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Marine News

OCTOBER 2015
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Salvage & Spill Response:
Unresolved Issues Hamper Progress

Maritime Security Workboats:
U.S. Yards Compete In Global Markets

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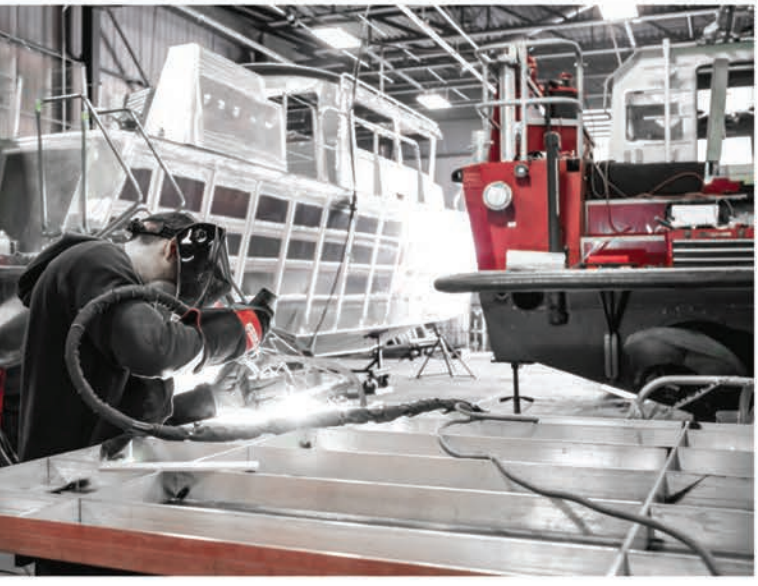

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The chemical tanker *Maritime Maisie* in 2014 suffered a fire off the Republic of Korea and quickly became the poster child for "Place of Refuge" salvage conflicts, an issue near and dear to both ASA and the ISU.

(Photo: ISU)

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Florida: 215 NW 3rd St., Boynton Beach, FL 33435
tel: (561) 732-4368; fax: (561) 732-6984
New York: 118 E. 25th St., New York, NY 10010
tel: (212) 477-6700; fax: (212) 254-6271
www.marinelink.com

PUBLISHER
John C. O'Malley • *jomalley@marinelink.com*

Associate Publisher & Editorial Director
Greg Trauthwein • *trauthwein@marinelink.com*

Editor
Joseph Keefe • *keefe@marinelink.com*
Tel: 704-661-8475

Web Editor
Eric Haun • *haun@marinelink.com*

Contributing Writers
Susan Buchanan • Lawrence R. DeMarcay, III
Joe Hudspeth • Randy O'Neill

PRODUCTION
Production & Graphics Manager
Nicole Ventimiglia • *nicole@marinelink.com*

SALES
Vice President, Sales & Marketing
Rob Howard • *howard@marinelink.com*

Advertising Sales Managers
National Sales Manager
Terry Breese • ***breese@marinelink.com***
Tel: 561-732-1185 Fax: 561-732-8414

Lucia Annunziata • ***annunziata@marinelink.com***
Tel: 212-477-6700 Fax: 212-254-6271
Frank Covella • ***covella@marinelink.com***
Tel: 561-732-1659 Fax: 561-732-8063
Mitch Engel • ***engel@marinelink.com***
Tel: 561-732-0312 Fax: 561-732-8063
Mike Kozlowski • ***kozlowski@marinelink.com***
Tel: 561-733-2477 Fax: 561-732-9670
Dawn Trauthwein • ***dtrauthwein@marinelink.com***
Tel: 631-472-2715 Fax: 631-868-3575
Jean Vertucci • ***vertucci@marinelink.com***
Tel: 212-477-6700 Fax: 212-254-6271

Managing Director, Intl. Sales
Paul Barrett • *ieaco@aol.com*
Tel: +44 1268 711560 Fax: +44 1268 711567
Uwe Riemeyer • *riemeyer@intermediapartners.de*
Tel: +49 202 27169 0 Fax: +49 202 27169 20

Sales & Event Coordinator
Michelle Howard • *mhoward@marinelink.com*

Classified Sales
(212) 477-6700

CORPORATE STAFF
Manager, Public Relations
Mark O'Malley • *momalley@marinelink.com*
Manager, Info Tech Services
Vladimir Bibik • *bibik@marinelink.com*

CIRCULATION
Circulation Manager
Kathleen Hickey • *k.hickey@marinelink.com*

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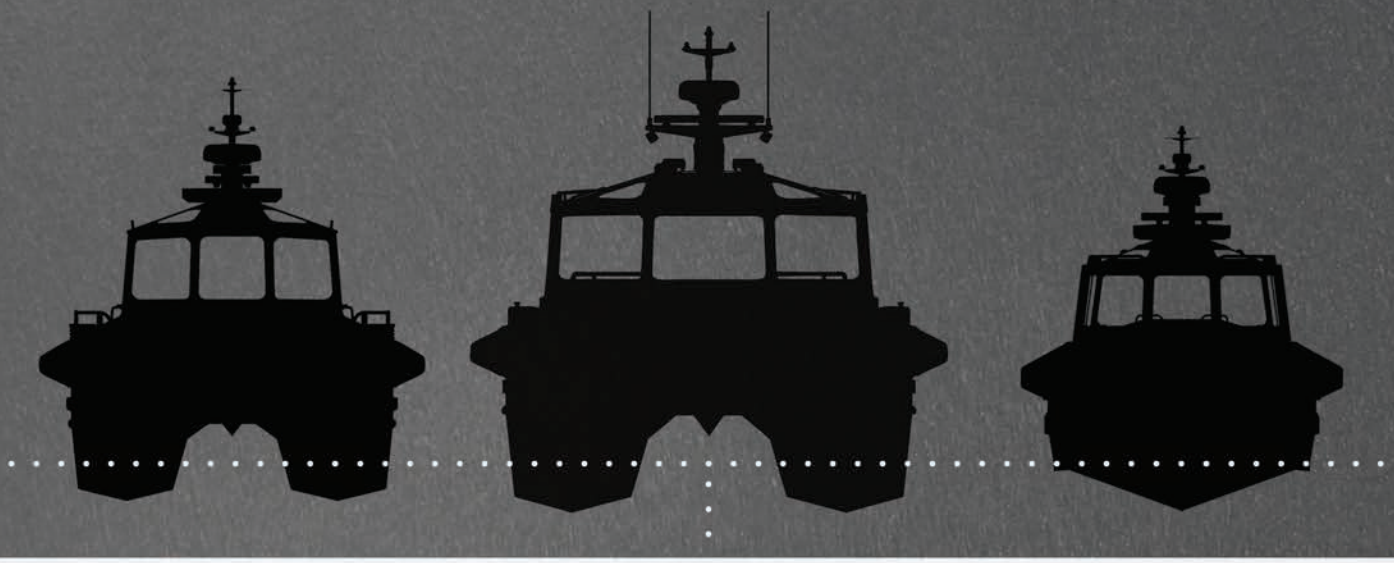

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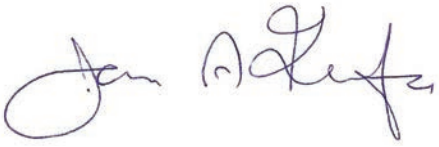
As the lines between salvage and spill response become increasingly blurred, there is no better time to examine the issues and emerging technologies that make both topics so fascinating to dissect. There's no better way to do just that than having the Chief Executives of both the American Salvage Association (ASA) and its international counterpart, the International Salvage Union (ISU) weigh in on all things salvage. Each viewpoint comes with its own laundry list of concerns, sometimes diverging in approach and at other times; coming together as a common voice. This month, you won't get that anywhere else but *MarineNews*.

Salvage and response firms both have a lot on their plates as the third quarter comes to a close. That's because each has to deal with the financial challenges of maintaining a ready arsenal of multi-mission equipment and vessels, but also the need to keep current with technology advances, onerous liability questions and the all-important protection of the environment. But environmental issues span far more than just salvage and response. That's because, heaven forbid, before you have to deal with a Lloyd's Open Form, the need to limit your vessel emissions – from the stack, on deck and below the waterline – are also in play. That costs money, but maybe not as much as you might think; that is, if you go about it in just the right fashion. This month, we delve into all of it.

Separately, and seemingly far from the worries of casualties, pollution and energy-induced financial worries, some U.S. boat builders are bucking the trend by riding the need for maritime security platforms, all the way to the bank. And, while *MarineNews* prides itself on covering all that is domestic brown water, all of the time, it is also true that there is brown water – and maritime security worries – on the other side of the pond. Domestic boat builders are happy enough to support those needs, with a raft of export hulls, while catering to an equally robust domestic appetite for the same multi-missioned, workboat hulls. Bringing a ray of sunshine on a partly cloudy day for boat builders, Susan Buchanan's optimistic look at this sector of the industry begins on page 28.

Without a crystal ball to tell you what comes next on the waterfront, you might take my assessments of the state-of-the-industry that follow with a grain of salt. That's okay, too. The latest rumor from inside the Beltway at DHS is that the long-awaited subchapter 'M' towboat rules could come as soon as February. No less important, also to come from inside the Department of Homeland Security, will be the next Offshore Patrol Cutter (OPC) cut. Both edicts will inject a much-needed dose of business into the boatbuilding sector. At a time when uncertainties fueled by the worst energy prices in more than six years have shipyards nervously eyeing their backlogs, both decisions will impact the domestic waterfront profoundly. That much I do know and you can take that – literally – straight to the bank.



Joseph Keefe, Editor, keefe@marinelink.com

Towing Industry Safety – AWO & USCG Outline the Facts, by the numbers …

In August, at a meeting co-chaired by the U.S. Coast Guard's RDML Paul Thomas, Assistant Commandant for Prevention Policy, and Tom Allegretti, American Waterways Operators (AWO) President & CEO, the effort to reduce crew fatalities and oil spills and to prepare the industry for the looming Subchapter M towboat rules, the USCG and AWO issued a Safety Report through their National Quality Steering Committee (NQSC). The report provides key metrics on Towing Industry Safety Statistics. For the past 15 years, the NQSC has used three measures to track overall trends in safety and environmental protection. Specifically, ***Crew fatalities per 100,000 towing industry workers, Gallons of oil spilled from tank barges per million gallons transported*** and ***the number of vessel casualties*** (overall or by incident severity) are outlined. Summary statistics on crew injuries for calendar years 2006-2014 were included.

Crew Fatalities

In 2014, the lowest number of fatalities (4) on record was reported. ***There were actually a total of eight deaths, and four were directly related to towing vessel operations.*** The other four deaths were attributed to medical conditions or natural causes. Three crew fatalities were the result of crew members falling into the water. In two incidents, a crew member went missing overboard – one while the vessel was underway and one while the vessel was anchored. In both incidents, the crewmen were found some time later and their deaths were attributed to an unintentional fall overboard. While the annual number of fatalities for all accident types has gone down over the last five years, the number of fatalities due to falls overboard has remained nearly constant. The crew fatality rate for 2013 was eight, and the projected crew fatality rate for 2014 is four. The crew fatality rate is calculated using the "Mercer Model", which was developed with AWO funded research. This crew fatality rate can be used in comparisons with other industries. In 2013, 41% of the fatal occupational injuries were the result of transportation incidents. The worker fatality rate for the transportation sector was 14.4, with 59% of the transportation fatalities related to roadway incidents.

Oil Spill Volumes

According to Coast Guard records, 200,363 gallons of oil was spilled as a result of 85 tank barge pollution incidents in 2014. The largest oil spill of 168,000 gallons (84% of the volume spilled) was the result of a collision between a freighter and a tank barge being pushed in the vicinity of Texas City, TX. Absent this event, there would have been only 32,367 gallons of oil spilled, similar to 2012. The second largest spill of 30,240 gallons (15% of the total volume spilled) was the result of a collision between 20 dry cargo barges and two tank barges being pushed on the Lower Mississippi River. ***These two spills accounted for 99% of the total volume of oil spilled from tank barges for 2014.*** Based on the ACOE data, the oil spill rate for 2014 is projected to be approximately one gallon of oil spilled per 373,000 gallons transported, or 2.68 gallons of oil spilled per million gallons transported. The tank barge oil spill rate is calculated using a denominator from the annual U.S. Army Corps of Engineers (ACOE) publication "Waterborne Commerce of the United States." The amount of oil transported by barge in 2013 increased by 5.7 billion gallons. This represents a 7.6% increase over 2012. While there has been an increase (+7.6 %) in the amount of oil transported by barge from 2012 to 2013 and the projected oil spill rate for 2014 (2.68) is a significant increase given the last five years of data, an oil spill rate of 2.68 is still very low given the volumes transported.

Vessel Incidents

Towing vessel incidents include all reportable marine casualties that involved any towing vessel or barge. Each incident is counted only once, regardless of the number of vessels involved. In 2014, 89% of towing vessel casualties were of the low severity type. Medium and high severity incidents represented 4% and 7% of all incidents, respectively. There was a slight decrease in all incidents, as well as medium and high severity incidents between 2013 and 2014. ***32% of medium & high severity incidents began with an allision.*** Material failure was the first event in 20% of marine casualties. According to USCG protocols, the "First Event" or "Initiating Event" is the first event in a sequence of events leading up to the casualty.

Crew Member Injuries

In 2005, the Coast Guard began documenting injury severity with each personnel casualty investigation. In

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2014, there were 133 injuries to crew members where the "vessel class" or "vessel service" was either "towing vessel" or "barge," of which 67% of injuries were classified as minor or moderate. In 2013, 68% of the injuries were classified as minor or moderate. In comparing serious, severe and critical injuries, there was an increase in these injuries between 2013 and 2014. Injury data may also be grouped by type of accident. Four accident types appear to account for most of the higher severity injuries, namely (1.) *falling onto a surface,* (2.) *Line handling/ caught in lines,* (3.) *being struck by moving object, and* (4.) *those crushed between objects.*

Chart 1: Crew Fatalities by Calendar Year (CY)

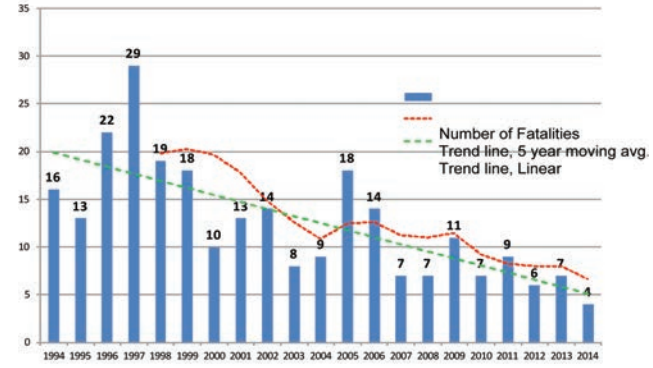

Chart 3: Crew Fatalities due to Falls Overboard by CY

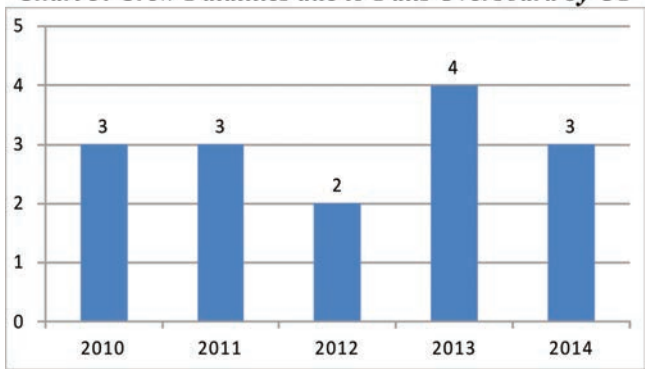

Chart 6: All Vessel Incidents by Severity and CY

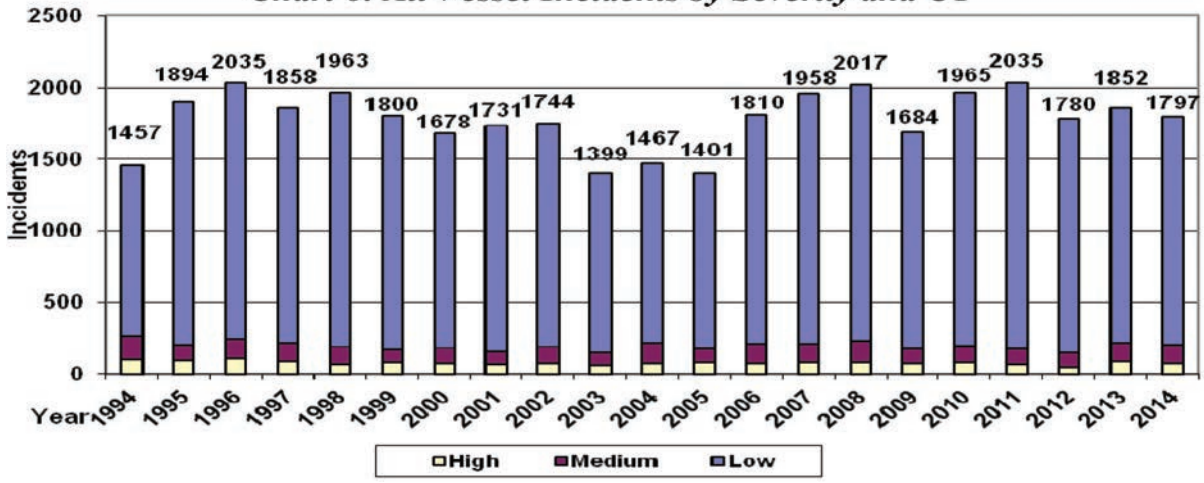

Chart 7: Medium and High Severity Incidents by CY

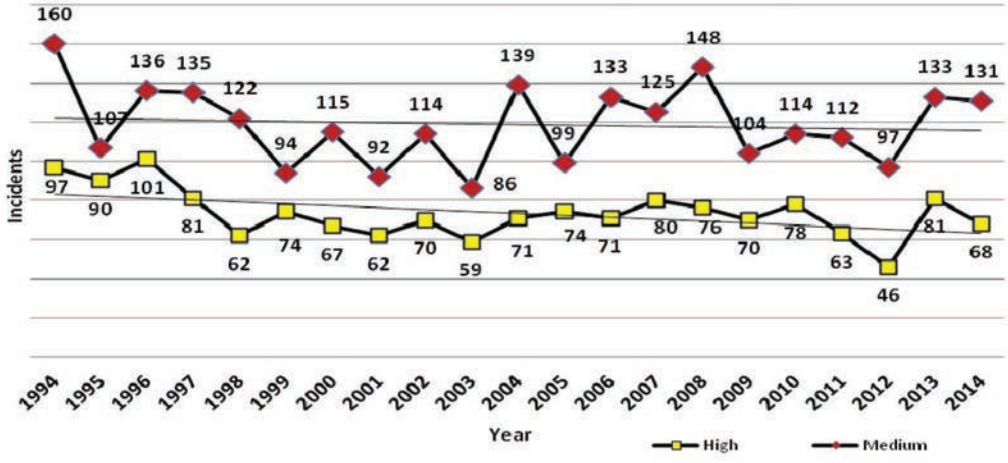

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Chart 10: Injuries by Accident Type (CY2006 – 2014)

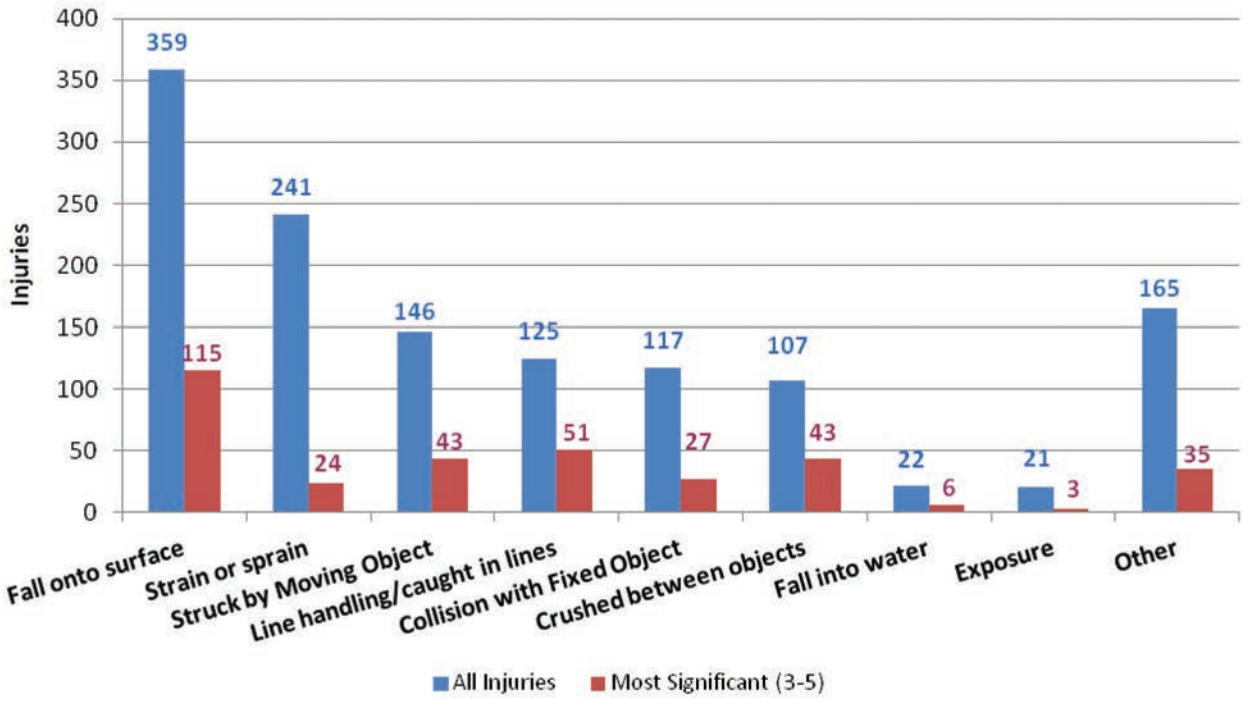
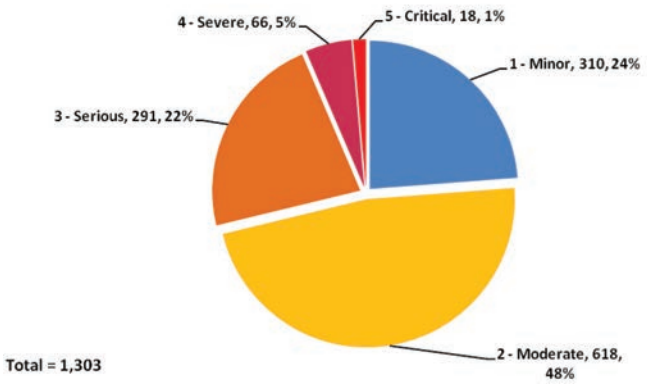


Table 1 – Oil Spills by Size for 2014

Gallons of Oil Spilled	Number of Oil Spill Events (spill amounts in gallons)
More than 1000	2 (168k, 32k)
101 to 1000	5 (630, 500, 200, 125, 101)
1 to 100	42
Less than 1	36

Chart 9 - Injuries by Severity (CY2006-2014)



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Access the USCG/AWO report at the following link: *http://www.americanwaterways.com/sites/default/files/USCG-AWO%20Safety%20Report%202015%20rev.1.pdf*

2015 Editorial Calendar

Marine News

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JANUARY **Ad Close:** Dec 12	**Passenger Vessels & Ferries** Market: Training & Education Technical: Arctic / Cold Weather Operations Product: Winches, Ropes & Cranes	**PVA/Maritrends** Jan. 31 - Feb 3, Long Beach, CA REGIONAL FOCUS: West Coast
FEBRUARY **Ad Close:** Jan 15	**Dredging & Marine Construction** Market: U.S. Coast Guard Technical: Naval Architecture Product: Fire & Safety Equipment	**ASNE Day** March 4 - 5, Crystal City, VA
MARCH **Ad Close:** Feb 14	**Fleet Optimization** Market: Management Software Technical: SATCOM for Workboats Product: Water Treatment & Technology	**CMA Shipping 2015** March 23 - 25, Stamford, CT REGIONAL FOCUS: US East Coast
APRIL **Ad Close:** March 14	**Shipyard Report: Construction & Repair** Market: Push Boats & Barges Technical: Marine Coatings/Corrosion Control Product: Interior Outfitting / Design / HVAC	**Sea-Air-Space** April 13 - 15, National Harbor, MD
MAY **Ad Close:** April 14	**Offshore Annual** Market: OSV and Offshore Vessel Trends Technical: Safety & Prevention Product: Oil Pollution: Prevention & Response	**OTC Houston** May 4 - 7, Houston, TX
JUNE **Ad Close:** May 14	**Combat & Patrol Craft Annual** Technical: Shortsea Shipping / Bulk Transport Technical: Lubricants, Fuels & Additives Product: Inland Boat Builders	**Inland Marine Expo** June 15 - 17, St. Louis, MO **MACC** June, Virgina Beach, VA **Seawork** June 16- - 18, Southampton, UK REGIONAL FOCUS: Inland Rivers
JULY **Ad Close:** June 15	**Propulsion Technology** Market: ATBs – Expanding Roles & Types Technical: Deck Machinery Product: Safety & Prevention	
AUGUST **Ad Close:** July 15	**MN 100 Market Leaders** Market: Workboat Boatbuilding & Repair Technical: Marine Operators Product: E-Solutions & Technology	***Marine News*** **25th Anniversary Edition**
SEPTEMBER **Ad Close:** Aug 15	**Inland Waterways** Market: Navigation, E-Solutions & Software Technical: Training/Regulatory Compliance Product: Cordage, Wire Ropes & Rigging	**ShippingInsight** Stamford, CT REGIONAL FOCUS: Great Lakes
OCTOBER **Ad Close:** Sept 15	**Salvage & Spill Response** Market: Maritime Security Workboats Technical: Emissions Control/Management Product: Deck Machinery/Cargo Equipment	**SNAME** Nov. 4 - 6, Providence, RI **CleanGulf** Nov. 10 - 12, New Orleans, LA
NOVEMBER **Ad Close:** Oct 16	**Workboat Annual** Market: Outfitting the Modern Workboat Technical: Pumps, Pipes & Valves Product: Marine Propulsion	**International Workboat Show** Dec. 2 - 4, New Orleans, LA REGIONAL FOCUS: Gulf Coast
DECEMBER **Ad Close:** Nov 15	**Innovative Products & Boats of 2015** Market: Fire, Patrol & Escort Craft Technical: Onboard / Wireless Comms Product: CAD/CAM Software	

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President, Shipbuilders Council of America (SCA)

Matthew Paxton is President of the Shipbuilders Council of America (SCA), and a partner at the law firm of Adams and Reese. SCA is the national trade association representing 41 companies that own and operate more than 120 shipyard facilities on all three U.S. coasts, the Great Lakes, inland waterways system, Alaska and Hawaii. SCA also represents 97 partner members that provide goods and services to the shipyard industry. Paxton, who has been practicing law since 2001, focuses his practice on maritime law and policy, fisheries law, natural resources development, and environmental policy issues. In addition to the SCA presidency in which Paxton works with member CEOs to develop and implement the organization's policy goals through legislation in Congress and advocacy before the Executive branch, he also serves as the federal lobbyist for the Coastal Conservation Association, the nation's largest marine conservation group dedicated to promoting the availability of coastal resources for the benefit of the general public. Paxton earned his J.D., in 2001, from Willamette University College of Law, and he received his B.A., in 1997, in political science from the University of Washington. Listen in as he weighs in on all things shipbuilding – especially where it impacts our domestic, Jones Act audience.

Describe the state of U.S. shipbuilding today. Give us a SITREP, if you will.

Overall the state of U.S. shipbuilding and ship repair industry is strong. Commercial markets vary, however. Yards building and repairing for the offshore oil and gas markets are feeling the impacts of the declining price of oil in the world market. Yet other markets continue to build; large vessel construction for vessels moving oil product as well as the recapitalization of the non-contiguous container fleets, are delivering vessels. The movement of energy in particular has inspired investment in cutting edge, environmentally friendly vessels that are leading the world in innovation and technology. On the military side, the effects of sequestration continue to be a challenge, but SCA is working diligently to protect the industry from potential future cuts in defense spending. The safety and security of our nation and those who risk their lives to protect our homeland is our upmost priority. As national security threats continue to arise globally, we need to ensure that our men and women in uniform have access to the equipment they need to do their jobs safely and effectively. Sen. John McCain and Congressman Mac Thornberry – co-chairman of the Senate and House Armed Services Committees – memorialized this sentiment recently in the *Wall Street Journal* writing,

"Continuing to slash defense invites greater danger to national security while shamefully asking the country's military men and women to do their jobs with shrinking resources."

Two organizations from one – it has been more than 15 years: The consolidation of NSA and SCA brought together the most successful and innovative shipyards in the U.S. under one national trade association. Boysie Bollinger, at the time said, "There should be no confusion, SCA is now the voice of the small and mid-sized shipyard industry in the U.S. that serves the commercial and governmental marketplace." How do you balance the concerns of both large and small yards under one roof?

SCA represents the entire shipbuilding and ship repair industry – large and small shipyards, commercial and government construction, repair and new construction. In fact, many yards are diversified, falling into several categories. SCA supports building more ships and growing the shipyard industrial base – both are paramount to our nation's economic and national security. At a time when the industry is facing attacks on the Jones Act and increased uncertainty over the federal budget, it is more important than ever that the industry stand together. Another benefit the association offers to all shipyards, regardless of product line or size, is the important regulatory work the association performs. This includes tracking and engaging the rulemaking process, specifically, EPA and OSHA rule promulgation, to ensure the industry's collective voice is heard.

Beyond big and large – the needs and concerns of dedicated ship repair facilities diverge with that of those yards primarily or purely

involved in new build activities. And, where does SCA get involved to further the agenda of the ship repair industry?

While some of the trade skills are common, the process by which one maintains and modernizes a ship is completely different than the process to build it. Repair requires taking a ship apart and putting it back together. Getting equipment off a completed ship is often more difficult than installing it in a module that ultimately becomes part of the ship. Just as SCA supports the shipbuilding accounts of the Navy and Coast Guard without advocating for individual programs, SCA supports the ship depot maintenance and various modernization accounts. In addition, as mentioned earlier, several of our members are building and repairing vessels, either commercially and/or for the military, and in some instances, in all of these categories. So, ship repair is equally as important as shipbuilding for the SCA and we advocate for the strength and health of both segments of the shipyard industrial base.

The most recent attack on the Jones Act from Senator McCain was particularly troubling in that it reached the stage of a bill rider. Industry and all sector stakeholders responded strongly. But, what's the status of the Jones Act today and how safe is its position, really?

The Jones Act supports a domestic fleet of 40,000 commercial vessels, nearly 500,000 American jobs, and roughly $100 billion in annual revenue to the economy. In addition to the tremendous impact our industry has on the U.S. economy, we play a critical role in our nation's national security. To outsource our fleet – the eyes and ears of our waterfront, waterways and ports – would be to outsource our national security, something that our nation cannot afford to do in these trying times abroad, in which the threats to our country and our allies continues to grow each and every day. That's why the Jones Act has broad bipartisan support in both chambers in congress, as well as the backing from every modern day U.S. president. Maintaining a strong commercial shipbuilding and ship repair base under the Jones Act, is also critical for Navy and Coast Guard shipbuilding. Without that strong commercial shipyard industry, there would be far less supplier companies, less heavy machinery capability, less Naval architects, and so on, and that would fundamentally impact the cost of Navy and Coast Guard ships, as well as, reduce severely the available pool of a skilled workforce that can build and repair the most advanced and complex Navy and Coast Guard in the world. This is why there has always been steadfast support for the Jones Act from the Navy. When the commandant for the Coast Guard, Adm. Paul Zukunft, warns that any changes to the Jones Act would "put our entire U.S. fleet in jeopardy," I think it's prudent for all of us, including Sen. McCain, to listen.

As President of the Shipbuilders Council of America (SCA), what is your primary advocacy today in terms of shipyard issues?

As a shipbuilding and repair industry, we touch all 50 states and 435 Congressional districts with the nearly 500,000 American jobs we create. For every direct maritime job we create, five more are generated. It's those hard-working men and women our industry provides jobs to, as well as the substantial investments the shipbuilding and repair companies have made to grow our fleet to reach the market demands of the next century, that guide the work of SCA. To that end, it's imperative that we work to maintain the integrity of the Jones Act, which serves as a strong backbone for our nation's economic and national security. The Jones Act provides certainty for the jobs our industry creates, as well as the strength of our Navy fleet. But in order to provide that stability, we need stable funding for government ship construction and repair. While we understand the driving forces behind funding restrictions like those proposed in sequestration, we cannot and should not do it on the backs of our armed forces. Time and again, the leaders of all branches of the military – Navy, Air Force, Army, Marine Corps and Coast Guard – have advised that drastic spending cuts to our defense programs not only put lives at risk but also impede on their ability to execute the National Military Strategy. As our equipment provides the tools that our military men and women need, we will continue our fight to ensure that our military has the proper funding it needs to keep those in harm's way as safe as they can be.

What would you tell those who may say that U.S. yards exist only because they are also protected?

To say that U.S. yards exist because they are protected is completely false. In fact, quite the opposite is true. U.S. shipyards don't receive one dollar in the way of subsidies or preferential treatment as many other foreign shipyards do. This fact is in stark comparison to the way shipyards in places like China and Korea are treated. In some cases, the entire shipbuilding industry in countries like Japan are supported and controlled at the highest levels of government. I will share this one concrete example with you: In January, China's COSCO group received a $1.75Bn financial agreement with Export-Import Bank of China (China Exim Bank) for its new shipbuilding program. The loan

will be used to fund the construction of 53 new ships at Chinese shipyards, replacing over 100 ships scrapped by COSCO within the past two years, according to the agreement. Since its foundation in 1994, China Exim has funded 9,637 ships with a total contract value of $197.7Bn. That is what U.S. shipyards are up against.

What one thing would propel U.S. shipbuilding to a new high, even from the heady levels and backlogs that we have seen recently?

Certain markets are strong right now, but you are correct to think that the industry is concerned with the future. Some opportunities on the horizon include opening new areas of the Exclusive Economic Zone (EEZ) to offshore oil and gas exploration. Congress is currently considering opening portions of the Atlantic coast, east Gulf coast and the Arctic. Jones Act vessels would support those activities, as the fruits of those activities would directly and positively impact U.S. shipbuilders and repairers. Farther out on the horizon, but definitely coming, is offshore wind. Plagued by regulatory hurdles and complexities, we do expect the first farms to come online in the coming years. In addition, the non-contiguous fleets will still have needs to recapitalize long-term and we will service that market. On the government side, again, I would return to the theme of predictability and stability surrounding the budget and procurement processes. Those government programs in series production, such as the Navy's Virginia-class submarine, the Coast Guard's Fast Response Cutter, allow the shipyards to take advantage of economic order quantities, plan hires, train workers for the right positions, and pursue overall efficient business practices. We need these programmatic and budgetary assurances Congress can provide to further future investments in our Navy and Coast Guard.

What are Shipyards excelling at in today's economy, as well as preparing for the future markets?

U.S. shipyards are building the most complex and sophisticated Navy and Coast Guard vessels in the world. In addition, we continue to deliver approximately 1,300 commercial vessels each year, as well as innovate to become world leaders in building vessels powered by LNG. This is a very exciting time in that regard. Additionally, shipyards are diversifying product lines, investing in new technologies, and partnering with foreign engineering and shipyard firms. All of this is evidence that the U.S. shipyard industry is positioning itself well to weather the peaks and valleys inherent to the business. Shipyards participating in government programs are always incorporating the latest research into ship procurement and making generational leaps in capabilities. The ships that enter our naval fleet are unrivaled in the world. And in today's economy, America's shipyards keep these assets performing by repairing, overhauling, converting, and modernizing ships and submarines in order to maximize their service lives and provide the greatest return on investment.

The Salvage & Wreck Removal Market:

Current Trends and the American Perspective

By Todd Schauer

Schauer

The global salvage business continues to be very dynamic with emerging trends and significant moves made by major salvors. While not as heavily affected by primary economic factors such as the offshore market's connectivity to oil prices, the global market for salvage and wreck removal continues to evolve rapidly and the U.S. influence on the market plays an important role. There are many market pressures on salvage companies beyond a business model that are inherently risky; these market forces will continue to shape the industry with interesting results.

The average cost and complexity of salvage and wreck removal cases has increased dramatically for a variety of reasons: mega ships (which can be incredibly challenging to salvage) are being placed into service at an alarming rate, there is ever-increasing regulatory oversight around the globe for salvage and wreck projects, environmental criteria and scrutiny for performing salvage work continues to tighten, and the number of stakeholders with influence during salvage cases continues to grow.

The *Costa Concordia* project is a good example of the many factors that can lead to an expensive end result. In the United States, a visit to a command center for a large emergency salvage project highlights the complexities and sheer number of stakeholders. It is actually common to have more stakeholders (personnel) in the command center 'overseeing' the project than those actually out responding to the incident.

On the emergency response side, there is a trend of decreasing Lloyd's Open Form cases despite a growing number of ships worldwide. This fact is the source of anxiety among many traditional salvage firms. The reduction in LOF's is especially apparent in the U.S. Pre-contracting of salvors and the obligation for salvors to respond has softened the leverage of the salvor for negotiating a traditional LOF contract at the time of the casualty. Owners and underwriters are also seeking response partners on a worldwide basis, and as a result of this 'preferred responder' arrangement, the LOF contract is not always viewed as favorably by many owners/underwriters.

Also in the United States, the 2014 implementation of the non-tank vessel response plan (VRP) regulations required operators of all tank and non-tank vessels over 400 gross tons in U.S. waters to comply with the requirements of OPA 90, including the recently enacted Salvage and Marine Firefighting (SMFF) regulations. These SMFF reg-

ulations are the most prescriptive and stringent of their kind in the world and while only applicable in the United States, the regulations have reaching international implications.

Preparation for implementation of the regulations demanded significant investments by core providers in personnel and equipment and the recurring maintenance costs for the required response posture are substantial. Additionally, the stakes are raised for primary providers from a responsibility standpoint; the core providers have a contractual obligation to respond to clients' emergencies.

Interestingly, the implementation of the SMFF regulations attracted global salvage players to the U.S. market that previously had little to no presence. Given the significant investments made and the increased level of commitment, many believed that there would be substantial returns in the form of annual retainer fees charged to vessel owners. Ironically, the pressure to sign up SMFF clients along with the additional players in the game resulted in a price war that virtually eliminated the retainer fees. The salvors are currently subsidizing the U.S. response posture! Ship owners and taxpayers should be pleased by the unexpected result.

The US response market is clearly important to the world market and service providers recognize this. The emerging trend is for vessel owners and operators to contract with response partners on a global basis, very much like the U.S. SMFF model with designated responders and pre-arranged contracts. In order to have competitive access to this emerging global market, a provider must be active in the U.S. market where most major shipping companies operate.

Market pressures have prompted both consolidation and diversification among the salvors. Svitzer Salvage and Titan Salvage have merged to form Ardent. Alaska-based Magone Marine has merged with Resolve Marine Group. Most successful salvage companies have diversified or have integrated with larger groups that offer other services including towage, spill response, training, diving, dredging, or marine construction. These trends are expected to continue as companies strive to achieve sustainable business models while maintaining increasingly expensive response capabilities.

Despite the market pressures, there are bright spots. As the bar for U.S. response capability has been raised, many core providers have leveraged this increased capability and profile to achieve direct success internationally. For example, American salvors are routinely securing contracts for the largest salvage and wreck removal contracts around the world.

The American Salvage Association (ASA) remains a common voice for the American salvage industry. The ASA has gained tremendous insight throughout the entire development and implementation process of the SMFF regulations, and has also earned credibility and respect among all stakeholders including the U.S. Coast Guard. The ASA is in a unique position to expand its horizons and provide guidance and insight on these processes in other countries with developing salvage response models. For example, recent activities of the ASA have included joint training sessions with the Panama Canal Authority and the Canadian Coast Guard. The American Salvage Association stands ready to share their guidance and insight on an international level. The simplest way to access that knowledge is as an active member of the ASA.

Todd Schauer *is Director of Operations, Resolve Marine Group and President of the American Salvage Association. He graduated from the U.S. Coast Guard Academy with a degree in Naval Architecture. His experience in the Coast Guard included shipboard engineering, marine safety, advanced engineering and emergency response. He served for 5 years on the USCG Salvage Emergency Response Team (SERT) including acting as Team Leader.*

The International Salvage Union Weighs In

Current issues in marine salvage: the ISU perspective.

By Leendert Muller

Muller

There have undoubtedly been great improvements in ship and operational safety in the past decades. SOLAS, the international Convention for the Safety of Life at Sea, has been in force for more than thirty years and has played a large part reducing the incidence of marine casualty. But accidents and incidents cannot be entirely eradicated and the potential for marine casualty – and pollution – remains present in all territories. Indeed, every few years there is an iconic casualty that seems to capture the public imagination and that of politicians.

While there remains the possibility of casualty, there is need for professional, experienced, well-equipped marine salvors. It is a fact that in most jurisdictions it is only the commercial salvors that have the wherewithal to response to maritime emergencies. The marine salvage industry, like all sectors, faces its special challenges and issues, some regulatory, some practical and some commercial.

Salvage: Local & Global

The way in which coastal states handle maritime emergencies varies. But one common theme has emerged in the past two decades. It is a zero-tolerance attitude to any environmental impact from shipping and shipping-related accidents. In many territories today, the loss of a just a few gallons of a potential pollutant is a serious matter. In the United States, the Exxon Valdez disaster in 1989 led to great changes, the final impact of which on the operation of tank and non-tank vessels in the U.S. has only been felt in the last two years. No one connected with shipping can be unaware of the Oil Pollution Act 1990 – OPA 90 – signed into law by President George Bush in the aftermath of the Exxon Valdez spill.

Salvage is governed by the 1989 Salvage Convention and for more than a century, all around the world emergency response to a casualty was conducted most commonly under the provisions of the Lloyd's Open Form (LOF) salvage contract. A simple contract which enables the owner and insurers of a casualty vessel to engage salvors rapidly to conduct the operation without the need to agree terms "up front" and on the basis that the salvor will only be rewarded if successful. It is the so-called, "no cure, no pay" principle. After the job is successfully concluded, the salvor is paid based on the value of the property saved and taking account of the circumstances. If the salvor and owner cannot agree a fair reward, the contract allows for an arbitration process. 75 percent of LOF contracts are settled without the need for arbitration.

LOF: past, present – and future

LOF is used less often today than in the past but the International Salvage Union (ISU) – the global trade association for marine salvors – firmly believes it is the best contract for emergency response situations.

In the U.S., however, LOF is not used as much as in other places. It is partly because of the requirements of OPA 90 which mean that anyone operating vessels of all classes in US waters must have a pre-prepared Vessel Response Plan. The plan, which must be approved by the US Coast Guard, requires the owners or their agents to nominate a Qualified Individual to coordinate response to an emergency. They must also have in place an agreement with a capable and properly equipped contractor able to provide the required Salvage and Marine Firefighting Services (SMFF) in specific geographic areas if there is a need to respond to an emergency and undertake pollution response should there be an incident.

In some US response arrangements elements of the LOF contract might be used as a component of the contracting structure. But a "time and materials" basis is most common.

ISU suggests that in all locations – even in the OPA-90 environment – LOF is still the most appropriate contract for emergency response. It is well suited to high risk, high value jobs and use of its SCOPIC clause means that it is also suitable for low value cases. SCOPIC is the Special Compensation P&I Club Clause. It was introduced to ensure that salvors were still prepared to intervene in cases where the values might otherwise be too low to tempt them or the chance of a successful outcome is uncertain. SCOPIC does not provide a traditional salvage award but compensates the contractor for their efforts according to a schedule of prices for use of their personnel and equipment which is agreed regularly with the insurance industry.

Across the Pond

Internationally, there is much variance of approach to the command and control of shipping emergencies. Salvors, for their part, want clarity of accountability and decision making with a spirit of cooperation between all parties and no political interference in operational decisions. A model supported by the ISU is that of the UK under which the Secretary of State for Transport nominates a representative to make decisions about marine casualty interventions and wreck removal requirements – without political influence. The so-called SOSREP is powerful and in practice the system has worked well in handling numerous high-profile casualties.

In the U.S., the role of the U.S. Coast Guard Captain of the Port, linked to the requirements of OPA 90, also works well. That is not the case in many coastal states. It is a problem exemplified by the very current issue of "Places of Refuge." A casualty vessel will often need to be brought to a Place of Refuge where its condition can be stabilized by, for example, carrying out emergency repairs or lightening her cargo. However, with all casualties there is the possibility of a spill of a pollutant and many coastal states are unwilling to allow a casualty to come to a Place of Refuge on their coast for fear of environmental damage if the vessel's condition deteriorates.

It is a narrow view because to keep the vessel at sea will not improve the casualty's condition and therefore creates the risk of any subsequent pollution spreading over a larger area – possibly along the coast of more than one country. There have been several recent, high profile cases where distressed vessels have struggled to find a Place of Refuge. In 2014, a chemical tanker, the Maritime Maisie, suffered a fire off the Republic of Korea. Japanese salvors attended the vessel to fight the fire and sought a Place of Refuge. Numerous applications to ports in RoK and Japan were turned down and it was only after the damaged vessel had been held at sea in poor conditions for more than three months that she was allowed into a port.

The ISU feels strongly that many coastal states are not meeting their obligations under existing international regulations and guidelines on the matter of Places of Refuge. There has been some recent progress in the European Union but nevertheless it remains a matter of concern and it is a concern shared equally by the ISU, the International Chamber of Shipping and the International Union of Marine Insurance.

Commercial marine salvors stand ready to intervene to save life; protect the environment and save property. They provide valuable services which protect the insurance industry from significant loss and in many cases they are the only ones with the equipment and capability to do so. But they need to be supported by sensible regulatory regimes and operational control arrangements that enable them to do the best they can in what are often difficult and dangerous circumstances.

INTERNATIONAL SALVAGE UNION

Leendert Muller *is President of the International Salvage Union and joint managing director of Multraship Towage and Salvage based at Terneuzen on the river Scheldt in the Netherlands. Mr. Muller started his career at sea and became a captain of tugboats rising to be Principal Salvage Master and he has been involved in many well-known salvage and emergency response operations. He is an Executive Committee member of the European Tug Owners' Association (ETA) and a board member of the Royal Dutch Shipowners' Association (KVNR). The International Salvage Union is the global trade association for marine salvors.*

Learn a Lasting Lending Lesson

Two key lending practices and today's workboat market conditions collide on the waterfront. Which course you choose depends on where you sit.

By Richard J. Paine, Sr., National Marine Sales Manager at Signature Financial LLC

Paine

Unless you are involved with your company's borrowing and credit issues, you may not be well versed in the two principal types of commercial lending. Asset based Lending (ABL) and Cash Flow Lending (CFL) – the cornerstones of commercial credit – are also, in most respects, as different as night and day. Typically, company finance officers must decide between the two, and, as it turns out, some companies are more suited to one or the other. For companies with the luxury of choice, the pros and cons of each option should be weighed carefully.

Credit 101

Credit is a key element in growth. It is also a means to remain in business in challenging times. ABL, for example, is a specialized loan product that provides a borrower the ability to fully collateralize a short term loan with the equity available from the company's asset pool. This pool can contain hard assets, like tugs and barges, be secured by accounts receivable, or be collateralized by intellectual property. It is a flexible source of funding that can be utilized by both healthy companies and those not so healthy.

To the former, it reflects the ability to monetize assets without violating other restrictive covenants. To the latter, it may function as a lifeline to turnaround, recapitalize or add enterprise value to a company in bankruptcy (debtor-in-possession or DIP) as an ongoing business entity has more value to creditors than does a closed firm whose assets have been liquidated.

For those companies operating on a seasonal basis, in particular the many dinner, excursion, freight and passenger vessels that ply Northern waters, revenues are often inconsistent and are dictated by weather, but balance sheets can be hefty. For companies with low margins, disturbed cash flow and large balance sheets, ABL provides the ability to tap into those large balance sheets as ABL lenders determine the amount of credit to be extended based on the liquidation value of the assets in the business' asset pool, not on future earnings. Since lenders are relying on a known collateral value, there is inherently less risk on the lender's behalf. Consequently, an ABL loan may carry a lower rate and be more forgiving of the financial condition of the borrower.

However, an ABL lender observes the borrower's financial condition with more scrutiny, carefully monitoring receivables, inventory, asset condition and valuation. Reporting requirements by the borrower will be more frequent and detailed than in a CFL facility. The maturity is usually short term allowing the lender to adjust the terms of the loan's amount, advance rate, reporting requirements, interest rates, etc. However, the increased reporting may be offset inasmuch as ABL loans do not normally include financial covenants whereas a CFL loan probably will.

An ABL loan usually takes the form of a revolving line of credit (RLOC) which is based on a fixed amount that is replenished when exhausted or by time (days, months, etc.). Two types of RLOCs are available: cumulative and

non- cumulative. In the first, the unutilized sum is carried over to the next period, in the second type, it is not.

Cash Flow Loans

A cash flow loan suits a different borrower profile. It is based on future revenue and the ability to service the debt from those future sums. Limits are set by the CFL loan are more suitable to higher margin companies whose balance sheets are considerably more leveraged or have fewer hard assets to back up the loan request. In considering a loan request the amount may be limited by the lender to the borrower's enterprise value, or the value of the entire company (tangible net worth). A CFL loan may contain financial covenants that borrowers must comply with. Covenants will typically include three or four covenants including:

- ***Fixed Charge Covenant:*** *this covenant measures the borrower's ability to service the company's fixed financing expenses such as loans and leases.*
- ***Debt to Net Worth (Leverage):*** *this covenant measures the borrower's total liabilities divided by its total shareholder value.*
- ***Capital Expenditure Covenant:*** *Limits the borrower's ability to spend for capital expenditures (money spent to buy or add value to fixed assets extending the useful life past the taxable year.)*

In the past failure to meet a covenant meant asking your lender for a waiver which was usually granted. Today, bank regulators are pressuring lenders to discontinue this practice. Compliance is critical as failure to meet a covenant's requirement can result in default and the lender "calling the loan." Where these metric meet is in the importance of the collateral in the transaction. Certainly the ability to repay the debt is important, but without collateral, making a case for financing is nearly impossible. Although "signature" or "personal" loans exist, they are usually provided by a lender at a much higher rate than those secured by conventional assets. That said; the five "Cs" of Credit still apply:

- ***The Character of the borrower;***
- ***The Capacity of the borrower to repay the debt;***
- ***The Capital the borrower puts toward the purchase of the Collateral;***
- ***The Collateral that secures the loan; and***
- ***The Conditions, such as interest rate, term and advance that convince the lender to lend to you.***

If opportunity comes knocking and you need to visit your commercial marine banker, you now know your ABL's from your CFL's. Use this knowledge to your considerable advantage.

Reporting Marine Casualties:

U.S. Coast Guard Guidance Helps to Bring some Clarity to the Debate.

By Jeanne Grasso, Blank Rome

Grasso

In July 2015, the U.S. Coast Guard released Navigation and Vessel Inspection Circular 01-15 ("NVIC"), titled Marine Casualty Reporting Procedures Guide with Associated Standard Interpretations. The purpose of the NVIC is to assist vessel owners and operators in understanding the marine casualty reporting requirements, which many in the industry think are about as clear as mud. Confusion as to what constitutes a marine casualty and what incidents need to be reported has persisted in the marine industry for years. And, unfortunately, little official guidance had been published by Coast Guard Headquarters regarding its policy interpretation of the reporting requirements. This problem was historically exacerbated by differing interpretations within the various Coast Guard field commands and attendant inconsistent enforcement actions.

The NVIC was an attempt to resolve some of these issues – it clarifies terminology and phrases within the regulatory context, draws attention to helpful regulatory citations, and provides policy interpretations to assist vessel owners/operators with the casualty reporting process. But, there's still a long way to go to make the marine casualty reporting process efficient and meaningful, and those necessary fixes may require a regulatory project, so relief is still on the distant horizon.

Back to the Basics

To put things in context, marine casualty or accident includes any casualty or accident involving vessels, with few exceptions, that: (1) occurs on the navigable waters of the United States, its territories or possessions (generally out to 12 nautical miles from the coastline); (2) occurs on a tank vessel in the Exclusive Economic Zone ("EEZ") if there is material damage affecting the seaworthiness or efficiency of the vessel; or involves significant harm to the environment as a result of a discharge, or probable discharge, resulting from damage to the vessel or its equipment; or (3) occurs outside the navigable waters of the United States in a certain geographic area and involves a U.S. citizen on a vessel that (i) embarks/disembarks passengers in the United States or (ii) transports passengers traveling under any form of an air and sea ticket package marketed in the United States.

Not all marine casualties, however, are reportable. The reporting requirements, described below, are different based on whether the casualty or accident occurs inside or outside the navigable waters (i.e., 12 nautical miles), whether it involves "significant harm to the environment," or whether it occurs on a tanker in the EEZ. For U.S.-flag operators, however, these reporting requirements apply anywhere in the world.

A reportable marine casualty means:

- *an unintended grounding or an allision with a bridge;*
- *an intended grounding or strike of a bridge that creates a hazard to navigation, the environment, or the safety of a vessel;*
- *a loss of "main propulsion, primary steering, or any associated component or control system" that "reduces the maneuverability" of the vessel;*
- *an occurrence materially and adversely affecting the vessel's seaworthiness or fitness for service or route, including but not limited to fire, flooding, or failure of or damage to fixed firefighting systems, lifesaving equipment, auxiliary power generating equipment, or bilge pumping systems;*
- *loss of life;*
- *an "injury" that requires "professional medical treatment" (treatment beyond first aid) and if the person is engaged onboard a vessel in commercial service (i.e., a crew member or contractor), that renders the individual unfit to perform his or her routine duties or stand their normal watch;*
- *an occurrence causing property damage in excess of $25,000 (including labor and material to restore the property to its pre-damaged condition, but not including the cost of salvage, cleaning, gas-freeing, drydocking, or demurrage); and*
- *significant harm to the environment (including a discharge of oil, i.e., a sheen, or other hazardous substance in a reportable quantity into navigable waters and EEZ).*

Importantly, a certain type of marine casualty, called a serious marine incident, also requires drug and alcohol testing for:

- *any reportable marine casualty which results in one or more deaths;*
- *an injury to a crewmember, passenger, or other person which requires professional medical treatment beyond first aid and, if the injured party is a crewmember, renders the individual unfit to perform his or her routine vessel duties or stand their normal watch;*
- *damage to property in excess of $100,000 USD;*
- *actual or constructive total loss of any vessel subject to inspection;*
- *actual or constructive total loss of any self-propelled vessel, not subject to inspection, of 100 gross tons or more;*
- *a discharge of oil of 10,000 gallons or more into navigable waters whether or not resulting from a marine casualty; or*
- *a discharge of a reportable quantity of a hazardous substance into the navigable waters, or a release of a reportable quantity of a hazardous substance into the EEZ, whether or not resulting from a marine casualty.*
- *At the time of occurrence of a marine casualty, a company must make a timely, good faith determination as to whether the incident is, or is likely to become, a serious marine incident. If so, each individual engaged or employed on board the vessel who is "directly involved" must be drug and alcohol tested. Alcohol testing must be completed within 2 hours and drug testing within 32 hours, unless precluded by safety concerns directly related to the incident. An individual "directly involved" means an individual whose order, action, or failure to act is determined to be, or cannot be ruled out as, a causative factor in the incident.*
- *All reportable marine casualties must be immediately reported to the nearest U.S. Coast Guard Sector Office, Marine Inspection Office, or Coast Guard Group Office after addressing the resultant safety concerns, with one exception. If the marine casualty involves "significant harm to the environment," it must be reported to the National Response Center (NRC), not the Sector. A written report on a Form CG-2692 must follow within 5 days, along with drug and alcohol testing results, if required, on Form CG-2692B.*

NVIC 01-15

In an effort to make compliance with the marine casualty reporting requirements more attainable and enforcement

more consistent, in January 2014 the Coast Guard published a draft NVIC seeking industry feedback on how the marine casualty reporting requirements can be clarified. According to the Coast Guard, the majority of the comments received from multiple industry segments and organizations made it clear that more detail was needed for specific types of marine casualties that had led to uncertainty in the past in terms of what needed to be reported (or not). As a result, several new definitions, interpretations, and common casualty scenarios were included in the NVIC.

The Coast Guard clearly sets forth its guiding principle in the NVIC when Rear Admiral Paul Thomas states, *"[i]f there is any doubt whether an occurrence is a reportable marine casualty, the Coast Guard strongly encourages responsible industry parties to contact the nearest Officer in Charge of Marine Inspection…to determine an appropriate response."* The NVIC goes on to indicate that when a report is made, the Investigating Officer will make a determination if the incident is reportable or not. If not, it is recommended that you document such a determination in writing. If so, a Form CG-2692 is required within 5 days of the incident.

The Coast Guard also issued industry specific interpretations for different types of commercial maritime operations. For example, the NVIC addresses incidents involving tankers at length. The Coast Guard also issues interpretations and policy statements related to reporting in the contexts of commercial diving, shipyards, and harbor workers. Further, the NVIC lists a variety of incident and occurrence scenarios and provides interpretations of regulations that have proven to be problematic for years. The NVIC also provides for interpretations of key terms which caused much consternation in the past, such as:

- ***a loss of main propulsion, primary steering, or any associated component or control system that reduces the maneuverability of the vessel;***
- ***an occurrence materially and adversely affecting the vessel's seaworthiness or fitness for service or route; and***
- ***an injury that requires professional medical treatment (treatment beyond first aid).***

Here, the Coast Guard adopts the Occupational Safety and Health Administration ("OSHA") definition, which is widely understood.

Bottom line, though, the marine casualty reporting

regime still needs reform. As some stakeholders have noted, the Coast Guard should adopt a two tier reporting system, similar to OSHA's; for reportables and recordables. This would allow minor incidents to be differentiated from major incidents, lessening the burden on both industry and the Coast Guard. As such, the Coast Guard would get an immediate oral report followed by a Form CG 2692 for major incidents where a response may be needed, but would not burden its limited resources with minor incidents, which could be reviewed on a log during inspections. In addition, enforcement should be streamlined and should more consistently take into consideration a company's efforts at compliance considering the size of the company's fleet, past history, and significance of the incident, rather than issuing what sometimes seem to be arbitrary penalties.

As the DHS Office of Inspector General Report Marine Accident Reporting, Investigations, and Enforcement in the USCG, dated May 23, 2013, noted:

The purpose of the investigations program in the Coast Guard (USCG) is to ensure the safety of mariners and vessel passengers by preventing marine accidents, protecting the environment from oil spills, minimizing the property loss and disruptions to commerce. The USCG is responsible for identifying, investigating, and enforcing reporting requirements related to marine accidents involving commercial vessels….

The USCG does not have adequate processes to investigate, take corrective actions, and enforce Federal regulations related to the reporting of marine accidents. These conditions exist because the USCG has not developed and retained sufficient personnel, established a complete process with dedicated resources to address corrective actions, and provided adequate training to personnel on enforcement of marine accident reporting. As a result, the USCG may be delayed in identifying the causes of accidents; initiating corrective actions; and providing the findings and lessons learned to mariners, the public, and other government entities. These conditions may also delay the development of new standards, which could prevent future accidents.

With its limited resources, the Coast Guard should focus on which incidents should be reportable and which warrant investigations. This way the Coast Guard could direct its efforts at ascertaining trends to further marine safety and help companies reduce their risks, rather than collecting data which often is not timely evaluated for purposes of ascertaining lessons learned. All marine casualties are not equal and should not be treated that way.

Until such time as there is wholesale reform of the marine casualty reporting system, however, the industry should become familiar with the guidance provided in the NVIC, which is in essence the Coast Guard's "playbook" for how it will respond to casualty reports or failures to report. Industry stakeholders should ensure that crew and shoreside personnel are familiar with the Coast Guard's guidance, and heed the recommendation to contact the Coast Guard whenever in doubt to avoid Coast Guard enforcement action for a failure to report a marine casualty, as penalties can range up to $35,000.

Kvichak

Demand for Maritime Security Vessels Keeps U.S. Builders Busy

Export hulls – through the FMS Program, as well as Direct Sales – are a key piece of the business model.

By Susan Buchanan

Even as the crash in energy prices feeds the oversupply of offshore support vessels – a key staple of U.S. boatbuilding diets – and the dwindling backlogs of some so-called 'second tier' yards, a number of U.S. boat builders are still seeing robust demand for security vessels. Separately, tightening federal, state, municipal and overseas budgets are being trumped by the increased need for security craft that can perform more than one function. And, a big part of that metric turns out to be export hulls.

As maritime defenses are bolstered in several regions, particularly the Middle East, U.S. Foreign Military Sales (FMS) assistance helps builders do business overseas. Some companies have expanded their order books through that channel, while still others have made direct sales to foreign governments.

On this side of the pond, counties and local municipalities are using their taut funds, along with grants and matched grants, to pay for security vessels. Last month, ***MarineNews*** spoke with six representative U.S. builders who have delivered security boats in this calendar year. It turns out that U.S. boat builders are alive and well in an increasingly difficult market. In the fourth quarter of 2015, maritime security also means job security.

Tampa Yacht

Gladding Hearn

Tampa Yacht:
Interceptors for Kuwait

Tampa Yacht Manufacturing in Florida is building a series of 29 fast, coastal interceptor-class vessels, 44 feet long, ordered by the Kuwait. "The contract started in March of this year, and construction began almost immediately," Tampa Yacht's CEO Robert Stevens said last month. "The first vessel was launched, sea-trialed, thoroughly tested by the customer and accepted in August. We built it in 18 weeks, and each succeeding boat will be completed five weeks apart."

Seven more vessels are in various stages of completion, with the first four of them scheduled to head to Kuwait in November, Stevens said. Notably, the contract is with the Kuwaiti government and is not under U.S. Foreign Military Sales. Stevens estimated that its total value might exceed $60 million.

Designed for a crew of four to six, the company's carbon-fiber-reinforced, all-composite-construction interceptors for Kuwait contain the latest electronics and a range of weaponry. They have Arneson ASD11 surface drives and Rolla propellers. Dual MAN R6-800 turbocharged engines, developing total power of 1,600 hp, give these interceptors a speed exceeding 55 knots at full load. The surface-piercing design of the Arneson Surface Drives cuts appendage drag by 50 percent, versus conventional submerged systems, Stevens said.

With its matched, five-blade, high-efficiency nibral Rolla propellers, the interceptors for Kuwait accelerate quickly and have a good payload-to-power ratio. Fast operation stability is enhanced with trim tabs from Twin Disc Arne-

son Surface Drives. They efficiently transfer a maximum amount of thrust from the engine to the water, Stevens said. High-quality materials, along with robust drive construction, keep maintenance costs low.

These interceptors give the crew control over tactical operations, including boarding. They employ Twin Disc's MGX-5114 A QuickShift marine transmissions, matched EC300 Power Commander electronic control and a bow thruster. The boats also offer precision, low-speed maneuverability when next to another vessel in a range of sea conditions, Stevens said.

It is also true that smaller patrol vessels in the Gulf at least partly reduce the need for cruisers and destroyers in that region. As smaller, more agile assets become the preferred vehicle for smarter response to coastal, littoral conflicts, these craft are rapidly replacing the legacy 600 foot warship in this theatre. For foreign governments and the Pentagon, that frees up larger assets for other uses and – in theory – reins in spending.

"All are under contract, with a scheduled delivery of 2018," Swiftships CEO Shehraze Shah said. "These contracts were signed with the nations' ministries of defense, and are funded as follows: four of the 28 meters are through U.S Foreign Military Financing via the Foreign Military Sales program; six of the 28 meters are via Middle Eastern-sourced funds, and two of the 35-meter patrol boats are via DomRep Security Assistance funds."

Shah said two primary avenues for overseas business are Foreign Military Sales, with the U.S. Department of Defense as negotiator, and Direct Commercial Sales. DCS is arranged directly between a vendor and a customer, with an export license issued by the U.S. State Department. Officials at Swiftships, asked about backlogs, replied, "In addition to the already-mentioned contracts, Swiftships has a $180 million backlog of in-builds for multi-purpose, maritime-marine vessels for the Middle East North Africa region," Shah said. He declined to name those countries.

Swiftships:
Catering to Egypt and the Dominican Republic

In Morgan City, La., Swiftships has orders to build ten 28-meter Coastal Patrol Craft for the Egyptian Coast Guard and two 35-meter patrol boats, along with two 32-foot, high-speed interceptors for the Dominican Republic Coast Guard-Navy.

Brunswick

Gladding-Hearn:
delivering at home, and in Colombia, as well

Somerset, MA-based Gladding-Hearn Shipbuilding has also been busy. "We just finished two significant projects – five patrol boats for New York City and seven patrol boats for the Colombian Navy," Peter Duclos, president and director of business development, said. "The vessels for Colombia were direct sale."

This April and June, Gladding-Hearn delivered two 70-foot, aluminum tactical-response vessels to the New York City Police Department for its Harbor Patrol Unit. Last year, Gladding delivered its third 61-foot patrol-rescue boat to the NYPD.

The 70-foot, high-speed NYPD vessels have deep-V hull and squared-off bows, with fendering and knees installed above the main deck for bow landings. They were designed by C. Raymond Hunt and Associates in Massachusetts to respond to the terrorism threat on New York's vast waterways system. Inside the flush-mounted wheelhouse, ballistic-resistant windows in the front, side and aft provide 360-degree visibility. The boats' fly bridges offer views, too. A remote-control water cannon is mounted on pilothouse roofs. A command center includes video monitors, decontamination showers and seating for five crew members. The boats have two berths, storage lockers and a small galley.

The NYPD vessels are powered by twin 12-cylinder MTU-12V2000M94 diesel engines, each producing 1,920 bhp at 2,450 rpm and allowing a top speed of over 41 knots. The engines turn a pair of Hamilton HM571 waterjets through ZF3050 gearboxes. A 30 kW Northern Lights/Alaska Diesel generator provides service power. Twin Humphree interceptor units adjust each vessel's running trim and list at various speeds and load conditions.

The Colombia Class vessels, 60-foot, deep-V hulled boats – also designed by C. Raymond Hunt – are of all aluminum construction. Production began in March 2013, and the first-in-class ARC Gorgonilla was delivered that year. A rotating davit, located above the water-level, recessed platform in the stern, is used for rescue operations. The boat has Furuno radar and is equipped with a FLIR camera that can detect someone in the water at 500 to 800 meters. The vessel has sleeping accommodations for a crew of six.

Powered by twin 800 bhp MAN R6-800CRM diesel engines, driving Ultra Jet UJ-452 water jets through ZF 360 gearboxes, the Colombia Class boat reaches a top speed of 27 knots. Cruising speed is 18 knots.

Kvichak
Builds for NYPD, U.S. Coast Guard and Oman

The recent acquisition of Kvichak Marine Industries by Vigor Industrial gives the Pacific West Coast giant not only a new line of business, but also a significant income stream, courtesy of the maritime security market, both here and abroad. There isn't much Vigor doesn't do anymore, and Seattle-based Kvichak is a big part of that puzzle. "We're currently building our fourth, Response Boat–Medium for the New York Police Department, with delivery scheduled for spring 2016," the company's marketing manager Carol Reid said. "We just completed delivery of seven Transportable Port Security Boats to the U.S. Coast Guard. With that, our deliveries to the Coast Guard total 59 vessels since 2011."

Beyond their significant domestic federal and municipal markets, however, Kvichak is also building two 19-meter, all-weather pilot boats for the Port of Duqm Company SAOC in the Sultanate of Oman. "They will function as search-and-rescue and oil-spill-recovery vessels, in addi-

MetalCraft

Swiftships

tion to pilot boats, and are scheduled for delivery in spring 2016," Reid said, adding, "They are a direct buy and not through a U.S. government program."

Brunswick's
Cutting Edge 'Sentry' Aluminum Model on Guard

In late July, Brunswick Commercial and Government Products delivered the first-of-its-kind, 30-foot Sentry aluminum boat to the Florida Fish and Wildlife Commission. This new model in the company's aluminum-vessel line complements its 32-, 36-, 40- and 45-feet variants. Designed with port security and extended patrol missions in mind, the 30-foot cabin boat contains lockable storage for weapons, a forward cuddy cabin and a computer workstation.

"This new platform was designed to accommodate many requirements in the maritime security industry," BCGP's sales director Jeremy Davis said, alluding to the growing appetite of budget-conscious municipalities for so-called multi-mission hulls. Today, local governments are looking to leverage many missions on the back of one hull. The Sentry, according to Brunswick, is just the ticket. "Whether the mission is port security, game conservation or the safety of recreational boaters, this vessel can be customized to the needs of law-enforcement agencies worldwide." The company's Sentry line stems from a Master Supply Agreement between Brunswick Commercial and Government Products and boat builder MetalCraft Marine Inc. in Ontario.

MetalCraft Marine
Supplies the U.S. Navy and Coast Guard

Not to be outdone, Kingston, Ontario-based MetalCraft is also busy, feeding on a steady diet of maritime security and military mission-specific hulls. MetalCraft sales and customer-relations representative Emily Roantree told *MarineNews* in September, "We're building several 30-foot, boom-handling boats for the U.S. Navy's Supervisor of Salvage and Diving, or SUPSALV, with a total of 30 ordered," said. "Nine have been delivered so far. We're also building ten, 35-foot cutter long-range interceptor boats for the U.S. Coast Guard, and four of those have been delivered."

Outlook: Terror Threat and Domestic Crime feed maritime security needs

Because of threats from ISIS and tensions in Syria and the Persian Gulf, Middle Eastern demand for maritime security vessels will remain steady, Swiftships CEO Shehraze Shah told *MarineNews*. It is also true that smaller patrol vessels in the Gulf at least partly reduce the need for cruisers and destroyers in that region. As smaller, more agile assets become the preferred vehicle for smarter response to coastal, littoral conflicts, these craft are rapidly replacing the legacy 600 foot warship in this theatre. For foreign governments and the Pentagon, that frees up larger assets for other uses and – in theory – reins in spending.

For its part, the U.S. Navy will likely continue to spread financing between boat builders as demand for maritime security vessels is met over the next several years, Shah said. Separately, federal, state, county and local officials will continue beefing up waterway protection against foreign and domestic terror threats, drug dealers, other criminals and fires. That demand isn't relegated to just local markets; foreign export hulls also constitute a big slice of the pie.

U.S. yards in particular have demonstrated that – through direct sales agreements – they can build in series, with economy and better quality than foreign counterparts. This, coupled with surprisingly persistent local domestic demand is a welcome infusion of life in a boat building climate that might otherwise be showing the beginnings of a slowdown. Maritime Security, as it turns out, is one market that appears to be immune to market pressures elsewhere.

***Susan Buchanan** is a New Orleans-based business writer, specializing in energy, maritime matters, agriculture, the environment and construction. She holds a master's degree from Cornell University in agricultural economics and an undergraduate degree from the University of Pennsylvania.*

Maritime Security
for the Municipal Sector

Metal Shark

Without sacrificing utility or features, the Metal Shark 75' Endurance and the Moose M3 models both provide multi-missioned platforms for the cash-strapped municipal sector.

By Joseph Keefe

Moose Boats

A crowded field for today's domestic boatbuilders and a highly competitive marketplace finds builders trying to position their output and designs to a place that separates them from the pack. One place to do just that is in the market for maritime security workboats, particularly when it comes to local, state and municipal buyers.

Municipal and state buyers want a great deal for their declining budget dollars. In response, builders are sharpening their pencils and putting together vessels that offer not only bang for the buck, but also multi-missioned vehicles designed to leverage a single hull into one that can perform the duties of three. Two builders, Louisiana-based Metal Shark and California-based Moose Boats, go about the task in a slightly different manner, but with similar, impressive results. Either way, cashed strapped public sector law enforcement and security stakeholders may have just found a way to get the job done, without sacrificing performance.

The Metal Shark 75 Endurance Catamaran

Billed as a dual-purpose custom fireboat, Command & Control and Multiuse Port Security Boat, the Metal Shark 75 recently built for the port of South Louisiana is powered by twin Caterpillar C-18 diesel inboards with a conventional straight shaft drive system. The 75' Endurance can also be equipped with straight shaft inboards, water jets, or pod propulsion systems. Incorporating the latest technology to support fire rescue missions, command and control (C2) operations, and around-the-clock port security efforts, the vessel can be custom-configured to suit a wide range of mission profiles including dive support, fire rescue, port operations, law enforcement, and defense.

For firefighting, twin dedicated drive engines channel up to 6,000 total gallons per minute through an oversized water main where electronic valves divert water to three RF-controlled monitors. Four additional 2.5" hydrant connections and a 400-gallon foam reservoir provide maximum flexibility across the full spectrum of firefighting needs. And, with a roomy pilothouse featuring 360-visibility, and bunking capacity for multiple crew, the 75 Endurance is ideal for multi-agency coordination. The latest version is equipped with a positive-pressure Chemical, Biological, Radiological, Nuclear, and high-yield Explosive (CBRNE) ventilation system for crew protection.

As currently outfitted, the vessel can do double duty as a multi-purpose municipal vessel. Josh Stickles, Metal Shark's Director of Marketing, explains, "Our 75' Endurance was designed as a multi-use platform that may be custom configured to support a wide range of missions, with a focus on firefighting capability. This particular boat is a 'multi-purpose port security and response vessel' set up for Fire Rescue, Law Enforcement, and Port Security missions."

According to Stickles, there is robust demand for aluminum catamaran designs across this sector. He told ***MarineNews*** in September, "We've seen demand for this type of vessel across numerous markets where stability and maximum deck workspace are key considerations. Due to its wide beam, a catamaran hull surpasses a monohull vessel of comparable length in both of these areas. On this par-

Endurance 75 at a Glance …

Length, Boat Only: 75'	Engines: Twin Cat C-18 diesel inboards	Beam: 24'
Foam Storage: 400 gallons	Firefighting Stream: 6,000 gpm	Hull Draft: 50
Fuel: Dual 600 Gallon Tanks	Draft (shaft propulsion): 50"	Range: 500 miles

"You'll see evolutionary enhancements throughout, from our 360-degree pilothouse glass that greatly improves visibility, to many designed-in, as opposed to bolted-on, mission specific features. Probably the biggest takeaway expressed by customers who have been aboard is that this is a very crew friendly design that manages to incorporate multiple complex systems in a way that makes them easy to use."
– Josh Stickles, Metal Shark's Director of Marketing

ticular vessel, the customer was looking for enhanced stability at slow and fast speeds, a hull shape that mitigates wake size as much as possible, maximum working space on deck, and ample crew quarters below."

Also according to Stickles, the boat's 6,000 total gpm pumping capacity is impressive, but it was also matched to their customer's requirements. He added, "We can easily offer higher or lower capacity solutions depending on what the customer wants." Beyond that, the boat can continue to pump water and maintain steerage if it drops an engine because the fire pump engines are independent of the propulsion engines. Not every fireboat can boast that metric.

With a hull draft of just 50 inches, the vessel is specifically designed for riverine and shallow draft operations. And Stickles insists, "It has a shallower draft than most vessels of this size and weight. For customers requiring something even shallower, the vessel may be equipped with water jets." According to Stickles, the type selected will depend on the needs and wants of each customer."

Stickles had a hard time distilling the merits of his newbuild offering down to a single innovation. We asked him to do so, nevertheless. He replied, "You'll see evolutionary enhancements throughout, from our 360-degree pilothouse glass that greatly improves visibility, to many designed-in, as opposed to bolted-on, mission specific features. Probably the biggest takeaway expressed by customers who have been aboard is that this is a very crew friendly design that manages to incorporate multiple complex systems in a way that makes them easy to use."

Already a key supplier to the U.S. Coast Guard, Metal Shark also offers armor as an option. Stickles says that the Command and Control aspect adds another level of capability and makes perfect sense for municipalities looking to get the most use out of their vessel. Or, in other words, big bang for the buck.

Moose Boats' M3-30 Monohull

When Moose Boats first built its M3 (34'-4" LOA) monohull demonstrator in 2011, the move may have surprised some stakeholders. After all, Moose is widely considered one of industry's most prominent catamaran builders. No one should have been surprised when the Moose monohull provided so much value in such a compact hull. Here's why:

According to Mark Stott, Sales Engineer for Moose Boats, the intent was to offer all the design features, ergonomics and quality of Moose Boats catamarans in a smaller, more tactically maneuverable and less expensive platform. Stott reports, "The model has been successful with Los Angeles Police Department Hydra Operations who have two of the boats in service, the original demonstrator and a version two feet longer with triple 300hp outboards configured as a multi-mission dive, offshore interdiction and SWAT deployment vessel."

Twin Yamaha outboard 300's propel the demonstrator at speeds that can reach 47 KT. Twin Yamaha outboard 300's propel the demonstrator at speeds that can reach 47 KT. Moose shied away from water jets, in part because the installation of inboard engines and drives would reduce space and functionality in the cockpit. Stott explains further, "The cost differential – as much as $150,000 – is prohibitive for some municipalities." Nevertheless, he adds, should a customer desire, the monohull can accommodate up to twin 350's or triple 300's, should that kind of power be mission necessary.

Another M3 was also built for New Orleans Fire Department. Stott says, "The feedback we received from LAPD on the M3's handling and offshore capabilities were exceptional and that its generous deck level cabin and large cockpit provided far greater functionality than other law enforcement monohull vessels available." With the firefighting configuration, the vessel pumps up to 1,500 gpm, adding to its multi-mission potential.

For several other agencies, however, with typical law enforcement crews often being limited to one or two personnel, it was difficult to access the bow line or make contacts with other vessels without leaving the helm. It then became apparent to Moose Boats that a void existed in the market for a versatile monohull law enforcement vessel that was large enough to handle offshore conditions and also offered seating for multiple crew members, and could also be utilized day-to-day by a single operator. The M-3, tweaked with some notable modifications, was just the ticket.

Based on feedback from several existing Moose customers, there was a need for a cabin allowing entry and egress for an operator and a second crew member through full height wide side sliding doors and unobstructed transit between the cockpit and foredeck while wearing service belts, ballistic protection and PFDs. Working with the proven high freeboard, 9'-6" beam M3 hull, Moose Boats design-

ers Roger Fleck and Charlie Hicks began design work on a walk around cabin with an emphasis on ergonomics, situational awareness, safety and deck functionality.

Fleck and Hicks sized the cabin to balance the internal and external requirements and developed custom, low profile sliding side doors to maximize the opening area and minimize obstruction to the walk around area. The helm seat is now biased closer to the M3's centerline, providing greater visibility for the operator while in-turn allowing access to the aft area without exiting through the side door. The newly designed offset helm chair also allows the operator to stand safely next to the helm seat with access to the steering and throttles while making contact with other craft.

Notably and to reduce visual obstructions, the windows of the M3's two side sliding doors and hinged aft door align with the cabin's fixed windows when the doors are open. Maximizing cabin space, a locking long rifle cabinet is integrated into the starboard aft cabin pillar while on deck fender pockets and a tow reel are recessed into the aft coaming keeping the decks uncluttered.

With modular and removable seat structures, the cabin interior layout can be tailored to suit the end user's intended mission or altered in the future, if required. Easily accessible engineering spaces provided for a forced air diesel heater, reverse cycle air conditioning and a 7kW Generator.

The M3-30 demonstrator – the Moose designation due to it's just under 30' hull length – has proven its performance to San Francisco Bay Area and Los Angeles marine law enforcement and is currently under evaluation by agencies in the Northeast United States. Based upon the immediate interest indicated by agencies that have already seen the M3-30, Stott explains, "Only one has been built so far. It is being evaluated by both the New Jersey State Police and the New York Police Department. Completed in July of 2015, it was arguably a gamble. But, this hull comes at an attractive price point, and gives an organization the opportunity to do more with less hulls, each of which will accomplish so much more."

Two Examples: One Goal, Enviable Results

Moose and Metal Shark both target similar markets with a different approach to providing the same end result: an affordable multi-mission hull that can be customized to suit the needs of myriad users. For domestic customers, the two vessels provide two distinct size choices (75' versus ~ 30') that satisfy the same market needs. And, that's not to say either or both wouldn't fit well into what has emerged as a robust export niche for smaller U.S. yards. As Moose and Metal Shark rapidly up the ante in Maritime Security for the Municipal Sector, the idea rolls right off your tongue, doesn't it?

Riders on the Storm

It's no shock that decking, seating and other related equipment for 'fast boats' is a critical ingredient for maritime security personnel.

By John Haynes

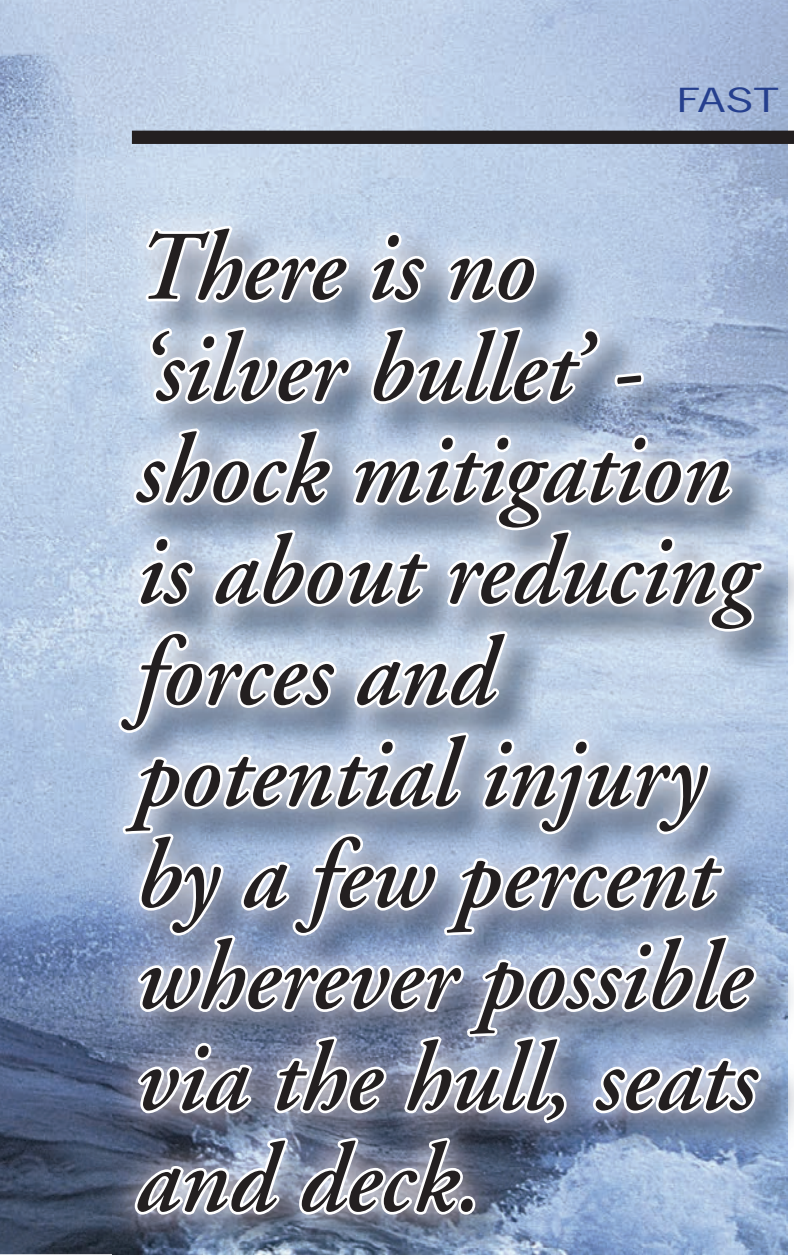
A shock mitigation strategy is essential for all craft that undertake open sea transits or operate in rough water. The definition of shock mitigation is, 'to make a violent collision or impact less intense.' The search for shock mitigation has created a range of solutions. Before that, however, criminal organizations capable of buying fast boats were most likely running something, or someone, illegal in from offshore.

The buyers, from the Mediterranean to the Caribbean, were concerned only with how much payload they could carry and how fast would the boat go. They soon owned the fastest boats on the water. Seating was irrelevant and crews were usually standing on hard decks as any wasted space or weight reduced the all important payload. As the distance from Morocco to Spain and Bimini to Miami is around 50 miles, identifying a boat capable of over 50 knots was an important criteria.

In the early days of counter 'go fast' operations for marine police, customs and borders organisations the focus was firmly placed on procuring high performance hulls to chase down offenders. Boat crews and enforcement officers were usually standing in wrap around bolsters or leaning against padded rails. There were no seats and these hard core operators were using their experience, balance and leg muscles to ride the boat.

Go Fast Operations

Countering a high value, high speed run required a capable fast response boat with fit crews ready for a short sharp pursuit, usually at night, that often ended in a 'lights off' high speed chase in the intercoastal waterways. This was a brief one on one, win or lose situation with lucrative pay off for evasion. Hence, the history of 'shock mitigation' technology can be traced back to the 1990's and the



There is no 'silver bullet' - shock mitigation is about reducing forces and potential injury by a few percent wherever possible via the hull, seats and deck.

rapidly changing requirements of counter narcotics and military marine operations as boats became faster with extended and more complex missions. The game changer for homeland security in port and maritime security operations was 9/11. As global stakes changed and requirements were analyzed, it became obvious that security and military boats would need to operate faster than ever before. The people on them would need to be 'fit to fight' determined adversaries after a fast transit in extreme sea conditions.

As high speed craft designers and professional sector boat builders rose to the challenge they built in 'over engineering' wherever possible. In the early days of shock mitigation, 'feet off the deck' suspension seating incorporated complex engineered solutions, often adapted from land vehicles. Other manufacturers then started to offer lighter and simpler 'feet on the deck' jockey suspension seats.

Next generation manufacturers have created a range of suspension seats and adjustable shock mitigation systems to enable humans to operate fast craft in the roughest of conditions. These solutions utilize sophisticated mechanical engineering to disconnect the boat occupant from G forces as the hull moves over rough water and wave conditions. Taking this a stage further, the latest shock mitigation technologies now utilize Man Machine Interface (MMI) to link coxswains, navigators, engineers, FLIR operators, gunners and commanders to their tasks, controls and screens.

Shock Mitigation: by all means

Shock mitigation is important for people who want to go further, faster or for longer in extreme conditions. RHIBs are an outstanding way to get afloat, but as technology changes, even a very fit human body has its limits. As crews need to focus on the task at hand it is important to protect all occupants of fast boats from injury, whether they are sitting or standing.

When a RHIB is running in flat sea conditions, occupants experience vibration coming up through their feet on the deck, held there by gravity and body mass, but boat occupants are not exposed to harm. That said; waves change everything. Waves can be windblown or can be caused by the wake from larger vessels even in calm weather conditions.

As powerboats get lighter and faster there are new issues to consider. Operating a fast boat in flat open waters is relatively easy, but running at high speed exposes novice crews and less experienced passengers to shocks and vibration when the boat hits a wave. Professional high speed craft operators need a combination of shock mitigation solutions. There is no silver bullet. Shock mitigation is about reducing forces and potential injury wherever possible via hull, seating and deck arrangements.

Whole Body Vibration (WBV) exposure on planing craft is usually caused by continuous 'hammering' from short steep seas or wind against tide conditions. Repetitive Shock (RS) on planing craft is usually caused by random 'hits' from head sea impacts, crossing seas or overtaking following seas.

The EC Vibration Directive came into force in 2010, and has driven an increasing awareness that operators must reduce the effects of vibration on employees by all means. Even moderate sea conditions can be painful and lead to serious injuries to ankles, knees, lower back and neck. What they often do not realize is that just 3 foot seas can produce impacts of up to 10g on deck.

Round Britain Record Holder 'Hot Lemon' with crew standing

"Skydex works differently than foam and is tuned to react to the expected levels of shock. For example, in a wave impact situation, particularly in the dark, the human body cannot react fast enough to protect itself from the shock. Skydex reacts instantly to the forces, plus the technology works in all axes to reduce the effect on the human body whether the boat is landing vertically, into head seas or even side on."
– Peter Foley, Chief Technology Officer of Skydex Technologies

Sitting & Standing on Fast Boats

Research has led to a better understanding of the forces involved on the human body at sea. On jockey or straddle style suspension seats, the occupants feet are still on the deck. In a head sea or following sea transit, some of the forces are vertical (usually referred to as Z axis) and some of the forces are fore and aft (usually referred to as X axis). The boat rarely moves sideways (usually referred to as Y axis) but side-on seas cause random events and a combination of forces that cannot be predicted and create the most damaging vector of forces on the human body.

On certain craft, there is the option to retrofit suspension seating. If seats are too large or too costly, then operators will find other methods to reduce the effects of vibration and impact on the human body. With boats now expected to last 15 to 20 years, government and commercial organizations may not retrofit suspension seats. Hence, global military and professional operators are now looking at the deck and considering how to reduce the forces there.

High G Forces for Occupants

The big force that RHIB crews experience is when the boat climbs over the top of a wave and occupants experience a negative gravity sensation, not unlike the hump on a roller coaster. As the boat lands, the Vee of the hull displaces water until it can go no deeper. A few milliseconds later, occupants land on deck and their body decelerates with everything from the head down pushing into the feet if standing, or into the backside if sitting. Ask a group of fast craft professionals where it hurts and you will usually get the same answer: lower back, knees and hips.

Without suspension seats, experienced operators usually choose to drive RHIBs standing up in anything but flat conditions. Most fast boat operators prefer to stand to see oncoming waves and use their legs to balance and absorb the boats movement. At that point, they also have the opportunity to engage and use an incredibly complex suspension system – the human body.

Typical decks made of aluminium, fibreglass and composite materials transmit shocks and vibration. Standing on foam or rubber flooring is an option, but most of these materials lack stability which causes fatigue. This is where the constant 'firing' of ankle and calf muscles eventually leads to shaking legs. When simply standing on most foam products the material is already pre-loaded, which means that feet sink towards the deck, therefore reducing the depth of cushioning. For heavier occupants in wave conditions, it becomes increasingly likely to bottom out which feels like the underside of the feet have been hit with a hammer.

Impact Mitigating Boat Decking

Just as suspension seats are more engineered than standard foam seats, impact mitigating boat decking solutions need to be more engineered than simple rubber or foam. For example, Skydex Technologies have developed high-performance boat decking products that use patented energy-absorbing geometries to reduce the effects of impacts and


SKYDEX Boat Decking on RHIB with shock mitigation seating

dampen vibration on high speed craft. The objective is to reduce the potential for injury and protect equipment when exposed to wave slam events.

James Taylor, President & CEO of Skydex Technologies, told *MarineNews*, "Skydex has developed products that excel in harsh environments and our technology has been employed extensively around the world. The technology that we bring to the marine market is the same that we have supplied as blast mitigation flooring to protect the occupants in over 20,000 military vehicles."

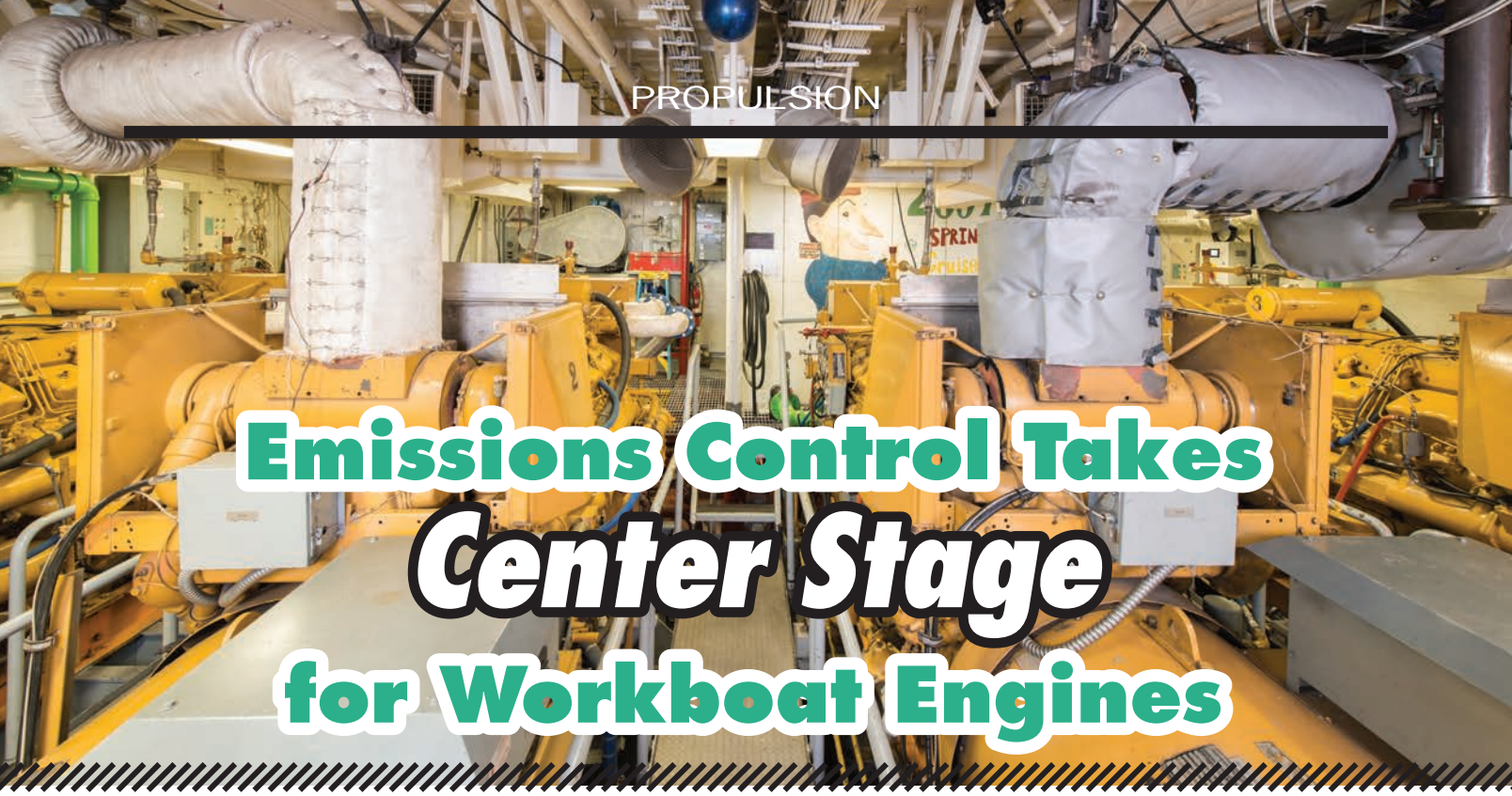
Skydex Boat Deck is available in a range of products, from 14 to 50mm thickness, based on the level of deck coverage and mitigation required. This can be fitted on new boats or as a retrofit solution. The technology leverages elastomers and proprietary geometries to create a multiphase spring that is engineered to react differently to various levels of impact.

Peter Foley, Chief Technology Officer of Skydex Technologies, explained, "Skydex works differently than foam and is tuned to react to the expected levels of shock. For example, in a wave impact situation, particularly in the dark, the human body cannot react fast enough to protect itself from the shock. Skydex reacts instantly to the forces, plus the technology works in all axes to reduce the effect on the human body whether the boat is landing vertically, into head seas or even side on."

Impact mitigating decking can be particularly beneficial on boats with leaning posts and on boats with fixed jockey or straddle seats where the occupants stand in rough conditions. Even 'feet on the deck' suspension seats require the occupant to use their leg muscles and carry a percentage of body weight on the deck, this can result in a significant weight on one leg particularly in crossing or side on seas.

A holistic approach to shock mitigation solutions on the water can improve comfort and reduce the effects of shock and vibration on the human body for crew and passengers. For professional 'Riders on the Storm,' this can minimize downtime from injuries and extend the working life of maritime professionals.

John Haynes** is an Associate Fellow of the Nautical Institute, a Yachtmaster Ocean and Advanced Powerboat Instructor. Subject matter expertise includes high speed craft consultancy, product development and specialist training. He is Operations Director of Shock Mitigation, providing WBV Awareness training **www.shockmitigation.com** and founder of the RIB & High Speed Craft Directory that brings together specialist boats and equipment for the sub IMO / sub 24 metre professional sector worldwide **www.ribandhsc.com



Emissions Control Takes Center Stage for Workboat Engines

By Joseph Keefe

Today's workboat operators must navigate increasingly stringent IMO and EPA environmental and emissions regulations in and around ports and rivers. As the drama unfolds, selective catalytic reduction or SCR is emerging as a viable vehicle to do just that. At the same time, fears about space constraints for smaller vessels and the hassle of carrying and handing urea for these systems are rapidly evaporating, as well.

Two different firms – both familiar names in propulsion markets – have embraced SCR as the way forward. Both, Tenneco and Volvo Penta, rely on deep roots in these markets and significant experience in the effort to reduce emissions from engines. For its part, Volvo Penta is a recognized stakeholder in the marine propulsion markets, while Tenneco is widely known for its deep roots in emissions reduction in the automotive sector. It now brings that expertise to the water, just in time for workboat operators thirsting for a compact, effective and class-approved solution.

Tenneco SCR

Already a leading global supplier of Clean Air aftertreatment technologies in other sectors, Tenneco was in July awarded three product design assessment (PDA) certificates from the American Bureau of Shipping for its new selective catalytic reduction (SCR) system for large engines. That said; Tenneco's SCR solution is already out on the water, performing as advertised, on not one but two workboat hulls.

Tim Jackson, Tenneco's head of Technology, told *MarineNews*, "Tenneco's core business in clean air technologies began in 1975 with light vehicle solutions for the passenger car and light truck market. We expanded to commercial trucks in 2004, and by 2010, developed our first SCR systems for locomotives and for off-highway equipment. In 2012 we developed our first marine and stationary power systems and in 2014 launched our first complete marine SCR aftertreatment system." Beyond this says Jackson, Tenneco is working to provide solutions for our customers to meet future regulations such as EU Stage 5."

Tenneco's SCR aftertreatment system features a complete dosing control solution specifically designed for marine engine applications up to 7,500 kW or 10,000 hp. The system is designed to enable propulsion and auxiliary engines to meet EPA Tier IV and IMO Tier III regulatory requirements and provide precise and reliable delivery of liquid urea via a proprietary, high-performance injector design, a precision mechatronic fluid delivery pump and customizable remote monitoring and controls.

In the past year, field tests were conducted on a 224 foot Great Lakes training vessel powered by four 800 horsepower, circa 1984 Tier 0 engines.

In a series of validation tests, including the ISO 8178 E2 cycle, when one of the engines was outfitted with the

Image above: In 2014, ship trials were conducted on a Great Lakes training vessel powered by four 800 horsepower, circa 1984 Tier 0 engines.

Johan Straus Volvo Penta D5

aftertreatment system, the engine met all criteria for IMO Tier III including NOx and SOx. In 2015, additional field tests are currently underway on the sister vessel – the training vessel of the Texas Maritime Academy, powered by the same type of engines. Initial testing produced results which meet EPA Tier IV emission levels. In August, ***MarineNews*** traveled to the Texas A&M Maritime Academy in Galveston, TX to see the installation up close, and talk with company officials about the results.

The SCR system's modular design enables seamless integration for a broad range of engine sizes and works with electrically or mechanically controlled engines. In two retrofit installations – both in enginerooms with limited physical room – the system has been proven in a wide array of installation options. Better known in automotive markets, Lake Forest, IL-based Tenneco is nevertheless one of the world's largest designers, manufacturers and marketers of clean air products for automotive and commercial vehicle original equipment markets and the aftermarket.

At Texas A&M, similar to its earlier successes at the Great Lakes Maritime Academy, Tenneco's SCR solution is helping the school meet new emissions regulations. Both the *TS General Rudder*, which is operated by the Maritime Academy and its Great Lakes sister vessel employ 33-year old 800 horsepower, Tier 0 engines. The Tenneco solution has been demonstrated to keep both engines compliant with today's stringent EPA Tier IV marine emission requirements under all operational conditions.

Because space is at a premium on workboats, Tenneco leveraged its packaging expertise in passenger car and commercial vehicle aftertreatment systems to develop a highly compact and flexible system for the large engine marine market. Indeed, Tenneco's large engine SCR can be integrated into a variety of engine designs. Jackson adds, "Our SCR Reactor can be installed vertically or horizontally inline with existing engine exhaust piping. The dosing control system is compact and can be mounted in a variety of locations. Urea pump supports flows of up to 120 meters, which enables a range of installation options for urea storage."

Ideal for newbuild tonnage, the modular system is compact and can be integrated with a variety of engines, engine room configurations and retrofits. According to Jackson, installation is straightforward and can be completed as part of a planned maintenance update. And, he says, additional validation testing is underway in Asia and Europe, and the system is currently being validated with marine and large engine customers.

Urea consumption – always a concern and an expense for any operator – depends on a number of factors including engine configuration, the level of NOx reduction required and duty cycle, but a good rule of thumb is urea consumption of approximately 3-5% of fuel consumption. The urea is completely consumed in the aftertreatment process, so there is nothing to be disposed.

Commenting on the cost of the urea, Jackson insists, "Urea consumption is a small fraction of fuel consumption. Also, the use of SCR to meet emissions requirements versus exhaust gas recirculation (EGR) technology typically allows the engine to be tuned for lower fuel consumption, so urea consumption and cost can often be offset with fuel savings.

Tenneco's Jackson sees a bright future for SCR on the water. "We see broad application for our SCR system in the

"We see broad application for our SCR system in the workboat market including push boats, tugs, pilot boats, offshore support vessels, rescue vessels, dredges and commercial fishing boats as well as offshore drilling rigs themselves."
– Tim Jackson,
Tenneco's head of Technology

workboat market including push boats, tugs, pilot boats, offshore support vessels, rescue vessels, dredges and commercial fishing boats as well as offshore drilling rigs themselves." And, he adds, "We bring decades of integration and packaging experience to every marine engine application we design. The result is an SCR aftertreatment system that is easy to install, economical to use, and simple to maintain."

"While EGR is slightly smaller in installation, SCR makes it possible for us to keep our high power outputs and is better suited to take care of the high sulfur contents of marine diesel. We are targeting to reduce the physical dimensions of our SCR solution by 30-50 percent in the future."
– Ron Huibers, President, Volvo Penta of the Americas

Volvo Penta of the Americas

Volvo Penta's strategy for emissions control in marine diesel engines, as it applies to its power range of high-speed commercial marine diesel applications (less than 600KW), also involves Selective Catalytic Reduction. Citing reliability and the lowest total cost of ownership, Ron Huibers, President, Volvo Penta of the Americas, adds, "We have determined that this is the best solution for its ability to reduce emissions to meet the most stringent current and projected regulations in North America and internationally."

Actually, says, Huibers, the Volvo Group was one of the pioneers with SCR technology, dating back to 2005. And like Tenneco, Volvo has many years of experience in deploying SCR on trucks, buses and offroad vehicles – as well as marine vessels - with proven SCR technology that meets the world's toughest emission standards. According to Huibers, SCR allows Volvo to sustain high power outputs without performance compromises. Beyond, he says, "Our SCR solution allows us to meet emission requirements without an additional diesel particulate filter (DPF)."

Committed to SCR, Volvo Penta is also teaming with STT Emtec in repowering some 50 sightseeing canal boats in Amsterdam to achieve the goal of zero emissions. In this case, however, the Volvo Penta D5A TA engines were fitted with a marine exhaust gas recirculation (EGR) solution that reduces NOx by diluting the charge air with recirculated exhaust gas. Using the system, the engine's carbon monoxide, hydrocarbon and carbon particle emissions are reduced by up to 60 percent and NOx emissions by up to 45 percent. The system has not yet been deployed in North America, but Volvo Penta will respond to requests, if the market evolves.

Here in the United States, Volvo Penta's range of commercial marine diesels are less than 600 KW and meet EPA Tier 3 without SCR. And Volvo says that to retrofit SCR on its existing uncatalyzed engines is not yet practical. In other markets, Volvo has employed EGR in combination with SCR, specifically in their on-highway US EPA 2010 rule and offroad market, Tier 4 Final.

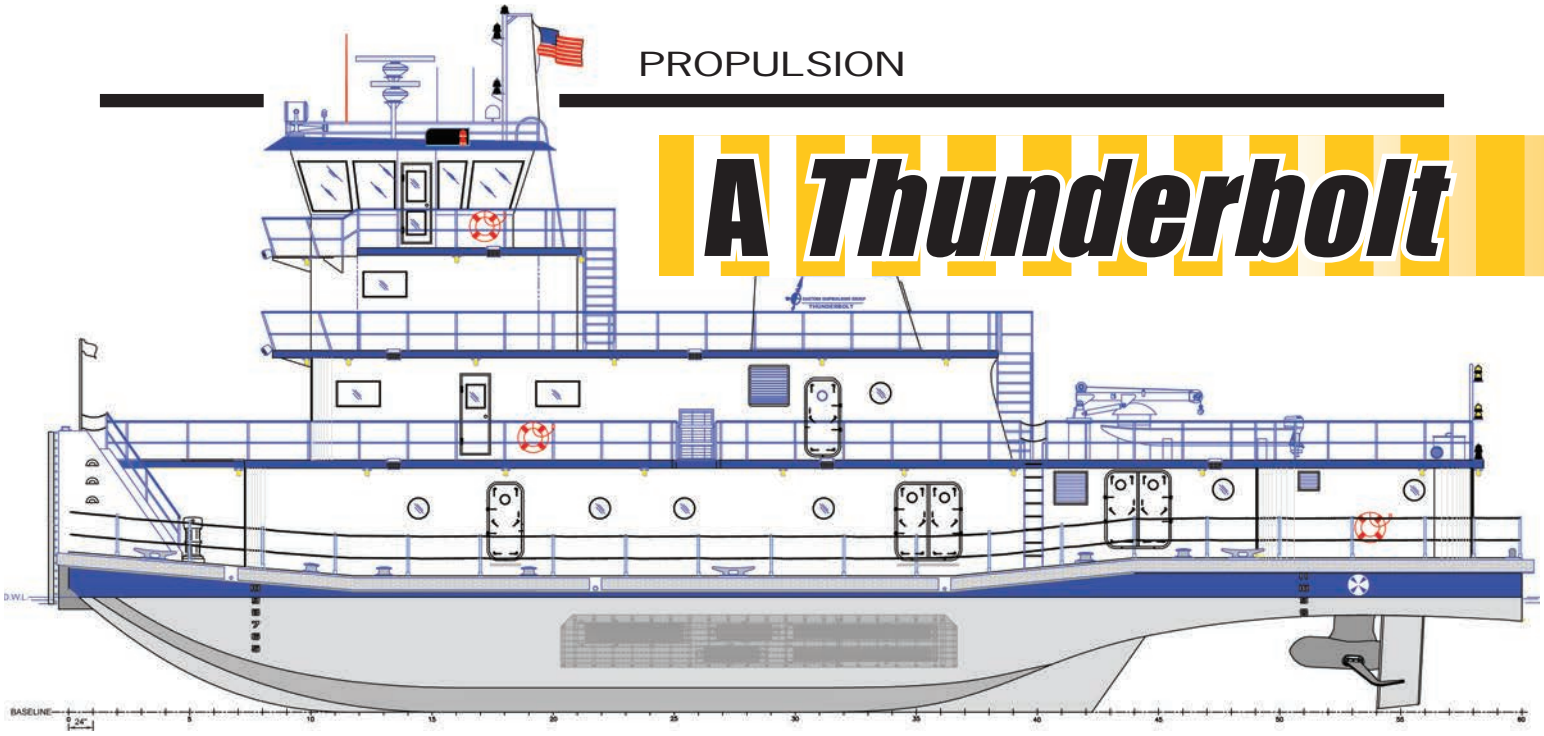
Like Tenneco, Volvo Penta is carefully looking at the limited engineroom space on workboats. Huibers explains, "While EGR is slightly smaller in installation, SCR makes it possible for us to keep our high power outputs and is better suited to take care of the high sulfur contents of marine diesel. We are targeting to reduce the physical dimensions of our SCR solution by 30-50 percent in the future."

Like Tenneco, Volvo Penta puts urea consumption at roughly 3 percent of annual fuel consumption, depending on the duty cycle. Huibers adds, "We are optimizing our engines and urea dosing strategies to make the end result cost neutral to the user when it comes to urea and fuel versus EPA Tier 3 levels."

Different boats, Different Longsplices

Every situation and business case is different. U.S. EPA Tier IV regulations apply to new vessels, and the costs and benefits of engine configuration and aftertreatment should be taken into consideration based on the operators' individual needs. The U.S. EPA Tier IV regulation requiring NOx reduction started in 2014. Notably, Tenneco's aftertreatment systems enable engines to comply with the IMO and EPA regulations.

For a workboat operator contemplating (a.) newbuild, (b.) repower and/or (c.) merely adding SCR to an existing engine, the choices can be confusing. Tenneco's Jackson sums up the equation succinctly, saying, "While there are costs associated with all powertrain technology upgrades, an SCR system would be a fraction of the cost of a new or remanufactured engine." Tenneco's money is on SCR, and Volvo Penta is on the same course. And, it is difficult to argue with either OEM. That's because, when it comes to emissions management, experience counts.



A Thunderbolt of an Idea for Inland Operators

Eastern's new inland towboat design personifies the movement towards purpose-built and designed tonnage that matches all equipment – including propulsion – to the platform itself.

By Joseph Keefe

Just a few months ago, Eastern Shipbuilding (ESG) introduced the Thunderbolt, a new inland towboat designed to capture better efficiencies, performance, improved maneuverability, and other important metrics. Notably, the 4,200hp Thunderbolt will be outfitted with twin azimuthing Verhaar Omega electric V-Pod propulsion and diesel-electric technology.

The ESG design involved collaboration with naval architects, propulsion OEM's and also relies on the advice of inland operators. The concept incorporates the common sense strategy of making sure that azimuth technology, when applied to any hull, is also done so in a manner that will maximize its utility. In this case, the inland markets are ESG's focus for the Thunderbolt. Eastern is anything but a stranger to inland boatbuilding, having has constructed and delivered on-time and on-budget as many as 85 inland vessels of all types since 2006. Today, its inland backorder book boasts no less than 18 vessels.

It is (arguably) unusual for a shipyard to come up with its own turnkey design, but inland 'teams' are now more common, as operators, shipyards and naval architects push the concept that all OEM equipment has to fit into a bigger package, instead of being procured in a stovepiped, standalone basis. On the other hand, ESG's experience with the proven Platform Supply Vessel "Tiger Shark" diesel electric and propulsion technology design, leveraged with Eastern's ongoing inland towboat construction program, kicked off the research and development phase of the program in November 2013.

Gilbert Associates, Inc. (GAI) became an integral part of the Thunderbolt team when ESG approached GAI looking for a conventional towboat design of about 110 feet LOA. GAI President John Gilbert explains, "The design length has grown to 120 feet and since has been widened. The initial design package consisted of a preliminary lines plans, inboard profile, outboard profile, and general arrangements which was enough for the presentation to Eastern's Senior Management for design funding approval. This was followed by the additional engineering required to bring the final Thunderbolt concept design as it exists today."

Two of the most significant design challenges for GAI were the development of the hull tunnels to which the Omega V-Pod's would reside as well as the V-Pod hull structure and top mount cans, the weight and trim of the vessel. Gilbert explains, "The machinery of a diesel electric boat

by design tends to weigh more than that of a conventional diesel gear and screw vessel design. The machinery weight has to be distributed differently for the V-Pod design."

A Gathering Storm – Thunderbolt Develops

The Thunderbolt design concept takes its roots from Eastern Shipbuilding's conversations with Omega's Dick-Jan de Blaeij and Jan Verhaar, where they began to flesh out the details of what was to later be known simply as "Thunderbolt." According to ESG Vice President of Sales & Marketing, Steve Berthold, "The Thunderbolt design was driven by the future, the latest proven technology, power management, an efficient propulsion system and complying with the latest US EPA Tier 3 emissions regulations." He added, "Then we included the pending USCG (Sub-M) regulatory requirements in order to provide the US Inland Towing Vessel Industry with a compliant, safer, comfortable, more dependable vessel with lower fuel consumption, higher efficiencies with power management and lower operating cost over the life of the vessel."

The Thunderbolt will be built to ABS rules, but will not be classed. Berthold explains why. "Regulatory (ABS) Class Rules/Electrical IEEE-45 Standards/USCG Regulations are what is used to design and build vessels regardless of whether it is an Inland or Offshore vessel, requiring Class or not." Berthold also points out that the new U.S. Coast Guard46 CFR Subchapter M Inspection of Towing Vessels Regulations will be quickly upon us. He adds, "The new regulations will impact all uninspected towing vessels which will define and update vessel firefighting, fire suppression, and safety systems, lifesaving, propulsion controls, steering, navigation and communication requirements. We have researched and incorporated the Sub-M requirements into the Thunderbolt design." Beyond this, ABS Americas has approached Eastern about classing the Thunderbolt design. The option, not mandatory, does add an additional upfront construction expense and probably additional time to the construction period.

Nuts and Bolts

Arguably, the Verhaar Omega V-pods that will be featured on Thunderbolt are at the heart of what makes the design package so desirable. Since 2012, 19 Omega V-pods have been installed and are currently in service in Europe on various types of vessels. Eastern selected the Omega V-Pod for the thrust efficiency, the absence of mechanical driveline shafting, bearings or mechanical internal angle drives and the fact that the propeller is coupled directly to the electric propulsion motor in the lower unit. Berthold told *Marine-News* in August, "It's a perfect fit for a pure diesel electric propulsion and power management system design."

Eastern's Thunderbolt is offered to customers with more than one engine solution – Cummins or Caterpillar. Berthold explains, "We understand that owner/operators have preferences for their fleets based on engine history, maintenance, service, operations and past performance in the field." Both options involve proven, time-tested equipment.

Taking Care of Business – and the Crew, too

Eastern touts the boat as having 'reduced Noise and Vibrations' for what they characterize as "Remarkable Crew Comfort." Berthold explains, "We have included noise, vibration and structural fire protection measures into the design. For example, thermal insulation is installed throughout the superstructure – A-60 insulation to protect the crew from fire – but in particular, sound dampening materials and vibration treatments where it makes sense." The effort doesn't stop there, however. The (3) main generator skids are on isolation mounts along with the 90kW harbor generator which dampen engine vibration through the steel structure. The Omega V-Pod itself has a vibration isolation system.

Thunderbolt will allow the operator to take boat handling skills to the next level. Those already with Z-drive experience will excel quickly by utilizing the additional performance features which only the Omega V-Pod propulsion system can offer. Nevertheless, ESG feels that additional training on the merits of 690 VAC medium voltage electrical switchgear, AFE propulsion VFD drives, power management and the automation systems of the design is desirable. Hence, Eastern along with its Integration Team are offering (Level 1) Classroom Training in Houma, Louisiana at no additional cost. Additional training can be requested at quoted at cost. Level 1 training consists of:

- *690/480/208VAC Electrical and Power Management System Training.*
- *V-Pod Electrical Propulsion and AFE/Drive System Training.*
- *V-Pod Steering and Propulsion Control System Training.*
- *Vessel Automation Training.*

V-Pods: Versatile, Positively

Eastern didn't select Verhaar Omega in a vacuum. Instead, they met with two inland owner/operators that currently have Z-drive towboats, and others that don't. Listening to each and noting their concerns, it was decided that the V-Pod was the best solution. Because the Thunderbolt will typically operate in shallow, sometimes turbid, debris

filled water, ESG designed underwater protection in the form of a pipe guard protection system for each Omega V-Pod. These pipe guards protect the V-Pod allowing the vessel to ride over shallow water mud flats, protect the vessel from side bank impacts when turning in rivers and canals and stern impact protection when backing down.

Omega itself offers a propeller guard which is bolted directly to the nozzle which protects the propeller from debris entering and being lodged between the blade tip and the nozzle. And, adds Berthold enthusiastically, "The best protection feature is that the Omega V-Pod propulsion electric motor has a shutdown sensor with alarm and is reversible, allowing the operator to reverse propeller rotation enabling nozzle/propeller jammed debris to be dislodged."

The Omega V-Pod is further designed with reduced maintenance in mind. The V-Pods are enclosed in the aft main deck superstructure, with no drive shafts, couplings, drive gears, hydraulic systems or external piping systems to contend with. Berthold says simply, "Disconnect the electric cables and the foundation mounting bolts and out the unit goes." And, since the Thunderbolt mounting flange is well above the design waterline, dry-docking is not required for maintenance. Finally, parts and service after the sale are always a huge concern, but not in the case of the V-Pod. Because Sewart Supply has been the U.S. service representative for Omega for more than 11 years, the availability of qualified technicians, spare parts, propellers and a complete V-Pod unit for quick change-outs in the field is always available at a moment's notice.

In addition, the Omega V-Pod is electrically capable of reversing its propulsion electric motor/propeller rotation from the pilothouse electronic throttle control-head providing instant back-down thrust, unlike other Z-drives in which the propulsion unit must rotate 180 degrees to reverse power applying back-down thrust.

E3: Economy, Emissions, Efficiency

Thunderbolt was designed for the medium horsepower inland towboat fleet with twin 2 x 1,770HP (1,320kW) propulsion units and still be capable to operate in the ICW and canals at a design operating draft of 9'-6". Currently, Omega has V-Pod units ranging from 445HP (330kW) to 2011HP (1,500kW), but the thrust efficiencies underway and the maneuvering capabilities are far greater than conventional tail shaft, propeller and nozzle propulsion systems. Comparing them to Z-drives the V-Pod efficiencies are most realized in reduced fuel consumption and higher thrust efficiencies.

The V-Pod offers fewer mechanical losses through the drivetrain which are measurable and coupled with diesel electric propulsion, fuel efficiencies are gained utilizing the power management system (PMS) which manages how many generators are required to have online for the power demand keeping the constant speed diesel engines at their optimum operating performance curves. All of that adds up to measurable fuel economy.

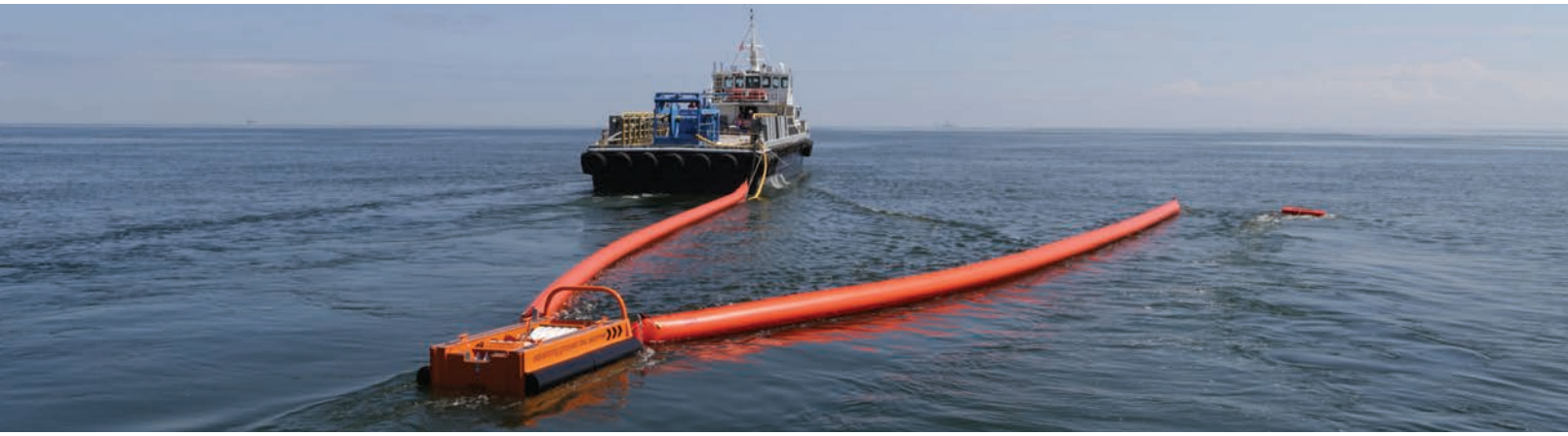
On January 1, 2017, 14 months from now, the Thunderbolt design will be required to meet Tier 4 emissions regulations which are marine diesel engines above 1,341 HP and under 1,877 HP (1000< kW <1400kW) range. US shipbuilders, the marine industry and design firms will feel the financial effects of Tier 4 emission regulations. As they do, design and engineering firms will be making vessel design changes to meet these new emission requirements.

The future financial cost and design issues to meet the US EPA Tier 4 regulations will introduce new EPA approved Tier 4 marine diesel engines with Selective Catalytic Reduction (SCR) systems with Urea injection, additional tankage, exhaust scrubbers, additional fleet maintenance, ongoing replacement parts and UREA fluid expenses for the life of the vessel. ESG's Berthold says, "It is our understanding that there will be limited availability from the engine manufactures for these new US EPA Tier 4 marine diesel engines in 2016 and 2017."

But, Tier 4 will likely not be a problem for any operator who selects the right after-treatment solution. Market ready applications – Tenneco's SCR solution among them – already fit neatly into the limited physical restraints of the typical workboat engineroom, for newbuild and/or retrofit installations alike. Before and after Tier 4, Eastern Shipbuilding's Thunderbolt combines all the key hot buttons of any inland operator: Economy and Efficiency all packaged neatly onto an Emissions friendly hull. None of that comes at lightning speed for the conservative inland markets, but when it hits the water, it will be a 'bolt out the blue.'

Solution	Service	Description of Equipment
Thunderbolt Cummins	Main Generator	(3) QSK38-DM, EPA Tier 3, V-12 Cylinder, 38 Liter with a 990kW @ 1,800 RPM 690VAC Generator.
Thunderbolt Cummins	Harbor Generator	(1) CMSL-QSB7DM, EPA Tier 3, Inline 6 Cylinder, 6.7 Liter with a 90 kW @ 1,800 480 VAC Generator.
Thunderbolt Caterpillar	Main Generator	(3) C32, EPA Tier 3, V12 Cylinder, 32 Liters with a 940kW @ 1,800 RPM 690VAC Generator.
Thunderbolt Caterpillar	Harbor Generator	(1) C4.4, EPA Tier 3, Inline 4 Cylinder, 4.4 Liter with a 95 kW @ 1,800 480 VAC Generator.

Elastec's Offshore Oil Spill Recovery System



***A complete system:** from deployment to the collection, encounter, skimming, and transfer to storage of spilled oil – with only one towing vessel. Elastec's X150 Skimmer Launcher does it all – seamlessly.*

The X150 Skimmer Launching System is a seamless oil spill response system with the capability to recover light, medium and some heavy oils in incidents such as the Deepwater Horizon/BP disaster in the Gulf of Mexico in 2010. Elastec CEO Donnie Wilson describes the new system as "a turning point in offshore and near shore mechanical oil spill recovery technology." He adds, "If the X150 Skimmer Launching System had been available along with our fire boom systems in the Gulf Spill, the oil cleanup operation would have been much faster and more efficient."

Successful sea trials of Elastec's new system were conducted recently in the Gulf of Mexico near Port Fourchon, La., a few miles from where one of the worst oil spill disasters in U.S. history took place five years ago. The centerpiece of the new launching system is the X150 skimmer, the first commercial model Elastec developed incorporating the company's patented grooved disc technology that won the first place prize of $1 million in the X Prize Foundation's global Wendy Schmidt Oil Cleanup X CHALLENGE. The X150 skimmer is a workhorse in recovering extreme volumes of oil. It has a verified nameplate oil recovery rate (ORR) of 660 gallons of oil per minute (150m3 per hour) and an oil recovery efficiency (ORE: oil-to-water collection rate) of 87.6%.

The high volume oil recovery rate of the X150 skimmer is only part of the story, however. The total system collects, encounters, skims, pumps and transfers the oil to storage in one seamless operation – while being towed at speeds up to three knots or while standing still. Suitable for offshore or nearshore operations, it is easily operated by three people. The launcher does all the heavy lifting by hydraulically telescoping the X150 skimmer from the stern of the vessel into the ocean. Attached to the X150 are two legs of a rugged, single-point, air-inflatable boom to sweep and guide the oil into the mouth of the skimmer. One leg of the boom is attached to the vessel, and the other leg is attached to an ELASTEC BoomVane to hold the boom in a "U" configuration as it is towed behind the vessel. The BoomVane takes the place of a second vessel which saves time and money and also reduces ship-to-ship communication issues.

The self-contained system is wirelessly remote controlled and includes the launcher, the X150 skimmer, boom and reel, BoomVane and power unit. Hydraulic and discharge hoses are built into the sweep boom, eliminating an external umbilical. The complete system fits into a 20' (6m) high-cube shipping container for rapid global shipment.

www.elastec.com

A unique vessel designed to address a wide range of oil spill scenarios.

In collaboration with Naval Architects Laurent Giles Ltd, a team of boatbuilders has developed a fiberglass response vessel that rapidly and effectively recovers spilled oil. The boat, introduced earlier this year, underwent tank testing over a continuous six month period – in sea states varying from calm to 2.5 meters – at the Wolfson Institute of Marine Technology, Southampton University UK. With a final design that is Lloyds approved for use 60 nautical miles from shore or the mother ship, the vessel and project have full backing of Lloyds Registry and the "Clean Seas" Environmental Program. The vessel's creators have also applied for U.S. Coast Guard approvals.

Reportedly, a critical priority for the design team revolved around work with Lloyd's Register to achieve the coveted 150 nautical mile structural offshore certification. This permits installation aboard commercial tankers, as well as the capability to conduct operations in polluted offshore and/or coastal waters.

Billed as a revolutionary way to help combat oil spills, UK-based Gobbler Boats Ltd has proven that the vessel that can remove light and heavy oils from water surfaces in offshore and coastal environments. Carrying nine unique patents, both granted and pending in the UK and United States, the Gobbler is small, easily transportable, lightweight, highly maneuverable, environmentally friendly, safe and simple to operate with minimum crew/operational costs. Ideal for operations at new oil field sites with no pipelines ashore, it is especially useful around storage/

Recovery Rate: 16 tph	Recovery Capacity: 2,674 bpd	LOA: 8.85 meters
Endurance: 120 nm	Bladder Capacity: up to 3,500 gallons	Tons: 3.25 tonnes
Top Speed: 23 KT	Fuel Capacity: 360 liters	Design Approval: LR

transfer barges when "over-spills" occur.

Gobbler fits the hold space of transport aircraft for rapid transit to isolated locations, and the vessel can be carried by commercial or passenger vessels and larger ocean going oil spill vessels, for immediate and efficient response to accidents/incidents at sea.

Of interest to domestic spill cooperatives that might contemplate the purchase of a Gobbler, because the vessel does not carry recovered oil on board, the U.S. Coast Guard has ruled that the mandatory surveys for similarly sized craft do not apply. The important waiver saves both time and money for cash strapped municipalities and spill co-ops, who must make every dollar count.

Importantly, Gobbler vessels do not store recovered oil in on-board tanks, nor do they tow from the transom. Oil is pumped via patented transfer system directly into custom made High-Visibility, quick release, towed bladders. The filled bladders can be pumped directly to an accompanying mother-ship, or towed ashore in a necklace for emptying. Bladder capacities vary from 200-3500 gallons as per client requirements.

A heated recovered oil tank for very cold climates, to assist pumping of oil to bladder, can be fitted. The option that will allow Gobblers to operate in colder climates includes skimmer heating, combined with the internal on board heating system. In cold weather, Arctic and Antarctic operations, this helps the flow of recovered oil through the hoses. Beyond this, recovered crude oil contains no water, recovered light oil (diesel) contains a maximum of 2% water. Both can be recycled if required – in which case, the purchase cost of the boat can be quickly amortized.

The beauty of the gobbler system is that it requires only a two person crew, both of whom are housed in a wheelhouse equipped with a standard, reverse cycle air-conditioning and UV air Purification system to prevent crew sickness from oil fumes. Optional equipment includes Auto Pilot, Radar, GPS, VHF, SSB, Epirb, Spotlights, and a four person liferaft. On board equipment is hydraulically powered by a single, powerful, EPA approved main diesel engine, thus eliminating auxiliary power units and their excess emissions. It is estimated Gobbler is all but spark free. A quick release bladder system enables 24/7 operation subject to crew change facilities. And, in the event of oil spill emergencies (for example, fire or unexpected inclement weather), Gobbler can quickly disconnect the load and speed to safety.

The Gobbler transfers recovered oil by means of a centrally-mounted bollard into the bladders. The bladders are then towed ashore or can be simply pumped to a larger collection vessel. Replacement bladders are then supplied to the two-man vessels, and work can continue unabated.

Reportedly, plans to build 25 to 50 vessels by the end of 2015 are in the works. The vessels will be built in the UK, and addressing Jones Act issues unique to U.S. waters, at a manufacturing facility in Arizona. An ambitious target of producing as many as 500 Gobblers annually per factory has been set by the boat's creators.

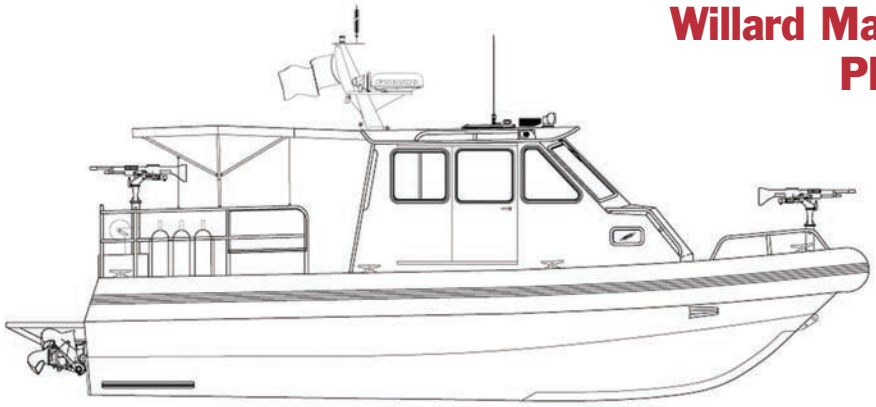
Rapid Oil Spill Response Vessel Launched in Vancouver

Western Canada Marine Response Corporation (WCMRC) launched their newest oil spill response vessel last month in Burrard Inlet. The $4.5 million *G.M. Penman* is a 65-foot Ocean Class Oil Spill Response Vessel (OSRV) built by Rozema Boat Works in Washington State. It is only the fifth vessel of its kind in the world with sister vessels operating in Santa Barbara servicing the offshore production platforms off the California coast. The G.M. Penman has a top speed of 26 knots when travelling to an incident. Once on-scene, the boom arms can be deployed within minutes. With overnight accommodation space for five crew members and a gyro-stabilized FLIR (forward-looking infrared) camera, the G.M. Penman is the first vessel in WCMRC's fleet that can operate continuously for multiple days in open water before requiring resupplies. The G.M. Penman joins WCMRC's fleet of 32 spill response vessels, including two other Rozema built vessels -- the 47-foot Bay Class OSRV's the Eagle Bay and the M.J. Green. It will conduct sea trials in Vancouver for the foreseeable future until it is deployed to one of WCMRC's satellite response bases on the West Coast.

OSRV at a Glance ...

Skimming speed is 1.5 knots	Aerostat Ariel observation balloon	65-foot OSRV for unsheltered water
Fuel Capacity: 3,000 gallons	Two Lamor brush skimmers	Engines: twin 1,600 HP Caterpillar diesel
Storage Capacity: 30 tonnes	Skimming Capacity: 32.8 tph	Boom: 1,500 feet, 42" Kepner ocean boom

Willard Marine Patrol Boats for Philippine Government



The United States Department of State last month awarded a contract to Willard Marine, Inc., to provide the Philippine National Police Maritime Group with patrol vessels equipped to conduct search and rescue operations along Philippine maritime borders. This contract marks the third time Willard Marine has been chosen to provide military vessels to the Philippines. Willard has also developed boats for international military use by the Navy of Ukraine and the Nepalese Army. Willard will supply 30-foot patrol boats equipped with twin 480-hp engines and dual water jets, as well as 34-foot patrol boats with 600-hp engines and dual water jets. The cabins will feature shock-mitigating seats, heating and air conditioning. Gun posts will be positioned forward and aft, and the boats will display a 40oz. Polyurethane foam collar. The customized patrol craft for the Philippines is derived from a former SeaArk Marine boat design that Willard Marine acquired the licensing rights to last year.


Walsh


Wagner


Rooney


Loebl

Horizon Marine


Leber


Gustafson


Rosenberg

Walsh Named FLA Ports Council Secretary-Treasurer

Port Canaveral CEO **John Walsh** was elected to serve on the 2015-2016 Florida Ports Council Board of Directors as Secretary-Treasurer. Since 2011, Walsh has directed the planning, engineering, design, construction, and development of hundreds of millions of dollars in capital projects. With more than 32 years of construction, design-build, and real estate development experience, he holds a MBA from the University of Pennsylvania, and a Bachelor of Science from Drexel University.

Matson Appoints Wagner Director, Corporate Communications

Keoni Wagner has joined Matson Lines as director, corporate communications. He succeeds Jeff Hull, who is retiring from Matson after a 33-year career with the company. Wagner most recently served as public information officer and spokesman for Oakland International Airport.

Rooney to Lead AAP

Port of Hueneme Harbor Commissioner **Mary Anne Rooney** has been named President of the Association of Pacific Ports (APP). The Port of Hueneme will host APP's Annual Conference in 2016. The Association of Pacific Ports is a trade and information association founded for the purpose of promoting increased efficiency and effectiveness of the ports of the Pacific.

Hornblower Names Loebl Marine Ops SVP

Hornblower Cruises & Events has named **Gordon Loebl** Senior Vice President, Marine Operations. Loebl's 28-year U.S. Coast Guard career most recently includes service as the Commander of Sector New York where he was charged with ensuring the safety, security and stewardship of the Port of New York and New Jersey as well as the Hudson River beyond Albany, NY.

Horizon Marine Expands after Acquisition

Horizon Marine, a recent CLS Group acquisition, has **Michael Leber, Aaron Rosenberg,** and **Drew Gustafson** to support its EddyWatch, RouteWatch, and SurveyWatch clients. Gustafson earned a BA in Earth and Oceanographic Science from Bowdoin College. Rosenberg received a B.S. in Marine Science from Boston University and dual M.S. in Environmental Engineering and Oceanography from the University of Connecticut. Leber is a 2013 cum laude graduate of the University of Massachusetts-Lowell where he earned his B.S in Environmental Science/Atmospheric Science with a minor in Mathematics. He is expected to receive his M.S. in Environmental Studies/Atmospheric Science this December.

Shelkin Appointed to MERPAC

Managing Partner **Michael A. Sheklin** of Seaworthy Industries has received a federal appointment from Secretary Jeh Johnson to serve on the Merchant Marine Personnel Advisory Committee (MERPAC). Sheklin, appointed to serve a three year term of office, brings over forty years of experience in the maritime industry. He holds a U.S. Coast Guard Master's License, and graduated from the State University of New York, Maritime College.

Bollinger VP Fanguy is SNAME's William M. Kennedy Award Recipient

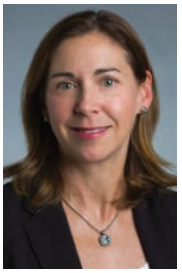
The Society of Naval Architects & Marine Engineers' (SNAME) 2015 William M. Kennedy Award will be presented to Bollinger VP-Quality Management System, **Dennis Fanguy**. Dennis, a graduate of University of New Orleans with a BS in Electrical Engineering, has been employed at Bollinger since his graduation for 31 years. The William M. Kennedy Award is presented for outstanding service and contribution in the development of systems and planning applying to shipbuilding and ship repair.

Mercury Marine Names Dauchy as Chief Marketing Officer

Michelle Dauchy has joined Mercury Marine as Chief Marketing Officer. Dauchy has nearly two decades of global marketing experience with S.C. Johnson, managing iconic brands and P&L's in more than 15 business segments across 80 countries. Dauchy has a BA in economics from Dartmouth College and an MBA in marketing


Sheklin


Fanguy


Dauchy


Warrick


Goley


Edgar


Jaenichen

from Northwestern University's Kellogg Graduate School of Management.

Seafarers' House Warrick Recognized by Broward Foundation

Lesley Warrick, Executive Director of Seafarers' House at Port Everglades, has been selected to receive Leadership Broward Foundation's 2015 Special Recognition Award at the organization's upcoming Profiles in Leadership Gala. The award is designed to recognize the achievements of individuals who have distinguished themselves as leaders in their industry and who have used their leadership to enrich the community. Ms. Warrick has served as Seafarers' House executive director since April 2006, during which time the nonprofit organization has been honored on many occasions.

SAFE Boats International Appoints Goley Business Development Director

Rob Goley has been named Business Development Director – U.S. Federal Programs at SAFE Boats International. Rob comes to SBI as a recently re-red 20-year veteran of the U.S. Coast Guard (USCG). He also serves as the national secretary for the Maritime Professional Responders and Officers, the only national organization dedicated to the maritime public safety professional.

Glosten Acquires Noise Control Engineering, LLC

Glosten, a Seattle-based naval architecture and marine engineering consultancy, announces the completion of their acquisition of Noise Control Engineering, LLC (NCE). "For over 55 years, Glosten has grown carefully, responding to the unique and challenging needs of our clients," remarked Glosten President **Jay Edgar**. NCE President and founder **Ray Fischer** added, "We are very excited for the two companies to come together. We have collaborated with Glosten for over 20 years on many fascinating projects." Noise Control Engineering, LLC, which will continue to operate under that name, is now a wholly owned subsidiary of Glosten, Inc.

Marad Antes $500,000 for Hydrogen Fuel Tech Study

The U.S. Department of Transportation's Maritime Administration (MARAD) announced that it provided $500,000 to support a feasibility study for the design, construction, and operation of a high-speed passenger ferry powered by hydrogen fuel cell technology and a hydrogen refueling station. The fuel cell would provide power for the ferry's propulsion and auxiliary electrical systems, while the hydrogen refueling station – which would be the largest in the world – would service ferries, electric cars, buses and fleet vehicles, and other maritime vessels powered by fuel cells. "This study is just one more way in which MARAD is working to find new and efficient technologies for use in the maritime industry that offer clean-fuel options to cut emissions," said Maritime Administrator **Paul 'Chip' Jaenichen**. MARAD partnered with Sandia National Laboratories of the U.S. Department of Energy (DOE), which will lead the research effort.

Wunderman Appointed to WETA Board

James Wunderman has been named to the Water Emergency Transportation Authority (WETA) Board of Directors. Wunderman, President and CEO of the Bay Area Council since 2004, is a visiting professor at the UC Davis Graduate School of Management. A graduate of San Francisco State University, majoring in political science, he received an Associate's Degree in Business Administration from Kingsborough College. San Francisco Bay Ferry is a service of WETA.

Boating Industry Leaders Inducted into NMMA Hall of Fame

The recreational boating industry recognized two leaders this year with the National Marine Manufacturers Association's (NMMA) highest honor. **Bob Long**, chief executive officer and owner of JRL Ventures, Inc. and Marine Concepts, and **Dusty McCoy**, chairman and chief executive officer of Brunswick Corporation, will be recognized for their achievements and contributions to industry. Long has spent 45 years in the marine industry, including time spent at the helm of Starcraft, Crestliner, and Wellcraft Marine. Under McCoy's steady hand,


Wunderman


McCoy


Long


Michel


Reeves


Watson

the Brunswick Boat Group assembled a headquarters staff and capabilities, developed and refined market strategies, and set about a series of changes in the development, manufacture and marketing of its boats.

New Coast Guard Vice Commandant Named

U.S. Coast Guard VADM **Charles Michel** formally assumed the role of vice commandant of the Coast Guard during a ceremony at U.S. Coast Guard Headquarters Monday. As vice commandant, Michel oversees the Coast Guard's operations, strategic development, organizational governance and management of the service's more than 58,000 employees and 30,000 volunteers. A 1985 graduate of the U.S. Coast Guard Academy, he also graduated summa cum laude from the University of Miami School of Law.

EBDG Welcomes Captain John D. Reeves

EBDG has announced that Captain **John D. Reeves** has joined the firm. Reeves is a licensed professional engineer and mariner who spent 22 years leading high-performance teams and directing engineering, maintenance, safety and operations for the United States Coast Guard. Reeves graduated with honors from the US Coast Guard Academy with a BS in Naval Architecture & Marine Engineering. He also holds a MS in Naval Architecture and Marine Engineering and a MSE in Mechanical Engineering, both from the University of Michigan.

Kirby Selects ABS as Subchapter M Solutions Provider

ABS has been selected by Kirby Corporation to provide classification and International Safety Management certification for 11 push boats. Under the requirements proposed by the U.S. Coast Guard, towing companies will be required to receive a Certificate of Inspection and comply with new regulations relating to the construction and operations of safety equipment and recordkeeping. The proposed regulation states that adoption of ABS class with ISM certification will show compliance with the new requirements. "We are proud that Kirby has chosen to expand its longstanding relationship with ABS by bringing these additional vessels into class," said **James Watson**, ABS Americas President and COO.

Kings Point Class of 2019 Plebes Join the Regiment

The U.S. Merchant Marine Academy (USMMA) at Kings Point last month welcomed 243 "plebe candidates" of the Class of 2019 into the Regiment of Midshipmen as they took USMMA's Corps of Cadets Oath during the Acceptance Day Ceremony and Parade. They were then sworn in as midshipmen in the U.S. Navy Reserve by RADM Mark Whitney, Deputy Commander, Logistics, Maintenance and Industrial Operations Naval Sea Systems Command.

WFSA Ferry Design Competition 2015 Announced

The Worldwide Ferry Safety Association (www.ferrysafety.org) announced its latest competition for a Safe Affordable Ferry, with entries being sought from naval architectural students from all over the world. WFSA's Executive Director, Dr. Roberta Weisbrod, said: "The goal of the design competition, now in its third year, is to elicit new approaches for ferry design for and with the developing world, where there are still many accidents. We also hope to encourage designers to enter this arena, where we see both an urgent need and real business opportunities in an emerging market." The 2015 Design Competition will be focused on an Indonesian inter-island RoPax vessel. Register at: www.ferrysafetydesigncompetition.org

Rose Point Navigation Systems Supports Marine Industry Training

Rose Point Navigation Systems has donated its Rose Point ECS software to the Inland Logistics and Marine Institute at West Kentucky Community & Technical College. Steve Hearn, manager of external education programs - river operations at WKCTC, said, "This donation will enable the Inland Logistics and Marine Institute to offer the professional


U.S. Merchant Marine Academy


Weisbrod


Hearn


Allegretti


Ellis

mariner access to training with Rose Point ECS' quality navigation tools that they might not normally be able to receive." The Inland Institute, located near Paducah's riverfront, provides training and education for the logistics and marine industries.

AMP Touts U.S. Maritime Industry's LNG Leadership

The American Maritime Partnership (AMP) in August celebrated General Dynamics NASSCO's launch of TOTE's newest vessel, noting the growth opportunities the new ship will provide to the U.S. economy and those who work in the maritime sector. "The launch of Perla del Caribe marks a momentous step forward for the future of U.S. maritime, using green technology to ensure the products we deliver are transported safely and efficiently, all while using the most environmentally friendly mode of transportation," said **Tom Allegretti**, AMP chairman.

Metalcraft Celebrates 50th Anniversary

Metalcraft, a company serving a broad range of industries, including marine, defense and aerospace, is celebrating its 50th anniversary. "From its early days in a humble tool shop, the company has grown to become an international player in the fire and safety arena," said Metalcraft President Ernie Ellis. Metalcraft's maritime arm, Sea-Fire Marine, provides next-generation fire detection and suppression equipment.

Earthwise EAL Wire Rope Grease

Lubrication Engineers Earthwise EAL Wire Rope Grease (3353) meets the rigorous performance demands of EPA and industrial applications. This soft, semifluid coating grease is a certified Environmentally Acceptable Lubricant, recommended for use in applications on or near waterways. Perfect for oil-to-sea interfaces as well as deck applications, it is biodegradable, exhibits minimal aquatic toxicity and will not accumulate in the cells aquatic life.

www.LElubricants.com

Liebherr's 1000th Offshore Crane Order

Liebherr-Werk Nenzing recently celebrated an order for their 1,000th offshore crane. These will be the first RL-K series cranes for Total, and the first Ex-rated knuckle-boom cranes for Liebherr. Liebherr Offshore Crane Division has almost completed another project with long-term partner TOTAL. Three state-of-the-art ram luffing knuckle-boom cranes of the type RL-K 4200 will be delivered for Total's Egina Floating Production Storage and Offloading (FPSO) vessel.

www.liebherr.com

BlokCam Crane Camera Systems

Compact Lifting Group's BlokCam delivers live video from the hook block to the operator in the cabin. BlokCam Limited will provide camera systems available in four versions, including one for explosive environments. The ATEX Ex rated system is tailored to the requirements of Zone 1 explosive environments, particularly in the offshore and petrochemical industries. Compact Lifting Group provides "eyes where you need them."

www.compactlifting.com

The Rapid Repair Clamp

An innovative new pipe repair system minimizes down time and maintenance costs while helping to protect crew and assets. When a pipe bursts, there's no time to wait for a technician, especially when working with chemicals, fuels or toxins. With its hassle-free installation, the Rapid Repair Clamp is an essential tool to have when every second counts, helping to prevent costly damages in an emergency leak situation.

www.worldwidemetric.com

Chafe-Pro FS Now Available Through Samson Rope

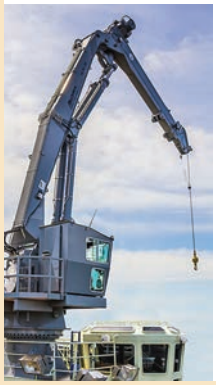
Providing critical protection for high-performance mooring lines, the Chafe-Pro FS employs the same great Chafe-Pro material, but is custom designed specifically for Samson to have a free-sliding fit. Durable and easily installed either before or after deployment, the Chafe-Pro FS is easily positioned wherever lines are subject to abrasion. A simple hook-and-loop closure allows Chafe-Pro FS sleeves to be quickly installed or repositioned.

www.ChafePro.com

Allied Marine Crane on R/V Neil Armstrong

The R/V Neil Armstrong is equipped with an array of oceanographic equipment. Allied Marine Crane was chosen to design and manufacture two cranes, one A-frame, one davit, two handling systems and two hydraulic power units. Allied Marine Crane equipment was specified based on their history with research equipment handling, their proven design and build capabilities, and strong working relationship with marine winch supplier Markey Machinery.

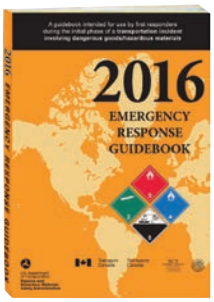
www.alliedsystems.com/crane

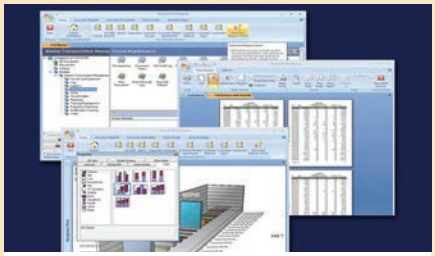


Labelmaster's Emergency Response Guidebook

Labelmaster offers the 2016 edition of the Emergency Response Guidebook (ERG) – a must have for anyone who handles or transports dangerous goods (hazardous materials). The ERG is a go-to manual to help responders quickly identify specific or generic classifications of hazardous materials that may be involved in an incident, which helps protect themselves and the general public during the initial response phase.

www.labelmaster.com/shop/books





MarineCFO's Endurance Product Line Released

MarineCFO's "Endurance," a cloud version of the MarineCFO Enterprise Solution offers subscribers a solution for Planned Maintenance, Compliance & Safety, Personnel, Training, Certifications, Operations, Logging, and a Document Management. Endurance can also be extended with mobile apps and integrations to MarineCFO Enterprise or other popular software solutions. MarineCFO solutions are scalable from the largest industry players to small family-run companies.

www.MarineCFO.com

Vesconite Polymers for Workboat Applications

Vesconite's low-friction, long-lived polymers thrive in dirty, marine environments. A self-lubricating, low-wear material able to carry high loads at slow speeds, it doesn't swell in water or need to be greased, offering ten times the usable life of bronze. Ideal for rudder necks and pintles, it excels when used with winches, sheaves, rollers and pulleys, and in dockyards for slipway bogies and syncrolifts.

www.vesconite.com

SurvitecZodiac's Arctic Range of Liferafts

Vessel operators can now equip their vessels with liferafts chosen from the SurvitecZodiac range, manufactured to meet demanding Arctic operating conditions. SurvitecZodiac's heating system, launched in response to increased levels of shipping in polar regions and to the requirements of the IMO Polar Code, can be specified to keep any one of nearly 60 different liferaft models fully operational at temperatures down to minus 50 deg C.

www.survitecgroup.com

Hoover Container Solutions Unveils New Liquitrac Tracer

The Liquitrac Tracer is a battery-powered GPS unit that can be attached to any of Hoover's product offerings to track asset location, even in the most hazardous environments. The ATEX-certified unit is equipped to support calling-based movement, meaning immediate notification of movement of a GPS or GPS-equipped unit. The unit features prolonged battery life to ensure reliable coordinate tracking, 24/7.

www.hooversolutions.com

FCI Watermakers for Workboat Applications

Fresh, pure water is vital to life aboard any vessel. Now, making it has never been easier with type approved (ABS, GL, LR, DNV) FCI Watermakers' state-of-the-art V4 Controller. Most watermakers rely on some form of control. What separates FCI Watermakers' unit from the competition is the quality and reliability of its monitor, simplicity of use, depth of standard features and overall technological superiority.

www.fciwatermakers.com

MagnaShear Motor Brakes

MagnaShear motor brakes from Force Control Industries employ oil shear technology, providing longer service life even in demanding dredging applications like hoist ladders, cutterhead ladders, and more. Proven oil shear technology transmits torque between lubricated surfaces – thereby eliminating wear on friction surfaces. A patented fluid recirculation system dissipates heat – eliminating heat build-up which is the most common problem in dry braking systems.

www.forcecontrol.com

Torqeedo's Deep Blue Power

A vessel with a Torqeedo Deep Blue drive is emission free and can be used on environmentally sensitive waters. Deep Blue provides input power of up to 65 kW and delivers the same propulsive power as an 80 hp gas outboard. It employs high-performance lithium batteries, which have been modified to excel in demanding marine applications and carry a nine-year capacity warranty.

www.torqeedo.com

Golight's Model GXL 4021 LED Work Light

Golight's sturdy model GXL 4021 fixed-position LED work light measures just 4.5" by 4" inches tall, has a depth of only 3.5" and comes with a 2" stainless steel mounting bracket. The GXL 4021 represents the company's expansion of its permanently mounted, manually adjustable LED work lights and is the smallest of the four lights it now offers in that category.

www.golight.com

Lincoln Electric's U/LINC Welding, Cutting Curriculum

Lincoln Electric 's U/LINC, a complete curriculum of lesson plans, videos, student handouts, assessment tests, and presentations is designed to streamline the teaching experience and free welding school instructors from curriculum development. The subscription-based online learning management system allows instructors at training centers to focus on teaching in the classroom, rather than spend hours developing custom curriculum from available sources.

www.lincolnelectric.com/ulinc

Elebia Continues Evolution of Automatic Safety Hook Range

Elebia has made available two major enhancements to its automatic hook range, which keeps crane operators and those responsible for rigging at a safe distance when connecting loads to lifting equipment. The patented Elebia hook is equipped with a magnet that both attracts and positions slings and other rigging gear. Now, safety and productivity is further improved with optional additions—a new remote control system called the eMax and a load cell.

www.elebia.com

Ferguson Group's Bunded Offshore Tank

Ferguson Group's bunded tanks are used where HSE mandates a bunded area, but there is insufficient space to provide this. Therefore they are ideal for places such as vessels, platforms, jack ups and rigs. The new bunded T11 chemical tanks are made of 316 stainless steel, have a 4-bar working pressure, with a payload of 5900 kg and a maximum gross weight of 8500 kg.

www.ferguson-group.com

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Photo courtesy of Eastern Shipbuilding Group

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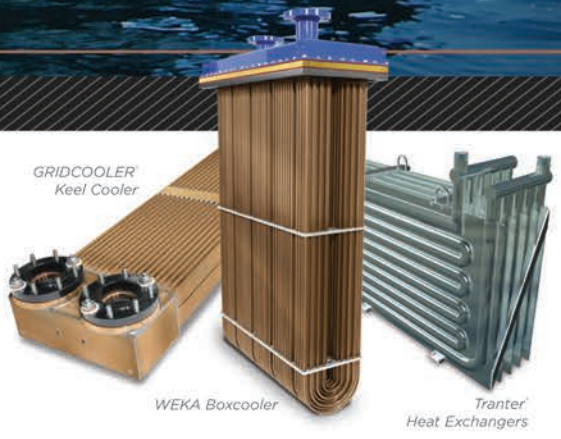

fernstrum.com
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sales@fernstrum.com

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