruise missile (ASCM) threats.

DDG 1000 has 16 electronics module enclosures (EMEs) that are fully outfitted with 230 cabinets. The EMEs are produced by Raytheon and are fully tested and ready to install, saving 110,000 man hours per ship.

The ship is totally integrated thanks to the Total Ship's Computing Environment (TSCE) from Raytheon and the command and control software integration of the various computing domains that permits the networking and integration of internal and external information into efficient displays for control and monitoring of the ships systems. Raytheon created 6.7 million lines of code to date for the integrated system that controls everything from ship and machinery control to combat management, weapons control and automated fire suppression.

Despite the fact that it's almost 50 percent bigger than the 9,000-ton DDG 51, it has a much smaller crew. The 14,500 ton DDG 1000 has a crew of crew of 142, including the aviation detachment, which will operate a pair of Sikorsky MH-60R Seahawk helicopters and three Northrop Grumman MQ-8B Fire Scout UAVs (compared to the DDG 51 crew of 281, not counting the air detachment). The all-electric integrated propulsion system has the power for future weapons such as electromagnetic rail guns and lasers.

DDG 51

As the Navy is ending the procurement of DDG-1000 with the third ship, it has instead "restarted" the DDG 51-class Aegis destroyer production line. The DDG 51 program began in the 1970s, and is the largest class of combatants in the world. The first ship of that class— USS Arleigh Burke (DDG 51)—was commissioned in 1991 and is currently undergoing a midlife modernization, the first of the 62 Arleigh Burkes to do so. With the truncation of the DDG 1000 program at three just three ships, the DDG 51 production line has been reopened, with several more ships of the current configuration Block IIA configuration will be built. The Block IIA ships are longer than their predecessors and have a helicopter hanger. With DDG 122, the Navy will begin a new air and missile defense variant which will feature the new air and missile defense (AMDR) radar.

Aegis Modernization

The Navy is modernizing the Aegis fleet with a midlife update to the combat systems and hull, mechanical and electrical (HM&E) systems. Some Aegis ships—including destroyers and some cruisers— are being modified to have an additional capability for ballistic missile defense (BMD) operations. The modification for BMD operations entails new software program for the Aegis combat system and the arming of the ship with the SM-3 missile, a version of the Navy's Standard Missile that is designed for intercepting ballistic missiles.

JHSV

Originally planned as a joint Army-Navy effort, the Joint High Speed Vessel (JHSV) is now a Navy program. The split-up came over the aviation capability. The Army said, "Why would you build a ship with a helicopter deck?" and the Navy said "Why would you build a ship without a helicopter deck?" JHSV has a flight deck that can operate an MH-60 Seahawk helicopter, although it does not have a hangar.

Based on a high-speed commercial ferry design, the all-aluminum JHSV has significant internal volume for vehicles, but is strengthened for very heavy equipment, such as M1A1 Abrams main battle tanks and Mine Resistant Armor Protected (MRAP) vehicles, as well as the mechanized wrecking cranes large enough to handle them.

The guided-missile destroyer USS Ross (DDG 71) is moored pierside at BAE Systems Ship Repair at Norfolk, Virginia. Ross is undergoing the execution phase of her availability prior to system restoration. Norfolk Ship Support Activity recently completed initial phases of a piloted Master Integrated Schedule on Ross.

A crew of 22 Military Sealift Command civilians operates the vessel, while additional military mission personnel can embark as required. The JHSVs have berthing for up to 146 personnel, and there is also airline-type seating for 312 troops and their weapons (it even has racks for stowing weapons) .

The 1,500-ton ferry is powered by four MTU diesel engines and four waterjets, and can achieve speeds up to 43 knots. Built for long transits, JHSV is considerably stronger than other ferries to be able to handle high sea states—up to sea state 7.

MLP

General Dynamics NASSCO is building the unique mobile landing platform (MLP). Based on a tanker design, the ship can ballast down so that the main deck is awash, and landing craft can be discharged or recovered, and transfer personnel and vehicles from other vessels such as the large, medium-speed, roll-on/roll-off ships (LMSRs) onto landing craft air cushioned (LCAC) vehicles and transport them ashore. The ship's size allows for 7,620 square meters of vehicle and equipment stowage space and 380,000 gallons of JP-5 fuel storage.

USNS Mountford Point (MLP 1) returned to San Diego on April 30 following following installation of the ship's Core Capability Set (CCS) at Vigor Marine, LLC in Portland, Ore. The CCS enables the transfer of vehicles, personnel and equipment from vessels such as the Large, Medium-speed, Roll-on/Roll-off Ships onto Landing Craft Air Cushioned (LCAC) vehicles for movement to shore. MLPs will have a maximum speed of 15 knots and range of 9,500 nautical miles. At 239 meters long, MLPs displace over 80,000 tons when fully loaded. MLPs will operate with a crew of 34 Military Sealift Command personnel.

(U.S. Navy photo by Shelby F. W. West/Released)

The Year of LNG

This being the "Yearbook" edition of Maritime Reporter & Engineering News, it would be remiss to not have coverage of LNG, one of the hottest fueling trends in maritime circles, particularly in North America. For a unique insight on a rapidly evolving market, MR caught up with Edward Scott, COO, Excelerate Energy, which is making big strides in the LNG Regasification sector, and recently received on the of the world's largest and most capable units, the FSRU Experience which he touts as the world's largest and most capable FSRU.

By Greg Trauthwein, Editor

For those of our readers not familiar, please describe the business of Excelerate Energy.

We are about 105 people, with our core group based in The Woodlands in Houston, Texas, with offices in Rio de Janeiro, Buenos Aires, London, Dubai and Singapore. Our current FSRU fleet is comprised of nine purpose built re-gasification vessels including the FSRU Experience, which just delivered from DSME. With a storage capacity of 174,000 cu. m. and peak send out capacity exceeding 1.0 BCF, Experience is the world's largest and most capable FSRU.

However, if you look at the crewing on our ships, our project facilities and our extended team of consultants and contract engineers, we are a far bigger organization. Our business is primarily asset development, meaning we'll build, own and operate fixed and floating infrastructure and facilitate LNG import and export solutions on a global basis. But we also are fairly significant players in the maritime logistics of LNG; all of our re-gas vessels are also conventional tankers (LNGC's), so we do a lot of chartering and sub-chartering when our re-gas terminals or vessels of re-gas capability are not required for re-gas specific projects. Additionally, we have a significant trading group that have traded more than 5 million tons of LNG in the last six years or so. So in summary, we are a mid-stream company focused on floating LNG asset development and trading, with the added benefit of nearly a decade's worth of logistical and operational experience.

So what specifically do you mean when you say "asset development?"

When I say asset development I mean that we can design, build and operate not just the vessels, but all other aspects of a total import or export solution including pipelines, jetties and offshore moorings, as well as transfer equipment for loading or unloading LNG cargos. We work with our project partners on a case by case basis to define the scope of these opportunities and plan the most efficient execution strategy for each given solution.

INNOVATE AND ADVANCE
A PATHWAY TO THE FUTURE

At Austal, it's not just our aluminum multihull designs that make us stand out. Austal is expanding its work portfolio to include warranty and post-delivery work on both JHSV and LCS vessels. We're a dedicated Alabama workforce over 4000 strong, with international roots, redefining how the Navy builds warships. The same level of precision that goes into the construction of our advanced vessels also drives the cultivation of our outstanding team.

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Austal USA shall abide by the requirements of 41 CFR §§ 60-1.4(a), 60-300.5(a) and 60-741.5(a). These regulations prohibit discrimination against qualified individuals based on their status as protected veterans or individuals with disabilities, and prohibit discrimination against all individuals based on their race, color, religion, sex, or national origin. Moreover, these regulations require that covered prime contractors and subcontractors take affirmative action to employ and advance in employment individuals without regard to race, color, religion, sex, national origin, protected veteran status or disability.

"Consider, for example, that South America was not an LNG consuming region seven years ago. In 2014, more than 100 cargoes will be sold there. As floating technologies gain acceptance, there will continue to be a big shift in the market demographics."

Edward Scott, COO,
Excelerate Energy

How many re-gas vessels do you have today?

Nine.

And how many of those are operating as re-gas vessels and how many are operating on trade?

At present, we have four of the vessels in term re-gas service … two in Argentina, one in Brazil, one in Israel. We have two other projects that have been sanctioned – one in Puerto Rico and a second in Pakistan where we are working with our respective customers to finalize permitting and other details. In addition, there are more than a dozen other re-gas opportunities that are in various stages of development. We envision that by the end of this year, or latest by the second quarter next year, we will have all of our available re-gas vessels committed to projects.

What are the major business segments in which you are engaged?

There are four primary segments of the LNG business in which Excelerate is engaged. We have our downstream re-gas business, that is the development of terminal facilities and the term charter of FSRUs to act as import facilities where they are needed around the world. We have a robust trading capability with a team that has traded about five million tons of cargo in the last six years or so along with a complimentary conventional in-charter and out-charter component that is opportunistic based, essentially, on where we are with the utilization of the fleet as re-gas vessels and our trading positions. Our upstream floating liquefaction development activities round out our current areas of focus in the business. It is worth noting, however, that as the market continues to evolve, we are dedicating significant resources to applying the technologies and practices we have developed to solutions both smaller and larger than our current mid-scale capabilities.

Can you sum up your near term business prospects in a sentence.

We have developed a full suite of midstream value chain solutions and are capable of working from the well head all the way through the downstream LNG marketing downstream, and continue to work with counterparties on a global basis to be midstream partners in monetizing reserves and/or capturing the cost savings and environment benefits of fuel switching in downstream market segments.

So what is the key … what is the plan to get to where you want to be?

We have developed an extraordinarily solid commercial and technical reputation on a world-wide basis. We have developed technical and commercial solutions in what we like to call the "full value chain:" as such, we have in place all of the pieces required to get to that next level as we move toward the realization of our first upstream LNG production project. So the next critical step in our company's growth is to find and sanction that first opportunity, whether that's our Lavaca Bay project or one of the offshore projects that we're developing elsewhere.

We'll get back to Lavaca Bay in a moment. To set the stage, what are the two or three top trends that are driving your business in the coming five years?

I would say that in our core business of re-gas, one of the trends is the global acceptance of floating re-gas or LNG import solutions; specifically, its acceptance as a permanent answer to alleviating energy concerns. But with that more ubiquitous acceptance comes the competition, and we are not the only player in this space anymore. It used to be we had a fleet of vessels and a fairly well-defined set of operating characteristics, and the discussion (with the potential customer) was 'how can we make what we do fit their needs.'

Today that equation has changed. With a broader market and competition, we are seeing a lot of potential counter parties looking for more bespoke solutions that are tailored to their specific requirements. Certainly, it makes for interesting challenges for us with respect to how we view the future of our shipbuilding, whether it is on a speculative basis or whether we retain some of our existing assets to bridge some of these opportunities to new builds. It is a little bit of a different dynamic in terms of our business development efforts today, but it still really gets down to a solid commercial and technical solution and a team that's capable of executing that. From a start-to-finish perspective, the "full solution provider" concept really drives our business in that space.

What do you see out there today?

I think the worldwide tightness in the LNG supply market is certainly something that we have not seen in our 11 years. It makes for a sometimes interesting market dynamic. Add to that the entrance of the dual-fuel diesel engine propulsion technologies to the new

builds, the wave of new builds with this technology that are entering the market. Everybody's steam turbine ships (including ours) are disadvantaged a little bit on a fuel-consumption basis.

Overall though, market dynamics are changing as they always do, and we see a fairly short-term depression in the market until some of these new liquefaction projects come online. As fast as new volumes come online, it seems to me that these new, smaller markets are opening up and stepping right into the breach. So the whole floating LNG world has had a significant impact in the LNG business in the last five years. Consider, for example, that South America was not an LNG consuming region seven years ago. In 2014, more than 100 cargoes will be sold there. As floating technologies gain acceptance, there will continue to be a big shift in the market demographics and dynamic on both the supplier and consumer side.

The shale oil and gas revolution obviously has changed a lot in the energy sector. Can you put in perspective for me how the U.S. domestic production of oil and gas has inherently changed your business?

It is a story we tell quite often, and it created a fundamental shift in our business. Excelerate's original business model contemplated, at least to start, that we were going to be a U.S.-centric trading company that had lower cost market access points and controlled its own access to those points. At that point, we were very definitely looking at the U.S. as the center of our business. As such, developing cost effective capabilities to address seasonal and regional demand swings was key to our plan. To that end, we developed our first generation FSRUs as well as complimentary terminal infrastructure in the UK, the US Gulf of Mexico, and in the Northeastern US offshore Boston. As these efforts were completed and moved into commercial operatons, the full impact of the technological advances in the development of shale gas really started to became apparent.

And more specifically, what has this meant for your company in both the short term and the long term?

With the days of the U.S. as a high volume destination market for global LNG supply coming rapidly to a close, we had to very quickly re-tool our business plan and leverage the technologies that we had developed, looking to a broader, global market, both as a facilitator of trading on a more global basis, but also as an asset development company utilizing the technologies and expertise we had gained to help other countries in other regions access LNG as a lower-priced alternative to some of the liquid fuels they've burned for generations.

The impact of that was enormous on us. We had always planned on expanding into those areas, but that was always over the horizon for us until the true impact of the shale gas evolution became apparent. Having a great suite of resources and solutions already proven, and a shareholder willing to support the effort were the keys to our success in "reinventing" Excelerate.

We understand that you've just filed with FERC the formal applications for the Lavaca Bay. I was just wondering if you could give me an overview of that project, how, how you see it panning out, and in what time frame?

We started looking at liquefaction as the next logical progression in our business about five years ago. Since then, we have invested a fairly significant amount of time and money – in excess of $40 million– in developing floating LNG production solutions that we feel fit our market goals and overall technical approach. With Lavaca specifically, when we elected to explore the opportunities to export U.S. natural gas, the first thing we did was to scout the Gulf Coast looking for a suitable location to start. Ultimately, we settled on the site in Port Lavaca, Texas. While there are substantial differences between an import and an export facility, in terms of environmental impacts, they are not entirely different. In that sense, the fact that the site had previously been permitted as an LNG import facility was encouraging to us. We liked the site and we liked the local community support we found there. Along with a reasonably close proxim-

ity to numerous pipeline interconnection points, we found a very well established industrial and technical workforce base there and a community very familiar with the types of things we do. With the site selected and an interim lease agreement in place, we initiated a site-specific project FEED effort, and began the development of our applications for DOE free trade and non-free-trade natural gas export authorizations and laying the groundwork to enter the FERC pre-filing process. The culmination was the submittal of formal application six weeks ago. If the FERC process follows true to form – without any unanticipated interruptions – we should receive the FERC authorization around the end of the first quarter of 2015. Obviously, the DOE non-free trade export authorization will be key to the project's success, but while we await that we are making excellent progress with project contracting discussions as well as securing offtake or capacity partners. Assuming that all continues as we expect, we should be in service early in 2019.

When you say "in service," physically what will this facility look like?

Building the facility will consist of dredging the 27 mile Matagorda ship channel from the sea buoy up to the port location. That's deepening and widening the Matagorda ship channel to accommodate vessel sizes up to 175,000 cu. m. The project is designed to be executed in two phases. We'll build the above ground infrastructure and then the jetty itself in Port Lavaca while the floating liquefaction storage and offloading (FLSO) unit will be built in Korea at Samsung Heavy Industries in partnership with Black and Veatch who will provide the liquefaction process design and key equipment. That vessel will be built, pre-commissioned, delivered from the shipyard and commissioned on site in about 47 months.

At a cost of ...?

The overall capital cost of the project right now is between $2.5-2.6 billion. The vessel itself is about $1.5-1.6 billion with the balance representing the costs of the dredging, jetty construction, and other land based gas process and support equipment. The vessel itself

will have 250,000 cu. m. of LNG storage and 4.4 million tons per annum of LNG production capacity. We're permitting for 10 million tons of export capacity, in order to allow for a second phase of the project if market demand supports it and to allow ourselves a little bit of room for overproduction. In short, we will initially have a single berth, a single vessel, and then the potential to expand to two berths and two vessels. Offloading to conventional LNG carriers will be by ship-to-ship transfer using cryogenic articulated arms.

You just segued perfectly into the next question, which is "Your pioneering efforts in the ship-to-ship transfer technology that's central to your other operations. Can you just give me an overview?

We have transferred more than 600 full LNG cargos in a couple of different configurations – onshore, offshore, side-by-side and in across the dock. We put an intense effort into developing that capability, and that was one of the other things that came out of looking forward and seeing that the trading model in the U.S. might not be the long-term business of this company. We took an existing concept, which was the emergency transfer of LNG via these flexible hoses, and spent a great deal of time and effort in developing that into a safe and reliable commercial solution. '

So in a dynamic and fast moving market, what is the "Excelerate" advantage?

I think it really comes down to our people. We have a fantastic group of people here, from our technical team all the way through our business development group, including our trading and operations team. We all support the mission of developing safe, reliable and commercially attractive LNG import and export solutions. You don't avoid the slings and arrows of being pioneers, but we temper that to a great extent with 11 years of proven expertise and faithful adherence to what one of our operations guys, Captain Lane, says, and I quote often: "LNG stands for Let's Not Guess."

Scott to Keynote SHIPPINGInsight 2014

Edward Scott, COO of Excelerate Energy, will deliver the keynote address at the SHIPPINGInsight 2014 Marine LNG Symposium, Sept. 30 in Stamford, Conn.

Scott's topic – "LNG–New Reality or Simple Evolution" – will set the stage for the symposium, which will include sessions addressing regulatory issues, infrastructure, bunkering, designing and building new LNG-powered ships, retrofitting existing ships and training requirements for handling LNG fuels. Speakers will include experts from all industry sectors.

www.shippinginsight.com

U.S. Coast Guard Archives

MV Argo Merchant was a Liberian-flagged oil tanker that ran aground and sank southeast of Nantucket Island, Mass., on Dec. 15, 1976, causing one of the largest marine oil spills in history.

The history of marine safety is soaked in water and written in blood.

"There is no other way around it," says Robert Frump, author of "until the Sea Shall Set Them Free," and Pulitzer Prize nominee, "Changes occur only when there is a meaningful disaster."

"I think that most people will tell you that changes in marine safety are almost exclusively disaster-driven," agrees Dr. Josh Smith, a professor at Kings Point and interim director of the American Merchant Marine Museum.

It hasn't always been that way. Actually, it's been worse. Despite some efforts early on to exert some control over shipping practices, going to sea has been accepted as a risky undertaking as long as man has floated vessels. It was so dangerous an occupation that "the unpredictability of the weather and the vast power of the sea itself seemed so great that for centuries it was assumed that little could be done to make shipping safer," observed the sole globally recognized facilitator of sea safety – the International Maritime Organization (IMO).

That's because, as Francis Stokes put it, "The sea finds out everything you did wrong." Finishing that thought is Anton Chekov, who observed that "The sea has neither meaning nor pity." In short, the sea is not your friend.

Of course, caution was not thrown entirely to the wind. Over hundreds of years, typically spurred on by disastrous voyages, the seafaring industry has moved from local regulation to what the IMO calls bilateral treaties, agreements or understandings among the leading maritime nations, to eventually, international conferences and the establishment of intergovernmental organizations to oversee and "encourage the adoption of international instruments to regulate safety at sea and prevention of pollution from ships."

While the bulk of modern safety regulation and policy followed the establishment of the Inter-Governmental Maritime Consultative Organization as an arm of the United Nations at the 1948 Geneva Conference (which later became the IMO in 1959), the defining moment in modern maritime safety is the 1912 sinking of the "unsinkable" RMS Titanic after hitting an iceberg on her maiden, and only voyage.

The most famous disaster of all, the **Titanic**, with 1,517 dead, struck the first blow for real international cooperation on safety regulations, codified as the International Convention for the Safety of Life at Sea (SOLAS), and adopted in 1914. The primary safety book from which most other policies and regulations sprang, SOLAS is updated on a regular basis and is considered the safety bible for the maritime industries. (See related story page 43)

The Titanic may have gotten the ball rolling, but the 1934 sinking of the **Morro Castle** off the New Jersey coast, which left 126 dead, also left quite a

Disaster @ Sea

Disasters Drive Key Safety Improvement

Future safety policy to address the human element

By Patricia Keefe

safety legacy in its wake. The ship, which went up in flames, not only led to new fire suppression, protection and control regulations and equipment requirements, it served as the impetus for both the U.S. Merchant Marine Act of 1936, which created the Maritime Commission, and the adoption of a significant upgrade to SOLAS in 1948. It also led to federally mandated officer training requirements and eventually, to the establishment of the federal maritime academy at Kings Point, N.Y.

Historically, the list of maritime disasters is long, and the number of casualties is high, but there are specific incidents that have occurred over the last 75 years that stand out in terms of their significance in helping to force, and forge, international agreement on safety, liability and environmental controls, essentially reshaping the marine landscape. The top five on virtually everyone's list includes:

- The **Torrey Canyon** oil spill off French and Cornish coasts in 1967, which led to the International Convention for the Prevention of Pollution from ships (MARPOL) in 1973, and is credited with moving the IMO into environmental and legal issues with the Civil Liability Convention of 1969. Activated in 1975, that policy was adopted to ensure that adequate compensation is available to victims of oil pollution resulting from maritime casualties involving oil-carrying ships, and places the liability for such damage on the owner of the polluting ship.
- The **Amoco Cadiz** tanker ran aground due to a steering gear failure on March 16, 1978, three miles from the coast of Brittany, France. It split in three before sinking, creating the largest oil spill of its kind in history to that date – 1.6 million barrels. Public outcry and political pressure resulted in significant updates to both MARPOL and SOLAS, and the addition of safety and pollution audits that led to in 1982 to the Paris Memorandum of Understanding (Paris MoU), which established Port State Control. The beauty of port state control is that it has enabled an international port inspection system that makes it impossible for non-compliant ships to hide. It also led to the International Convention on the Standards of Training, Certification and Watchkeeping for Seafarers (STCW) in 1978.
- The **Marine Electric**, a retrofitted WWII rust bucket that sank in a storm off the Virginia coast in 1983 and led to what many historians say are some of the most important safety reforms in the second half of the 20th century. The disaster called out lax U.S. Coast Guard inspection polices, changed the face of the U.S. Merchant Marine by leading to the almost immediate scrapping of 70 similar WWII-era vessels, mandated survival suits and led to the creation of the U.S. Coast Guard Helicopter Rescue Swimmer Program.
- The capsizing of the **Herald of Free Enterprise** in 1987 minutes after leaving the harbor in Zeebrugge, Belgium. Incredibly, the bow door was left open, resulted in the loss of 193 out of the 539 passengers and crew. It also led to the adoption of the Guidelines on Management for the Safe Operation of Ships and for Pollution Prevention, or the International Safety Management (ISM) Code, which was designed to prevent damage to life and the environment at sea, by requiring each vessel to have a working, audited, Safety Management System (SMS). It also required shipping companies to have a license to operate.
- The **Exxon Valdez** ecological disaster of 1989, which led to the first Port state establishment of policy with international repercussions - the Oil Pollution Act (OPA) of 1990 in the U.S., which mandated that all tankers entering U.S. waters be double hulled – a requirement

> **"Blame the captain and fire that person.** I always cringe when I see that, it's just the easy way out. Seafarers want to do better, they don't want to go to work and cause accidents."
>
> Tim Donney, global head, marine risk consulting, Allianz Global Corporate and Specialty

that eventually became the rule internationally, especially following several oil spills in European waters. OPA greatly increased federal oversight of maritime oil transportation, toughened liability and provided greater environmental safeguards. It also put the spotlight on drug abuse in the merchant marine and led to related programs and reforms.

Rounding out the list of accidents that spurred calls to action and helped to write the book on maritime safety are the following:

• The **Argo Merchant**: In December 1976, the Liberian flagged tanker ran aground in Nantucket, Mass., resulting in the worst U.S. oil spill (7.6 million gallons) up to that date. According the Coast Guard, the cause was the result of ineffective vessel navigation due to faulty gyrocompass, erratic RDF and human error in the ineffective use of standard and secondary navigation – exacerbated by a winter storm.

The spill led to the creation of the Port and Tanker Safety Act of 1978, which established vessel traffic services, provided for greater supervision and control of vessels in U.S. waters, and instituted an inspection program for tank vessels carrying oil and hazmat. It also helped lead to the development and adoption of MARPOL Annex 1, and led to a host of new CFR regulations in the U.S., including for radar requirements depth finders and required pre-arrival navigation tests.

• The **SS Yarmouth Castle**: The Panamanian-flagged, largely wood vessel caught fire on Nov. 13, 1965, and was quickly abandoned by most of her crew, resulting in 90 deaths. No alarm was sounded, no distress call sent out, nor did the sprinklers work, the windows open, nor were all the lifeboats accessible. Less than half were launchable and the master and crew were the first to abandon ship. It led to a major update of SOLAS, and a mandate that any vessel carrying 50 overnight passengers or more had to be built entirely of noncombustible materials or steel. Retroactive fire and safety amendments went into effect for all ships in 2010.

• The **MS Estonia:** The RoRo Ferry sank in heavy seas Sept. 28, 1994 in circumstances very similar to the Herald of Free Enterprise – in this case the bow door failed, letting in too much water, sinking the boat, and killing 852 people out of the 1,000 on board. To improve the survivability of ferries, it also led to changes in the design parameters so that ferries can take up to a half meter of water on the car deck before the ship starts to list.

• **Prestige** (2002) and **Erika** (1999): Both casualties and spills happened in almost the same spot off the northwest coast of France and Spain, and both became a huge political issue, leading to Eur-OPA, the European equivalent of OPA90 "It was the final nail in the coffin," says Simon Bennett, Director External Relations for the International Chamber of Shipping (ICS), an international trade association for the shipping industry representing ship owners and operators. Those incidents "led to a massive acceleration of the schedule to phase out single-hulled tankers."

Prestige was a driver for the creation of "Eur-OPA".

Inset Photo: U.S. Coast Guard Archives

Environmental Concerns & Controls

Increasingly, there has been a growing focus on environmental issues, accelerating in the late 1970s and onward, as spills mounted, each seeming worse than the last. There was a palpable shift in focus to combating pollution, and providing adequate training and certification of crews. Even the oil companies got into the act, proactively launching spill response coalitions in both Europe (1985) and the U.S. (1990), to respond to catastrophes and providing training.

It all started with the **Torrey Canyon**. "In the same way the Titanic led to the development of safety regimes, the Torrey Canyon stimulated the development of international environmental regulations," said ICS' Bennett. The International Convention for the Prevention of Pollution from Ships (MARPOL) is one of the earliest, and most influential international environmental safety convention. In the wake of the Torrey Canyon and other spills, it was designed to protect the marine environment with the hopeful goal of "completely" eliminating pollution by oil and other harmful substances, and by minimizing the accidental discharge, dumping or exhaust of oil and other substances.

To achieve its objectives, MARPOL provides a detailed set of regulations, covering issues from vessel construction and operation to the discharge of sewage and other substances via a set if six technical Annexes.

It was signed in 1973, but it took so long to get the necessary ratifications that the original set of protocols were merged with a 1978 update fueled by a number of accidents in 1976-1977. It finally became effective in 1983, 16 years after the outrage over Torrey Canyon. The international community has come around: o date 152 states, representing 99.2 percent of the world's shipping tonnage, have signed on.

Similarly, the **Amoco Cadiz** oil spill a decade later was "pretty monumental" on the pollution side of [regulations]," he added, noting that six annexes later, MARPOL today covers every form of pollution from tankers.

But the real game changer has been the fallout from the March 24, 1989, **Exxon Valdez** spill, which dumped 11 million gallons of oil into the pristine inlet, creating the country's worst ecological disaster until the Deep Water Horizon well blow out April 20, 2010, in the Gulf of Mexico.

The U.S. Coast Guard considers the Valdez to be one of the largest human-caused disasters and cites as contributing causes to the accident, ineffective lookout, poor navigational watchkeeping, inoperable radar, reduced manning, lack of shore side supervision and loss of situation awareness, among other things.

OPA OPA Double Hulls

The U.S. responded with the Oil Pollution Act (OPA) 90, essentially the first time a Port State had acted on its own to create and enforce rule that would affect global shipping. OPA created a comprehensive program to address prevention, response, liability and compensation for oil pollution incidents within U.S. waters.

It set requirements for construction (double hulls), crew licensing and manning, created the national Oil Spill Liability Trust Fund (up to $1B per spill incident), mandated contingency planning and the development of disaster response plans from tankers, ties driving records with mariner licenses and mandated post-casualty drug and alcohol tests. It also decreed that all tankers entering U.S. water after a certain date be double hulled.

"The whole world felt that change," said Bennett. And resisted at first. But a pile up of oil spills in European waters, particularly the Prestige and the Erika, brought an outraged EU in line with U.S. thinking quickly.

While not a perfect solution, the move to double hulls added to the level of environmental protection. "It's why the record of the industry is better than it was in 1990, never mind 1970. It's a

Rules & Regulation

The following are the major international shipping conventions, adopted by the International Maritime Organization (and the International Labour Organization) concerning safety and pollution prevention. However, many other maritime instruments concerning more specific issues are also in force worldwide.

Dealing with the ship

- SOLAS (International Convention for the Safety of Life at Sea, 1974) lays down a comprehensive range of minimum standards for the safe construction of ships and the basic safety equipment (e.g. fire protection, navigation, lifesaving and radio) to be carried on board. SOLAS also requires regular ship surveys and the issue by flag states of certificates of compliance.
- MARPOL (International Convention for the Prevention of Pollution from Ships, 1973/1978) contains requirements to prevent pollution that may be caused both accidentally and in the course of routine operations. MARPOL concerns the prevention of pollution from oil, bulk chemicals, dangerous goods, sewage, garbage and atmospheric pollution, and includes provisions such as those which require certain oil tankers to have double hulls.
- COLREG (Convention on the International Regulations for Preventing Collisions at Sea, 1972) lays down the basic "rules of the road", such as rights of way and actions to avoid collisions.
- LOADLINE (International Convention on Loadlines, 1966) sets the minimum permissible free board, according to the season of the year and the ship's trading pattern.
- ISPS (The International Ship and Port Facility Security Code, 2002) includes mandatory requirements to ensure ships and port facilities are secure at all stages during a voyage.

Dealing with the shipping company

- ISM (The International Safety Management Code, 1993) effectively requires shipping companies to have a licence to operate. Companies and their ships must undergo regular audits to ensure that a safety management system is in place, including adequate procedures and lines of communication between ships and their managers ashore.

Dealing with the seafarer

- STCW (International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, 1978/1995/2010) establishes uniform standards of competence for seafarers.
- ILO 147 (The ILO Merchant Shipping (Minimum Standards) Convention, 1976) requires national administrations to have effective legislation on labor issues such as hours of work, medical fitness and seafarers' working conditions. This was superseded by the ILO Maritime Labor Convention, 2006) which entered into force on 30 August 2013.

Credit: International Chamber of Shipping

Photos: U.S. Coast Guard Archives

Left: On 21 December 1976, Argo Merchant broke apart and emptied its entire cargo of fuel oil, enough to heat 18,000 homes for a year. Right: Herald Of Free Enterprise at the dock in Dover, Great Britain. While leaving the Belgian port of Zeebrugge on the night of 6 March 1987, the RoRo ferry left the harbor with her bow-door open, allowing the sea to rush in and flood her decks. She capsized in minutes, killing 193 passengers and crew.

combination of technological innovation and improved operating practices," Bennett said. Indeed, figures from multiple sources show a steady drop in oil spills.

U.S. regulators also boosted the oil company pollution compensation ceiling while making the cost of having an accident "so prohibitively expensive that the industry got seriously inventive to avoid this liability," said Bennett.

Coast Guard Gets a Wake Up Call

On the inspection front, the Marine Electric, and indirectly the SS Pendleton and SS Mercer, were game changers as well. All three were aging World WWII ships retrofitted to carry coal and other cargo. All three split in two, and sank. Eerily, the Pendleton and Mercer broke up almost simultaneously in almost the same spot off Cape Cod in November of 1952. With great difficulty and heroism, most of the crews were saved.

The Marine Electric has no such luck. In 1983 the "jumbo-ized" coal ship broke up during a winter storm off the Virginia Coast, and quickly sank. Only three out of the 34 men aboard survived. Survivor and Chief Engineer Robert Cusick decided to speak out about the conditions of the Marine Electric and other WWII ships of its ilk. Built with dirty or brittle steel during the war, some of these ships had been "stretched" and then "banded" in place. Most were badly patched and barely hanging together. All of the ships were horror shows, says Frump."

"The Coast Guard had been allowing a lot of American flagged ships to pass inspection even though it was abundantly clear that they were unsafe to operate, because the thinking was, 'let's keep the American merchant marine going. If we're too strict, all these ships will be forced to shut down," said Smith. And, noted Frump, "The truth of it was, if the owners and unions did not have these ships to sail, they would not have ships to sail."

As an example of what the Coast Guard was letting slide by, Frump said that the cargo hatches for the Marine Electric were approved when it was in drydock – and the hatches were 200 miles away.

"It was that horrible and terrible." When the hatches did arrive, they had 200 holes patched with expoxy.

Frump estimated there were at least 500 deaths due to the unsafe conditions of the old WWII ships, which he said "were sinking pretty consistently through the '50s, '60s and '70s."

"You can't have planes falling out of the sky, but apparently, you can have ships breaking in two over a period of 40 years, before any serious action is taken," he said. Cusick's decision to speak up, coupled with a scathing report from the Coast Guard' s own investigatory board headed by Captain Domenic A. Calicchio, changed all that.

The Coast Guard was forced to reexamine and restructure its inspection policies and did an about face on WWII-era ships, establishing safety standards for older ships, essentially sending 70 of them to the scrap yard in short order.

The inability to extract the exhausted Marine Electric crew from the frigid waters by helicopter lead to the launch of the Coast Guard's elite helicopter rescue swimmer program in October 1984, whose motto is, "So that others may live." Despite the years of work often involved in getting a proposed safety change through the IMO process of member state committees and debate, IMO acceptance and individual government approvals, followed by typically phased-in enactment, the process works.

Figures from multiple sources, including the "Safety and Shipping 1912-2012" report from Allianz Global Corporate & Specialty, the International Union of Marine Insurance, and the 2012 report, "15 Years of Shipping Accidents : A Review for WWF," from Southampton Solent University, show that the incidence of Marine accidents is significantly down, and has been trending down for some time now.

A Little Bit of that Human Touch

Looking forward, and some might say, very much in a proactive sense, the U.S. National Transportation Safety Board (NTB) hopes to see a shift in focus to what it sees as more key to the future of marine safety - the human element.

Aging ships, bad weather, high seas traffic and runaway cargoes aside, it's estimated that 80-85% of all marine accidents can be traced back to human error.

And that is what many observers think the next generation of IMO protocols should target.

"I think some of the more recent accidents highlight arguable the more challenging element to address – the human element," said Tracy Murrell, NTBS director of marine safety.

"'Blame the captain and fire that person.' I always cringe when I see that, it's just the easy way out.

Seafarers want to do better; they don't want to go to work and cause accidents," says Tim Donney, global head, marine risk consulting, Allianz Global Corporate and Specialty.

The biggest change he's seen in 35 years of experience in global marine surveying and loss control is an evolution in how the industry approaches maritime safety. It's moving from engineering fixes to problems, to addressing the human factors, he says.

Titanic

Launch of a Landmark Safety Agreement

100 years later, SOLAS still steering international maritime cooperation

By Patricia Keefe

Image: Public Domain

When the RMS Titanic made its debut in 1912, the ship epitomized everything new and advanced about shipbuilding and construction. It was the largest ship of its day, a steel-jacketed vessel that featured cutting-edge safety measures such as 16 watertight compartments, 15 bulkheads and 11 remotely activated watertight doors. The ship had her own waterworks, an electrical power plant more powerful than the then typical city power plant, and two wireless telegraphs. It was a sight to behold and a technological marvel, cutting a course away from the wood and sails of the shipping past.

While it turned out not to be the unsinkable safely marvel it was billed to be, the Titanic, in fact, by dint of its preventable disaster, nonetheless, led the martime world onto the first leg of its journey into creating an internationally supported collection of marine safety regulations and policies.

There had been some minor attempts at agreements between some key marine states prior to the Titanic, but these were hardly global protocols. To get there took what it often does to effect safety changes - a major sea disaster, to create enough public and political pressure to force safety changes. And the foremost example is the most famous maritime incident of all time, the April 15, 1912 sinking of the Titanic after hitting an iceberg on its maiden voyage. Out of 2,214 complement on board, 1,517 lives were lost.

Enthusiastically billed as "unsinkable" (and incredibly, not the last ill-fated ship to make such a claim), the Titanic is an epic monument to human error and arrogance. For starters, the ship's captain ignored 20 plus warnings about icebergs, and unlike the nearby SS Californian, decided to push on in the dark of night, even though it made seeing icebergs that much more difficult. Worse, the provision of lifeboats turned out to be little more than window dressing on an "unsinkable" ship.

Even more tragic is the fact that the nearest ship – the SS Californian – lay at anchor 15 miles away waiting for daylight to proceed, all the while the Titanic was sinking. It saw the Titanic's distress rockets but thought they were just signaling their presence, as ships often did then with rockets and such. Had it understood the distress signal, there is little doubt more passengers could have been saved from the doomed ship, which sank in four hours.

Fed by headlines such as "TITANIC DISASTER GREAT LOSS OF LIFE!," and the fact that the Titanic was the celebrity event of its day – many powerful, famous and wealthy people went down with the ship - the ensuing investigation produced recommendations for better watertight bulkheads, 24-hour wireless service on all passenger ships, sufficient lifeboats to accommodate all on board and hey, lifeboat drills! It was also decreed that that rockets at sea would be used for distress signals only. These changes were codified in the 1914 launch of the International Convention for the Safety of Life at Sea (SOLAS), the first international maritime safety treaty of note. It ensures that ships flagged by member states comply with minimum safety standards in construction, equipment and operation, and through its many amendments over the years, remains the safety bible for the industry more than 100 years after its adoption.

> "It was just total incompetence and disregard for passengers, who were left to fend for themselves."
>
> U.S. Coast Guard CMDR Erich Doll

The 1960 Convention, which took effect in May 1965 – provided a major update in commercial shipping regulation, making note of new technology and procedures in the industry. An even bigger overhaul of Solas took place in 1974 version, which was essentially a new convention and simplified the process for passing amendments by creating an opt-out policy for ratification. Solas has been amended numerous times since, but is referred to as SOLAS 74.

In the U.S., the disaster led to the passage of the Radio Act of 1912, which required ships to keep in contact with ships in the area, as well as coastal radio stations. It also required both 24-hour radio communications and backup power to make sure it stayed that way.

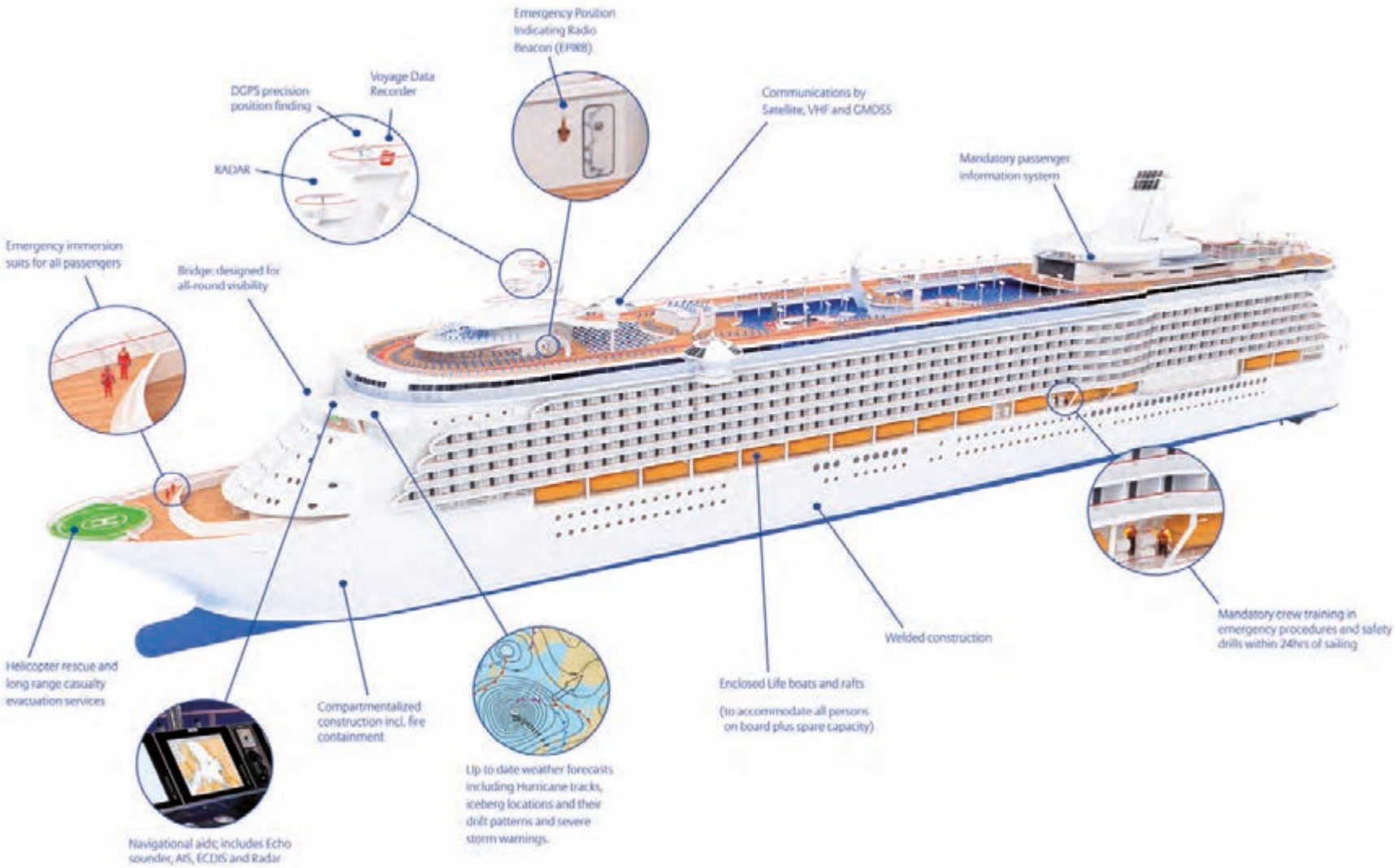
The Titanic was also the impetus for the 1913 launch of the International Ice Patrol (IIP) with international funding, to monitor shipping lanes for icebergs in the North Atlantic and to provide a regular reports. The IIP has been run by the U.S. Coast Guard since its inception. Over time, aircraft have replaced ships on the ice patrols in most circumstances.

Within the industry, the Titanic's sinking led to ship design changes and retrofitting of existing ships, for example extending the double walls bottoms of ships further up their sides, creating double hulls. The bulkheads on some ships were extended in height as well. The Titanic's bulkhead rose 10 feet; it wasn't high enough to keep the compartments completely watertight.

Another early, but significant influencer of maritime safety efforts was the Sept. 8, 1934 burning and sinking of the Morro Castle cruise ship. While loss of life (137 out of 549) was small in comparison to other disasters that saw upwards of 1,000 or more perish – the incident took place in full view of the public and was a case study in incompetence. "It was pretty horrendous," says USCG CMDR Erich Doll, "the aftermath led to the SOLA 48 adoption, a major step from the original SOLA."

While on its way back from Cuba to New York, the ship caught fire under suspicious circumstances and burnt down to a shell, washing up on a beach in New Jersey.

"People could literally swim out and touch the hull with no difficulty; it was still smoking," says Kings Point Prof. Josh Smith. Some passengers were able to escape but many died n their cabins, where portholes were painted shut. Others were killed ironically by their life preservers, which knocked many unconscious when passengers jumped from the stern as instructed. Only half the lifeboats were able to be launched, and they carried only a quarter their capacity



Credit: Allianz Global Corporate & Specialty

– mostly crew members. Rescuers were slow in coming, if they came at all; the Coast Guard was too far away to be of much assistance. Smith attributes much of the disaster and deaths to the incompetence of the engineering and deck officers.

"It was a strange story. The captain died of natural causes or was poisoned, and that night a fire broke out on the ship. The chief mate took over and decided the best thing to do was to get to New York as fast as possible, and rang the engines to go full ahead. It was a bad decision. The wind from the bow just fanned the flames ensuring the ship would burn up completely, which it did," said Smith.

Worse though, were the actions of the chief engineer. His response to the fire was to put on his white dress uniform and get into a life boat with the engineering crew and hightail it out of there, according to Smith. "Both officers behaved so badly, that there were demands for reforms, both in ship construction and officer training. This is the event that eventually led to the establishment of the federal merchant Marine Academy, more or less as part of the Merchant Marine Act of 1936. "

The officer's behavior was so disturbing that the federal government decided to raise the bar by creating a federal program. Initially it insisted that any steamship company taking a subsidy from the government had to take on cadets from the federal program.

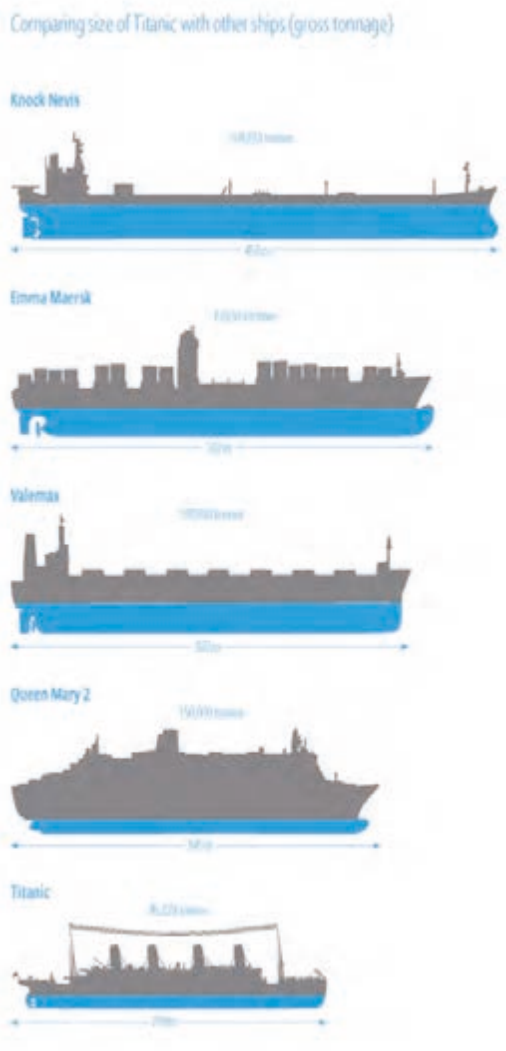
Those cadets also took a correspondence course. The Federal academy didn't open until 1943, once the government realized it was going to need a lot more officers in a hurry.

The fire so haunted famed naval architect Francis Gibbs that he became a fanatic about fire safety and designed the S.S. United States in 1952 virtually without wood or flammable materials.

The fire also led the International Maritime Organization (IMO) to adopt standards requiring automatic fire suppression and protection equipment on board ships. There were training requirements for crews and fire drills for passengers. Solas48 included fire protection regulations such as the subdivision of the ship into main vertical zones separated by fire-resistant divisions and fire-retardant materials.

"It had a dramatic impact on the Coast Guard and mariners as well," says Doll, noting that disaster also led to prison time for the master and chief engineer, as well as a $5K fine for a company vice president.

"It was just total incompetence and disregard for passengers, who were left to fend for themselves."



Marine Salvage

Saving time can help save Money, Lives & the Environment

Though maritime transportation is unequivocally proven as the safest and most environmentally benign means to move goods from 'point A to point B,' it is a given that accidents do happen. When they do, having a qualified, competent marine salvage company around can be the difference between minor incident and major tragedy. For insights on the maturation and future of marine salvage sector, MR reached out to the leadership of the American Salvage Association (ASA) for answers.

By Greg Trauthwein, Editor

What are the major missions, objectives and challenges ASA has on its top line agenda today.

Paul Hankins: As a relatively small trade association relative to other maritime organizations, the American Salvage Association tries to concentrate on those issues most important to its members and likely to have the greatest impact on their livelihood and long-term survivability. After leading the effort to get the nation's new salvage regulations implemented, ASA has several important issues in front of it as it enters its 14th year. The first issue directly involves the new regulations. Every covered vessel is required to enter into a pre-negotiated salvage contract with a qualified marine salvage. This ensures an immediate response, skipping the sometimes involved process of negotiating a salvage contract – and hence a delayed response. Now that these contracts are in place, the accompanying responsibility of the ship master to notify the salvor must be enforced. This will ensure that the reason for the contracts - timely notification and response to a potential incident – is preserved and not squandered. The master's organization is required to notify the salvor within 2 hours of a qualifying event. If that does not happen, the salvor is prevented from taking those early actions that could make the difference between success and failure.

The second key challenge faced by all ASA members, and indeed the response community at large, is the incorporation of a Responder Immunity clause into the Oil Pollution Act of 1990 (OPA90). If a responder must worry that its every (responsible) action could be litigated in court later, the speed and willingness to respond is severely restricted. A marine responder must be protected from the same immunities that cover land responders, that is that their responsible actions when conducted in the best interest of the response will be immune from frivolous litigation by those trying to profit off a response.

Finally, a third continuing challenge is the identification of what we call Safe Harbor of Refuge. When a ship is in trouble, an important element in keeping it safe is to move it (if at all possible) to a harbor of safe refuge where it will be protected from the high winds and seas of bad weather that could quickly further imperil it. While this sounds to be a common-

> "Perhaps the most painful thorn in our side is the rapid and timely notification of the salvor at the beginning of an incident."
>
> Paul Hankins, VP of Salvage Operations, Donjon Marine

sense concept, what happens in an actual event without outside influence is that those responsible for the harbor often prevent access as they do not want a ship in potential peril to threaten their harbor, which of course allowing access might do. Understandably, these officials have the mandate to protect their harbor without the burden of having to consider the larger picture. An accepted protocol to quickly open these harbors to use for safe refuge must be established, a protocol that both protects the harbor officials and ensures the rapid approval of such a harbor. The protocol that could spell the difference between just a temporary incident and a total loss of a vessel in the throes of an imminent storm.

Breaking this down, what is the number one hot button issue in the view of ASA?

Hankins While the ASA doesn't rank these three priorities as they are all of equal importance to the salvor, perhaps the most painful thorn in our side is the rapid and timely notification of the salvor at the beginning of an incident. The regulation states the notifications must occur as soon as there is a threat of an oil spill. While this can be widely interpreted, the most beneficial path in terms of protecting life, property, and the environment is to make those notification as soon as something goes awry. There is some reluctance to make a notification because of the misconception that as soon as the salvor is called the money starts flowing. This misconception must be corrected.

Todd Schauer Responder immunity is a huge issue for the salvage community right now given the unwarranted exposure that responders are currently facing in lawsuits following the Deepwater Horizon incident and oil spill. Given the awareness raised by these recent legal issues, we have a rare opportunity to address this serious problem for the entire industry; we need to focus our attention and bring this issue to a rapid and successful conclusion.

In regards to Places of Refuge, where are we in terms of regulatory bodies as to solving this issue?

Jim Elliott In 2004, the International Maritime Resolution published Guidelines on Places of Refuge for Ships and, in 2007, the US Coast Guard published their Places of Refuge Policy. Since then, various Area Committees around the United States have grappled with the issue and some areas, Houston for example, have published geographical specific plans on places of safe refuge. The safe refuge issue is often played out in tank vessel marine casualty exercises.

In fact, in the last month alone, I have been involved in two large-scale exercises with major oil companies that include discussions on places of safe refuge. With this said, it is easy to envision a Prestige or Erika scenario off the U.S. coast. In the U.S., response operations, including marine casualty events, are often an exercise in civil society where political, media and stakeholder issues drive decision-making as opposed to the pragmatic cost-benefit analysis. The issues are complex and exercises are typically played out in a vacuum without the benefit of political leaders in the discussions.

Schauer Internationally, this is a major issue that demands attention. The recent case involving the Maritime Maisie chemical tanker is a key example. Salvors for the loaded and severely damaged chemical tanker sought refuge for more than three months before being allowed into Korea; and had to keep the vessel under tow under difficult offshore conditions and with critical levels of structural damage throughout this period. Fixing the places of refuge problems around the world will not be easy; we must continue to raise awareness and work on solutions.

In the United States, I have witnessed and participated in several places of refuge success stories, and I believe both the U.S. Coast Guard and the involved salvors deserve credit for facilitating refuge solutions with the many stakeholders. In 2005, the capsized car carrier Couger Ace was allowed to be towed into Dutch Harbor under difficult circumstances. Also in 2005, we worked with the USCG and local stakeholders to gain approval to tow the capsized and upside down 150,000 barrel fuel barge DBL 152 into Mobile, Alabama. In 2007, the severely flooded Tong Cheng was allowed refuge into Barber's Point Hawaii. Every one of these cases ended positively and averted the likely loss of each vessel, saving property and preventing tremendous environmental impact.

> "Responder immunity is a huge issue for the salvage community right now given the unwarranted exposure that responders are currently facing in lawsuits following the Deepwater Horizon."
>
> Todd Schauer, Director of Operations, Resolve Marine Group

Is there more work to do to formalize and streamline processes for places of refuge in the U.S.? Certainly, but some great work has already been done and we should build upon that.

How about responder immunity for salvors … where are we on this issue?

Elliott The American Salvage Association is leading the effort to integrate responder immunity language into the Oil Pollution Act through active participation in the Response Coalition. Like the effort to establish salvage and marine firefighting regulations, the push to clarify responder immunity will continue to build the nation's salvage and marine firefighting capabilities and capacity. Most importantly, it will ensure those on the front lines are protected from frivolous litigation so they can focus their efforts on minimizing environmental impacts and preventing the loss of property in coordination with the Coast Guard led Unified Command.

The ASA continues to build the coalition and engage with senior Coast Guard leaders and legislators to move this issue forward. There is little doubt that protecting those that often risk their lives and livelihoods to help others is in the best interest of the public good, and should be integrated into legislation.

Put in context the evolving relationship between salvors and the insurance community today versus 10 years ago.

Tim Beaver Overall, I believe that the relationship between the insurers and the salvors has been good, and because of the efforts of the ASA, through our inclusion of representatives of the insurance community, as well as with our bi annual salvage conference, both parties have become more knowledgeable and understanding of the other's position, problems and priorities. So on the positive side, this recognition of our mutual dependency has made a relationship that can be naturally adversarial, somewhat less so. One pet peeve of mine on the negative side would be the continuing trend towards not using insurer representation on projects.

I may be dating myself some here, but in past decades there was hardly an incident too small but that a smart, local surveyor was not called in to represent the interests of the owner and underwriters. While for some salvors this may have been a thorn in their side, we found that by working with the surveyor, in their capacity to "advise and assist" we were able to make good decisions, balancing risk with prudence, that allowed an effective response to be launched. Perhaps not the least expensive set of options, but the most prudent. The natural inclination for the underwriter to question why things didn't go perfectly, and why they cost so much, and so on was controlled to a great degree because of the participation and buy in of the surveyor during the project. There was a much improved understanding of what the job took to do, and why it cost what it did. Maybe there are some underwriters that want it that way, maybe there are some that like room for 'discussion' after the fact, who knows?

Schauer There are many challenges that salvors and the insurance community share alike. For example, the continuing trend for ship owners to build and operate exceedingly large vessels including mega containerships, with little regard for the implications of salvaging such vessels when in distress, is highly concerning if not alarming. Another concern is the recent trend by certain government authorities to dictate prescriptive salvage methods by un-informed government agencies that ultimately limit creativity and drive up the cost of salvage operations. Salvors and insurers must continue to work closely to address these kinds of serious issues.

Based on your experience, looking back, what has been the most significant technological and / or legislative change that has impacted your business?

Beaver If I look back over the past decades, the most significant impact on the salvage business over my career has not been on the technical side. Granted, chain pullers, roller bags, 3D renderings, subsea mapping, ROV's and things like that are now part of our common arsenal, but the concepts and basic tools for salvage remain very much the same.

The most overarching and pervasive impact to maritime salvage, in the U.S. at least, has been in my opinion the Oil Pollution Act of 1990. This wed pollution and salvage together.

The salvor has for the most part greatly benefitted by this relationship. Vessels that wouldn't be worth a dime, have been inspected, boomed off, stripped of pollution, removed from navigable waterways, all under the authority of OPA 90. Our industry has had to change and grow to adapt to the requirements of coast guard, the use of incident command systems, and working within the BOA system.

Elliott The most significant legislative change that has impacted the salvage industry has been the implementation of salvage and marine firefighting regulations for both tank and non-tank vessels. These regulations clearly set response timeline expectations, now incorporated into both Coast Guard and industry standard operating procedures. As a result, the major US salvage companies have purchased and pre-positioned salvage equipment, such as portable lightering and marine firefighting packages, around the country and have formalized networks of subcontractors to immediately respond around-the-clock. In doing so, the nation's salvage capacity and capabilities have expanded logarithmically.

Looking ahead, is there anything on the horizon that gives you cause for pause, perhaps thinking "I should get out of this business?"

Hankins If one has to ask oneself should he be in the business, than the time to get out of the business has probably passed. The salvor's world is one of constantly changing parameters, constraints, and opportunity. That's probably what draws many of us into it. So the mindset of the average salvor is such that we can easily deal with changing landscapes. I personally see nothing but continued opportunities for the salvage community.

Elliott Looking ahead, the salvage industry continues to face many challenges. For example, the size and complexity of commercial and passenger ships continues to grow. The regulatory oversight and political landscape is also proving to increasingly become more challenging. The unique challenges and the ability to make order out of chaos, however, is what drives the men and women in the salvage industry. As opposed to running away from these challenges, the salvage industry runs toward them, always ready to compete for the next opportunity to pragmatically solve the most demanding marine casualty incident. I have personally had the good fortune of working with many of the leaders in the US salvage industry over the years. I don't know of a one that would back down from the challenges

that lie ahead.

Schauer I often joke that the misery of the salvage business is that once you get in, you can't get out – that you rapidly lose any qualifications, attention span, or possibly even the sanity required to hold any real job!

In all seriousness, and notwithstanding the potential liabilities of our current responder immunity status, the future of the salvage business is bright. Global shipping will continue to grow as well as the challenges that vessel operators will face in staffing ship's with competent and experienced crews. Casualties will continue to happen and salvors will be needed as much or more than ever. Expectations for response capability will continue to extend for larger ships and for deeper water.

Developing countries will continue to expand their adherence to internationally accepted environmental standards, and the days of leaving polluted wrecks behind in the waters of under-resourced nations will come to an end. It's a good time to be a salvor, which is fortunate, given my questionable employability for any other job.

The Respondents

Paul Hankins

Paul Hankins, VP of Salvage Operations at Donjon Marine, has more than 30 years in the maritime industry. He graduated from the U.S. Naval Academy in 1981.

Jim Elliott

Jim Elliott, VP, T&T Marine Salvage, started his maritime career 30 years ago working as a commercial diver and managing search and rescue operations for the U.S. Coast Guard. As Vice President of T&T Marine Salvage, he manages all aspects of operations, from heavy lift to diving.

Todd Schauer

Todd Schauer has 20 years of marine salvage experience that began with a career in the U.S. Coast Guard and serving on the USCG's Salvage Emergency Response Team. He has worked for Resolve Marine Group for 14 years, and is currently the Director of Operations for Resolve's worldwide salvage business.

Tim Beaver

Beaver is a company founder. He began diving commercially in 1977, and made dives on a regular basis for the subsequent 30 years. His in-water experience includes ship repair, salvage, marine construction, pipeline installation, and other services utilizing air, mixed gas, and saturation diving techniques.

Beaver It may sound corny, but the salvage business is a passion, it gets in your blood. Maritime salvage is the ultimate test of ingenuity, skill, business savvy and seamanship. Naturally the emergent nature also has appeal. One never knows when the phone will ring, and the battle is to begin. This is what salvors love, this is what salvors do.

As far as thinking "should I get out of this business," the only thing that could do that would be if my company's very existence was put in the crosshairs of the legal community.

This is why the ASA is working so hard to establish responder immunity for marine salvors. There is no reason for a reputable salvor to have to hesitate during a response because he thinks he may get caught up in a frivolous lawsuit. We members of the ASA hope that good clear language in the law will prevent this from happening.

Floating Production

Currently, 320 oil/gas floating production units are now in service, on order or available for reuse on another field. FPSOs account for 65% of the existing systems, 76% of systems on order. Production semis, barges, spars and TLPs comprise the balance. Total oil/gas inventory is down two units since last month – two off-field FPSOs have been scrapped. Another 27 floating LNG processing systems are in service or on order. Liquefaction floaters account for 15%, regasification floaters 85%. No liquefaction floaters are yet in service – all four are on order. Total LNG inventory is down one unit since last month. A regas carrier used as an interim FSRU in Brazil has resumed trading following delivery of the permanent FSRU. In addition, 102 floating storage units are in service, on order or available. There has been a decrease of one unit since last month. An LNG carrier used in Chile as an interim storage unit has been replaced by permanent land storage tanks.

Production Floater Order Backlog

Sixty eight production floaters are currently on order. The figure includes 41 FPSOs, 13 other oil/gas production units and 14 LNG processing units. In the later are 4 floating liquefaction plants and 10 regasification terminals.

Current backlog includes an FPSO order placed in May.

TH Heavy Engineering received an EPCI contract + 7 year lease with 3 year option from JX Nippon to supply an FPSO for the Layang gas/condensate

Floating Production Projects
In the Near Term Contracting Stage

Project	Country	Field Operator	Water Depth	Planned Production Start	Type Production Unit	Likely Acquisition Strategy	Likely Mooring System
Sankofa	Ghana	ENI	1000	2017/20	FPSO	Lease	ET
Bonga SW	Nigeria	Shell	1200	2020/21	FPSO	Own	S
Chissonga	Angola	Maersk Oil	1355	2017/18	FPSO + TLWP	Own	ET
Libra EWT	Brazil	Petrobras	2200	2016	FPSO	Lease	S
Tartaruga Verde	Brazil	Petrobras	930-980	2017	FPSO	Lease	S
Park of the Sweets	Brazil	Petrobras	1900	2017	FPSO	Lease	S
Sul Parque Baleias	Brazil	Petrobras	1010	2018	FPSO	Lease	S
Oliva/Atlanta	Brazil	Queiroz Gal	1560	2017/19	FPSO	Lease	ET or S
Lavaca Bay LNG	USA	Excelerate	<50	2018/20	FLNG	Own	J/P
West Cameron LNG	USA	Delfin	<100	2017/18	FLNG	Own	ET
Main Pass LNG	USA	Freeport	65	2017/20	FLNG	Own	ET
Ayatsil/Tekel	Mexico	Pemex	120	2017/18	FPSO	Lease	IT
Pemex EWT	Mexico	Pemex	80-700	2016/17	FPSO	Lease	IT or DP
Appomattox	USA	Shell	2270	2017/18	SEMI	Own	S
Mad Dog 2	USA	BP	1370	2018/19	TLP	Own	T
Leviathan Phase 1	Israel	Noble	1630	2017/19	FPSO	Lease	ET
Bream	Norway	Premier	~100	2016/18	FPSO	Lease	S
Mariner	UK	Statoil	107	2017/18	FSO	Own	IT
Bressay	UK	Statoil	91	2018/19	FSO	Own	IT
Port Meridian Regas	UK	Meridian	<50	2016/18	FSRU	Lease	IT
Madura BD	Indonesia	CNOOC	55	2016/17	FPSO	Lease	ET or S
Gehem/Gendalo	Indonesia	Chevron	1830	2017/18	FPU (2)	Own	S
Ubon	Thailand	Chevron	75	2018	FSO	Own	ET
Nong Yao	Thailand	Mubadada	60-75	2014/16	FSO	Lease	ET
Bangka Strait	Indonesia	Conoco		2016	FSO	Lease	SPM
North Malay	Malaysia	Hess	55	2016/17	FSO	Own	ET
Tembikai	Malaysia	Vestigo	50-100	2016/17	FSO	Lease	SPM
Ham Rong	Vietnam	Petronas	30	2015	FSO	Lease	SPM
Port Qasim Regas	Pakistan	Engro	<50	2015/16	FSRU	Lease	IT

Notes:

(1) IT = Internal turret ET = External turret S = Spread moored DP = Dynamic positioning J/P = Jetty/pier moored SPM = Single pt mooring T = Tendons

(2) This information is as of beginning June 2014.

While every effort is made to ensure information on near term contracts is accurate, IMA makes no representations or warranties, expressed or implied, about the accuracy of the information.

field offshore Sarawak. The lease day rate is $144,500 over the initial firm period of the lease.

The partially completed Deep Producer 1 will be used for the Layang project. This had been a speculative FPSO conversion contracted by FPSOcean with Dubai Drydocks in 2006. FPSOcean could not obtain a field contract, ran out of money and could not find a buyer for the unit – and in February 2009 filed for bankruptcy protection. Malaysia-based TH Heavy Eng. acquired the unit in October 2011 for $82.5m for use on marginal oilfields. Delivery of the 68 production floaters now on order is spread over the next five years. The units with delivery furthest out are the three final FPSOs in the eight serial hulls on order in Brazil, a TLP being designed for use in the GOM and an FLNG for use in Malaysia. These five units are scheduled for completion in 2018.

Chart 1

Number of Floating Production and Storage Units In Service, On Order or Available for Reuse

(As of June 1, 2014)

	Total	Active	On Order	Available
Oil/Gas Production				
FPSO	213	156	41	16
Production Barge	10	8	2	0
Production Semi	47	40	3	4
Production Spar	22	18	4	0
TLP	28	24	4	0
Total	320	246	54	20
LNG Production				
FLNG	4	0	4	0
FSRU	23	13	10	0
Storage Systems				
FSO	102	91	10	1

Backlog of Planned Floater Projects

In total 224 floating production projects are in various stages of planning as of beginning June 2014. Of these, 58% involve an FPSO, 14% another type oil/gas production floater, 22% liquefaction or regasification floater and 6% storage/offloading floater.

Brazil, Africa and SE Asia continue to be the major locations of floating production projects in the visible planning stage. We are tracking 44 projects in Brazil, 48 in Africa and 38 projects in SEA – 58% of the visible planned floating production projects worldwide.

Several large projects in Brazil will entail use of multiple production units. Development of the Libra complex, which is counted as one project, could require as many as 18 FPSOs. The Lula and Jupiter complexes could each require three to six FPSOs. So while Africa currently has greatest number of projects in the planning stage, Brazil clearly leads in number of future production units required. Around 14% of the 224 visible planned projects are likely to advance to the EPC contracting stage within the next 12 months. These near term projects typically have either entered the FEED phase, pre-qualification of floater contractors has been initiated or bidding/negotiation is in progress.

Another 50% of the visible projects are at a stage of development where the EPC contract for the production unit is likely within the next two to five years. The remaining projects are less advanced in planning, with the EPC contract likely five to 10 years out.

Near term projects vary significantly by region. Brazil will likely produce at least five major contract awards for FPSOs over the next year. Africa has three major FPSO contracts pending. SEA has eight contracts in the near term, mostly FSOs. The U.S. GOM will likely produce contracts for several FLNG export terminals and two major production floaters. The Mexican GOM will require two major FPSOs. Northern Europe will likely produce orders for several FSOs and a cylindrical FPSO. The Mediterranean will produce a major FPSO contract. A list of near term projects is provided on the following page, and for each project the likely lease/buy acquisition strategy and mooring system is indicated. Please note that the list is a snapshot as of beginning June. Information in the list changes as more details come available.

The Floater Forecast

At the beginning of each year we forecast the number of production floater orders likely over the next five years. The forecast is based on our analysis of (1) projects in the planning cycle that appear ready to move to the contracting stage and (2) future underlying market conditions that will impact the timing of the

project investment decision. We have been making an annual five year forecast since the mid-1990s. Our forecast in 2014 anticipates orders for 104 to 150 production floaters between 2014 -2018. This is an average of approximately 20 to 30 production floater orders annually.

As indicated below, the most likely forecast of orders is 25 to 30% greater than actual orders over previous five year periods. How does this forecast correspond with events over the past five months? Did we get it right so far?

Since January 2014 there have been orders for seven production floaters – fiive FPSOs, one gas/condensate production barge and one LNG regas barge. The five-month order pace equates to ~17 units on an annualized basis. So at the moment our forecast is higher than actual experience. Looking forward through the remainder of the year, at least a dozen of the production floaters listed appear ready to go to contract by the end of 2014. This would bring the 2014 orders to within the forecast range, though at the lower end of the forecast range.

But near term underlying market conditions have been trending a bit south. Energy companies have been reducing Capex budgets and unconventional oil projects are drawing investment resources from deepwater. This could delay some investment decisions and dampen production floater contracts over the next 6 to 12 months.

Breakdown of Planned Projects by Location of Field

(As of June 1, 2014)

Project Location	# of Projects
Africa	48
Brazil	44
SE Asia	38
GOM	22
No. Europe	22
Aust/NZ	16
Medit	10
SW Asia	10
Other	14
Total	224

BY JIM MCCAUL, IMA

IMA provides market analysis and strategic planning advice in the marine and offshore sectors. Over 40 years we have performed more than 350 business consulting assignments for 170+ clients in 40+ countries. We have assisted numerous shipbuilders, ship repair yards and manufacturers in forming a a plan of action to penetrate the offshore market. Our assignments have included advice on acquiring an FPSO contractor, forming an alliance to bid for large FPSO contracts, satisfying local content requirements and targeting unmet requirements through technology development.

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Offshore Rig Dayrates

The day rates are the current day rates for each rig type drawn from the RigLogix database. These numbers, which include both competitive and non-competitive rigs, are updated on a daily basis.

Floating Rigs

Rig Type	Rigs Working	Total Rig Fleet	Average Day Rate
Drillship < 4000' WD	8 rigs	8 rigs	$260,000
Drillship 4000'+ WD	80 rigs	100 rigs	$512,000
Semisub < 1500' WD	11 rigs	15 rigs	$294,000
Semisub 1500'+ WD	60 rigs	88 rigs	$339,000
Semisub 4000'+ WD	89 rigs	118 rigs	$431,000

Jackup Rigs

Rig Type	Rigs Working	Total Rig Fleet	Average Day Rate
Jackup IC < 250' WD	38 rigs	54 rigs	$105,000
Jackup IC 250' WD	46 rigs	61 rigs	$96,000
Jackup IC 300' WD	100 rigs	140 rigs	$109,000
Jackup IC 300'+ WD	169 rigs	208 rigs	$171,000
Jackup IS < 250' WD	6 rigs	9 rigs	--
Jackup IS 250' WD	6 rigs	9 rigs	$75,000
Jackup IS 300' WD	2 rigs	5 rigs	$60,000
Jackup IS 300'+ WD	0 rigs	2 rigs	--
Jackup MC < 200' WD	2 rigs	10 rigs	$82,000
Jackup MC 200'+ WD	11 rigs	22 rigs	$108,000
Jackup MS < 200' WD	2 rigs	3 rigs	--
Jackup MS 200'+ WD	7 rigs	10 rigs	$76,000

Other Offshore Rigs

Rig Type	Rigs Working	Total Rig Fleet	Average Day Rate
Drill Barge < 150' WD	19 rigs	40 rigs	--
Drill Barge 150'+ WD	6 rigs	8 rigs	$66,000
Inland Barge	12 rigs	70 rigs	$76,000
Platform Rig	135 rigs	249 rigs	$55,000
Submersible	0 rigs	2 rigs	--
Tender	22 rigs	39 rigs	$162,000

(Source: RigZone.com)

Offshore Rig Utilization by Region

Below is the breakdown of rig utilization by region of the world for each time period indicated. Utilization numbers are based on a snapshot rig count. Only competitive rigs are included.

Region	Current	6 Months Ago	1 Year Ago
Africa - Other	66.7% (6/9)	50% (4/8)	100% (6/6)
Africa - West	73.8% (59/80)	88.2% (60/68)	81.8% (54/66)
Asia - Caspian	33.3% (1/3)	50% (1/2)	50% (1/2)
Asia - Far East	69.4% (25/36)	79.3% (23/29)	82.8% (24/29)
Asia - South	86.5% (32/37)	94.1% (32/34)	100% (33/33)
Asia - SouthEast	73.8% (79/107)	76.8% (86/112)	78.7% (85/108)
Australia	92.3% (12/13)	100% (13/13)	100% (12/12)
Black Sea	66.7% (4/6)	50% (2/4)	75% (3/4)
Europe - East	100% (1/1)	100% (1/1)	100% (1/1)
Europe - North Sea	86.3% (82/95)	89% (81/91)	89.9% (80/89)
Mediterranean	66.7% (10/15)	77.8% (14/18)	70.6% (12/17)
MidEast - Persian Gulf	77.6% (90/116)	83.9% (94/112)	84.8% (89/105)
MidEast - Red Sea	64.7% (11/17)	81.3% (13/16)	80% (12/15)
N. America - Canadian Arctic	100% (1/1)	0.0% (/0)	0.0% (/0)
N. America - Canadian Atlantic	100% (2/2)	75% (3/4)	100% (3/3)
N. America - Canadian Pacific	0.0% (0/1)	0.0% (0/1)	0.0% (0/1)
N. America - Mexico	83.9% (52/62)	80.4% (45/56)	81.6% (40/49)
N. America - US Alaska	100% (2/2)	100% (2/2)	100% (2/2)
N. America - US GOM	78.7% (70/89)	82.5% (66/80)	88.6% (70/79)
S. America - Brazil	92.1% (58/63)	98.5% (66/67)	98.6% (72/73)
S. America - Other & Carib.	70% (7/10)	71.4% (5/7)	66.7% (6/9)
S. America - Venezuela	88.9% (8/9)	72.7% (8/11)	80% (8/10)
Worldwide (No Region)	20.0% (1/5)	0.0% (/0)	0.0% (/0)

(Source: RigZone.com)

United States Flag Privately-Owned Merchant Fleet*

Oceangoing Self-Propelled, Cargo-Carrying Vessels of 1,000 GT and Above (As of May 1, 2014)

IMO	Current Name	Vessel Type	GT	DWT	Year Built	Operator	Jones Act Eligible
7515339	Advantage	General Cargo	18,296	27,750	1977	Sealift Inc	
9244661	Alaskan Explorer	Tanker	110,693	193,049	2005	Alaska Tanker Co LLC	Y
9244659	Alaskan Frontier	Tanker	110,693	193,049	2004	Alaska Tanker Co LLC	Y
9271432	Alaskan Legend	Tanker	110,693	193,048	2006	Alaska Tanker Co LLC	Y
9244673	Alaskan Navigator	Tanker	110,693	193,048	2005	Alaska Tanker Co LLC	Y
9303546	Alliance Fairfax	Ro-Ro	59,705	19,670	2005	Farrell Lines Inc	
9332547	Alliance Norfolk	Ro-Ro	57,280	21,500	2007	Farrell Lines Inc	
9303558	Alliance Richmond	Ro-Ro	59,705	19,670	2006	Farrell Lines Inc	
9285500	Alliance St. Louis	Ro-Ro	57,280	15,880	2005	Farrell Lines Inc	
9564578	American Phoenix	Tanker	30,718	49,035	2012	Midoceanmarine LLC	Y
9139713	APL Agate	Containership	65,475	63,693	1997	APL Ltd	
9218686	APL Belgium	Containership	65,792	67,500	2002	APL Ltd	
9074389	APL China	Containership	64,502	66,520	1995	APL Ltd	
9139749	APL Coral	Containership	65,475	64,145	1998	APL Ltd	
9139725	APL Cyprine	Containership	65,475	64,157	1997	APL Ltd	
9074535	APL Korea	Containership	64,502	66,520	1995	APL Ltd	
9139737	APL Pearl	Containership	65,475	64,050	1998	APL Ltd	
9077276	APL Philippines	Containership	64,502	65,642	1996	APL Ltd	
9074547	APL Singapore	Containership	64,502	66,520	1995	APL Ltd	
9077123	APL Thailand	Containership	64,502	66,520	1995	APL Ltd	
9331593	BBC Houston	General Cargo	7,002	7,492	2005	BBC Chartering & Logistic GmbH	
9161168	BBC Seattle	General Cargo	13,066	20,406	1997	American Overseas Marine Co	
8124371	Black Eagle	Containership	31,041	32,709	1983	Sealift Inc	
9144926	California Voyager	Tanker	30,770	45,656	1999	Chevron Shipping Co LLC	Y
8313661	CAPT Steven L. Bennett	General Cargo	29,226	41,151	1984	Military Sealift Command	
9429209	Carat	Containership	9,983	12,356	2009	Hapag-Lloyd Ag	
8109668	Charleston	Tanker	31,452	48,846	1983	USCS Chemical Chartering	Y
9243162	Charleston Express	Containership	40,146	40,478	2002	Hapag-Lloyd Ag	
6806444	Chemical Pioneer	Tanker	21,760	34,930	1968	USCS Chemical Chartering	Y
9010498	Coastal Navigator	General Cargo	1,904	1,500	1991	Coastal Transportation Inc.	Y
8213249	Coastal Nomad	General Cargo	1,920	1,200	1983	Coastal Transportation Inc.	Y
8855463	Coastal Progress	General Cargo	1,920	1,200	1988	Coastal Transportation Inc.	Y
5408491	Coastal Trader	General Cargo	1,823	1,825	1963	Coastal Transportation Inc.	Y
7119678	Coastal Venture	General Cargo	1,301	1,383	1971	Stevens Transportation LLC	Y
8919922	Courage	Ro-Ro	52,288	29,213	1991	American Roll-On Roll-Off	
9198501	Delta Mariner	Ro-Ro	8,679	3,950	2000	Foss Maritime Co	Y
7395351	El Faro	Ro-Ro	31,515	17,915	1975	Sea Star Line LLC	Y
7367445	El Morro	Ro-Ro	28,137	16,079	1974	Sea Star Line LLC	Y
7506015	El Yunque	Ro-Ro	28,137	16,144	1976	Sea Star Line LLC	Y
9408126	Empire State	Tanker	29,527	48,635	2010	Crowley Petroleum Service	Y
9121273	Endurance	Ro-Ro	72,708	48,988	1996	American Roll-On Roll-Off	
8026799	Energy Enterprise	Dry Bulk	28,250	33,373	1983	International Shipholding	Y
8813025	Eot Spar	Ro-Ro	2,762	3,095	1990	Round Bay Holdings LLC	
9408138	Evergreen State	Tanker	29,606	48,641	2010	American Petroleum Tankers	Y
9568469	Florida	Tanker	29,242	45,760	2013	Crowley Petroleum Service	Y
9118630	Florida Voyager	Tanker	30,415	46,094	1998	Chevron Shipping Co LLC	Y
9129706	Freedom	Ro-Ro	49,821	19,884	1997	American Roll-On Roll-Off	
7710733	Geysir	General Cargo	2,266	2,000	1980	Transatlantic Lines Shphldgs	Y
9407562	Golden State	Tanker	29,527	48,632	2009	Crowley Petroleum Service	Y
9339818	Green Bay	Ro-Ro	59,217	18,090	2007	Waterman Steamship Corp	
9181560	Green Cove	Ro-Ro	57,566	22,747	1999	LMS Shipmanagement Inc	
9158288	Green Lake	Ro-Ro	57,623	22,799	1998	NYK Line	
9056296	Green Point	Ro-Ro	51,819	14,930	1994	Sulphur Carriers Inc	
9177428	Green Ridge	Ro-Ro	57,449	21,523	1998	NYK Line	
9126297	Honor	Ro-Ro	49,814	19,844	1996	American Roll-On Roll-Off	
8419142	Horizon Anchorage	Containership	20,965	21,282	1987	Horizon Lines LLC	Y
7224306	Horizon Consumer	Containership	25,644	25,651	1973	Horizon Lines LLC	Y
6820579	Horizon Discovery	Containership	18,888	20,568	1968	Horizon Lines LLC	Y
7617905	Horizon Enterprise	Containership	28,219	31,423	1980	Horizon Lines LLC	Y
7218462	Horizon Fairbanks	Containership	20,987	22,086	1973	Horizon Lines LLC	Y
8419166	Horizon Kodiak	Containership	20,965	20,668	1987	Horizon Lines LLC	Y
7116315	Horizon Navigator	Containership	28,212	31,203	1972	Horizon Lines LLC	Y
7617890	Horizon Pacific	Containership	28,219	31,213	1979	Horizon Lines LLC	Y
7366312	Horizon Producer	Containership	25,644	25,651	1974	Horizon Lines LLC	Y
7729461	Horizon Reliance	Containership	34,077	45,895	1980	Horizon Lines LLC	Y
7729459	Horizon Spirit	Containership	34,077	46,154	1980	Horizon Lines LLC	Y
8419154	Horizon Tacoma	Containership	20,965	20,668	1987	Horizon Lines LLC	Y
7326233	Horizon Trader	Containership	28,212	31,495	1973	Horizon Lines LLC	Y
8220761	Houston	Tanker	21,471	32,689	1985	USS Chartering LLC	Y
9070448	Independence II	Ro-Ro	55,598	15,199	1994	American Roll-On Roll-Off	
8919934	Integrity	Ro-Ro	52,479	29,152	1992	American Roll-On Roll-Off	
9233167	Jean Anne	Ro-Ro	37,548	12,561	2005	Pasha Group	Y
7802718	Kauai	Containership	25,640	26,350	1980	Matson Navigation Co Inc	Y
7408081	Kodiak	Tanker	64,329	124,644	1978	Seariver Maritime Inc	Y
9278753	Liberty Eagle	Dry Bulk	28,762	51,812	2004	Liberty Maritime Corp	
9228136	Liberty Glory	Dry Bulk	28,836	50,601	2001	Liberty Maritime Corp	
9228148	Liberty Grace	Dry Bulk	28,836	50,601	2001	Liberty Maritime Corp	
9448114	Liberty Pride	Ro-Ro	57,030	21,233	2009	Liberty Maritime Corp	
9448425	Liberty Promise	Ro-Ro	57,030	21,359	2010	Liberty Maritime Corp	
7105471	Lihue	Containership	30,877	38,656	1971	Matson Navigation Co Inc	Y
8212714	LTC John U.D. Page	Containership	57,075	58,869	1985	Military Sealift Command	
7321087	Lurline	Ro-Ro	30,506	22,030	1973	Matson Navigation Co Inc	Y
9164263	Maersk Alabama	Containership	14,120	17,375	1998	Maersk A/S	
9164251	Maersk Arkansas	Containership	14,120	17,375	1998	Maersk A/S	
9348649	Maersk Atlanta	Containership	74,642	84,676	2006	Maersk A/S	
8820195	Maersk California	Containership	18,979	25,275	1992	Maersk A/S	
9155133	Maersk Carolina	Containership	50,698	62,229	1998	Maersk A/S	
9332975	Maersk Chicago	Containership	74,642	84,775	2007	Maersk A/S	
9332987	Maersk Columbus	Containership	74,642	84,704	2007	Maersk A/S	
9332999	Maersk Denver	Containership	74,642	84,771	2007	Maersk A/S	
9333034	Maersk Detroit	Containership	74,642	80,000	2008	Maersk A/S	
9333008	Maersk Hartford	Containership	74,642	60,375	2007	Maersk A/S	
9193264	Maersk Idaho	Containership	50,698	61,986	2000	Maersk A/S	
9298686	Maersk Iowa	Containership	50,686	61,454	2006	Maersk A/S	
9193240	Maersk Kentucky	Containership	50,698	61,986	1999	Maersk A/S	
9348651	Maersk Memphis	Containership	74,642	84,868	2007	Maersk A/S	
9255244	Maersk Michigan	Tanker	28,517	47,047	2003	Handytankers K/S	
9155121	Maersk Missouri	Containership	50,698	62,226	1998	Maersk A/S	
9305312	Maersk Montana	Containership	50,686	61,499	2006	Maersk A/S	
9298698	Maersk Ohio	Containership	50,686	61,454	2006	Maersk A/S	
9278492	Maersk Peary	Tanker	25,487	38,177	2004	Maersk Line Ltd.	
9342176	Maersk Pittsburgh	Containership	74,642	84,676	2008	Maersk A/S	
9305300	Maersk Utah	Containership	50,686	61,454	2006	Maersk A/S	
9193252	Maersk Wisconsin	Containership	50,698	62,441	2000	Maersk A/S	
7907996	Mahimahi	Containership	41,036	30,825	1983	Matson Navigation Co Inc	Y
8320559	Major Bernard F. Fisher	Ro-Ro	34,318	24,500	1985	Military Sealift Command	
7907984	Manoa	Containership	41,036	30,825	1982	Matson Navigation Co Inc	Y
9244130	Manukai	Containership	32,575	38,261	2003	Matson Navigation Co Inc	Y
9273674	Manulani	Containership	32,575	38,261	2005	Matson Navigation Co Inc	Y
9232979	Marstan	Containership	6,368	8,627	2000	Sealift Inc	
7821154	Mary Ann Hudson	Dry Bulk	21,734	36,414	1981	US United Ocean Services	Y
7334204	Matsonia	Ro-Ro	33,095	22,501	1973	Matson Navigation Co Inc	Y
7602338	Maui	Containership	25,630	24,683	1978	Matson Navigation Co Inc	Y
9273686	Maunalei	Containership	25,324	34,027	2006	Matson Navigation Co Inc	Y
9268538	Maunawili	Containership	32,575	38,261	2004	Matson Navigation Co Inc	Y
9232278	Midnight Sun	Ro-Ro	65,314	22,437	2003	TOTE	Y
7929308	Mississippi Enterprise	Dry Bulk	22,518	37,244	1980	US United Ocean Services	Y
9131369	Mississippi Voyager	Tanker	30,415	46,069	1998	Chevron Shipping Co LLC	Y
9100243	Mohegan	Containership	6,158	7,850	1994	Sealift Inc	
7908005	Mokihana	Ro-Ro	57,379	30,652	1983	Matson Navigation Co Inc	Y
8302246	National Glory	Containership	11,652	12,418	1988	APL Ltd	Y
9232280	North Star	Ro-Ro	65,314	22,437	2003	TOTE	Y
9213959	Ocean Charger	General Cargo	7,252	8,034	2000	Intermarine LLC	
9258193	Ocean Crescent	General Cargo	7,252	8,097	2002	Intermarine LLC	
9506722	Ocean Freedom	General Cargo	12,810	14,359	2010	Intermarine LLC	
9437335	Ocean Giant	General Cargo	15,549	18,389	2012	Intermarine LLC	
9144914	Oregon Voyager	Tanker	30,770	45,671	1999	Chevron Shipping Co LLC	Y
9353591	Overseas Anacortes	Tanker	29,242	46,666	2010	Overseas Shipholding Group	Y
9353565	Overseas Boston	Tanker	29,242	46,802	2009	OSG Ship Management Inc	Y
9475935	Overseas Cascade	Tanker	29,234	46,287	2009	OSG Ship Management Inc	Y
9432218	Overseas Chinook	Tanker	29,234	46,666	2010	Overseas Shipholding Group	Y
9351062	Overseas Houston	Tanker	29,242	46,814	2007	Overseas Shipholding Group	Y
9353527	Overseas Long Beach	Tanker	29,242	46,911	2007	OSG Ship Management Inc	Y
9353539	Overseas Los Angeles	Tanker	29,242	46,817	2007	OSG Ship Management Inc	Y
9353589	Overseas Martinez	Tanker	29,242	46,653	2010	OSG Ship Management Inc	Y
9435894	Overseas Mykonos	Tanker	29,433	51,711	2010	OSG Ship Mgmt	
9353541	Overseas New York	Tanker	29,242	46,810	2008	OSG Ship Management Inc	Y
9353577	Overseas Nikiski	Tanker	29,242	46,666	2009	OSG Ship Management Inc	Y
9435909	Overseas Santorini	Tanker	29,433	51,711	2010	OSG Ship Management Gr	
9353606	Overseas Tampa	Tanker	29,242	46,666	2011	OSG Ship Management Inc	Y
9353553	Overseas Texas City	Tanker	29,242	46,817	2008	OSG Ship Management Inc	Y
9408102	Pelican State	Tanker	29,527	48,598	2009	Crowley Petroleum Service	Y
9486958	Pennsylvania	Tanker	29,242	45,760	2012	Crowley Petroleum Service	Y
9243203	Philadelphia Express	Containership	40,146	40,478	2003	Hapag-Lloyd Ag	
9244063	Polar Adventure	Tanker	85,387	141,740	2004	Polar Tankers Inc	Y
9206114	Polar Discovery	Tanker	85,387	141,740	2003	Polar Tankers Inc	Y
9193551	Polar Endeavour	Tanker	85,387	141,740	2001	Polar Tankers Inc	Y
9250660	Polar Enterprise	Tanker	85,387	141,740	2006	Polar Tankers Inc	Y
9193563	Polar Resolution	Tanker	85,387	141,740	2002	Polar Tankers Inc	Y
9295830	Prestige New York	Ro-Ro	57,280	15,880	2005	Liberty Maritime Corp	
9002037	R. J. Pfeiffer	Containership	32,664	28,555	1992	Matson Navigation Co Inc	Y
9080297	Resolve	Ro-Ro	49,443	13,548	1994	American Roll-On Roll-Off	
9118628	S/R American Progress	Tanker	30,415	46,103	1997	Seariver Maritime Inc	Y
9127863	Sagamore	General Cargo	3,838	5,151	1996	APL Ltd	
7517698	Sea Trader	General Cargo	3,185	1,496	1976	Trident Seafoods Corp	Y
9131371	Seabulk Arctic	Tanker	30,415	46,103	1998	Seabulk Tankers Inc	Y
7816551	Seabulk Challenge	Tanker	29,763	49,636	1981	Seabulk Tankers Inc	Y
7816549	Seabulk Trader	Tanker	29,763	49,990	1981	Seabulk Tankers Inc	Y
9143001	Sea-Land Charger	Containership	49,985	59,961	1997	Maersk A/S	
9106182	Sea-Land Comet	Containership	49,985	59,840	1995	Maersk A/S	
9143025	Sea-Land Intrepid	Containership	49,985	59,840	1997	Maersk A/S	
9143037	Sea-Land Lightning	Containership	49,985	59,840	1997	Maersk A/S	
7408093	Sierra	Tanker	64,329	125,133	1979	Seariver Maritime Inc	Y
9383663	Slnc Pax	Tanker	5,713	7,985	2008	Patriot Contract Services	
8212673	SSG Edward A. Carter Jr.	Containership	57,075	58,943	1985	Military Sealift Command	
9243186	St Louis Express	Containership	40,146	40,478	2002	Hapag-Lloyd Ag	
8414518	Stone Buccaneer	Tanker	1,576	3,549	1985	Stone Oil Distributor	Y
7634331	Strong/Mariner	ITB	15,029	7,470	1978	Foss Maritime Co	Y
9077044	Sulphur Enterprise	Tanker	16,771	21,649	1994	International Shipholding	Y
9408114	Sunshine State	Tanker	29,527	48,633	2009	Intrepid Ship Management	Y
8846151	Thunder/Lightning	ITB	8,123	7,164	1992	Foss Maritime Co	Y
9148520	Transatlantic	General Cargo	4,276	5,055	1997	Transatlantic Lines LLC	
7504639	TSGT John A. Chapman	Ro-Ro	26,409	26,763	1978	Military Sealift Command	
9243198	Washington Express	Containership	40,146	40,478	2003	Hapag-Lloyd Ag	
9243174	Yorktown Express	Containership	40,146	40,478	2002	Hapag-Lloyd Ag	

U.S.-Flag Fleet by Sector	of Vessels	GT	DWT
Total U.S.-Flag Fleet	175	6,861,549	7,739,066
Jones Act Eligible	90	3,084,180	4,225,979
Non-Jones Act Eligible	85	3,777,369	3,513,087
By Vessel Type			
Containership	69	2,985,819	3,257,170
Dry Bulk	6	158,936	260,045
General Cargo	17	132,886	166,488
Ro-Ro	32	1,520,248	652,173
Tanker	49	2,040,508	3,388,556
ITB	2	23,152	14,634

USACE Helps to Define Inland, Coastal & Great Lakes Markets

The November 2011 Fact Card produced by the U.S. Army Corps of Engineers' Navigation Data Center is a revealing look at the composition of America's Inland waterways. The fact card provides an overview of information about U.S. ports and waterways for the latest complete statistical year. Domestic data is collected by NDC.

Vessel Facts

There were 1,178 domestic vessels constructed in 2010, an increase of 25% from 939 that were constructed in 2009. This metric is reflected positively in the fact that the number of double hull tank barges has increased significantly from 2,530 in 1997 to 3,359 in 2010, a 32.8% increase.

The inland carrier is getting safer and markedly more modern and in a very short period of time. That said, almost 40 percent of the domestic fleet is greater than 25 years in age. The overwhelming majority of all domestic vessels today are brown water, inland or OSV-type vessels. A compilation snapshot of American flag vessels operating in the transportation of freight and passengers is depicted (numbers / age / type) as depicted inthe table below.

U.S. Trust Fund Facts

The Inland Waterway Trust Fund earned $84 million in Fiscal Year (FY) 2011. This included $83.9 million paid by the barge and towing industry and $0.052 million interest. The Fund disbursed $97.2 million for construction projects leaving a balance of $45.3 million. However, $13.4 million of the balance is set aside for prior year commitments, leaving only $31.9 million available for new construction obligations. The FY 2011 Harbor Maintenance Trust Fund equity grew 13.7% from FY 2010 to $6.42 billion. Total receipts increased 17.3% to $1.6 billion. The taxes from domestic commerce of $122.3 million increased 13.5% over the previous year. The taxes collected from imports increased 16.3% to $1,059.1 million. All transfers totaled $826.9 million (U.S. Army Corps of Engineers received $791.4 million, a decrease from FY 2010's $793.0 million). Hence it is easy to see that disbursements, despite a huge surplus, are not anywhere near to the amount being paid in by industry. In the meantime, the inland locks and dams – most approaching or exceeding their 50-year intended lifespan – crumble .

Waterways Facts

- The Port of South Louisiana which stretches 54 miles along the Mississippi River is the largest tonnage port in the United States. It is comprised of facilities in St. Charles, St. John the Baptist, and St. James Parishes. In CY 2010 it shipped 114.0 million short tons of cargo. Primary outbound cargoes include corn, animal feed, wheat, soybean, petroleum coke, chemicals and fuel oils.
- Duluth – Superior, located at the western tip of Lake Superior, is the largest port on the Great Lakes and is one of the premier bulk cargo ports in North America. In CY 2010 it shipped 32.7 million short tons of cargo. Principal cargo loadings include ore, coal, and grain. It has a navigation season that usually begins in late March and continues until mid-January.
- Commercial dock facilities at Fairmont, WV are 2,080 statute miles from the Gulf of Mexico via inland waterways (Monongahela, Ohio and Mississippi Rivers). Those at Sioux City, IA are 1,899 statute miles from the Gulf via the Missouri and Mississippi Rivers, and those at Minneapolis, MN are 1,831 statute miles up the Mississippi River.
- The 12,000 miles of inland and intracoastal waterways, like highways, operate as a system, and much of the commerce moves on multiple segments. They serve as connecting arteries, much as neighborhood streets help people reach interstate highways. Waterways are operated by the Corps as multi-purpose, multi-objective projects.

Corps Dredging Facts

- Corps and contractor owned dredges removed 221.7 million cubic yards (mcy) of material from Corps constructed and maintained channels in Fiscal Year (FY) 2010 (1 October to 30 September) at a cost of $1,465.3 million. The decrease of 15.9% in cubic yards and 9.0% increase in cost from FY 2009 was due to the infusion of Recovery Act funds.
- In FY 2010, maintenance dredging accounted for 75.0% of the quantity dredged, an additional 14.9% of the total yardage was attributed to PL 109-062 Hurricane Katrina recovery dredging. New construction (channel deepening) 8.3% and emergency dredging 1.7% accounted for the remainder of the dredging volume.
- The average cost/cy for maintenance work dredging increased 33.2% to $5.97 and the average cost/cy for new work dredging decreased 17.3% to $15.27 when compared to 2009 values.
- Private dredging contractors removed 82.4% (182.7mcy) of the material dredged and were paid 90.5% ($1,327.4 million) of the total FY 2010 Corps dredging expenditures.
- In FY 2010, 111 private dredging companies submitted a total of 441 bids for 195 contracts. Awards were made to 57 different companies, 19 large and 38 small businesses. Large and small companies received 106 (54.3%) and 89 (45.7%) of the contracts respectively.
- The cutterhead pipeline dredge was the most widely used dredge in FY 2010 receiving 60.0% of the contracts, removing 56.3% of the contracted quantity and earning 56.5% of the contract dollars. Hopper dredges removed 33.8% of the quantity and earned 19.6% of the contract dollars. Mechanical dredges removed 9.8% of the quantity, earning 23.7% of the contract dollars. The remaining dredging was performed by a combination of more than one type of dredge.
- The District that awarded the most contract dollars in FY 2010 was Mobile with $203.6 million. New Orleans District had contracts dredging the most cubic yards (65.5 mcy).

http://www.ndc.iwr.usace.army.mil/ports/ports.htm.

Type	Number	< 5 years	5–10	11–15	15–20	21–25	>25
Self Propelled	**9,078**	**949**	**691**	**773**	**426**	**464**	**5,767**
• Dry Cargo	875	61	110	111	63	109	421
• Tanker	77	17	7	9	3	3	38
• Pushboat	2,886	259	158	158	79	76	2,155
• Tugboat	2,580	314	145	172	66	71	1,809
• Passenger	843	27	59	92	114	155	395
• OSV	1,817	271	212	231	101	50	949
	Number	**< 5 years**	**5–10**	**11–15**	**15–20**	**21–25**	**>25**
Barge (total)	**31,412**	**6,561**	**3,946**	**6,098**	**3,093**	**1,250**	**10,153**
• Dry covered	11,373	1,888	1,629	3,139	1,043	125	3,359
• Dry open	8,567	1,529	991	1,868	1,319	786	2,053
• Lash/Seabee	7	0	0	0	1	0	5
• Deck	6,669	1,961	760	553	389	293	2,249
• Other Dry	232	13	18	27	12	10	138
• Single Hull (t)	400	27	2	16	11	11	333
• Double Hull (t)	3,359	766	456	446	307	23	1,360
• Other Tank	805	377	90	49	11	2	276
TOTAL (ALL)	**40,512**	**7,511**	**4,640**	**6,874**	**3,520**	**1,715**	**15,933**

Table 1: U.S. Flag Vessels as of December 31, 2010 (updates through October 19, 2011).

Global Containershipping: Consolidation, Economy of Scale Define the Sector

The chart on these two pages, courtesy of Alphaliner - http://www.alphaliner.com/top100, highlights better in numbers than words the consolidation of the global container ship market, as of the total of 5,963 ships active on the liner trade (an aggregate 18,177,502 TEU and 230,590,490 dwt), nearly half of the ships (2,462) and more importantly, nearly 65% of the TEU (11,551,181 TEU) are controlled by the Top 10 companies, per the data from Alphaliner as of May 22, 2014.

Source: Alphaliner - http://www.alphaliner.com/top100/

Alphaliner - Top 100 : Operated fleets as per 22 May 2014

		Total		Owned		Chartered			Orderbook		
Rnk	Operator	TEU	Ships	TEU	Ships	TEU	Ships	% Chart	TEU	Ships	% existing
1	APM-Maersk	2,707,299	574	1,501,925	250	1,205,374	324	44.5%	238,440	14	8.8%
2	Mediterranean Shg Co	2,443,610	491	1,057,945	194	1,385,665	297	56.7%	429,448	37	17.6%
3	CMA CGM Group	1,533,044	422	554,826	86	978,218	336	63.8%	381,457	40	24.9%
4	Evergreen Line	899,684	198	526,439	110	373,245	88	41.5%	260,032	21	28.9%
5	COSCO Container L.	776,153	159	434,093	96	342,060	63	44.1%	73,772	7	9.5%
6	Hapag-Lloyd	774,936	156	420,608	66	354,328	90	45.7%			
7	CSCL	638,639	136	456,723	75	181,916	61	28.5%	125,108	8	19.6%
8	APL	602,951	111	377,343	49	225,608	62	37.4%	9,200	1	1.5%
9	MOL	591,148	116	212,264	34	378,884	82	64.1%	100,000	10	16.9%
10	Hanjin Shipping	583,717	99	264,916	36	318,801	63	54.6%	90,720	10	15.5%
11	OOCL	512,792	97	354,607	50	158,185	47	30.8%	35,552	4	6.9%
12	NYK Line	496,867	110	295,591	53	201,276	57	40.5%	112,000	8	22.5%
13	Hamburg Süd Group	496,477	109	253,165	43	243,312	66	49.0%	94,970	11	19.1%
14	Yang Ming Marine Transport Corp.	397,057	87	227,242	46	169,815	41	42.8%	229,308	19	57.8%
15	Hyundai M.M.	374,858	62	131,178	20	243,680	42	65.0%	99,300	9	26.5%
16	PIL (Pacific Int. Line)	360,671	164	247,518	113	113,153	51	31.4%	46,800	12	13.0%
17	K Line	350,562	67	127,352	21	223,210	46	63.7%	69,350	5	19.8%
18	Zim	331,997	83	133,394	25	198,603	58	59.8%			
19	UASC	288,756	51	198,164	26	90,592	25	31.4%	281,926	19	97.6%
20	CSAV Group	255,002	50	96,897	17	158,105	33	62.0%	65,100	7	25.5%
21	Wan Hai Lines	179,752	78	160,823	68	18,929	10	10.5%			
22	X-Press Feeders Group	100,044	74	12,886	9	87,158	65	87.1%			
23	HDS Lines	88,608	22	6,864	3	81,744	19	92.3%			
24	KMTC	83,174	51	28,569	23	54,605	28	65.7%	12,956	4	15.6%
25	NileDutch	74,886	30	1,301	1	73,585	29	98.3%	14,000	4	18.7%
26	SITC	71,097	67	34,125	33	36,972	34	52.0%	21,600	12	30.4%
27	UniFeeder	58,572	56			58,572	56	100.0%			
28	CCNI	51,437	16			51,437	16	100.0%	36,120	4	70.2%
29	Arkas Line / EMES	51,107	38	39,594	28	11,513	10	22.5%	5,000	2	9.8%
30	Simatech	50,321	21	13,485	7	36,836	14	73.2%	8,700	2	17.3%
31	RCL (Regional Container L.)	45,018	30	20,755	19	24,263	11	53.9%			
32	Sinotrans	44,176	32	25,074	19	19,102	13	43.2%			
33	Quanzhou An Sheng Shg Co	43,917	41	39,226	32	4,691	9	10.7%	13,088	6	29.8%
34	TS Lines	43,817	27	3,156	2	40,661	25	92.8%			
35	Grimaldi (Napoli)	37,517	36	36,882	35	635	1	1.7%	24,400	11	65.0%
36	Swire Shipping	37,516	28	31,378	22	6,138	6	16.4%	6,468	4	17.2%
37	Heung-A Shipping	33,761	29	8,024	13	25,737	16	76.2%	5,275	5	15.6%
38	Meratus	33,392	52	32,330	46	1,062	6	3.2%			
39	Matson	32,666	20	31,118	17	1,548	3	4.7%	7,200	2	22.0%
40	Schöller Group	31,238	18	6,042	3	25,196	15	80.7%			
41	Seaboard Marine	29,360	25	1,444	2	27,916	23	95.1%			
42	Salam Pasific	29,079	49	27,791	47	1,288	2	4.4%			
43	Sinokor	28,900	32	19,031	21	9,869	11	34.1%			
44	Samudera	28,817	34	10,971	18	17,846	16	61.9%			
45	Zhonggu Shipping	26,033	38	15,920	14	10,113	24	38.8%	15,000	6	57.6%
46	Linea Messina	25,901	12	18,528	8	7,373	4	28.5%	11,600	4	44.8%

47	Tanto Intim Line	25,402	44	25,402	44						
48	Horizon Lines	24,840	12	19,836	9	5,004	3	20.1%			
49	MACS	24,792	14	15,566	8	9,226	6	37.2%			
50	S.C. India	24,491	7	14,407	5	10,084	2	41.2%			
51	OEL / Shreyas (Transworld Group)	24,310	18	16,329	13	7,981	5	32.8%			
52	FESCO	23,068	21	11,428	14	11,640	7	50.5%			
53	Mariana Express Lines	22,359	14			22,359	14	100.0%			
54	Nam Sung	22,326	26	18,965	22	3,361	4	15.1%	1,009	1	4.5%
55	Crowley Liner Services	18,463	18	8,304	9	10,159	9	55.0%	4,800	2	26.0%
56	Log-In Logistica	17,024	7	8,964	4	8,060	3	47.3%	8,424	3	49.5%
57	Great White Fleet	14,746	23			14,746	23	100.0%			
58	Westwood	14,699	7			14,699	7	100.0%			
59	Turkon Line	13,578	8	13,578	8						
60	DAL	13,567	6	1,684	1	11,883	5	87.6%			
61	Emirates Shipping Line	13,393	4			13,393	4	100.0%			
62	Far Shipping	12,629	10			12,629	10	100.0%	3,600	2	28.5%
63	Marfret	12,333	9	3,731	4	8,602	5	69.7%			
64	Dole Ocean Liner	12,331	19	9,178	10	3,153	9	25.6%	4,620	3	37.5%
65	Containerships OY	12,299	14	966	1	11,333	13	92.1%	2,800	2	22.8%
66	Temas Line	12,096	23	12,096	23						
67	King Ocean	11,786	14	158	1	11,628	13	98.7%			
68	Guangxi Hongxiang Shipping Co	11,284	23	11,284	23						
69	Goto Shipping	11,120	8			11,120	8	100.0%			
70	Shanghai Hai Hua (Hasco)	10,342	13	5,221	7	5,121	6	49.5%	4,080	4	39.5%
71	Shanghai Jin Jiang	9,728	11	8,182	9	1,546	2	15.9%	5,500	5	56.5%
72	Borchard Lines	9,445	10	4,451	4	4,994	6	52.9%			
73	Peel Ports (BG Freight)	9,412	14			9,412	14	100.0%			
74	Chun Kyung (CK Line)	8,767	13	3,244	8	5,523	5	63.0%	3,800	2	43.3%
75	Delphis NV / Team Lines	8,574	8	1,440	1	7,134	7	83.2%			
76	Independent Container Line	8,208	4			8,208	4	100.0%			
77	Melfi C.L.	8,040	5			8,040	5	100.0%			
78	MTT Shipping	7,941	7	4,552	4	3,389	3	42.7%			
79	Vinalines	7,891	13	7,891	13				1,794	1	22.7%
80	Eimskip	7,375	11	4,550	7	2,825	4	38.3%	1,750	2	23.7%
81	Samskip	7,252	11	3,945	5	3,307	6	45.6%			
82	OPDR	6,964	10	3,792	6	3,172	4	45.5%			
83	Tropical Shg	6,789	14	4,188	11	2,601	3	38.3%			
84	Kambara Kisen	6,765	8	2,947	3	3,818	5	56.4%			
85	Caribbean Feeder Services	6,384	8	3,450	5	2,934	3	46.0%			
86	Marguisa	6,383	5			6,383	5	100.0%			
87	Boluda Lines	6,369	10	3,782	7	2,587	3	40.6%			
88	Grand China Logistics	6,366	4	6,366	4						
89	Shin Yang Shipping Sdn Bhd	6,219	17	5,506	16	713	1	11.5%			
90	Caraka Tirta Perkasa	6,103	9	5,873	8	230	1	3.8%			
91	Qatar Navigation (Milaha)	6,095	8	4,977	7	1,118	1	18.3%			
92	Oceanic Cargo Lines	6,047	17	6,047	17						
93	SeaFreight	5,646	5			5,646	5	100.0%			
94	SASCO (Sakhalin Shipping Co)	5,544	14	5,224	13	320	1	5.8%			
95	Ocean Shell Shipping (OSS)	5,380	4	779	1	4,601	3	85.5%			
96	Valfajre Eight Shg Co	5,299	8	5,299	8						
97	Tarros	5,222	4			5,222	4	100.0%			
98	Centrans Container Lines	4,951	6			4,951	6	100.0%			
99	Interasia Line	4,816	3			4,816	3	100.0%			
100	Perkapalan DZ (PDZ Lines)	4,697	6	2,147	3	2,550	3	54.3%			

The World in Charts: Insights & Analysis from The Platou Report 2014

Getting a grip on world trends defining the maritime sector can be challenging. Resources such as annual Platou Report strive to make it easy, delivering authoritative, comprehensive yet easy to sift market insights and overview statistics. Find on these two pages the statistical overview that our editorial team found most compelling. For the full report, simply visit www.platou.com.

Source: The Platou Report 2014, RS Platou Group, www.platou.com

World Fleet Development (Mill.dwt)

Start	Tankers	Chemical carriers	Bulk carriers	Combined carriers	Others	Total
2004	279.1	25	299.2	12.1	189.6	805
2005	295	25.7	317.4	11.6	200.5	850.1
2006	317.7	26.9	339.3	11.6	213.3	908.8
2007	334.7	29	362.4	11.2	232.5	969.9
2008	352.3	31.7	386.5	11.2	253.5	1035.1
2009	369	34	413.4	10.4	273.1	1099.9
2010	396.2	35.8	454.9	9.6	294.9	1191.3
2011	413.1	36.1	532.5	6.8	309.9	1298.4
2012	439	36.5	615.7	*	305.3	1396.6
2013	460.5	36.6	681.1	*	280.7	1458.9
2014	471.3	36.3	718.7	*	293.3	1519.4

*From 2012 combined carriers are included in bulk carrier fleet.
(Source: The Platou Report 2014, RS Platou Group • www.platou.com)

Tonnage Sold for Scrapping, Lost and Other Removals (Mill.dwt)

Start	Tankers	Chemical carriers	Bulk carriers	Combined carriers	Others	Total
2004	10.6	0.1	1	0.5	1	13.2
2005	5.3	0.3	1.2	0	1	7.8
2006	6	0.2	2.5	0.3	1.1	10.1
2007	11.1	0.4	0.7	0	2.1	14.3
2008	16.6	0.5	4.9	0.8	8.8	31.6
2009	18.4	0.5	10.2	0.9	6.7	36.7
2010	22	1.3	6.9	0.1	7.7	38
2011	13.8	0.6	23.4	-	6.3	44.1
2012	11.7	0.8	33.9	-	11.4	57.8
2013	11.6	0.5	22.8	-	9	43.9
2014	51.4	2.1	117.8	-	62.2	233.6

(Source: The Platou Report 2013, RS Platou Group • www.platou.com)

Deliveries (Mill.dwt)

Start	Tankers	Chemical carriers	Bulk carriers	Combined carriers	Others	Total
2004	26.4	0.8	19.2	-	11.9	58.3
2005	28	1.5	23.1	-	13.8	66.4
2006	23	2.4	25.5	-	20.3	71.2
2007	28.7	3	24.8	-	23	79.5
2008	33.2	2.9	31.8	-	28.4	96.3
2009	45.7	2.2	51.7	-	28.4	128
2010	38.9	1.7	84.6	0.6	22.7	148.5
2011	39.7	1	101.2	1	22.7	165.6
2012	31.4	0.5	99.5	-	19.2	150.6
2013	21.3	0.2	58.9	-	21.5	101.9

(Source: The Platou Report 2013, RS Platou Group • www.platou.com)

New Orders of Tankers by Size (incl. chemical carriers) (Mill.dwt)

	10 to 69,999	70 to 119,999	120-199,999	200,000+	Total
2004	7.8	10.9	4.5	13	36.2
2005	7	5.8	1.1	11	24.9
2006	16.2	21.6	13.3	30.3	81.5
2007	15.4	13.5	8.3	15	52.2
2008	6.3	5.3	5.8	32.8	50.1
2009	1.4	0.6	3	5.8	11.1
2010	2.1	6.8	11.3	19.9	40.1
2011	2.7	1.9	2.8	2.2	9.6
2012	6.1	1.1	2.5	5.3	15.1
2013	10.8	7.1	0.6	13.6	32.2

(Source: The Platou Report 2013, RS Platou Group • www.platou.com)

New Orders (Mill.dwt)

Start	Tankers	Chemical carriers	Bulk carriers	Combined carriers	Others	Total
2004	34	2.2	28.7	-	28.1	93
2005	24	0.9	16.9	-	25.9	67.7
2006	74.7	6.8	36.7	-	25.7	143.9
2007	42.1	10.1	158.3	3.4	52.4	266.3
2008	47.4	2.7	90.4	-	20.4	160.9
2009	10.3	0.8	33.6	-	1.5	46.2
2010	38.5	1.6	82.3	-	10.8	133.2
2011	9.2	0.5	27.9	-	25.7	63.3
2012	14.2	0.9	17.8	-	11.1	44
2013	31	1.2	73	-	29.8	135

(Source: The Platou Report 2013, RS Platou Group • www.platou.com)

New Orders of Bulk Carriers by Size (Mill.dwt)

Start	Handysize	Handymax/ Supramax	Panamax/ Kamsarmax	Post Panamax	Capesize	Total
2004	2.8	6.5	5.9	0.6	12.8	28.6
2005	1.8	4.2	3	0.9	6.9	16.8
2006	4.8	7.5	5.5	0.9	18	36.7
2007	10.5	27.2	18.5	21.9	80.2	158.3
2008	12.8	19.7	8.5	9.2	48.2	98.4
2009	4	7.8	5	2.2	14.6	33.6
2010	8.3	12.7	28.1	5.7	27.5	82.3
2011	3.1	5.3	8.1	1.5	9.8	27.8
2012	3.7	5.4	4.4	0.4	3.9	17.8
2013	8.6	21.1	11.4	0.7	31.3	73.1

(Source: The Platou Report 2013, RS Platou Group • www.platou.com)

Orderbook (Mill.dwt)						
Start	Tankers	Chemical carriers	Bulk carriers	Combined carriers	Others	Total
2004	65.1	10.2	48.4	-	41.2	164.8
2005	72	11.6	60.6	-	56.2	200.4
2006	76.5	3.3	61.4	-	68.1	209.3
2007	128.7	11	78.9	-	80	298.6
2008	147.7	19	216.1	3.4	105.7	491.9
2009	164	18.4	286.3	3.4	92.2	564.3
2010	120.6	13.9	268.7	3.4	70.5	477.1
2011	113.4	9.7	246.5	2.76	53.7	426.06
2012	75	1.4	191.5	-	53.7	321.5
2013	49.4	1.6	105.4	-	54.6	211.1
2014	51.4	2.1	117.8	-	62.2	233.6

(Source: The Platou Report 2013, RS Platou Group • www.platou.com)

Second Hand Prices of 5 Year Old Tankers (Mil. $)				
Start	MR Product	Aframax	Suezmax	VLCC
2004	28	38	48	72
2005	39	56	71.5	106
2006	45	61.5	75	113.5
2007	45	64	81	118
2008	50	68	93	136
2009	38	53	71	102
2010	25	40	56	82
2011	27	40	58	85
2012	27	35	45	62
2013	24	28	44	60
2014	28	32	40	62
2013	10.8	7.1	0.6	13.6

(Source: The Platou Report 2013, RS Platou Group • www.platou.com)

Orderbook, By Year of Delivery - Tankers Mill. dwt (incl. chemical carriers)				
Delivery Schedule				
Size	Total on Order	2014	2015	2016+
10-69,999	17.2	6.9	6.5	3.8
70-119,999	11	4.3	4.2	2.5
120-199,999	3.9	2.8	1.1	0
200,000+	21.5	9.2	5.1	7.2
Total	53.6	23.2	16.9	13.5
2010	25	40	56	82
2011	27	40	58	85
2012	27	35	45	62
2013	24	28	44	60
2014	28	32	40	62
2013	10.8	7.1	0.6	13.6

(Source: The Platou Report 2013, RS Platou Group • www.platou.com)

Second Hand Prices of 5 Year Old Bulk Carriers (Mil. $)			
Second Hand Prices of 5 Year Old Bulk Carriers (Mill. Dwt)	Handymax	Panamax	Capesize
2004	20.5	27.5	45
2005	31	38	64
2006	25.5	29	55
2007	40.5	45.5	80
2008	73	88	138
2009	26.5	30	49
2010	28	34	55
2011	31.5	37.5	52
2012	25	26	38
2013	19	19	31
2014	25	25.5	41
2013	10.8	7.1	0.6

(Source: The Platou Report 2013, RS Platou Group • www.platou.com)

Orderbook, By Year of Delivery - Bulk Carriers				
Delivery Schedule				
Size	Total on Order	2014	2015	2016+
Handysize	13.2	6.3	5.4	1.4
Handymax/Supramax	26.1	11.4	10	4.6
Panamax/Kamsarmax	27.1	16	7.2	4
Post Panamax	3.5	2.2	1	0.3
Capesize	48	22.5	15	10.5
Total	117.9	58.4	38.6	20.8
2011	27	40	58	85
2012	27	35	45	62
2013	24	28	44	60
2014	28	32	40	62
2013	10.8	7.1	0.6	13.6

(Source: The Platou Report 2013, RS Platou Group • www.platou.com)

Orderbook, By Year of Delivery - Containerships				
1000 TEU Delivery Schedule				
Size	Total on Order	2014	2015	2016+
Below 1,000	1.8	1.8	0	0
1,000-1,999	102.9	63.2	33	6.7
2,000-3,999	231.1	113.6	92.4	25.1
4,000-5,999	278	217.8	50.3	10
6,000-7,999	112.8	85.4	27.4	0
8,000-9,999	1073.2	448.6	480.1	144.5
10,000+	1990.8	867.3	1020.5	103
Total	3790.6	1797.7	1703.7	289.3
2014	28	32	40	62
2013	10.8	7.1	0.6	13.6

(Source: The Platou Report 2013, RS Platou Group • www.platou.com)

Training to Prevent Marine Accidents & Deaths

Reducing accidents depends on knowledge, skill and just as importantly, attitude, says the Indian Maritime Administration. And, human error is not always just seafarer error.

By Joseph R. Fonseca

As the government of India strives to raise India's share of the global seafaring community from 7 to 15 percent by 2020, at the same time, it struggles with the reality of an escalating death rate attributed to accidents and suicides among Indian mariners. According to the casualty figures released by the Directorate General of Shipping, government of India (the Indian administration) there were 25 accidental deaths, 2 cases of suicide and 8 sailors reported missing during 2012. Year to date data in 2013 suggests a similar and perhaps even slightly elevated pattern.

Since human factors are said to account for 80 percent of marine accidents, one of the administration's many motivations for reversing the trend is that the inherent dangers are a deterrent to youth who might otherwise want to enter the seafaring profession. According to Gautam Chatterjee, the Director General of Shipping (DGS), who heads the Indian Maritime Administration, much depends on competence of the seafarer for reducing accidents. In his address on the National Maritime Day he also insisted, "For competence, one needs knowledge, skill (that is hands-on proficiency) and attitude. So in order to reduce accidents at sea, all these three aspects need to be targeted."

Causes & Remedies

The faster turnaround of ships resulting in very short port stays and reduced opportunities to undertake maintenance of deck and machinery has, over time, brought tremendous pressure on seafarers. As seafarers hurry to complete work within a limited time frame, they also often end up getting injured. A new system, put into place for curtailing accidents, begins at the time of selection itself, wherein only the right candidate is allowed to register for training. The DGS has fixed norms for eligibility for candidates, including but not limited to minimum qualifications and psychometric tests. Beyond this, Behavior Based Safety Courses are being conducted for both pre sea and post sea levels.

"In order to reduce accidents, Anglo Eastern conducts various value-added courses to address knowledge and skill," said Captain Kersi N. Deboo, Director & Principal of the Anglo-Eastern Maritime Training Center, a well-regarded India-based maritime training institute offering a large number of pre-sea and post-sea curriculum. He added, "Courses must be current, up-to-date, topical and with practical hands-on training. Because statistics indicate that 80 percent of accidents happen due to human error, we have introduced a number of courses to address the attitude and the behavioral aspects of error management / preventing accidents. We have a set of safety related courses which address occupational hazards, risk assessment and incident investigation. Further, we have a number of courses that address the behavioral aspects of behavior-based safety, maritime resource management, leadership and team work."

He also points out that all these courses are incorporated in the recent revision of STCW 2010 where additional elements have been included at all levels of resource management, leadership and team work. After recognizing that attitude and behavior play a dominant role in reducing the cause of accidents, Anglo Eastern became the first training institute in India to introduce these requirements, well prior STCW 2010 coming into force. The 2010 amendment has made it part of the competency syllabus and are more of soft skill training.

"We conduct the courses at various levels," says Capt Deboo. "We have occupational hazards, risk assessment, safety inspections and also maritime resource management and behavioral based safety at all levels. Besides, incident investigation and leadership for the senior level officers there are number of workshops based on case studies, experience sharing, role play and simulation exercise."

Turning Knowledge into Policy – and everyday practice

Anglo Eastern says it all boils down to how much of the learning that takes place ashore is adapted on board. Shipping companies therefore need to develop a mechanism to monitor activities on board the ship, while also making senior officers accountable for developing a professional safety culture on board. This involves adequate preparations for every possible scenario. For example, port calls entail pre-arrival work, the inward passage, followed by cargo activities, port state inspections, agents, vetting, and a dozen more necessary tasks. Separately, ship's engineroom staff has to perform maintenance on the power plant – all within a very narrow time frame. In other words: a stressful time where a large percentage of accidents are known to occur.

"Working under stress, seafarers are often pushed to work quickly," says Captain Deboo. "Doing things fast without adequate rest leads to seafarers taking shortcuts or bypassing certain functions. This ultimately leads to mistakes. A thorough understanding all the equipment and the skill to do the job is of course necessary. So, too, is the right attitude, particularly the "buddy factor" – that is everybody working as a team; sharing the work load or warning somebody about any imminent danger or action that will lead them to harm."

Human Error vs. Seafarer Error

Captain Yashoverman Sharma, Head of Training, International Maritime Training Center (Wilhelmsen Maritime Services), takes a holistic view. "It is wrong to assume that human error, which is associated with 80 percent of accidents at sea, is the same as 'seafarer' error," he contends. "In fact, in my assessment, human error is 99.9 percent of the cause of accidents. Typically, losses suffered in any accidents at sea are considered in 'dollar terms' and human lives hardly factored into the equation. This is sad. On the contrary, everything else should be sacrificed to save human lives. In reality, this is rarely the case."

Sharma insists that by assuming 'human error' being solely 'seafarer error' has led to the incorrect assumption that training (alone) can put an end to accidents. "But, I am sorry to say that it is not so," he emphasizes. "They have identified human error as the critical issue and training programs are being revised to help the operators to reduce accidents. I am not saying this is not useful. It is very good. But I want to point out that eventually, the circumstances of the conditions under which such incidents take place involves more people than just the

"Working under stress, seafarers are often pushed to work quickly."
Captain Kersi N. Deboo, Anglo-Eastern Maritime Training Center.

"Typically, losses suffered in any accidents at sea are considered in 'dollar terms' and human lives hardly factored into the equation. This is sad."
Captain Yashoverman Sharma, Wilhelmsen Maritime Services

seafarer on the spot. These people are the 'behind-the-scene' operators."

But then what is human error, he asks. Sharma points out that it is humans who make rules. If it happens that the port state control and flag state don't do their duty well, then that too becomes human error. If the engine fails, leading to loss of life or property then that too becomes human error as the engine was designed by humans. "Why should we equate human error to seafarer error alone?" he asks. "If I say the seafarer was fatigued and therefore his judgment was impaired leading to a collision or injury to himself, I would say that instead of falsely implicating the seafarer one must ask, 'What about the people who put the seafarer in that position where he ends up getting fatigued?' Shall we say that it is the company which should have seen that there were more hands on board or the administration that should have brought into place necessary preventive regulations? Or is it possible that the ship board management was responsible? There are so many possibilities."

Sharma contends that very few accidents are really solely attributable to the lack of knowledge or skills. Furthermore, he says, every seafarer is under the threat of being blamed for the ship being delayed or the owner facing losses or the ship machinery or equipment gets damaged. So, he says, with the best of intentions people are driven to cause accidents. According to Sharma, in any incident, before one assigns blame, it is necessary to see what created that accident. Under what conditions was the vessel being operated? Often the conditions under which seafarers have to work are not entirely under their control. Was it lack of spare parts, improper machinery and no money from the owner?

"I am not saying that the shipowners who spend all the money on training and maintenance of the ship do not experience accidents; there are accidents still happening," Captain Sharma says, "The best of companies have faced marine disasters. It is a matter of reducing risks that is important. It does not end only with issuing instructions to the ship. There needs to be support as well. I say one must delegate more powers. If proper responsibility is given and conditions created for operating the ship safely, then accidents will reduce."

Sharma had more to say. "Accidents which are assigned to the human element cannot in my opinion be attributed to seafarers alone. It also involves the operators and working environment they have created on the ship, the designers of the ship, the naval architects, etc. Unfortunately, ship designers don't typically sail on the ships that they design. It is found that many accidents resulting in injury or death to seafarers could have been avoided if care had been taken to integrate safety measures while designing the ship. Even in the administration, accountability is lacking. People survey ships and make it pass all safety tests. Should I say the surveyor did his job in the case of MOL Comfort? Did he ensure that it would not break into two?"

Safety: Everyone's Business

The takeaways from the foregoing discussions are clear. Of course, competence, knowledge, skills and attitude are primary ingredients of a safe and productive merchant seafarer.

At the same time, all of that can count for little if the mariner is placed into poorly designed physical surroundings, impossible situational scenarios, and with inadequate engagement from above and ashore.

It turns out that safety does come from the top: from the superior officer(s) on board, ship's management ashore, the ship's design team, the flag state and the classification society, too. The introduction of STCW and its many amendments is just one piece of the puzzle. Likewise, training alone will not prevent accidents from happening. And, until that reality is embraced by the full chain of personnel involved with today's intermodal transportation chain, the inevitable accident will remain the rule, rather than the exception.

Unique Rig Training Model

Credit: Harald Nordbakken

Kongsberg Maritime recently delivered a new rig simulator model at Simsea, based on the Floatel Superior accommodation unit, which is currently in operation in the North Sea. Developed as a part of the Kongsberg K-Sim Offshore simulators already installed at Simsea, the new customized model will be used to train semi-submersible rig personnel in advanced operation of Dynamic Positioning (DP), position mooring system (POSMOOR), stability/ballasting and rig move/anchoring.

Floatel International commissioned development of the simulator model to provide training for maritime rig personnel and to support its safety strategy. Simsea has already conducted courses for Floatel International and today the organization boasts significant experience of rig personnel training on Kongsberg Maritime's simulators. The new Floatel Superior rig simulation model offers the opportunity to practice on leadership and decision making in emergency and abnormal situations including communication and teamwork, all of which are training fundamentals. K-Sim Offshore has been designed to provide highly realistic, task specific or full vessel training exercises, making it the ideal foundation for such a diverse training program.

"The new rig model in K-Sim Offshore represents a significant boost to training opportunities for maritime rig personnel in Norway and internationally," said A. Rune Johansen, Managing Director, Simsea AS. "It is a strong training ground not only for personnel on the accommodation units but also in most other mobile rigs used in the oil & gas sector."

Global Engine Room Simulation

Kongsberg Maritime secured a number of new Engine Room Simulator (ERS) contracts around the world in the last few months. The company will deliver the latest version of its ERS, K-Sim Engine, to a new Applied Technology Facility at the Nelson Marlborough Institute of Technology (NMIT) in New Zealand. Set for delivery in June 2014, this will be the first Kongsberg Maritime ERS delivery to a customer in New Zealand.

In Africa, the Regional Maritime University (RMU) awarded Kongsberg Maritime a contract to deliver K-Sim Engine for its premises in Accra, Ghana. The Full Mission ERS, was due for delivery in May, and it will enable RMU to provide education according to STCW requirements. Demonstrating the flexibility of K-Sim Engine, four vessel models will be available on the simulator: Trawler, Ferry, Anchor Handling Tug and Supply vessel (AHTS) and a low speed VLCC.

In Europe, Kongsberg Maritime and Lycée Maritime Jacques Cassard in Nantes signed a contract for the delivery of K-Sim Engine. The delivery will consist of an instructor station and eight student stations, with two engine models: MAN B&W 5L90MC L11 (Very Large Crude Carrier) and K-Sim Engine MaK 8M32C M11 (Trawler). Lycée Maritime Jacques Cassard is the eighth of 12 French Regional Maritime Vocational Schools to use K-Sim Engine for highly realistic maritime engine room training courses.

Marine engineering students at Lycée Maritime d'Etel, training and testing skills using the K-Sim Engine Simulator.

Credit - Lycée Maritime d'Etel

LNG Bunkering Safety Training

(Photo courtesy is MSI)

LNG training for Magnolia LNG inMSI's Full Mission Bridge.

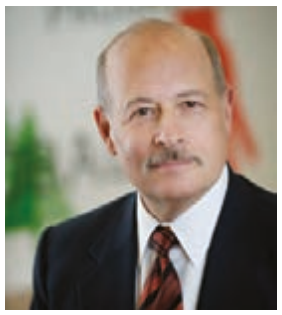
Maritime Simulation Institute

The Maritime Simulation Institute in Middletown, RI, is developing a liquefied natural gas (LNG) bunkering safety training course, with the first session to begin in June for Harvey Gulf International Marine. The 45-hour bunkering course for Harvey's LNG bunkering persons-in-charge (PIC) will be offered ahead of any U.S. Coast Guard regulations governing LNG bunkering. The first course likely will include Harvey Gulf master's, mates and engineers. Courses will be offered at MSI facilities at Texas A&M outside Houston and at MFA, the Massachusetts Firefighting Academy in Stow, west of Boston.

Harvey hired MSI as it launches its first dual fuel offshore supply vessel, which is designed to run primarily on LNG. The OSV Harvey Energy – powered by Wärtsilä 34DF engines – is being built at TY Offshore yard in Gulfport, Miss., and is the first U.S.-flag vessel designed to operate on natural gas.

"Harvey Gulf is committed to using state-of-the-art vessels that provide clean, safe, efficient, reliable and competitive operations. Key to this paradigm shift is ensuring that our ships' crews are properly trained in the bunkering of LNG," said Chad Verret, EVP, Harvey Gulf Alaska & LNG operations.

In February, the U.S. Coast Guard published CG-OES 2-14, Guidelines for Liquefied Natural Gas Fuel Transfer Operations and Training of Personnel on Vessels Using Natural Gas as Fuel. The final policy letter will establish the guidelines for fuel transfer operations and training of personnel working on vessels that use LNG as a fuel and conduct transfer operations in waters subject to jurisdiction. MSI is working with the USCG and a number of classification societies to develop this and other training courses.


Spinrad


Chiarello & Foxx


Ulrichs


Gerhardt


Ulstein


Shankar


Remi Eriksen, DNV GL & Stein Eggan


Vergine


Shane J. Guidry & J. Barry Snyder seal the deal.


Shaw

Spinrad Named NOAA Chief Scientist

Dr. Richard (Rick) Spinrad will be stepping down from his MTS position as he is named chief scientist of the National Oceanic and Atmospheric Administration (NOAA). President Barack Obama announced the appointment May 8, 2014. Currently he serves as Vice President for research at Oregon State University.

White House Honors Chiarello

TOTE, Inc. President and CEO Anthony Chiarello was among 11 honored by the White House as 2014 transportation industry "Champions of Change." Chiarello was chosen for his role in leading the U.S. maritime industry toward natural gas as fuel. TOTE is building the first natural gas-powered containerships in the world to serve Puerto Rico and is converting its ships in Alaska to natural gas; TOTE is the first in the United States to convert its fleet to liquefied natural gas (LNG).

Ulrichs: CEO at Rickmers-Linie

Ulrich Ulrichs, COO of Rickmers-Linie has been promoted to CEO of the heavy lift and project cargo liner service specialist, effective May 1, 2014. In this context Rüdiger Gerhardt has passed on the role of Global Head of Rickmers-Linie to Ulrichs.

Ulstein Increases U.S. Focus

"U.S.A. is an increasingly important area of growth, and we see the importance of being present (at the recently held OTC in Houston)" said Gunvor Ulstein, CEO Ulstein. Several Ulstein designed vessels are working in the Gulf of Mexico with Galveston as port. A N.Y. listed ship owner recently bought eight platform supply vessels from Ulstein. And Ulstein was recently contracted to design their first vessel to be constructed in U.S. The vessel of the large and new-developed offshore construction vessel design (SX165) will be constructed at Edison Chouest Offshore's LaShip yard in Louisiana. The contract also includes options. Edison Chouest Offshore operates a fleet of more than 200 vessels. It was important for Edison Chouest Offshore to establish themselves in the Gulf of Mexico with a large Jones Act construction vessel, and the SX165 design was selected for building such a vessel at their own shipyard. The current market situation indicates that the demand for such vessels will be strong in the coming years.

Vessel Safety, Onboard Management Go Hand-in-Hand

Attitude change is key to boosting shipping's professional image, says Rajaish Bajpaee, CEO, Bernhard Schulte Shipmanagement (BSM). Ensuring a robust and dependable safety culture onboard ship is essential to reducing large scale accidents at sea, which is why BSM has placed seafarer attitude-change at the heart of its loss-prevention strategy. "Getting your onboard and shore-based management teams to embrace a loss-prevention mind-set is crucial to the industry goal of no injuries or loss of life, no damage or loss to cargo, no damage or loss to the ship, and no damage or loss to the environment," said Bajpaee.

IRClass Makes Three Appointments

Indian Register of Shipping (IRClass) announced three new senior appointments aimed at boosting its presence in key international maritime centers. Narayanan Shankar joins as Senior Vice President of Business Development in Singapore. Praveen Kumar Mishra has been appointed as Vice President of IRClass in London. Ravi Kiron Kalra has been promoted to Head of Safety from his previous role as Senior Principal Surveyor in IRClass based in Mumbai.

DNV GL Acquires Marine Cybernetics

DNV GL acquired Marine Cybernetics, a company for third-party testing of computer control systems. The acquisition expands DNV GL's scope of services in the offshore and maritime industries. Marine Cybernetics was established in 2002 as a spin-off from the Norwegian University of Science and Technology.

Vergine Named CEO of Saipem

The Board of Directors of Saipem S.p.A. confirmed the appointment of Umberto Vergine as CEO of Saipem S.p.A.

Allianz Names Khanna

Allianz Group's specialist corporate insurer Allianz Global Corporate & Specialty (AGCS) announced the appointment of Captain Rahul Khanna to Global Head of Marine Risk Consulting, effective July 1, 2014.

Harvey Gulf Sells Towing Division to Signet Maritime

Harvey Gulf International Marine sold its towing division to Signet Maritime Corporation. Through the deal, Signet will acquire eight offshore towing vessels (OTVs) ranging in size from 75 to 153 metric tons bollard pull. The transfer of OTV ownership was completed on May 15, 2014 in New Orleans, with financing provided by Wells Fargo Equipment Finance as part of a $209 million syndicated financing facility.

Chet Morrison Names Shaw, Ristic

Jerome Shaw has been named VP of Marine Construction for Chet Morrison Contractors, LLC, bringing more than 20 years of experience in the oilfield marine service lines. He will be responsible for the strategic planning, management and operations of the division. He takes over for Brett Blanchard, who has been named to Chet Morrison Contractors' Board of Managers. Replacing Shaw as HSEQ Director is Bo Ristic, who previously served as Executive HSEQ and Business Development Manager for Triton Diving Services. Ristic has more than 15 years experience managing complex projects and developing HSEQ action plans.

Maritime College Honors Angerame, Bouchard

The State University of New York (SUNY) Maritime College honored two industry leaders at its annual Admiral's Scholarship Dinner on May 6. The College honored Richard A. Angerame,

Morton S. Bouchard III and Dr. Michael A. Cappeto

Waryas

Ladd

Hoek, Terlouw, Kapitein & Bekker

Class of 1973, President and CEO of utiliVisor, and Morton S. Bouchard III, President and CEO of Bouchard Transportation Company, Inc. for their generous and continued support of the College and its students.

Waryas III Joins MPS

Marine Procurement Solutions (MPS) announced the appointment of Ed Waryas III as Marketing Manager. MPS offer sship owners a cost effective alternative for maritime e-Procurement. Waryas III will be responsible for the marketing and sales of Marine Procurement's expanding product line up which provides a modern approach to the user interface by utilizing intuitive usability.

Ladd Joins EBDG

Elliott Bay Design Group (EBDG) hired Jen Ladd to head its human resources department. Ladd, formerly a consultant for the firm, brings more than 18 years of experience to her new role as part-time HR director.

MacNeil Joins New England Ropes

TEUFELBERGER Fiber Rope Corporation, based in Fall River, Mass., hired Stuart MacNeil as an Associate Market Manager for the New England Ropes brand within its Pleasure Marine division.

Clark Joins ASA

The American Salvage Association appointed Jason Clark as the Association's Communications and Public Relations Manager. Jason replaces the previous Communications and Public Relations Manager, Anne Davis Burns.

ABS Wins FLNG Contract

ABS won the classification contract from Petronas, Malaysia's national oil company, for the company's second floating LNG facility (PFLNG 2). The vessel will be built at the Samsung Heavy Industries yard in Geoje, Korea.

Start-up Enters FPSO Market

Deep Sea Mooring (DSM), a supplier of mooring solutions and services for the offshore industry, is backing the launch of a new, specialist business dedicated to subsea installation solutions. Deep Sea Installation (DSI), which will initially focus on the FPSO segment, is opening in Singapore with 12 highly experienced staff and an ambition to quickly establish itself in the key regional markets of Asia, West Africa and Europe.

Corvus Partners with GMC

Corvus Energy entered into an agreement in principle with BW Ventures' Green Marine Capital (GMC), a Maritime Technology Investment Partnership, for a strategic investment of $5 million with the primary purpose of funding working capital requirements. In addition, the company announced that Andrew Morden, CFO Officer, has been appointed as interim CEO replacing Brent Perry effective May 5, 2014.

Samson, United Offshore Unite

Samson and United Offshore Services (UOS) announced a partnership to supply Samson high-performance synthetic ropes to Europe. This expansion of the UOS product offering is driven by the increasing demand from their customers who recognize and value the advantages of heavylift slings made with synthetic rope.

Thrustmaster Closes OTC with Dutch Barge Company Deal

Thrustmaster of Texas closed out this year's OTC by placing ink to paper after signing a contract on the trade show floor with the Dutch Barge Company to supply a complete thruster package. Thrustmaster is staged to supply a complete thruster package to outfit a multi-purpose offshore supply vessel that will be classed by Buereau Veritas for dynamic positioning class two operations.

MARAD Office Realigns

The Maritime Administration (MARAD) announced an organizational realignment. Former Office of National Security is now the Office of Strategic Sealift, with three areas of focus:

- Federal Sealift continues to be responsible for Ready Reserve Force vessels, Emergency Preparedness and the National Defense Reserve Fleet.
- Commercial Sealift will coordinate both the Cargo Preference and Maritime Security Programs.
- The Office of Maritime Workforce Development will evaluate mariner training needs, and enforce service obligations for maritime academy graduates.

70 Years Later & Still Leak-Free

World War II Liberty Ship Tests Longevity of Grooved Piping Systems

To address the sudden need for supplies overseas during World War II, the United States government launched the Emergency Shipbuilding Program in 1941 that resulted in the construction of more than 5,700 cargo ships for the U.S. Maritime Commission. 2,710 of these vessels were of a design that became known as Liberty ships. These vessels were designed as economically and quickly built cargo steamers that formed the backbone of a massive sealift of troops, arms, materiel and ordnance to every theater of the war. Two-thirds of all cargo that left the U.S. during the war was shipped on Liberty ships. From beans to bullets and, in some cases, troops, each ship carried almost 9,000 tons of cargo.

Located in Baltimore, Maryland, the S.S. John W. Brown is one of two surviving fully operational Liberty ships preserved in the U.S. Launched at the Bethlehem-Fairfield Shipyard in Baltimore on September 7, 1942—Labor Day—the Brown was crewed by about 45 civilian merchant seamen, and its guns were manned by 41 Navy Armed Guard personnel assigned to the ship. The Brown was fitted out to carry troops as well as cargo. Around 500 soldiers at a time could be transported aboard the ship.

The John W. Brown saw duty in many Mediterranean ports during invasions and steamed in convoys that were attacked by enemy aircraft and submarines, but it was never seriously damaged. In total, the Brown made 13 voyages during and immediately after World War II. Her maiden voyage was to the Persian Gulf, carrying military equipment for Russia. Most of the rest of the ship's wartime voyages were to the Mediterranean Sea, including duty during the Anzio landings. She also served an important supporting role for the invasion force of southern France during Operation Dragoon in August 1944.

Immediately following the war, the Brown carried government cargoes to help rebuild war-torn Europe. From 1946 to 1982, the ship served as a floating maritime high school in New York City. In 1983, Project Liberty Ship acquired the Brown and, in 1988, moved the vessel to the harbor of her birth where it serves as a memorial museum ship to this day. The John W. Brown is one of only a few ships listed in the National Register of Historic Places.

Quick Build, Long Life

Liberty ships like the Brown were not expected to last much longer than five years, but the 441-foot-6-inch-long Brown looks and sails almost exactly as she did at the end of the war. Still powered by a reciprocating, triple-expansion steam engine, a relic from an earlier time in maritime history, the Brown's engine is fed with steam from two oil-fired boilers and drives a single four-bladed propeller 18 feet in diameter.

The longevity of the Brown can be credited to the students and instructors who lovingly cared for the ship during her years as a high school, and to the all-volunteer crew that returned it to operating condition and continue to maintain it today. Another element of its longevity is the systems selected and installed all those years ago, including the ballast lines that are joined with Victaulic grooved couplings.

According to Mike Schneider, a retired Navy captain and volunteer on the Brown for more than 25 years, while not all of the ballast lines are still used for their original purpose, "the lines still have fluid in them so they have to be integral or pipelines with integrity; we

The John W. Brown

can't have any leaks in them."

For more than 70 years, the lines have remained leak-free. According to Schneider, there is no known record of any maintenance being performed on the ballast lines. The grooved couplings visible on the piping today are the original couplings installed in 1942. In more than 70 years of service, the couplings never leaked or required replacement.

The Details

Found on the grooved carbon steel piping of the ballast system are flexible malleable iron Victaulic couplings, which at the time were referred to as standard couplings for grooved steel pipe. Victaulic Style 77 flexible grooved couplings are the equivalent of these couplings today.

Lines from the engine room to the forepeak tank, the bilge wells in the forward three cargo holds, and the #1 and #2 cargo deep tanks are joined with the couplings. The four lines to the deep tanks are 4-inch diameter lines and have around 32 couplings. These cargo deep tanks and the associated piping are not in use today, but were designed to handle cargo oil carried in the tanks. The single line to the forepeak tank is a 3.5-inch diameter line and has approximately nine couplings. This line is still in use and carries fresh water stored in the forepeak tank.

The four lines to the bilge wells in the #1 and #2 cargo holds are 3 inches in diameter and are for pumping water from the bilge wells. There are approximately 18 couplings on these four lines. All numbers are estimates because not all couplings are presently exposed.

The Benefits

From ease and speed of installation to accommodation of piping system movement and vibration, many of the reasons grooved couplings were likely selected for the John W. Brown are the same reasons grooved systems are specified for new ship construction, retrofit and repair today.

Because Liberty ships needed to be constructed quickly—Bethlehem-Fairfield could build one in as few as 28 days and launched an average of almost two each week—speed and ease of installation was probably the most important factor in selecting grooved joining systems for the Brown. Simply put, grooved mechanical piping systems help yards build, commission, test and turn over ships quicker.

A grooved joint comprises four elements: grooved-end pipe, a gasket, coupling housing, and nuts and bolts. The groove is made by cold forming or machining a groove into the end of a pipe. A gasket is centered around two abutted grooved pipe ends, and the coupling housing segments are placed over the gasket so that the key sections of the housing engage the grooves. The bolts and nuts are tightened with a socket wrench or impact wrench. In the installed state, the coupling housing encases the gasket and engages the grooves around the circumference of the pipe to create a leak-tight seal in a self-restrained pipe joint. Following installation, the joint can be visually inspected: metal-to-metal bolt pad contact confirms proper assembly.

With no heat or flame required for assembly, grooved systems offer easier, safer installation than welded systems. The lack of welding reduces or eliminates fumes and particulate matter emissions, hot works, fire watches and the confined space considerations and other precautions specific to welding. Compared to flanges, grooved couplings offer considerable weight and space savings.

The flexibility and vibration attenuation qualities of grooved couplings likely helped increase the life of the Brown's ballast system piping. Flexible grooved couplings permit a limited amount of linear and angular movement at the pipe joint, which can accommodate system expansion and contraction and help absorb the strains and stresses imposed on the piping as a result of typical ship operating conditions. This flexibility can also accommodate minor misalignment, which would have simplified the assembly of large prefabricated sections of the Brown and the coordinating piping systems within each section. Excessive vibration can decrease the lifetime of a piping system, but the elastomeric gasket contained within the grooved coupling creates discontinuity, reducing noise and vibration transmitted through the piping.

The longevity of the John W. Brown and its ballast system demonstrate the advantages grooved piping systems can bring to the shipbuilding industry. Many of the qualities considered in pipe-joining systems 70 years ago still hold true today: speed and ease of installation and maintenance, safety, reduced fire hazards and issues associated with welding, reduced downtime, and reduction in vibration and noise transmission. Liberty ships were at one point referred to as "five-year ships" for their expected service life, but the Brown has proven that a well-maintained vessel with durable, reliable piping systems—the veins and arteries of a ship—can greatly exceed expectations.

Ballast lines onboard John W. Brown

Project Liberty Ship

Project Liberty Ship is dedicated to the preservation of the Liberty ship S.S. John W. Brown as a living memorial to the men and women who built the great Liberty Fleet and to the merchant seamen and U.S. Navy Armed Guard who sailed the ships across the oceans of the world. Project Liberty Ship offers public tours, educational programs and Living History Cruises aboard the Brown. This "Voyage into History" is an exciting six-hour ride during which guests learn about the ship's history through historical reenactments, live music, flybys of vintage World War II aircraft and tours of the museum spaces, crew quarters, bridge, flying bridge, chart room, radio room, mess rooms, troop berthing areas, stern gun deck and more.

Visit **www.liberty-ship.com** for hours of operation, to purchase tickets and to learn more about the history of the vessel and volunteer opportunities.

Ship Location: Pier One, 2000 South Clinton Street, Baltimore, MD
Phone: 410-558-0646

About the Author
David Gibbons is Maritime Division Manager with Victaulic, a leading producer of mechanical pipe-joining and fire protection systems. Victaulic develops products for a full range of industrial, commercial and institutional applications. For more information, visit www.victaulic.com.

“Out of the Water in 60 Seconds”

Innovative Survivor+ Personal Overboard Survival System is new class of PFD with potential to significantly improve safety

Many people are still drowning unnecessarily at sea. Preparation, training and equipment undoubtedly save many lives, but the key questions remain: why are so many people still drowning and what solution exists today that may significantly reduce fatalities?

For anyone travelling by sea, whether a passenger on a ferry or a maritime worker, being in the water after falling overboard, abandoning a vessel or being involved in a helicopter ditching is a dangerous situation. Survivors face a greater risk of death with every additional minute spent in the water due to swimming failure and hypothermia followed by drowning. A key component to survival is being able to get out of the water as quickly as possible.

The regulations surrounding survival craft for the shipping industry is a key factor currently under debate and, more specifically, the subject of cruise ship safety has also been brought to the attention of legislators at a recent NTSB (National Transportation Safety Board) hearing. Whether lives could have been saved in recent tragedies such as the South Korean ferry disaster in April and the Costa Concordia shipwreck in January 2012 is also now being addressed.

In his March 2014 report, ‘The Need to Provide More Protection to Cruise Passengers,’ Captain William H. Doherty, Director of Maritime Relations for Nexus Consulting Group, warns about “reactive legislation.” He said: “To date, all legislation and regulatory activity has been more “reactive” to events which occurred that painfully identified our inadequacy to fully protect human life and our environment in the large cruise ship arena.”

Loss of Life at Sea

The highest loss of life worldwide is in the transport of passengers either on RoRo, passenger ferries, or cruise ships. A number of these sail from under privileged countries and capsize as a result of overloading. However other causes include collisions, rough seas, fire and or grounding. During a 10-year period (2004-2014) approximately 4,631 people died on 13 maritime disasters. Statistics for the U.S. Fishing industry for a 10-year period (2000 to 2010) reports 545 casualties. Of these, 279 (51%) result after a vessel disaster, 40 flooding, 27 vessel instability, 26 large wave and 148 severe weather.

In man overboard (MOB) situations, freezing sea and air temperatures, disorientation, panic, high sea states, exposure to sea spray and frigid winds all combine to overcome a person in water within just a few seconds, even if they are wearing a PFD (Personal Floatation Device). Data published by the U.S. Coast Guard on the effect of hypothermia on most adults states that in a water temperature of 32.5F (0.3C), exhaustion or unconsciousness will occur in under 15 minutes with an expected time of survival of under 15 minutes to 45 minutes. In temperatures of 40 to 50F, exhaustion occurs in 30 to 60 minutes with the expected time of survival at 1 to 3 hours. In temperatures of 50 to 60F, expected time of survival is 1 to 6 hours.

John Swain, the CEO of Survival Systems Training Ltd in Nova Scotia, Canada, is an offshore safety and survival specialist, especially in relation to cold water emergencies: “There are three things that happen when you hit the water. First, cold water shock, which then introduces swimming failure, so negates your ability to tread water or reach safety if, indeed, it is available. Then quite quickly, hypothermia starts.”

Equipment such as buoyancy devices, life jackets, immersion suits and other PFDs have been the primary means to protect from drowning when entering the water without a life boat, but sometimes they are not enough in the most extreme circumstances. It is also true that multi-person survival craft and other life rafts can be very difficult to launch and board in extreme conditions.

There are many partial solutions that keep the survivor in the water, but there is also a more complete solution which could significantly reduce the risk of fatalities at sea by getting the person out of the water quickly, according to Cobham Life Support, part of Cobham plc’s Cobham Mission Systems division, an established safety systems market leader in the defense sector.

“Out of the Water in 60 Seconds”

Dr. Chris Brooks is an internationally recognized authority on life jacket and PFD use and cold water survival, and has produced reports in which he covers the need for forward-looking solutions. In the

(Continued on the bottom of page 73)

Stauff Sensors Offer Real-time Oil Monitoring

Oil condition sensors detect the condition of fluids in real time and allow oil changes when necessary. According to Stauff, its OCS oil condition sensors determine the actual condition of hydraulic fluids and lubricating oils in real time, subject to all the criteria mentioned above. The sensors enable service and maintenance personnel and production managers to carry out complex and cost-intensive oil changes as and when required by the actual condition of the fluid, and not based on speculation or statistical maintenance schedules. This increases the availability and productivity of machinery and systems, reduces potential environmental pollution and reduces operating and maintenance costs for the system throughout its entire operating life. OCS oil condition sensors are designed for permanent installation in hydraulic and lubricating oil systems and, thanks to their robust construction and stainless steel housings, can even be used under extreme conditions with temperatures from -20 °C to +120 °C. They are suitable for use at operating pressures of up to 20 bar.

www.stauff.com

Courtesy of Walter Stauffenberg GmbH & Co. KG

AWT Launches Voyage Calculator

Image courtesy AWT

Applied Weather Technology, Inc. (AWT) debuted its Voyage Calculator program which calculates the distance, speed loss and corresponding cost of a voyage from one port to another, taking into account weather, ocean currents, hire rate and other factors. The output from Voyage Calculator is a cost estimate of a voyage in terms of charter time and fuel consumption. In addition to the weather and ocean current information that yields expected speed loss via AWT's proprietary Climatological Ship Resistance (CSR) model, Voyage Calculator can account for different fuels and rates of consumption.

www.awtworldwide.com

First Pieces of Scrubber System Fitted on AIDAluna

Photo: AIDA Cruises

AIDAluna had installed the first elements of a comprehensive filter system with which AIDA Cruises is gradually fitting out its fleet. The system for the treatment of exhaust gas emissions, which was developed within the Carnival Group, uses a new technology built in a compact form making it possible to technically integrate all of the main cleaning stages for the first time. AIDAluna is now fitted with the first element of the system, a scrubber that reduces sulfur oxide emissions by around 90%. Further elements of the exhaust gas treatment system will be installed in due course.

www.aida.de

Applied Membranes' Line of Watermakers

Applied Membranes, Inc. manufactures reverse osmosis systems, membranes and equipment. Backed by a large manufacturing facility, serving the entire range of commercial applications, and with installations in over 100 countries worldwide, Applied Membranes stocks a substantial inventory of watermaker parts, consumables, yacht-sized media filters, UV sterilizers, to cleaning, storage and mineralization cartridge filters and accessories.

www.appliedmembranes.com

Laborde Repower Provides Long Tug Endurance

Smith Maritime depends on Laborde. For its third repower with Smith, Laborde supplied three Mitsubishi S12R-Y2MPTK Tier II engines rated at 5,000 hp for the tug Rhea. For its maiden voyage, Rhea towed a huge piece of oil-field equipment for seven weeks. Rhea is a small, powerful, agile, seagoing tug capable of withstanding the rigors of any service in all weather conditions.

www.labordeproducts.com

John Deere's Engines for Marine Auxiliaries

John Deere Power Systems' full line of radiator-cooled, dry-exhaust-manifold PowerTech auxiliary engines are ideal for powering deck auxiliaries, including pumps, winches, cranes, hydraulics and generators. The lineup meets EPA Marine Tier 3 emissions regulations for U.S. waterways, and offers reliable, cost-effective power to customers for their auxiliary applications. Marine Tier 3 auxiliary drive engines will be available in summer 2014.

www.JohnDeere.com/jdpower

Rio Controls & Hydraulics

Rio Controls & Hydraulics' steering system modifies existing inductive sensors used in the oil and gas industry and designs a steering system that utilizes this technology to provide accurate, longer lasting sensor command and feedback signals. This technology revolutionizes the marine industry by replacing conventional devices with cutting edge technology. The system eliminates up to 62 hookup points and three junction boxes.

www.riomarineinc.com

Hebe: A New Steering Control System

MacGregor presented a new addition to its Hatlapa product range: the steering control system, Hebe. It is offered as an integrated part of the company's Hatlapa range of steering gear solutions and its inclusion will deliver operational and equipment compatibility benefits for customers. The name Hebe for the steering control system follows the tradition of naming Hatlapa's steering gear products after Greek gods and goddesses, Hebe is the goddess of youth.

"Hebe main steering control systems are designed for operation from nominal 24V DC or 110/230/440V AC power supplies and are suitable for virtually all SOLAS vessel types and high speed craft," said Carsten Pump, Hatlapa steering gear specialist at MacGregor. "They can also offer cost effective control solutions for smaller non-SOLAS units such as workboats and patrol craft."

The Hatlapa steering gear portfolio comprises four-cylinder ram-type steering gear up to 8,893 kNm, two-cylinder ram-type steering gear up to 950 kNm, rotary vane-type steering gear up to 1,100 kNm, twin-rudder steering gear, compact piston type steering gear and rudder carriers.

www.macgregor.com

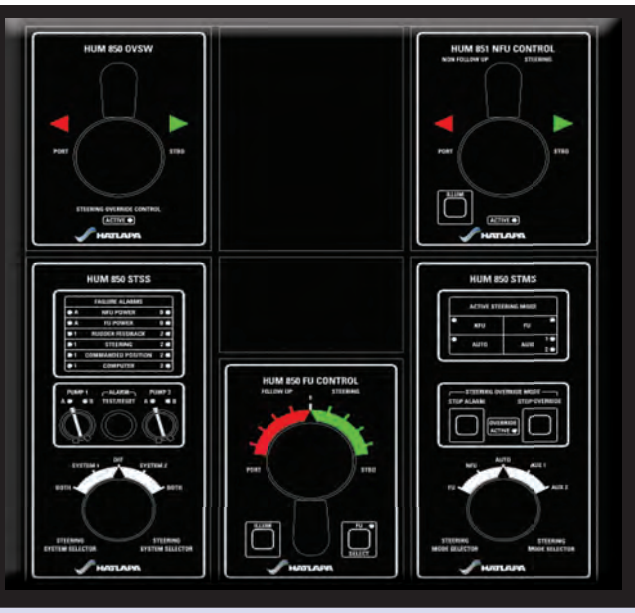


Image: MacGregor

Safe Escape Locking Systems

This simple, effective locking device locks down hatches while still allowing secured crew members to escape in a quick and easy manner. The SEL protects the vessel and crew by providing a resilient barrier from outside threats, such as piracy and theft. The SEL complies with SOLAS, USCG and NVIC regulations and is approved by ABS also meets and exceeds ISPS standards.

www.safeescapelock.com

Marco's BLASTMASTER 750 & 1600 CFM Air Dryers

Marco Group International's Blastmaster 750 & 1600 CFM Air Dryers remove up to 99% of water in compressed air by cooling and then passing it through moisture absorbing desiccant tablets. Wet abrasive reduces production rates by causing poor abrasive flow through the abrasive blasting system, resulting in excessive wear on equipment, increasing maintenance costs and increasing abrasive consumption.

www.marco.us

Multicam Introduces i401 Laser on 2000 Series

MultiCam has launched Synrad's new Firestar i401 laser on its 2000 Series CNC machines. The Synrad i401 laser produces a 400 watt beam. Four field replaceable integrated radio frequency modules facilitate ease maintenance. Twenty-Three percent more energy efficient and 24 percent less than previous models, the i401 laser's beam quality has the ability to produce consistent, high-quality parts over a large work surface.

www.MultiCam.com

Kissling Battery Disconnect Switches

Kissling Electrotec manufacturers battery disconnect switches range from 200 A to 500 A for the highest possible quality requirements in all vehicle applications. Options include single or dual pole configurations. Kissling switches from Peerless offer Environmentally sealed (IP67), High resistance to vibration and shock, full-amperage continuous duty at up to 32 VDC, Flange-mount or central-mount and Lock/out tag out capability and removable key option.

www.peerlesselectronics.com

Stainless Steel Grab Rail

Created with an eye to design as well as utility and economy, the new 9" stainless steel grab rail from Schmitt & Ongaro adds a finishing touch to any vessel. Made of cast stainless steel and fitted with engineered Santoprene rubber grip inserts, the rail offers a safe and comfortable grasp, and is approved by the NMMA and the International Marine Certification Institute.

www.schmittongaromarine.com

What's in Your Engine Oil?

Volvo Penta of the Americas is offering an Oil Analysis Program for all Volvo Penta diesel and gas engines. With this information, maintenance can be planned effectively and unplanned downtime and repair expenses avoided. Collect the sample and send it to a Volvo Penta laboratory and a complete report by email will be sent back with recommendations for maximizing engine performance.

www.volvopenta.com

UT99 AG's GL-Approved Oil Mist Separator

UT99 AG manufactures oil mist separators for crankcase ventilation of combustion engines and for lubricating oil tank vent for turbines. Environmental and safety requirements in the marine and offshore sectors mean that with GL approval, the UT99 AG has proven that their products fulfill highest demands on safety and reliability. Discharge of emissions from crankcase ventilation and lubricating oil tank ventilation is almost eliminated.

www.ut99.ch

Alfa Laval's PureBallast 3.0

Alfa Laval has redefined its chemical-free ballast water treatment system. A 600 cu. m./hr. reactor has been added to the portfolio, enabling new configurations with fewer components and energy savings. The system has received IMO type approval from DNV. An advantage of the PureBallast 500 and 600 configurations is the reduction in system components. Installation is simplified and space is saved.

www.alfalaval.com/marine

PPG PMC Coats USS Freedom

PPG Industries' protective and marine coatings (PMC) business received The Society of Protective Coatings (SSPC) 2014 Military Coatings Project Award of Excellence for the performance of AMERCOAT 240 and PSX 700SG coatings on the USS Freedom, the lead ship of the Navy's littoral combat fleet. The award is given annually by SSPC to recognize exceptional coatings work performed on U.S. military ships or facilities.

www.ppgpmc.com/northamerica

"Out of the Water in 60 Seconds"

(Continued from page 70)

2008-published report, 'Survival at Sea for Mariners, Aviators, and SAR Personnel,' Dr. Brooks writes about the inadequacies of life rafts and life boats, stating: "…a whole new concept is required to design a person-mounted life raft that may incorporate personal flotation and hypothermia protection, and most important of all be easy to board…."

One answer could be a completely new class of PFD which has just been launched for the offshore sector, but could also help save lives in other areas such as fishing, ferries and merchant ships. Cobham Life Support's innovative wearable personal overboard survival system, Survivor+, uniquely incorporates both a SOLAS-approved inflatable life jacket and a tethered personal life raft into a single compact vest. It enables the MOB to remove themselves from the water and the elements in as little as 60 seconds, therefore significantly improving the chances of survival. The lightweight system can be worn without hindering movement, is easy to use and deploys automatically when the wearer is immersed in water, with a manual-only option also available.

"We need a different perspective on how to save lives," said Don Blackman, Engineering Research Manager, Cobham Life Support. "People are always going to end up in the water in the event of a disaster, but, if passengers or offshore workers had Survivor+ instead of just a regular life jacket, they will be able to be out of the water in only one minute. Survivor+ will not take up any more room than the current life jackets and we believe it would be less costly for the industry to adopt them."

The major components of the Survivor+ system are already in use around the world. The personal life raft has been in use by the US, UK and other military services for more than 20 years and was originally designed to save the lives of pilots and air crew who might have to ditch or bail out over cold water, and then have to wait for some hours for rescue to arrive. The life jacket, as a SOLAS approved device, is used in a wide variety of global maritime operations. Survivor+ is a commercial version of the survival system used by the military, but with enhancements to make the product easy to use with minimal or no training.

Whatever the outcome of the current debate on future legislation surrounding out-of-water-craft on vessels, there is a strong case for the use of Survivor+ systems. If more boats are forced to carry survival craft, Survivor+ could be the answer for older vessels. It is less costly and will not require vessels to undergo the necessary rebuilding work to accommodate multi-person craft.

"We certainly identify with both sides of the debate," said Don Blackman. "We agree with the experts that you must get people out of the water as soon as possible and into their own personal safe environment. We also recognise that the addition of large multi-person craft may not in fact save lives. They can be expensive and unwieldy, difficult to launch and difficult for people to board. Regulating the shipping industry to carry survival craft will not necessarily save lives if people can't board them in a catastrophic disaster situation. As with the recent Korean ferry that capsized very quickly, the captain stated he was worried about giving an abandon ship order because the passengers would end up in the cold water and potentially perish from hypothermia or cold water shock. These victims were unfortunately in a no-win situation."

Awarded a certificate of compliance from Lloyd's Register after successfully completing all the materials and performance testing required under the IMO Life-Saving Appliance (LSA) Code, Survivor+ integrates a life vest and raft, using Cobham's own vacuum-packing technology, and is so ground-breaking, that no specific SOLAS category exists for it. Other distinguishing features of the Survivor+ life raft include ballast bags and sea anchor to provide stability and a water activated strobe light fixed to the top of the canopy for enhanced night detection. An integrated PLB option is also available.

The debate will continue about reducing loss of life at sea and finding pro-active solutions. Survivor+ looks certain to form a part of these discussions, a point reinforced by Bruce McDonald, Technical Manager for Fire and Safety for Lloyd's Register, who said: "Survivor+ provides a definite improvement to safety at sea."

BUYER'S DIRECTORY

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

ALUMINUM BOATS

Brunswick Commercial and Government Products, 420 Megan Z Avenue, Edgwater, FL 70518, USA , tel:(386) 423-2914, BCGPINFO@WHALER.COM

ANCHORS & CHAINS

Anchor Marine & Supply, INC., 6545 Lindbergh, Houston, TX , tel:(800) 233-8014, fax:(713) 644-1185, sales@anchormarinehouston.com

ATTORNEYS

Blank Rome - Admiralty & Maritime Law, 600 New Hampshire Avenue, NW, Washington, DC , USA , tel:(202) 944-3568, fax:(202) 772-5858, PBroadbent@BlankRome.com

AUTOMATIC IDENTIFICATION SYSTEM

Saab TransponderTech AB, SE-589 41 Linkoping , tel:46 13 180000, fax:46 13 180011, Info.transpondertech@saabgroup.com

BARGE FABRICATION

McDonough Marine Services, 1750 Clearview Pkwy. Suite 201, Metarie, LA 78634, USA , tel:800-227-4348, fax:(504) 780-8200, pstant@marmac.net

BATTERY CHARGERS

Ward's Marine Electric, 617 SW 3rd Avenue, Fort Lauderdale, FL 77258, USA , tel:(954) 523-2815, fax:(954) 523-1967, monica.avendano@wardsmarine.com

BOAT BUILDING AND DESIGN

Moose Boats, 274 Sears Point Road Port Sonoma Marina, Petaluma, CA , USA , tel:(707) 778-9828, fax:(707) 778-9827, abbie@mooseboats.com contact: Abbie Walther, www.mooseboats.com

Rigidized Metals Corporation, 658 Ohio Street, Buffalo, NY , USA

BOATBUILDING AND DESIGN

Brunswick Commercial and Government Products, 420 Megan Z Avenue, Edgwater, FL 70518, USA , tel:(386) 423-2914, BCGPINFO@WHALER.COM

Tampa Yacht Manufacturing, LLC, 4350 62nd Avenue North, Pinellas Park, FL , USA , tel:813-792-2114, fax:727-954-3436, robert.stevens@tampa-yacht.com contact: Robert Stevens, www.tampa-yacht.com

BOW AND STERN THRUSTERS

Omnithruster, 2201 Pinnacle Parkway Twinsburg,Ohio 44087 , tel:330 963-6310, fax:330 963-6325, widmer@omnithruster.com

COATINGS/ CORROSION CONTROL/ PAINT

Hempel A/S, Lundtoftegårdsvej 91 2800 Kgs. Lyngby , tel:45 4593 3800, fax:45 4588 5518, marine@hempel.com , www.hempel.com

Tri-State Coating and Machine Co. Inc., 5610 McComas Road, PO Box 296, Salt Rock, WV V4W 3S8, USA , tel:1-800-477-4460, fax:304-736-7773, brichmond@tscminc.com contact: Beverly Richmond, www.tscminc.com

COMMUNICATIONS

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

COMPRESSOR MANUFACTURERS

Bauer Compressors, 1328 Azalea Garden Rd., Norfolk, VA , tel:757 855-6006, sls@bauercomp.com

COMPRESSORS

Bauer Compressors, 1328 Azalea Garden Rd., Norfolk, VA , tel:757 855-6006, sls@bauercomp.com

CORDAGE

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

CORROSION CONTROL

Rustibus, 2901 West Sam Houston Pkwy, North SUITE E-325, Houston, TX 77041, USA , tel:(832) 203- 170, fax:(832) 203-7171, houston@rustibus.com

Ward's Marine Electric, 617 SW 3rd Avenue, Fort Lauderdale, FL 77258, USA , tel:(954) 523-2815, fax:(954) 523-1967, monica.avendano@wardsmarine.com

COUPLINGS

Centa Corporation, 2570 Beverly Drive #128, Aurora, IL 48331, USA , tel:(630) 236-3500, fax:(630) 236-3565, bobl@centacorp.com

CRANE - HOIST - DERRICK - WHIRLEYS

F&M MAFCO, Inc., 9149 Dry Fork Road, Harrison, OH , USA , tel:(800) 333-2151, fax:(513) 367-0363, websales@fmmafco.com contact: Jen Gardner, www.fmmafco.com

DECK MACHINERY- CARGO HANDLING EQUIPMENT

F&M MAFCO, Inc., 9149 Dry Fork Road, Harrison, OH , USA , tel:(800) 333-2151, fax:(513) 367-0363, websales@fmmafco.com

DIVING & SALVAGE

Hydrex Headquarters, Haven 29 – Noorderlaan 9 Antwerp 2030, Belgium , tel:32-3-213-5300 (24/7), fax:32-3-213-5321, hydrex@hydrex.be contact: Dave Bleyenberg, www.hydrex.be

Hydrex US, 604 Druid Rd E; Clearwater, FL, USA , tel:727-443-3900 (24/7), fax:727-443-3990, info@hydrex.us contact: Matthew Brooks, www.hydrex.us

DRILLS

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

DRIVESHAFTS

Centa Corporation, 2570 Beverly Drive #128, Aurora, IL 48331, USA , tel:(630) 236-3500, fax:(630) 236-3565, bobl@centacorp.com

EDUCATION

Sea School (U.S. Coast Guard Approved Courses), 8440 4th Street North, St. Petersburg, FL 70002, USA , tel:(800) 237-8663, cathybancroft@seaschool.com

ELECTRIC DRIVE SYSTEMS

Avtron, 7555 E Pleasant Valley Rd. Ste100, Independence, OH , USA , tel:216 642-1230, gabrielle.gillota@nidec-avtron.com

ELECTRIC MOTORS AND CONTROLS

Ward's Marine Electric, 617 SW 3rd Avenue, Fort Lauderdale, FL 77258, USA , tel:(954) 523-2815, fax:(954) 523-1967, monica.avendano@wardsmarine.com

ELECTRICAL EQUIPMENT

Ward's Marine Electric, 617 SW 3rd Avenue, Fort Lauderdale, FL 77258, USA , tel:(954) 523-2815, fax:(954) 523-1967, monica.avendano@wardsmarine.com

ELECTRICAL SERVICES

Ward's Marine Electric, 617 SW 3rd Avenue, Fort Lauderdale, FL 77258, USA , tel:(954) 523-2815, fax:(954) 523-1967, monica.avendano@wardsmarine.com

ENVIRONMENTAL SOLUTIONS

Environmental Solution, Inc., P.O. Box 788, Wake Forest, NC 99835, USA , tel:(919) 740-0546, john@totalbiosolution.com contact: John Paparone, www.totalbiosolution.com

FANS

Ward's Marine Electric, 617 SW 3rd Avenue, Fort Lauderdale, FL 77258, USA , tel:(954) 523-2815, fax:(954) 523-1967, monica.avendano@wardsmarine.com

FASTNERS

Nord-Lock / Superbolt, Inc., 1000 Gregg St., Carnegie, PA 92138, USA , tel:(412) 279-1149, fax:(412) 279-1185, Jason.Milburn@nord-lock.com

FILTERS/FILTER SYSTEMS

UT 99 AG Oil Mist Separators, Schaubenstrasse 5 CH-8450 Andelfingen , Switzerland , tel:+41 52 397 11 99, fax:+41 52 397 11 90, info@ut99.ch , www.ut99.ch/en

FUEL ADDITIVES

Nano Fossil Fuels Technology, LLC, 550 South 16th Street, Sparks, NV 60504, USA , tel:775-356-0280, fax:775-356-0283, nanofuels@sbcglobal.net contact: Ernie Gisler, www.combustion-catalyst.com

GALLEY EQUIPMENT

LOIPART AB, P.O.Box 694/Metallgatan 2-4, ALINGSAS , tel:+46 322 668 360, fax:+46 322 637 747, loipart@loipart.se

GROUNDING & EARTHING BRUSHES

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

INSURANCE SERVICES

WQIS (Water Quality Insurance Syndicate), 60 Broad Street 33rd Floor, New York, NY 18974, USA , tel:1-800-736-5750, fax:212-292-8716

INTERIORS

Rigidized Metals Corporation, 658 Ohio Street, Buffalo, NY , USA

LAUNDRY EQUIPMENT

LOIPART AB, P.O.Box 694/Metallgatan 2-4, ALINGSAS , tel:+46 322 668 360, fax:+46 322 637 747, loipart@loipart.se

LIFESAVING EQUIPMENT

CM HAMMAR AB, CM Hammar AB August Barks Gata 15 421 32 Västra, Frölunda, Sweden , tel:+46 31 70965 50, fax:+46 31 497023, info@cmhammar.com , www.cmhammar.com

HANSEN PROTECTION AS, P.O. Box 218, Tykkemyr 27 1597 Moss, Norway , tel:tel: +47 6900 1300, fax:fax: +47 6900 1301, hpro@hansenprotection.no , www.hansenprotection.no

LIGHTING SYSTEMS/ EQUIPMENT

Ward's Marine Electric, 617 SW 3rd Avenue, Fort Lauderdale, FL 77258, USA , tel:(954) 523-2815, fax:(954) 523-1967, monica.avendano@wardsmarine.com

NAVAL ARCHITECTS, MARINE ENGINEERS

Aveva Solutions Ltd, High Cross, Madingley Rd, Cambridge CB3 0HB, UK , tel:Tel +44 1223 556655 , www.aveva.com

JMS Naval Architects, 34 Water Street, Mystic, CT 22203, USA , tel:(860) 536-0009 EXT 16, fax:(860) 536-9117, RickF@JMSnet.com contact: Rick Fernandes, www.jmsnet.com

OFFSHORE SERVICES

Hydrex US, 604 Druid Rd E; Clearwater, FL, USA , tel:727-443-3900 (24/7), fax:727-443-3990, info@hydrex.us contact: Matthew Brooks, www.hydrex.us

PIPE FITTINGS/CUTTINGS/CONNECTING/ SYSTEMS

Tube-Mac Piping Technologies Ltd., 853 Arvin Avenue, Stoney Creek 32168, Canada , tel:(905) 643-8823 , x119, fax:(905) 643-0643, chris.peitchinis@tube-mac.com

PROPULSION CONTROL SYSTEMS

Centa Corporation, 2570 Beverly Drive #128, Aurora, IL 48331, USA , tel:(630) 236-3500, fax:(630) 236-3565, bobl@centacorp.com

PROPULSION EQUIPMENT

VOLVO PENTA OF THE AMERICAS INC, 1300 Volvo Penta Drive, Chesapeake, VA , tel:+1 757 3824010, lindsy.shrewsberry@volvo.com contact: Customer Relations Support, www.volvopenta.com

PUMPS

Ward's Marine Electric, 617 SW 3rd Avenue, Fort Lauderdale, FL 77258, USA , tel:(954) 523-2815, fax:(954) 523-1967, monica.avendano@wardsmarine.com

RIBS & INFLATABLE BOATS

Wing Inflatables, 1220 5th Street, Arcata, CA , USA , tel:(707) 826-2887, ewing@wing.com , www.wing.com

ROTATING EQUIPMENT

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

RUST AND PAINT REMOVAL

Rustibus, 2901 West Sam Houston Pkwy, North SUITE E-325, Houston, TX 77041, USA , tel:(832) 203- 170, fax:(832) 203-7171, houston@rustibus.com

SALT REMOVING PRODUCTS

Holdtight Solutions, PO Box 27907 Houston, TX 77227-7507 , tel:713 266- 9339, sales@holdtight.com

SEALS

Seco Seals, Inc., 1370 Logan Ave. Unit K, Costa Mesa, CA 63110, USA , tel:(714) 546-3478, secoseals@aol.com

SHIP REPAIR

Advanced Mechanical Enterprises, 217 SW 28th Street, Fort Lauderdale, FL 98052, USA , tel:(866) 377-0770, fax:(954) 527 – 0338, Christine@amesolutions.com

STEERING GEARS/ STEERING SYSTEMS

Jastram Engineering, 135 Riverside Drive, North Vancouver, BC,, North Vancouver , Canada , tel:(604) 988-1111, fax:(604) 986-0334, dholme@jastram.com

SURFACE PREP TOOLS

Rustibus, 2901 West Sam Houston Pkwy, North SUITE E-325, Houston, TX 77041, USA , tel:(832) 203- 170, fax:(832) 203-7171, houston@rustibus.com

TRAINING

Freelance Software, 39 Peckham Place Bristol, RI 02809, Bristol, RI , USA , tel:(401) 556-1955, fax:(401) 396-9717, chris@hawsepipe.com contact: Christopher Dady, www.hawsepipe.com

TRANSMISSIONS

Centa Corporation, 2570 Beverly Drive #128, Aurora, IL 48331, USA , tel:(630) 236-3500, fax:(630) 236-3565, bobl@centacorp.com

VACUUM TOILET SYSTEM

Jets Vacuum AS, Myravegen 1 6060 Hareid , tel:47 700 39 100, fax:47 700 39 101, post@jets.no

VIBRATION ANALYSIS

Advanced Mechanical Enterprises, 217 SW 28th Street, Fort Lauderdale, FL 98052, USA , tel:(866) 377-0770, fax:(954) 527 – 0338, Christine@amesolutions.com

WATER JET SYSTEMS

MJP Marine Jet Power AB, 1110A Claycraft Rd, Columbus, OH , USA , tel:(614) 759-9000 , www.marinejetpower.com

WINCH MANUFACTURER

Patterson Company, 870 Riversea Road, Pittsburgh, PA 30004, USA , tel:(412) 322-2012, fax:(412) 322-2785, russ.mayhew@pattersonmfg.com

WIRES & CABLE

Ward's Marine Electric, 617 SW 3rd Avenue, Fort Lauderdale, FL 77258, USA , tel:(954) 523-2815, fax:(954) 523-1967, monica.avendano@wardsmarine.com

Technology, Director
Job Location: USA, Seattle

The Technology Director - Liner Operations is responsible for the operational management and administrative direction of information technology (IT) operations for the Liner Operations business unit. Oversees the support and maintenance of existing systems and applications as well as the development of new technical solutions. Identifies hardware and software for purchase and directs implementation. Reviews project requests and assigns appropriate resources. Leads strategic planning and staffing responsibilities. Accountable for formulating and administering the department's annual operating budget as well as performing forecasting. Provides leadership and direction in policy and procedure development, enhancement and implementation. Develops and maintains partnerships throughout organization in order to attain departmental goals and objects. Ensures work is being performed in compliance with company standards.
Competencies:
- Ability to communicate technical and non-technical information effectively verbally and in writing.
- Ability to train and direct the work of others.
- Ability to evaluate process effectiveness and develop change or alternatives.
- Ability to interface business applications with other systems.
- Knowledge of standard programming languages, concepts, practices and procedures.
- Knowledge of computer software and operating systems.
- Knowledge of terminal processes including, but not limited to, gate operations, cargo operations, yard operations, and maintenance/repair and equipment tracking/optimization.

Minimum of 8-10 years of related information technology management experience specific to implementing one or more of the following: terminal operating systems, maintenance and repair, equipment management and tracking, and/or CPS/RFID/OCR technologies.
Advanced proficiency in Microsoft Excel, Outlook and Word.
Advanced proficiency in software package selection and implementation, change management, project management and gathering business requirements using a structured methodology.

Kathy Lonetto
Crowley Maritime Corporation
Seattle WA USA
Email: kathy.lonetto@crowley.com

Able Seaman - Limited and Unlimited
Job Location: USA, Amelia

Accepting applications for Able Seaman - Limited and Unlimited to work on OSV in the Gulf of Mexico.
Must have valid MMC to include: STCW BST, RFPNW, TWIC, Driver License.
Comprehensive benefits package available. Must be able to pass post offer physical and drug screen.
Please request application on our website at http://www.tdw.com/working-with-tidewater/marine-manning-requirements/manning-gulf-of-mexico-california/

Denise Baisden
Tidewater Marine, L.L.C.
200 Ford Industrial Road
P.O. Box 1519
Amelia LA 70340 USA
Phone: 985-631-5820
Email: dbaisden@tdw.com
Web: http://tdw.com/

Master 500/1600 GRT/3000 ITC - Unlimited - Brazil
Job Location: USA, Amelia

Job Description
Accepting applications for Master 500/1600 GRT/3000 ITC Near Coastal/Oceans to work on OSV in Brazil.
Valid USCG License, TWIC and Driver License.
Must have 2 years of recent experience as Master on OSV.
Comprehensive benefits package available. Must be able to pass post offer physical and drug screen.
Please request an application on our website at http://www.tdw.com/working-with-tidewater/marine-manning-requirements/manning-gulf-of-mexico-california/

Denise Baisden
Tidewater Marine, L.L.C.
200 Ford Industrial Road
P.O. Box 1519
Amelia LA 70340 USA
Phone: 985-631-5820
Email: dbaisden@tdw.com
Web: http://tdw.com/

Marine Paint Foreman
Job Location: USA, North Kingstown

J. Goodison Co. currently has an opening for an experienced Marine Paint Foreman with supervisory skills, and leadership ability.
Responsibilities Include but are not limited to the following:
•Activities to support the blast & paint operations
•Plan, layout, assign, and supervise the work of 5-10 employees
•Paperwork, maintain daily logs, prepare reports, maintain paint labeling system
•Supervise and participate in mixing and thinning of paint
•Coordinate inspections and paint approvals
Education / Experience
•Minimum 5 years' experience
•SSPC or NACE certification preferred
•Supervisory/Foreman experience
•Ability to plan, execute, and complete jobs on time
•Skill in applying coatings and other finishes by brush & roll, and spray equipment
•Knowledge of coating data sheets and MSDS.
•Knowledge of the hazards and safety precautions of the work place
This position offers the following benefits:
•Excellent Pay
•401K, Profit Sharing, and Cash Balance Retirement packages
•Medical, Dental, and Vision coverage
•Vacation and Holiday
•Bonuses

Danielle Goodison
J. Goodison Co., Inc.
244 Burlingham Ave
North Kingstown RI 02886 USA
Phone: 401-667-5935
Fax: 401-667-5939
Email: dgoodison@jgoodison.com

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