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Volume 29 • Number 4

Marine News

APRIL 2018

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ON THE COVER

Design techniques for newbuild tonnage have evolved over time. Most recently, Victaulic's collaboration with SSI Software has taken that trend to a new level. The story begins on page 38.

Image credit: Victaulic

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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
Tom Ewing • 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 **ext 6220** Fax: 212-254-6271
John Cagni • ***cagni@marinelink.com***
Tel: 631-472-2715 Fax: 561-732-8063
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
Jean Vertucci • ***vertucci@marinelink.com***
Tel: 212-477-6700 **ext 6210** 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

CORPORATE STAFF
Manager, Marketing
Mark O'Malley • *momalley@marinelink.com*
Accounting
Esther Rothenberger • *rothenberger@marinelink.com*
Tel: 212-477-6700 **ext 6810**
Manager, Info Tech Services
Vladimir Bibik • *bibik@marinelink.com*

CIRCULATION
Circulation Manager
Kathleen Hickey • *k.hickey@marinelink.com*
Tel: 212-477-6700 **ext 6320**

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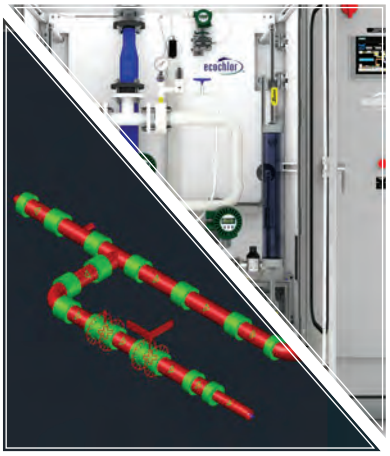
k.hickey@marinelink.com

Departments & Analysis



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For information about the acquisition, please contact Lisa Smith, President of JA Moody and Pima Valve LLC at Lsmith@jamoody.com or Frank Buzan, Chairman of JA Moody and Pima Valve LLC at Fbuzan@jamoody.com

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It seems like just yesterday that December snow and cold had us pining for Spring-like weather and as I pen this note, we find ourselves approaching April with almost one-quarter of 2018 in our turbid wake. Nevertheless, the fourth *Nor'easter* of the season is blowing through New York at this very moment, reminding us that nothing is ever certain – for the weather and/or the marine industry itself. Nowhere is that reality more evident than for domestic shipbuilders in today's business climate.

Our annual look at the North American boatbuilding markets reveals much, but in the end, asks as many questions as it answers. That's because these are indeed uncertain times for the boatbuilders and the OEM's and vendors that support their output. One key to what happens next seems to be the need to diversify output to the maximum extent possible. That can mean a lot of things: catering to export markets, multiple sectors, leveraging commercial and recreational markets and government contracts whenever possible. To that end, R.W. Fernstrum's President, Sean Fernstrum, within these very pages, says it best when he advises simply, "As is usually the case in the marine sector, as one sector rises, another falls ... Diversification is an absolute must." Amen.

This month's *INSIGHTS* discussion, led by shipbuilding subject matter expert Robert Kunkel, takes a different tack on the same topic. Never boring and always honest, Kunkel this month gives his unvarnished look at the nation's boatbuilding condition, how we got here and where we might go next. At a time of great uncertainty in the offshore markets – witness Harvey Gulf's bankruptcy just as this magazine headed to the printer – Kunkel's observations stem from 40 years of shipbuilding peaks and valleys, here and overseas, with boots on the ground and time spent in the boardroom. That narrative, which you won't want to miss, begins on page 14.

Also in this edition, an update on the EPA's small Vessel General Permit (sVGP) situation brings ***MarineNews*** readers fully up to speed on this important, but confounding regulatory issue. Operators of the nation's ~39,750 brown water workboats may think that just because the ballast water treatment discussion doesn't necessarily impact their fleet, they don't have to worry about the VGP, either. That's a mistake. Tom Ewing's in-depth look at the regulatory puzzle shows us that there are myriad – too many, as it turns out – cooks in the kitchen. Balancing that analysis is industry veteran and BWTS CEO Steve Candito, who weighs in and reminds us that, when it comes to compliance, "Failing to plan also means that an operator is planning to fail."

Spring is just around the corner – I just know it. As this edition of ***MarineNews*** hits your desk, I do find myself pining for just two things: (considerably) warmer temperatures, of course, and better times ahead for the collective North American brown water and shallow draft sectors. Both wish list items are 'do-able.' The former is beyond our control; the latter is not. Let's get to work.

Joseph Keefe, Editor, keefe@marinelink.com

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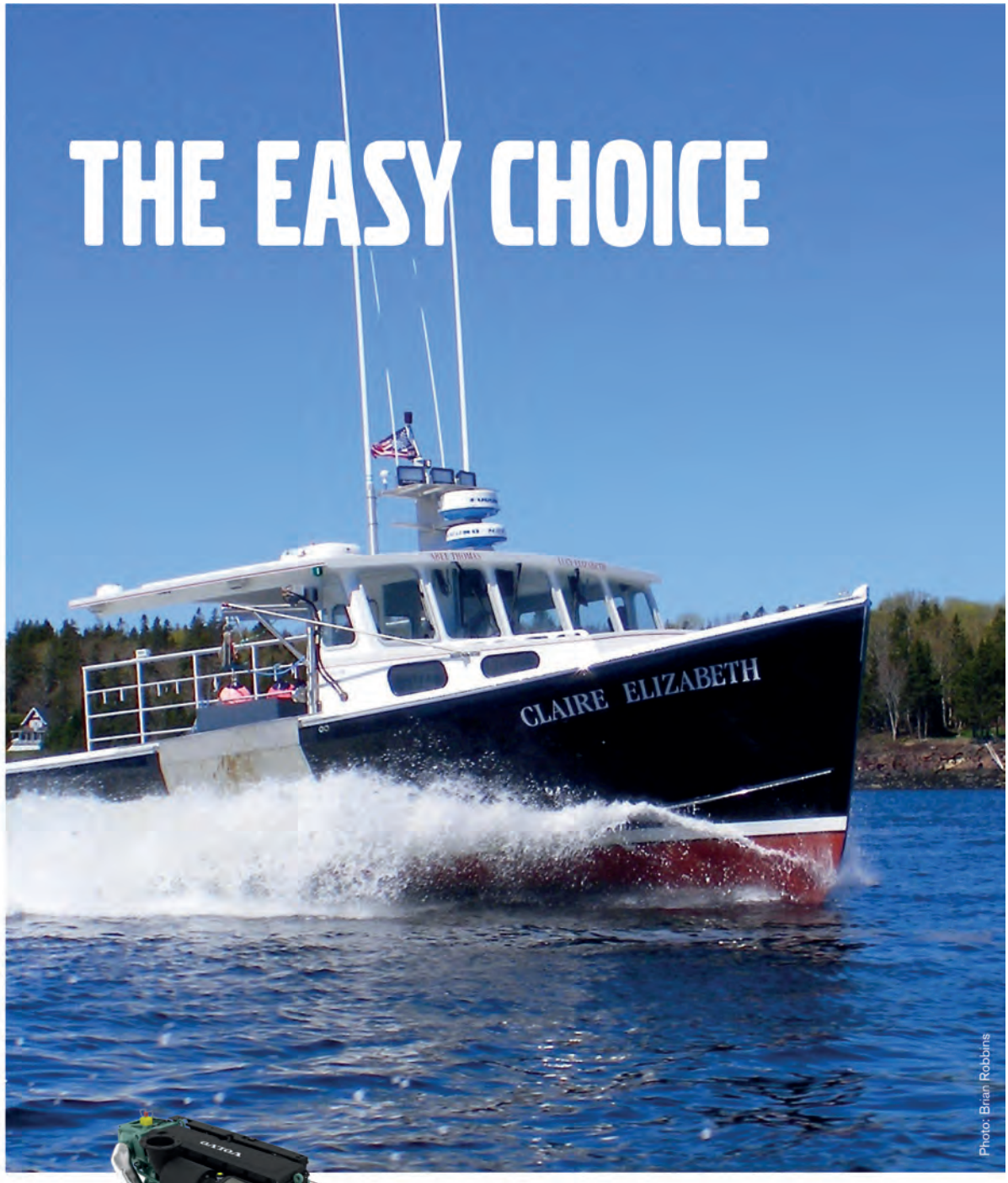

Photo: Brian Robbins

Maine Lobsterman Micah Philbrook knew about the reliability of Volvo Penta engines based on his past experience with two previous lobster boats, so he saw no other option when it came time to power the new H&H 49' *Claire Elizabeth*. Billings Diesel installed a D16 750-HP Volvo Penta in the vessel which bolsters an impressive top speed of 21 knots and cruises at 18 knots at 1800 rpm, burning 30 gph. Cut back to 1600 rpm, she maintains 15 knots and burns only 20 gph.

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Authors & Contributors

MarineNews
April 2018
Volume 29 Number 4


Jelenić


Candito


Kunkel


Ewing


Pfaller


Gallenberger


Zakula

Steve Candito is the CEO of Ecochlor, Inc. Prior to joining Ecochlor, Steve was Founder, President and CEO of Foresea Consulting where he provided various advisory services including strategic planning, regulatory compliance and crisis management to the maritime and environmental communities. Before Foresea, he was President and CEO of National Response Corporation (NRC). During his 20+ years at NRC he grew the business from a start-up to a leading global emergency response and environmental services firm. Steve graduated from Hofstra University School of Law and the United States Merchant Marine Academy.

Tom Ewing is a freelance writer specializing in energy and environmental issues.

Rick Gallenberger is Great Lakes Regional Marine Specialist for Sherwin-Williams Protective & Marine Coatings. He is NACE Level I Certified and has been with Sherwin-Williams for 29 years, including the last six years as a dedicated marine representative. He works with fleet and vessel owners to help protect their assets, along with servicing shipyards and contractors to promote efficiencies with their coating procedures. He can be reached at Rick.J.Gallenberger@sherwin.com.

Thomas A. Jelenić is Vice President for Pacific Merchant Shipping Association (PMSA). Mr. Jelenić works with policy makers, regulators, industry leaders and other entities to help ensure that sound science and industry issues are part of the discussion as California continues to call for the increased use of zero and near-zero emissions equipment at California's ports and throughout the goods movement industry. Jelenić has two decades of maritime industry experience, including more than 14 years in environmental and planning positions at the Port of Long Beach, the nation's second busiest seaport, and senior management roles in private consulting and logistics development.

Robert Kunkel, President of Alternative Marine Technologies, previously served as the Federal Chairman of the Short Sea Shipping Cooperative Program under the Maritime Administration and the USDOT from 2003 until 2008. A past Vice President of the Connecticut Maritime Association, he is a contributing writer for MarineNews. A graduate of the Massachusetts Maritime Academy, Kunkel sailed as a licensed engineer and continued his career in ship construction at NASSCO and Hyundai Heavy Industries, among others. He is a senior member of the Special Committee on Ship Operation with ABS and an elected member of the NCB.

Andrew Pfaller is a Product Manager at Miller Electric Mfg. LLC, a global provider of welding equipment and manufacturing. Based on a foundation of real-world welding, Pfaller achieved a BS in Welding Engineering Technology prior to starting his career as a Welding Engineer at Miller in 2012. Andrew is an AWS CWI and manages the current portfolio and leads customer-back new product development for the TIG Solutions Division.

Steve Zakula is an electrical engineer who has been in the drives industry for 25 years. He has focused on applications, sales and marketing. He is a Senior Product Marketing Manager for Danfoss Drives. Reach him at steve.zakula@danfoss.com.

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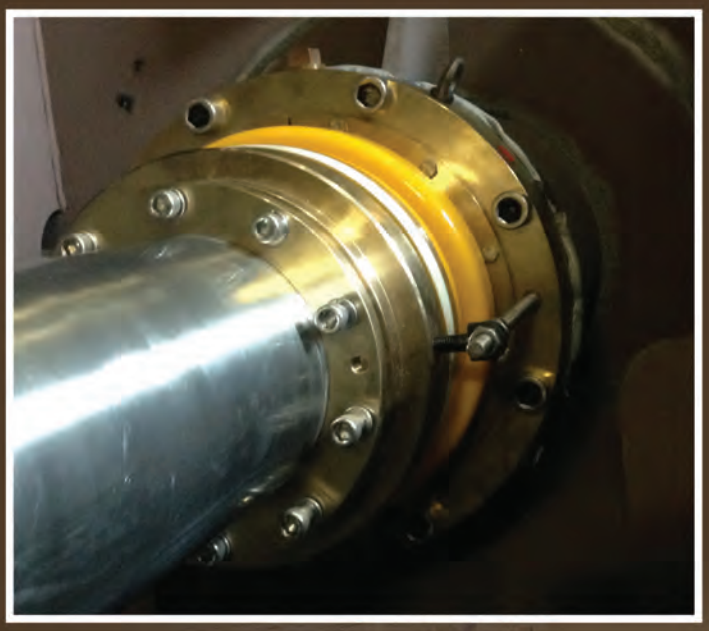

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Barge Transportation Market Report: 2016 - 2024

Barge transportation comprises an extensive network, ideal for carrying seaborne cargo to inland destinations and exports alike. Responsible, in part, for the worldwide trade of bulk transport, the industry is of great significance to the agricultural sector. In North America, The Army Corps of Engineers maintains and operates over 12,000 miles of canals, rivers, and inland waterways. The Illinois Waterway and Mississippi River are the major waterways in the region that are responsible for moving agricultural and farm products through barges. Shifting preferences toward marine transportation, especially for liquid cargo across the region, will fuel barge transportation market growth.

The North America barge transportation market accounted for USD 22.2 billion in 2016 and is predicted to reach USD 31.1 billion by 2024 with around 5% CAGR from 2017 to 2024. Rising petrochemical shipments across the region have contributed to the industry growth in the region. The extensive usage of inland waterways by various farm belts for the transportation of agricultural chemicals and farm products will further propel the regional growth. The strong interconnectivity of rivers and canals will positively impact the industry and will lead to an increased demand for petrochemical transportation. This could result in an increased production of tank barges, further impacting the industry positively. That said, industry has only recently all but completed its latest recapitalization program with the elimination of the last non-double hull barge.

The advantages of barges in terms of capacity, emissions, and fuel usage in comparison with trucks and railcars are the major factors responsible for industry growth. The rising demand for petrochemical shipments across the globe and huge investments from industry players for the modernization of the existing fleet will further propel the barge transportation market growth over the forecast timespan.

In North America, the production of shale oil is enhancing the barge transportation market size for the liquid cargo. The main advantage of the shale oil over offshore is that it has a short lead time from development to production initiation, resulting in time reduction.

The barge transportation industry is witnessing changing government support for the development and modernization of inland waterways across the region. The rivers including Ohio, Mississippi, Illinois, etc., are undergoing modernization. The Inland Waterways Users Board has reported an increased fund support from the government. For instance, in 2015, the government allocated USD 281 million for few priority projects that was a 12% rise from the fund allocated in 2014.

	Total Cost (USD million)	Allocations before 2015 (USD million)	Remaining Cost after 2015 (USD million)
Olmsted	USD 3,040	USD 2,047	USD 993
Lower Mon (with deferrals)	USD 1,238	USD 739	USD 499
Kentucky	USD 887	USD 438	USD 449
Chickamauga	USD 847	USD 188	USD 659
Total	USD 6,012	USD 3,412	USD 2,600

These projects will contribute significantly to the enhancement of efficiency and navigation capacity of inland waterway systems. For instance, Chickamauga project expects the construction of 110-foot-by-600- foot lock located immediately downstream of Chickamauga dam and riverward of existing lock. This project is expected to enhance navigation capabilities and efficiency, simultaneously allowing the movement of nine jumbo barges where only one (at present) can transit at a time.

As the industry is capital-intensive, it requires a huge initial investment. Owing to the capital-intensive nature of this industry, it becomes difficult for a new player to enter this market. The operational costs of the participants increase their CAPEX due to the extra expenditure such as maintenance & repairs, insurance, and the return on investments.

The demand for the petrochemical shipment is witnessing a continuous rise across the region. This rising demand will fuel the barge transportation market growth over the coming years as the import and export of these petrochemicals are heavily dependent on the marine transportation. Operators are finding ways to optimize shipment costs for the rising petrochemical and gas production.

Industry stakeholders have made huge investments to increase the capacity of barges and to expand their barge portfolio owing to the increasing petrochemical demand. In 2014, Kirby Corporation invested USD 135 million to construct 66 new inland barges. Similarly, in 2016, the company spent USD 231 million for its expansion along the U.S. Gulf Coast. Later in the year, the company purchased a 155,000-barrel articulated tank barge and a tugboat unit for the ethanol transportation from the Great Lakes to Northeast region. The import and export of petrochemicals contribute to almost half of the revenue of the major industry players.

The rising demand for crude oil in North America owing to technological advancements in hydraulic fractur-

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ing and horizontal drilling has fueled its oil production over the last decade. In the U.S., the crude oil production has increased from 3.8 million barrels to approximately 9 million barrels per day; a 137% rise. Due to the increased production of crude oil, the demand of tank barges has increased considerably over the past years in the region.

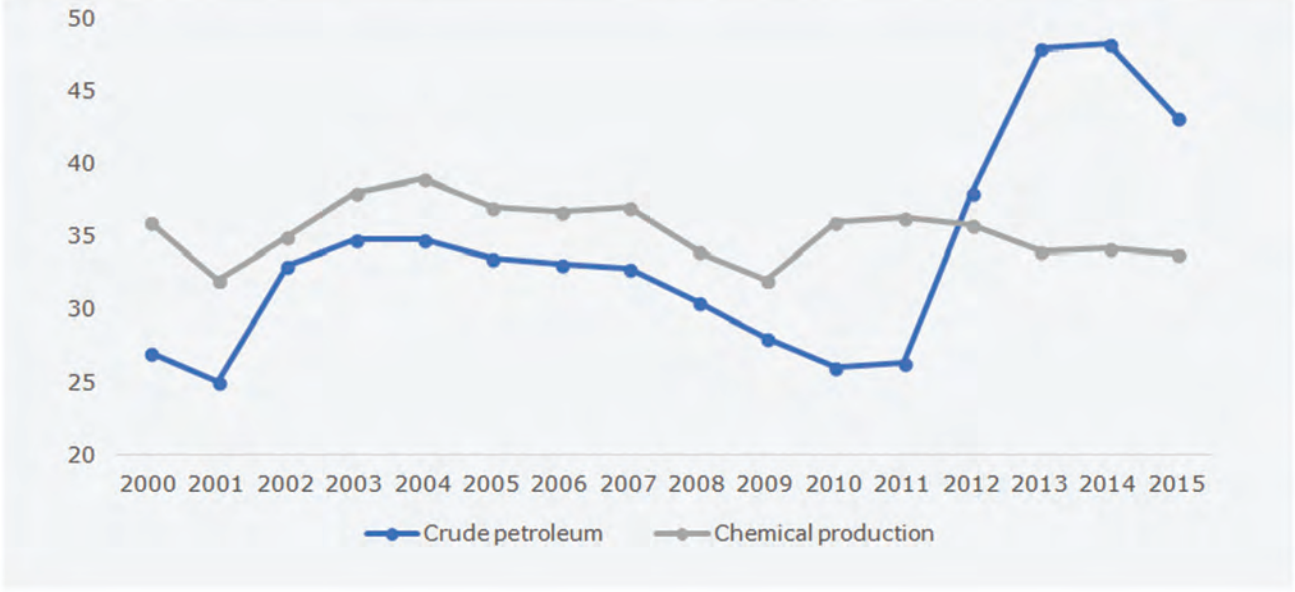
Barge transportation market has numerous participants in these markets. American Commercial Barge Line (ACBL), Ingram Marine Group, Kirby Corporation, SEACOR Holdings, Campbell Transportation Company, APL Logistics, and Crowley Maritime Corporation are among the most prominent vendors in the industry.

The industry leaders are focusing on new barge constructions with larger loading capacity and technically-advanced features. The demand for tank barges is increasing owing to the rise in the crude oil production. For instance, in 2014, Kirby Corporation made an investment of USD 135 million for the construction of inland towboats and 66 inland tank barges. In 2012, the barge operators in the U.S. purchased 336 new tank barges with an overall capacity of over 8 million barrels. Short term, however, there are too many barges for available domestic cargoes – both in the dry bulk and liquid markets. Hence, freight rates have suffered.

Industry participants have recently focused on mergers, collaborations, and partnerships. For instance, in May 2012, Ingram Marine Company completed the acquisition of United Barge Line for the expansion of its workforce and strengthening of its inland footprint. This acquisition further helped the company in the extension of its product line by adding 650 barges and 17 towboats. In May 2016, Kirby Corporation acquired inland barge fleet of SEACOR Holdings that consisted of 13 towboats and 27 inland barges. Consolidation may well continue well into the future.

Global Market Insights, Inc. has a report titled "Barge Transportation Market Size By Product (Dry Cargo, Liquid Cargo, Gaseous Cargo), By Barge Fleet (Open, Covered, Tank), By Application (Coal & Crude Petroleum, Agricultural Products, Coke & Refined Petroleum Products, Metal Ores, Secondary Raw Materials & Wastes, Food Products, Beverages & Tobacco, Basic Metals & Fabricated Metal Products, Chemicals, Rubber & Plastic, Nuclear Fuel) Industry Analysis Report, Regional Outlook (U.S., Canada, Germany, UK, France, France, Belgium, Netherlands, China, India, Japan, Brazil, Mexico), Application Potential, Price Trends, Competitive Market Share & Forecast, 2017 – 2024."

FIG. 1 US domestic liquid barge transportation, 2000 - 2015 (Million tons)



President, Alternative Marine Technologies, Inc.

Bob Kunkel needs no introduction to *MarineNews* readers. Kunkel, President of Alternative Marine Technologies, previously served as the Federal Chairman of the Short Sea Shipping Cooperative Program under the Maritime Administration and Department of Transportation from 2003 until 2008. A past Vice President of the Connecticut Maritime Association, he is a contributing writer for ***Maritime Professional Logistics*** Magazine and of course, ***MarineNews***. A graduate of the Massachusetts Maritime Academy, Kunkel sailed as a licensed engineer and eventually continued his career in ship construction at myriad venues. Arguably, there is no one on this side of the pond with more experience in foreign and domestic shipyards alike. With no formal ties to any yard, he is an ideal sounding board for the domestic boatbuilding industry as we race ahead into the second quarter of 2018. This month, as our featured *INSIGHTS* subject matter expert, Kunkel weighs in as perhaps no one else in industry can.

Give us a sense of where U.S. shipbuilding sits today – financially, strategically and its prospects for the near term.

Shipbuilding is suffering globally. The traditional commercial markets of dry bulk and containers have suffered for periods longer then any previous recorded cycle of boom to bust. As a result, few if any vessels are being built in those market sectors. The shift in crude prices has also affected both dirty and clean sectors in the wet markets despite a huge MR product carrier delivery through 2017. China is slowly closing the "pop-up" yards and Korea is suffering through a consolidation of majors along with the closing of some of the smaller second tier builders.

Some believe it's the 'perfect storm' with emission issues, poor freight markets and the fact that banks and private equity are slowly moving out of shipping. All of which makes it difficult to finance projects. Your question may be looking for technical answers. That said; we need to understand that Cargo is King. Without those bullish markets and that continued investment shipbuilding suffers. We have offices in the U.S., Korea and China and we see the global comparisons and trust me: no one is killing it.

Most if not all of the U.S. shipyards, both top tier and second tier have limited or no backlogs. The orders are just not there and as a result domestic shipbuilding is also suffering. The largest influence has been the collapse of our offshore and crude markets. The savior might well be LNG. Taking all of that into consideration we have a long road ahead and that road may lead to changes in how we look at the domestic markets and domestic shipbuilding. The changes will occur in the larger tier one yards or what is left of them. A resurgence of Navy builds may be the answer and that is a discussion for another time.

American yards, especially those smaller, so-called tier 2 builders, compete well in certain sectors (typically 300' and down) with foreign yards. Why is that?

The answer goes well beyond ship size or length. Every smaller "Second Tier" yard we work with delivers a quality product and competes with their neighbors on final delivered cost. A new construction project has many cost levels an owner and builder must analyze. It goes well beyond the simple calculation of labor and material. A yard will look at production liability when a new design or technology is submitted, financing through construction as a payment plan is developed, or the liability of contracting with an owner who may not be there at the end of the project to take delivery. This is a huge business decision when looking at a $12 million dollar ferry or a $130 million dollar product tanker. From the owner's side, we look at delivery location, deviation costs to move the vessel from delivery yard to place of business and available parts and service at that business location. With that analysis, what would your decision be to build a 5,000 horsepower tug or ferry that was going to work in the U.S. Gulf? Would it be a build in Korea or Italy and deal with the delays and costs

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World Energy News	49,498

All stats from 01/02/2018

of getting the tonnage to the business location or would you choose aTexas yard where she goes right to work upon delivery? The Jones Act as legislation doesn't necessarily play an important part in that analysis for smaller tonnage.

You have probably spent more time in Korean yards than any other U.S. technical subject matter expert. Tell us about what they do right, what we could learn and the areas in which we'll never be able to match.

My Korean opportunity reaches as far back as 1981 and was nothing more than being in the right place at the right time. The U.S. government 615 Waiver in the 1980's actually allowed many U.S. companies to participate in a lottery to build U.S. flag tonnage in a foreign yard and I was lucky enough to take a project manager's position on a series of Panamax bulk carriers. It was more than an eye-opening experience as a young engineer to work in a shipyard as beautiful as Hyundai. As a result of that experience, we established a relationship with Hyundai Heavy Industries and Hyundai Mipo Dockyard early in their development and continued working with them right up to opening our office within the Hyundai Mipo Dockyard in 2015.

The yard and the country have an amazing asset and that is their work force. They are proud of what they do and relentless in the pursuit of excellence in design and production. One of the most promising reasons they are successful is the ability to draw young talent into the industry both in the design office and out in the yard. We have been lucky enough to employ more then several former Hyundai employees at Amtech that have held many of those positions.

I continue to be impressed with their production schedules. Not once have I seen a milestone missed in a Korean project from launching to delivery and that project management is what makes them successful. Let's remember there can be as many as fifty hulls under construction at one time in any of these yards and the movement from module construction to graving dock and erection is like a symphony. The basic reason for the successful orchestration is the fact that they build from completed designs, a wealth of production experience and work from approved production drawings form the first steel cut. Unfortunately, in many cases, we do not follow that pattern in the U.S. and we need to move away from building as the design is being developed.

You hear much about the vertical integration of the foreign yards in terms of steel production being tied to the shipyard conglomerate. Not unlike what our domestic shipbuilding industry once was. Is this a key reason for the difference in costs from U.S. to foreign yards?

The difference between U.S. yards and foreign yards is the relationship between yard and their vendors/suppliers. The Korean yards are surrounded by their suppliers, most of them local and all dependent upon the success of the yard. This relationship runs from Main Engine to nuts and bolts. The economic success of these businesses and in many cases the city where the yard is located is reflected in the Builder's success. As a result, the suppliers support the system no matter where we are in the market cycle. Not so in the United States as we have lost our manufacturing base. Our yards are forced to pay transportation charges, duties and multiple levels of distribution networks to purchase and receive the same material. The suppliers are not dependent on the Builder; the builder is dependent on the supplier. This affects production schedules, leads to delivery delays and as a result either an increased price or contract defaults.

During a Korean product tanker build we can literally walk to the engine manufacturer, attend most if not all "factory authorized tests" by a short car ride or bicycle trip and in many cases circumvent production delays before they happen as we patrol the factories day to day. We are big believers in the vertical integration business model and it is a major factor in the competitive analysis we develop for owners when selecting a shipyard.

Foreign governments, even discounting the FMC contracts (which chiefly involve U.S. government money), are flocking to U.S. builders in the small, littoral patrol craft sector. What are we doing right?

I believe many of those manufacturers in this market will say, "Who cares, as long as we keep doing it?" It's been the change in warfare strategy where Special Forces are the first called and the speed to get them deployed has created a need for a high speed, stealthy lightweight craft. We have a large number of first class aluminum hull builders with experience gained from the U.S. Gulf offshore markets and this goes back to our discussion that the smaller yards as competitive. That said, its time for the United States to rebuild its global surface warfare fleet. We need more destroyers and frigates to police the oceans and extend our reach again past coastal waters.

Labor: at one time it was labeled as one of the big differentiators in cost between U.S. yards and foreign competition. Today, stakeholders say that pay gap has tightened to insignificance. Where does the real price advantage come from when it comes to domestic versus foreign shipbuilding?

In Korean, Japanese and European shipyards, the differentiator is not the cost of individual labor when compared to U.S. shipbuilding. I can't qualify that statement when

it comes to China. Understand that we are talking about a specific man/hour cost for a shipyard trade as "labor" has many components – one of which is the actual total man-hours required to deliver the vessel at completion. On average Hyundai contracts and delivers a standard design in about nine months. The U.S shipyard's build period for a similar size vessel is closer to 18 months. Unfortunately some of the latest domestic projects have taken longer than that. We again attribute the difference to project management and the ability to build from a completed design package.

Marad is backing a plan to replace the aging state maritime academy training ships. That might take the form of a newbuild program of the so-called NSMV's. Or, it could mean the refurbishment of a laid up commercial hull or two. What's the best way to go about this (if at all)?

We need to decide if leading as a maritime nation is in our future. We have a new Maritime Administrator with a Navy background and a new Secretary of Transportation with a family commercial shipping background. What better time to make that decision? With five very successful State Maritime Academies in operation, we owe it to these students to provide a platform that teaches them the latest technology in navigation and propulsion. That platform should also be capable of teaching them sustainability and environmental compliance. New construction is the path that can make that platform possible. Now ask who is actually being supported with that decision. Are we supporting the youth that has determined that a career at sea or in the maritime trades is the direction they have chosen? Do we continue as a Nation to build a commercial fleet that supports that career? Or do we limit the design and construction for these training ships to only U.S shipyards that will result in a cost that is not economically feasible? We tried U.S built cruise ships before and it wasn't pretty. Is the construction of a training ship platform gathering all of the latest technology to educate seafaring students a Jones Act required build? Can we work with a favored nation as a partner in Europe or Korea to make that build happen? Answer those questions and in my opinion we can look at either raising the level of interest at Marad or determining [if] the cost is prohibitive.

You are building an exciting new hull up on the U.S. East Coast. The Harbor Harvest program could well become a designated Federal Marine Highway project. Why is this important and what are you trying to accomplish in this corridor. Any plans for a second hull?

We believe new alternative marine technologies are the path forward in coastal shipping and a domestic building plan. The world looks to the United States as a technology leader. And that is not a quick off-the-cuff statement as AMTECH has reached into our own pockets to build for own account. With this project, AMTECH and Harbor Harvest are now owners and that is a big step for both the Marine Highway and us. The project research supports many of the questions we have answered here.

Historically, we have looked to reducing energy consumption as a means to reach environmental compliance and sustainability. The internal combustion engine drove that thought process in all transportation sectors. The quantum leap in battery technology and energy storage has changed that path. In the future will be creating as much power as possible through alternative energy sources and storing that energy. Solar, wind and Fuel cell cannot be turned on and off like an internal combustion engine. Storage is the key and we believe it will work towards reinventing the marine propulsion markets. The BAE HybriDrive system works towards that end.

Our Harbor Harvest Hybrid project has been submitted to the Secretary of Transportation after meeting Maritime Administration approval in the Marine Highway program. The application relieves congestion on our local highways and moves this freight without emission or environmental impact. You only need to drive on the U.S. Interstate highways to understand why we believe the Marine Highway's time has come.

How does it affect domestic shipbuilding? The project reflects our vertical integration model. The propulsion system and hull is U.S built at BAE Hybrid and Derecktor Shipyards – U.S manufacturers. The design and production drawings are complete and have resulted in two successful builds with the same hull form and as a result, a reduction in price to build. We have built the Harbor Harvest Ecosystem around the transportation platform with agriculture distribution centers and retail spaces supporting the move away from historical diesel trucking. It is our long-term goal to take this short haul model in larger RO/RO vessels and apply it to coastal itineraries in other ports once we prove it economically successful. This first phase will trade Long Island Sound and the Hudson River supporting local farmers and artisan chefs. Our Derecktor contract is 'one plus one' and a second hull is in the works. We have extended plans to deliver up to ten vessels and the community and cargo support is there to make that happen. Look ahead to the first Naming and Delivery ceremony in March of 2019. We'll get you an invitation.

Marine News

EDITORIAL CALENDAR

JANUARY

Ad Close: Dec 15

Passenger Vessels & Ferries

MARKET: Training & Education
TECHNICAL: Hybrid Propulsion
PRODUCT: HVAC & Ventilation
SPECIAL REPORT: Ballast Water Treatment
REGIONAL FOCUS: U.S. East Coast

PVA Maritrends:
Jan 28 - 31, Savannah, GA

FEBRUARY

Ad Close: Jan 16

Dredging & Marine Construction

MARKET: U.S. Coast Guard
TECHNICAL: Marine Lubricants
PRODUCT: Pumps, Pipes & Valves
SPECIAL REPORT: Inland Port Development

Inland Waterways Conference:
Mar 20 - 21, New Orleans, LA

MARCH

Ad Close: Feb 15

Pushboats, Tugboats & Assist Vessels

MARKET: Winches & Capstans
TECHNICAL: Naval Architects
PRODUCT: Workboat Engines
SPECIAL REPORT: Thrusters & Inland Propulsion

CMA Shipping:
Mar 12-14, Stamford, CT
Clean Waterways:
April 4-5, St. Louis, MO

APRIL

Ad Close: Mar 15

Boatbuilding, Construction & Repair

MARKET: Marine Cranes
TECHNICAL: Coatings/Corrosion Control
PRODUCT: CAD/CAM Software
SPECIAL REPORT: VGP Compliance
REGIONAL FOCUS: North American West Coast

NACE Corrosion: April 15-19, Phoenix, AZ
OTC: Apr 30 – May 3, Houston, TX

MAY

Ad Close: Apr 16

Inland Waterways

MARKET: Barge Building & Outfitting
TECHNICAL: Workboat Comms
PRODUCT: Cordage, Wire Rope & Rig
SPECIAL REPORT: Subchapter M Towboat Rules

IMX: May 21-23, St. Louis, MO
Electric & Hybrid Marine World Expo:
Jun 27-29, Amsterdam, NL

JUNE

Ad Close: May 15

Combat & Patrol Craft Annual

MARKET: Salvage & Spill Response
TECHNICAL: ATB's
PRODUCT: Pollution Prevention & Response equipment
SPECIAL REPORT: Shipyard Exports

Clean Pacific: Jun 19-21, Portland, OR
SeaWork: Jul 3-5, Southampton, UK

JULY

Ad Close: Jun 15

Propulsion Technology

MARKET: Lubricants, Fuels & Additives
TECHNICAL: Safety & Fire Prevention
PRODUCT: Shafts, Seals & Bearings
SPECIAL REPORT: Workboat Repair
REGIONAL FOCUS: Great Lakes

AUGUST

Ad Close: Jul 16

MN100 Market Leaders

MARKET: Boatbuilders
TECHNICAL: Marine Operators: Crew Training and Retention
PRODUCT: Hull and Deck Coatings

SEPTEMBER

Ad Close: Aug 15

Offshore Annual

MARKET: OSV & Offshore Trends
TECHNICAL: Dynamic Positioning Equipment & Training
PRODUCT: Pumps, Pipes & Valves
SPECIAL REPORT: Regulatory Outlook

OCTOBER

Ad Close: Sep 17

Autonomous Workboats

MARKET: Multi-Mission Workboats
TECHNICAL: Management & Operations Software
PRODUCT: Electronics & Navigation Equipment
SPECIAL REPORT: Simulation Tech & Trends

SHIPPINGInsight: Oct 9-11, Stamford, CT
Commercial Marine Expo:
Oct 17-18, Providence, RI
SNAME: Oct 23-27, Providence, RI

NOVEMBER

Ad Close: Oct 15

Workboat Annual

MARKET: Outfitting Today's Workboat
TECHNICAL: Marine Gears
PRODUCT: Deck Machinery-Winches and Cranes
SPECIAL REPORT: The Marine Fuel Debate
REGIONAL FOCUS: Gulf Coast

Clean Gulf:
Nov 13-15, Houston, TX
Workboat Show:
Nov 28-30, New Orleans, LA

DECEMBER

Ad Close: Nov 15

Innovative Products & Boats

MARKET: Fire, Patrol & Escort Craft
TECHNICAL: Emissions Compliance and Monitoring
PRODUCT: Fire & Safety Equipment
SPECIAL REPORT: Top 10 Stories for 2018

The Small Vessel General Permit (sVGP)

Compliance Difficulties Continue for the Workboat Sector.

By Steve Candito

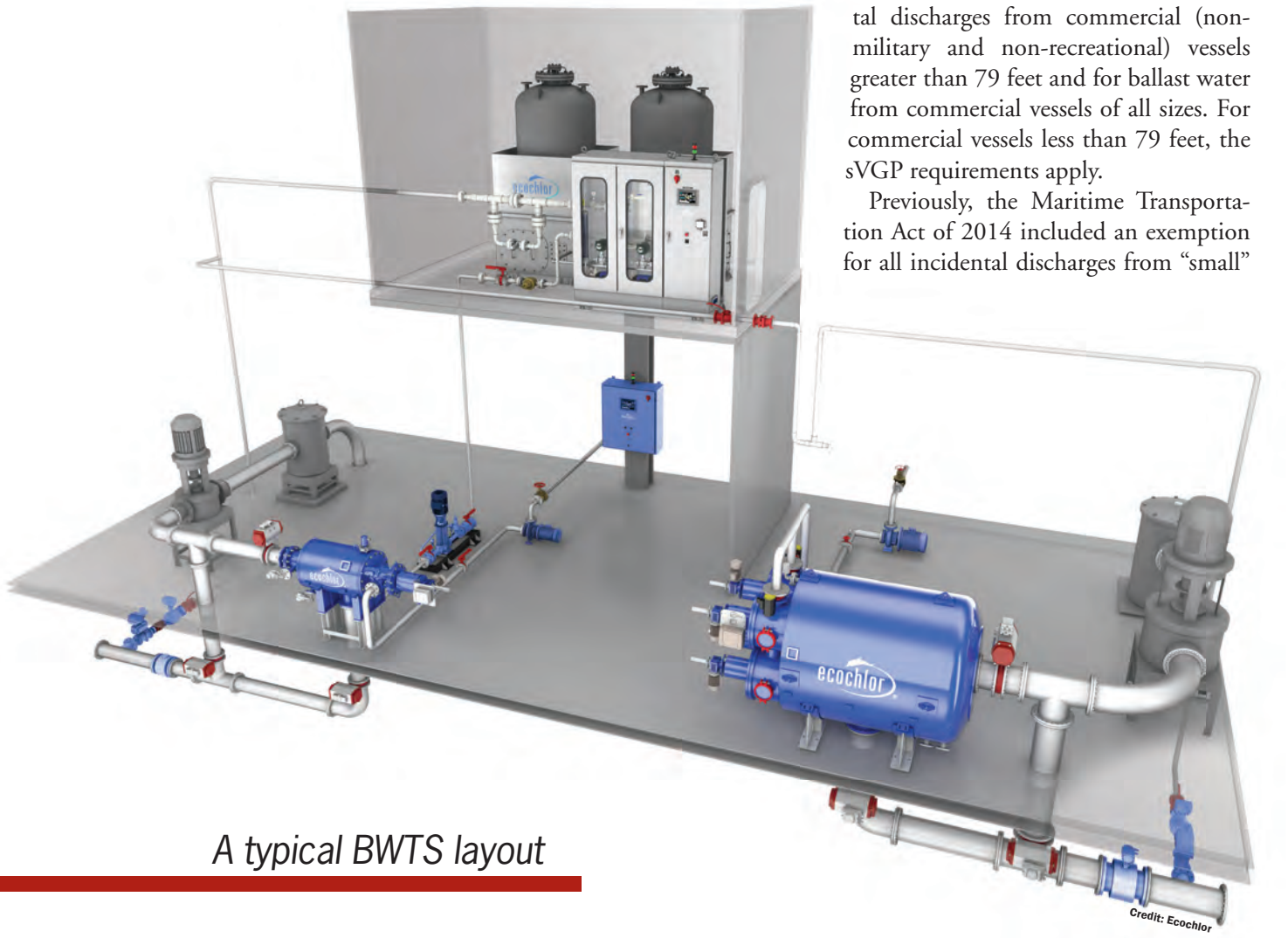
Candito

The recent implementation (19 January 2018) of the long delayed small Vessel General Permit (sVGP) requirement has major implications for environmental regulations in general, and specifically how the compliance difficulties continue for vessel owners with no real end in sight. Moreover, the U.S. Coast Guard's (USCG) recent publication of NVIC 01-18 (1 March 2018), while helpful in advising owners on how to comply with the ballast water regulations, does not relieve vessels from the underlying requirements, specifically the risks associated with inoperable ballast water treatment systems (BWTS). With vessel charter rates still generally in a down cycle, the need for vessel owners to spend more money on environmental regulations does not come at a good time.

sVGP Timelines

By way of background, the Environmental Protection Agency (EPA) VGP requirements first went into effect in 2008, with permit reissuance in 2013. The VGP provides for National Pollutant Discharge Elimination System (NPDES) permit coverage for incidental discharges from commercial (non-military and non-recreational) vessels greater than 79 feet and for ballast water from commercial vessels of all sizes. For commercial vessels less than 79 feet, the sVGP requirements apply.

Previously, the Maritime Transportation Act of 2014 included an exemption for all incidental discharges from "small"



A typical BWTS layout

vessels – with the exception of ballast water – from having to obtain an sVGP until December 18, 2017. This exemption was not extended. Thus, vessels less than 79 feet must now comply with the sVGP requirements including ballast water management. Given this long delay, and similar delays with implementation of the USCG BWT requirements, many vessel owners deferred taking compliance action, but the "do nothing" approach is no longer an option.

Overlapping Regulations

One of the primary challenges facing the industry is overlapping regulations. In addition to the USCG ballast water regulations, the EPA's VGP creates another layer of US federal regulation. The complexity increases with individual US States having the ability to attach state-specific conditions to the VGP. The Commercial Vessel Incidental Discharge Act (CVIDA) was drafted to alleviate some of these compliance headaches, and many industry stakeholders support this effort. The proposed CVIDA legislation attempts to unify and simplify both the regulatory and compliance aspects of vessel discharges by creating one federal standard for both the USCG and EPA as well as preempting any similar state regulations.

The Passenger Vessel Association (PVA) recently announced that the CVIDA bill in the Senate (S168) has finally been voted out of the Senate Commerce Committee and been placed on the list of bills that could come to the floor for a vote. Whether, and when, that could occur is up to Majority Leader McConnell. PVA and the shipping lobby are pushing hard to bring the bill forward, taking the position that it advances the Trump Administration's agenda of

"streamlining government regulation of industry." Hopefully, this tactic will work, but in the meantime, owners must comply with the myriad of regulations as they currently exist, which is no easy task.

Looking more closely at EPA VGP compliance, the current 2013 VGP is set to expire on December 19, 2018. EPA is currently accepting comments on what revisions should be made to create the new 2018 VGP (i.e., prior to its issuance of a draft permit, which is expected this fall). As usual, regulators are late in issuing the draft VGP as they initially indicated it would be published last summer, and now fall 2018. Hence, all stakeholders should monitor the EPA's website for publication of the draft 2018 VGP and submit comments to the EPA, particularly if the CVIDA proposed legislation does not progress in Congress.

With respect to the planning and logistical aspects of VGP compliance for ballast water, many owners think that testing laboratories are either limited in numbers and/or altogether unavailable. In reality, there are many laboratories – both in the United States and overseas – that are qualified to perform the VGP biological and/or chemical analysis, especially in larger ports. However, those facilities must be close to the port where sampling will occur due to a short 6-hour biological sample holding time.

It isn't getting any easier: *The 27 discharges outlined in the 2013 Vessel General Permit:*

Bilgewater/Oily Water Separator Effluent	Sonar Dome Discharge	Deck Washdown and Runoff
Anti-fouling Hull Coats/Coating Leachate	Welldeck Discharges	Aqueous Film Forming Foam (AFFF)
Oil Sea Interfaces (props, tubes, etc.)	Fish Hold Effluent	Boiler/Economizer Blowdown
Motor Gasoline, Compensating Discharge	Elevator Pit Effluent	Equipment Subject to Immersion
Refrigeration & Air Condensate Discharge	Firemain Systems	Gas Turbine Washwater
Distillation and Reverse Osmosis Brine	Freshwater Layup	Non-Oily Machinery Wastewater
Graywater Mixed with Sewage from Vessels	Cathodic Protection	Seawater Piping Biofouling Prevention
Exhaust Gas Scrubber Washwater Discharge	Chain Locker Effluent	Boat Engine Wet Exhaust
Seawater Cooling Overboard Discharge	Ballast Water	Underwater Ship Husbandry

Planning

Failing to plan also means that an operator is planning to fail. Therefore, advance planning for VGP compliance is a matter of paramount importance. Even though a VGP sampling event can be arranged quickly, time is needed to ensure qualified labs are available, arrange for lab supplies and a sampling technician. While it is understood that vessel schedules fluctuate based on a variety of factors, if the vessel informs the service provider/lab of the port where ballast water discharge/sampling is expected to occur in advance, the service provider can better support the vessel. Like other husbandry services ships require, conducting VGP sampling in large ports is generally easier and more cost effective.

Vessels also need to ensure they are operating their BWTS, if required, in accordance with the operations manual. For example, if treated ballast water requires a holding period, ballast discharge and sampling should only be done after the prescribed treatment process has been completed. If VGP sampling is conducted when the BWTS has not been operated properly, the vessel is in risk of being non-compliant.

Much of the recent VGP focus has been on ballast water. However, it's important for owners to know that the VGP regulates 27 different vessel discharges. Owners must become familiar with the regulated discharges applicable to each vessel and the respective monitoring requirements that crew need to implement for compliance.

Hopefully, most owners have already submitted their VGP Annual Report, which was due 28 February 2018 for all vessels that filed a Notice of Intent (NOI) form. The Annual Report must be filed even if a vessel did not operate in U.S. Waters during the calendar year. Information can be found in Section 4.4 of the VGP. ***https://www.regulations.gov/document?D=EPA-HQ-OW-2011-0141-0949***

The complacency that permeated VGP, the delays associated with ballast water management requirements, and the uncertainty of whether CVIDA may resolve some of these issues, all combined to distract owners from taking proactive compliance actions. Given that the long delayed sVGP legislation is now in force and USCG BWT extensions are more difficult to obtain and quickly being phased out completely, owners have no choice but to comply with these new regulations despite the generally poor freight markets.

Although there is still hope that CVIDA may provide some relief, owners must make sure they are in compliance with these various environmental regulations now. The sting of these compliance costs at this uneconomical time may hurt, but it does not outweigh the risk of vessel delays and fines associated with noncompliance.

Steve Candito *is the CEO of Ecochlor, Inc. Prior to joining Ecochlor, Steve was Founder, President and CEO of Foresea Consulting where he provided various advisory services including strategic planning, regulatory compliance and crisis management to the maritime and environmental communities. Before Foresea, he was President and CEO of National Response Corporation (NRC). During his 20+ years at NRC he grew the business from a start-up to a leading global emergency response and environmental services firm. Steve graduated from Hofstra University School of Law and the United States Merchant Marine Academy.*

California's Zero-Emission Domino Theory

By Thomas Jelenić

Jelenić

The Domino Theory was the Cold War concept that if communism obtained a foothold in a region – say Vietnam in Southeast Asia – other countries would soon fall like a perfectly aligned row of dominoes to communism (e.g., Cambodia and Laos). Whether one supports the theory or not, it has at least one strong point: it was a simple story to tell.

It feels like California has adopted its own version of the Domino Theory: if California pushes the regulatory envelope for zero emissions, other states and countries will certainly adopt similar strategies. The narrative's importance is that it counters the argument that California is building a regulatory state that will leave it hamstrung with costs and uncompetitive in a global marketplace.

This zero-emission Domino Theory is on full display in California's maritime industry where port authorities and regulators are working to reduce emissions from port-related activities. California port authorities have led the way in establishing themselves as global green port leaders. It is a well-earned reputation. During the past decade, ports have reduced diesel particulate matter, a pollutant of particular concern to local communities, between 76% to 88%, depending on the port complex. That reduction is no mean feat. It translates to meaningful improvements in air quality and reductions in health risk.

Credit: Thomas Jelenić

But part of the argument for being a green leader is that other ports will follow California's example. The dominoes must fall at each port around the country and, when it happens, California will not stand alone. We will have started the movement. Yet, to date, no has followed California's green leadership; the dominoes remain upright.

No port outside of California requires or incentivizes the use of shore power for cargo vessels. No port has developed a meaningful Clean Trucks Program to accelerate the turnover of drayage trucks. Those ports that do have green port programs on paper are letting time, rather than command-and-control regulation, do the heavy lifting. With time, older, more polluting equipment is replaced with modern equipment that has the latest emissions control systems. This is the same strategy that has successfully reduced emissions from passenger vehicles across the country. In addition to achieving the same emission reductions, the time approach also eliminates stranded asset costs and the need to incentivize equipment replacement saving billions.

As California ports look to further burnish their environmental credentials, they face a difficult challenge. Because all available feasible, cost-effective technology has been deployed, two paths exist to further emission reductions. One is incremental through the use of near-zero technologies. In this case, incremental means achieving an additional 90% reduction on top of a previous 90% reduction in emissions standards for on-road and off-road equipment. For the mathematically challenged, that would be the equivalent of a 99% emissions reduction. The only hurdle to this pathway is that equipment is just now becoming commercially available and a new (California-only, of course) engine standard requiring equipment manufacturers to sell cleaner equipment is not expected until the 2023 timeframe and may only apply to on-road engines.

The other pathway is a paradigm shift with a move straight to zero-emissions. This pathway's main hurdle is that the equipment available today is fully automated and costs about $35 billion to address just cargo-handling equip-

ment statewide. This equipment makes-up only 4% of port-related diesel emissions and less than 1% of regional diesel emissions. Or, we can place our bets on electrified versions of the existing diesel-powered equipment marine terminals currently use. It should be noted that this equipment does not currently exist and nor does any of the supporting infrastructure necessary to power it. To further complicate matters, tackling zero emission "solutions" for other port-related equipment (locomotives, drayage trucks, harbor craft and tugs) is even more challenging and more expensive.

How California ports accomplish this transition to zero-emissions while remaining both competitive and an industry leader remains unanswered.

Not to be out done, California's regulators are taking a cue from the ports and pressing for even more aggressive action. In a proposal heard by the California Air Resources Board (CARB) at the end of March, California will lay out their new vision for tackling emissions. This updated vision calls for beginning the transition to zero-emission cargo-handling equipment early, in 2026, despite the fact that no equipment capable of successfully operating in a marine terminal environment exists.

Even more disturbing, it upends the traditional approach to improving air quality. Normally, the State would require equipment manufacturers to build and sell equipment that meets an emissions performance standard. California would sometimes match that demand with a requirement that forces users to retire the oldest equipment to accelerate the introduction of the newest, cleanest equipment. This time, no proposal for tighter (or even zero) emission standards exists and there is no requirement for equipment manufacturers to sell zero emission equipment. Instead, it appears that California will give the equipment users a hearty "good luck" and the sole burden to find such equipment.

California regulators have targeted the maritime industry to lead the way on zero emissions because it can. State regulators are poised to set aggressive maritime sector targets that are decades ahead of the requirements proposed for other California industrial sectors. In doing so, it shifts the costs of technology development from all California industrial sectors to the maritime sector. The maritime sector will have to bear the burden of technology development that the rest of the State will be able to rely on to meet their requirements decades later.

All of this "leadership" is happening in the context of a decade-long slide in California ports' market share – a trend that isn't likely to end soon. Both California ports and regulators assure stakeholders that they will proceed judiciously and do not wish to harm the source of tens of thousands of jobs statewide. To that end, both port authorities and the State have repeatedly called for other jurisdictions to follow their lead to help maintain an even playing field. No one has followed.

Despite efforts by California ports and regulators to form partnerships outside of California, no dominoes have fallen elsewhere. The question to be asked, after more than a decade of California "leading" the way, is anyone willing to follow? Or, will California and its ports continue to stand alone?

Thomas A. Jelenić *is Vice President for Pacific Merchant Shipping Association (PMSA). Mr. Jelenić works with policy makers, regulators, industry leaders and other entities to help ensure that sound science and industry issues are part of the discussion as California continues to call for the increased use of zero and near-zero emissions equipment at California's ports and throughout the goods movement industry. Jelenić has two decades of maritime industry experience, including more than 14 years in environmental and planning positions at the Port of Long Beach, the nation's second busiest seaport, and senior management roles in private consulting and logistics development.*

BOATBUILDING 101:

Keep it Simple

In an era of increasingly complicated regulations and sophisticated technologies disrupting the workboat sector, one piece of the equipment – the Keel Cooler – remains as possibly the most important and at the same time, the simplest piece of hardware on the water. Likewise, much the same way as it was more than 70 years ago, Fernstrum remains the standard.

By Joseph Keefe

For today's workboat sector, the most pressing issue facing operators is arguably comprised of meeting and paying for the advent of so-called 'Tier' emissions standards. The American subset of 5,500 towboats additionally faces the subchapter M towboat rules and new requirements for hardware installation and physical construction. The one thing they shouldn't have to worry about is engine cooling solutions.

The Keel Cooler, out of sight below the waterline, may be the most important piece of equipment on the boat. Without it, engines can't perform and freight and people don't get from point A to point B. As EPA Tier levels march on from 1 to 2 and all the way to 4, the mighty keel cooler has matched strides to make sure that cleaner air doesn't also mean poorly performing or out-of-service boats.

Similarly, subchapter M rules that center on hull penetrations represent a potential challenge for operators that employ keel coolers. Already in compliance with the U.S. Coast Guard's tough subchapter K requirements (for passenger vessels), what comes next will be nevertheless be business as usual for R.W. Fernstrum & Company. That's because Fernstrum, the oldest name in the marine cooling sector, is also its most experienced. Selling into every workboat sector up to a maximum engine output of 10,000kW, there is a keel cooler for any marine hull, and Fernstrum will custom engineer one to match. With no moving parts, the keel cooler is the ideal and simple solution for today's workboats even as other equipment becomes increasingly complicated and otherwise difficult to maintain.

KEEL COOLERS 101

According to Dale Gusick, Fernstrum's Export Sales Manager, a keel cooler or a box cooler are the same thought process. "It is a closed circuit cooling system for a marine engine. It is similar to a radiator on a car or truck except we're underneath the vessel," explains Gusick. "And we're in direct contact with the ambient water – providing a direct water (coolant) to water heat transfer. This eliminates sea water or ambient water from coming into the vessel for heat exchangers."

Inland operators have options when it comes to cooling requirements. That said; most inland marine vessels tend to be keel cooled because of the dirty, shallow water environments that they operate in. Dale Gusick puts the question into perspective, saying, "If they were heat exchanged, there would be constant problems with heat exchangers clogging, plugging, pumps failing, overheating and eventually the engines could be damaged. A new marine engine today is typically going to have two cooling circuits because of the new Tier level requirements."

It turns out that challenging inland conditions – shallow, silty, turbid, debris filled environments – are the perfect application for keel coolers. That type of environment is a primary reason it was developed. Back in 1944, the U.S. Navy supplied landing craft for a mock assault of Iceland which was intended to prepare for the logistical nightmare that was later to be the Normandy landings. Sean Fernstrum, President of R.W. Fernstrum, told ***MarineNews*** in March, "Less than half of the craft made it ashore because

(L-R) Dale Gusick, Dave Peura, Frank Bjorkman & Sean Fernstrum

ice was sucked into the intakes and strainers and consequently cracked engine blocks. Sean's grandfather (Robert Fernstrum), then the Chief engineer at Gray Marine, was given the task of fixing it. What he came up with was the prototype of our packaged keel cooler."

In reality, the Navy didn't start using keel coolers until after the war. Company President Sean Fernstrum explained, "My grandfather received an order for 10,000 units in 1945. He had nowhere to build them, no one to do the work, and due to rationing, getting silver and copper nickel proved challenging. When the war ended, the contract was cancelled. Subsequently, in between WWII and Korea, he received the landing craft order. All of the landing craft at Inchon, for example, had keel coolers installed."

Today's keel cooler is typically mounted in a recessed arrangement on the side of the vessel. The coolers remain out of harm's way, protected with guards and grills. Bjorkman adds, "The vast majority of these inland vessels typically end up with side mounted, recessed installations."

HIGH SPEED VESSELS

Beyond the inland freight markets, keel coolers have many applications. Indeed, and contrary to some perceptions, another ideal keel cooler application involves the so-called 'high speed vessel' sector. A high speed vessel entails anything that operates typically at speeds of 15 to 40 KT. Within that range can be found ferries, pilot boats, and rigid inflatables. Nevertheless, a common misperception is

that the cooler will cause too much drag on the high speed vessel. Dale Gusick says that's just not true. "We have done tank model testing where we ran three different types of hulls, one fitted with a properly installed keel cooler, one with no keel cooler and another with an improperly installed keel cooler. In the end, the testing demonstrated that a properly installed keel cooler in a recess did not impact the speed of the vessel. A final coat of bottom paint restricted a vessel's performance more than a properly installed keel cooler."

Today, most of Fernstrum's heat transfer testing occurs in-house, electronically with software or in test tanks at the Fernstrum facilities.

EVOLVING WITH THE INDUSTRY

Horsepower has nothing to do with the size or shape of a keel cooler. Nevertheless, as operating conditions on board have changed, so too, has the keel cooler. The variables that have had the most impact involve the heat being generated by today's engines, as they evolved from Tier 1 to Tier 4. Frank Bjorkman explains, "Today's coolers look outwardly very much like they did in the past. We've made changes internally to help strengthen the unit. The other thing that has changed – in part because of the Tier changes – we've gotten into much larger units. Additionally, the manufacturing techniques that we use improved over time." Hence, Fernstrum coolers evolved to a more rugged and durable standard. That's because a 100 HP engine 40-50 years ago would require a small cooler. Today and in order to meet the emissions regulations, that system could be twice as big.

Sean Fernstrum perhaps explains it best, saying, "In the past, a new engine type might be expected to be standard for two or three decades, now those changes are coming every five years. This has created some confusion for the OEM's and customers in keeping track of where they are in a multi-year planning stage for a vessel.

In the case of the increasingly popular GE Tier 4 engine, for example, the low temperature circuits require a tremendous amount of surface area in comparison to an SCR Tier 4 engine. When that happens, Fernstrum merely takes technical data from the engine company and engi-

When installing a keel cooler without a recess, fairing blocks and side plates provide protection and help improve streamlining. Protective side plates with openings eliminate seawater flow restrictions.

Ideal GRIDCOOLER Keel Cooler applications

Bridge erection boats (BEB)	Ferries (23-24 knots)	RIBs (Zodiac Canadian Coast Guard)
Bristol Bay gillnetters	Pilot boats (15-20 knots)	Inland Pushboats / Assist Tugs
Crew boats (15-25 knots)	Police and SAR (Search & Rescue)	Freight Landing Craft

neers a solution to match. "It's about heat generated and the flow rate of the coolant versus the temperatures that we have to hold. The closer we are to the ambient water temperature, the more surface area we need to cool that engine." says Peura.

For any operator, especially those in sectors where downward freight rates are exacerbated by regulatory pressures, the need for robust, reliable and simple equipment is a must. Those boxes, however, have long ago been 'checked' by Fernstrum. Depending on the maintenance cycle that a particular vessel might be going through, routine maintenance might dictate some new gasket sets, or possibly an anode update. In actual practice, however, Dale Gusick says the GRIDCOOLER Keel Cooler holds up admirably. "We frequently see a life cycle of 20 years for a copper nickel keel cooler. That said; we get calls from customers every week about keel coolers that have lasted 30 to 40 years. They (the vessel) may have even repowered a couple of times. And, sometimes, those vessels end up in developing countries after having been sold to overseas buyers."

THE IDEAL KEEL COOLER INSTALLATION

It wasn't that long ago that as few as 6 to 8 keel cooler models could cover 60% of the inland river boats. Fernstrum today still stocks some of those models so that customers have access to them. Today, the vast majority of Fernstrum's output is custom-designed for a vessel or a series of vessels. Much like the trend in designing fit-for-purpose hulls to match the new wave of thrusters for inland applications, every Fernstrum keel cooler is designed on a myriad of variables. Those variables will include the particular propulsion package, the operating environment, the water temperature itself, intended service and many other factors. "Some of these designs can take years to come to fruition, it's fascinating to watch it all come together," says Sean Fernstrum.

Frank Bjorkman agrees. "We work very closely with naval architects on the design aspects and installation of keel coolers. As a result, we are seeing better installations than we did 20 and 30 years ago. We also work closely with engine OEM's before the release of a new engine to help determine how changes may impact the cooling system for the vessel.

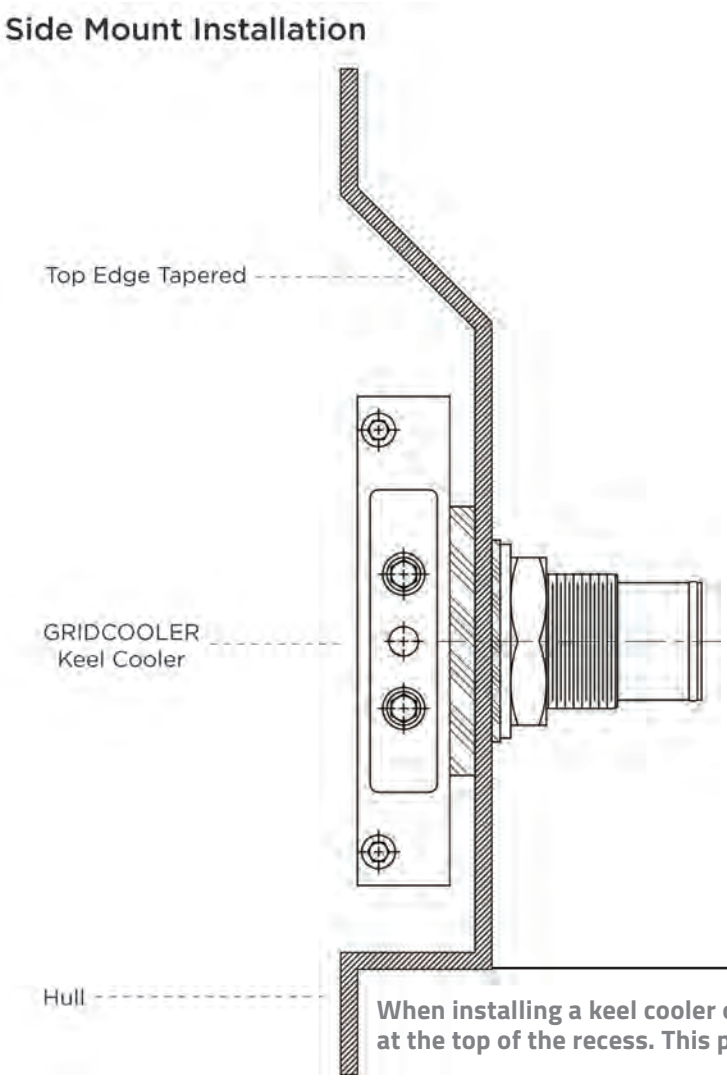
Where a new vessel experiences cooling issues, it is often due to the wrong diameter of piping, too many turns or elbows; all things that can cause pressure losses. "That's the kind of thing that we work with our customers on," says Dave Peura, adding quickly, "We look at all the engine data, heat projections, flow rates, design temperatures of the engine, and then we look at application data – minimum hull speed at full rated power, sea water temperature, we even look at whether it will be fresh water or 50% cooling antifreeze being used in the system. All of that – and more – plays into sizing of a keel cooler."

LOOKING AHEAD

The Fernstrum business calls for looking back, planning for what comes next, and as Sean Fernstrum likes to stress, staying diversified. To that end, he says, "Ferries have always been a staple of ours, and they seem to be coming on stronger. As is usually the case in the marine sector, as one sector rises, another falls. We all rode that wave of the offshore industry, as significant as it was. But commercial fishing and some of these other sectors have worked to take off some of the edge from that loss from offshore.

"Today's coolers look outwardly very much like they did in the past. We've made changes internally to help strengthen the unit. The other thing that has changed – in part because of the Tier changes – we've gotten into much larger units. Additionally, the manufacturing techniques that we use improved over time."

– Frank Bjorkman, Fernstrum's Domestic Sales Manager



When installing a keel cooler on the side of the hull, create a beveled or tapered edge at the top of the recess. This promotes natural convection and allows heat to escape.

Diversification is an absolute must."

Overseas, Fernstrum points to emerging markets that need energy. "These are really interesting markets – underwater tidal turbines, AUV's and ROV's. It's been an interesting change that's allowed us to work with some specialized projects – marine engineers and naval architects where there hasn't been a previous market, so we're breaking new ground in some of these applications."

In smaller countries with developing economies, Fernstrum is seeing the return to landing craft – newbuilds and recycling old ones. "They use them as ferries moving people and equipment back and forth. And if the keel cooler is properly located and recessed into the vessel typically back towards the aft end of the vessel where the engines are, they are pretty well protected even if they are on the beach," says Gusick.

Separately and also within Fernstrum's considerable export market experience, South American operators are increasingly demanding new build tonnage. And, when they do, those demanding Amazon conditions call for robust equipment. "We're involved in several newbuildings down there right now. These include three large pushers for the Dreyfus group; all RAL design with GRIDCOOLER Keel Coolers," explains Dale Gusick. With 18 active distributors and/or agents around the world, South America in particular has been a good market for Fernstrum.

For those U.S. yards that also produce tonnage for export, it isn't unusual to see Fernstrum coolers on those vessels as they take last line for the Amazon, and beyond. Eastern Shipbuilding's series-build Brevante class PSV's were a perfect example. All had custom-designed Fernstrum box coolers fitted.

To a much lesser extent, the so-called 'hour of power' and hybrid propulsion revolution has also impacted the iconic keel cooler. But, for different – and says Dale Gusick – good reasons. He continues, "It's going to impact us even more once people settle on something. The hybrid systems have brought in some business because we're cooling all of the electronics – converters, transformers, DC motors – on the vessels. All of that requires cooling. When you get into the true systems where batteries are now being used, we are currently doing some battery pack cooling on a ferry over in Denmark. So much of that is still in flux, and we're not sure where it's going to take us."

Typical side mounted, recessed keel coolers on a shallow draft vessel. Mounting the keel cooler on the side of the hull helps prevent potential damage. When utilizing protective guarding, guarding should not cover more than 25% of open area.

BOTTOM LINE FOR THE SUBMERGED KEEL COOLER

Out of sight, and because it has remained so reliable over time, Keel Coolers typically remain out of mind for shipbuilders and operators alike. Today's version that evolved from a government plea to solve a critical issue during WWII remains similarly important.

Sean Fernstrum wrapped up an educational talk by declaring, "With all the complications that a vessel in operation may experience, it is reassuring to have equipment that's efficient, effective, durable, and simple. The GRIDCOOLER Keel Cooler is a piece of equipment we strive to keep simple. Simplicity is hard. Making something complicated is very easy." The operators of 5,500 subchapter M impacted vessels would probably agree.

BALLAST WATER REGS:
Difficult and More Difficult

As the Coast Guard tightens its BWTS compliance rules and more systems are approved, there are still many unanswered questions for operators finally looking to comply.

By Tom Ewing

Ecochlor's U.S. Coast Guard approved ballast water treatment system. At this time, there are six systems approved by the U.S. Coast Guard.

It's no secret among marine stakeholders that ballast water regulations remain a top concern at the start of 2018, and a confusing one, to say the least. Hence, if someone offers to sell you a clear, concise and complete ballast water instruction manual, move that email over to your spam filter right away. However, if you get a similar offer from the Mariners' Department of Beneficial Sorcery, go ahead and click on that one – it'll likely be easier to understand, and maybe even dependable.

The forgoing, of course, is a bit of an exaggeration, but not really much of a stretch. After all, despite years of policy development, 2018 holds real directives and mandates for ballast water management systems (BWMS). The larger background and context for these directives, however, remains unsettled, making decisions about investments due today appear questionable and hard to evaluate. The cost to retrofit vessels with BW treatment systems is estimated to be between $1 and $5 million per vessel, according to the International Chamber of Shipping.

Too Many Cooks in the Kitchen?

In this case, however, two heads are not necessarily better than one. It's admirable that the U.S. Coast Guard and EPA are working together to advance ballast water treatment. Unease moves in quickly though as two complex regulatory programs work to build ironclad frameworks in the same berth.

At the national level, ballast water regulations are in play within three broad venues: EPA, the Coast Guard and Congress. Of course, there are important sub-venues – the States, for example, or the Great Lakes, or concerns within particular rivers, such as the Hudson. And, of course, there's the international level – particularly the International Maritime Organization (IMO) agreement established in 2004, but on hold until ratification by a threshold number of countries, which happened in September, 2016, when Finland signed the IMO agreement starting a 12-month activation countdown to September, 2017. And, consider that the IMO has backed off of its hard deadline for compliance while the United States, inexplicably, did not.

Moreover, there is even less clarity for U.S. mariners because the United States did not sign the IMO agreement. Again, consider the particular challenges for Great Lakes shippers: the United States is not an IMO signatory, but Canada is. And, it's not clear how this Great Lakes internationalism will play out. The Coast Guard writes that "the Coast Guard, EPA, and Transport Canada maintain an ongoing dialogue to identify and resolve differences in their respective regulatory requirements to manage ballast

"The USCG says that the time is ready to stop planning and move to implementation, despite industry concerns about efficacy and cost. 'The Coast Guard is in compliance mode,' the Guard announced in an October 2017 summary presentation. An integral part of the USCG's program is its approval of treatment technologies and laboratories. As this is written, there are six 'type approved' ballast treatment systems and five approved independent ballast water testing labs. And, with certain conditions, vessels can also use foreign systems to reach compliance."

water and other potentially harmful discharges from vessels." Just how that ongoing dialogue is progressing is hard to determine.

The Coast Guard Weighs In

The U.S. Coast Guard (USCG) introduced its ballast water regulations in March 2012, effective June 21, 2012. The standard established an allowable concentration of living organisms in ships' ballast water discharged into waters of the U.S. This authority stems from the National Invasive Species Act (NISA), intended to prevent invasive species from entering inland waters through ships' ballast.

The CG's 2012 rule established requirements for "type approval" of ballast water management systems (BWMS). The 2012 standards aligned with the 2004 IMO Ballast Water Management Convention. However, the standards are not the same. The main difference between the Coast Guard regulations and the IMO is in the equipment testing and verification protocols.

The USCG says that the time is ready to stop planning and move to implementation, despite industry concerns about efficacy and cost. "The Coast Guard is in compliance mode," the Guard announced in an October 2017 summary presentation. An integral part of the USCG's program is its approval of treatment technologies and laboratories. As this is written, there are six "type approved" ballast treatment systems and five approved independent ballast water testing labs. And, with certain conditions, vessels can also use foreign systems to reach compliance.

In a big way, operators have largely dealt with compliance by seeking deadline extensions – over 12,000 extensions have been granted. But that regulatory largess is reaching its limit. Now that type-approved BWMS are available, a vessel owner or operator seeking an extension needs an "explicit statement supported by documentary evidence (e.g., a delay in commercial availability) that installation of the type approved system is not possible for purposes of compliance with the regulatory implementation schedule," according to a CG ***"Ballast Water Frequently Asked Questions"*** document. This document points out "there are other ways that vessels can comply with U.S. BWM regulations," including:

- *the temporary (5-year limit) use of "a foreign Administration type-approved BWMS that has been accepted by the Coast Guard." Over sixty such alternate systems are approved;*
- *Use of ballast water obtained exclusively from a U.S. public water system;*
- *Discharge of ballast water to a reception facility; and,*
- *No discharge of unmanaged ballast water inside 12 nautical miles.*

The Lake Carriers' Association (LCA), represents operators of U.S.-Flag Vessels on the Great Lakes. Thomas Rayburn is LCA's Director of Environmental & Regulatory Affairs. He said the LCA has done preliminary assessments of sending ballast water to publicly owned treatment works (POTW), or reception facilities usually within metropolitan sewer districts. This would require new infrastructure on a grand scale.

In Cleveland, for example, there are three potential facilities, the closest is about 2 miles from Lake Erie docks. But that facility has no capacity for the 16 million gallons of ballast discharged from a single 1000-foot vessel (within about

U.S. Coast Guard RADM John Nadeau, Assistant Commandant for Prevention Policy

8 to 12 hours). If it could work, Rayburn calculates that POTW service at Cleveland would cost $167,000 per discharge, or about $171 million annually for all LCA members.

The 2016 singular cost is worth a closer look: it increases to $263,000 in 2022 because of in-place rate increases. Conversely, in Wisconsin, the POTW for the City of Superior, on Lake Superior, has available capacity – but the plant is designed for 4 million gallons/day.

Rayburn estimated it would cost $80,000 to use Cleveland's potable water. But operationally potable water presents issues: the ballast system first has to be cleaned and then kept clean, isolated. A ship could not adjust for trim during its voyage because that would be a contaminating move, requiring treatment at discharge. Potable water is allowed, Rayburn noted, but "it is not really a practical option for any vessel."

Meanwhile, the Coast Guard is actively trying to keep the regulated community abreast of ballast water management developments. At the end of November, RADM John Nadeau, assistant commandant for prevention policy, started a 5 part blog on the USCG's Maritime Commons website. The series concludes with a helpful, updated FAQ page. But, the blog series concludes with a reference for operators to be on the lookout, in late 2017, for a new NVIC (Navigation and Vessel Inspection Circular) for field units and industry dealing with ballast compliance. The motto for ballast water?: *semper reprehendo retro* or "always check back."

As the USCG moves to implementation, so too is the US EPA preparing critical next moves regarding ballast water. Importantly, though, EPA's work is within a different regulatory framework – the pollutant discharge program

within the Clean Water Act, which regulates vessels as a "point source," that is, a singular, identifiable source of pollution. (In contrast with a "non-point source" – a roadway, for example, or runoff from a contaminated but mostly undeveloped site, portions of an old landfill, for example.)

The EPA

In 2008, after decades of exempting ballast water as incidental to normal operations, EPA developed its first five-year "vessel general permit," or VGP, a move forced on the Agency by lawsuits from environmental groups. The VGP has had a contentious history. The 2008 permit was challenged as inadequate regarding ballast water.

In 2013, VGP 2.0 was developed. Again, lawsuits: the Natural Resources Defense Council, Northwest Environmental Advocates and other environmental groups sued, charging that EPA acted "arbitrarily and capriciously" on a range of ballast issues, including using the IMO standard for certain effluent limits, not considering onshore treatment, just shipboard treatment, that it excluded numeric effluent limits for viruses and exempting (Great Lakes) Lakers built before 2009 from certain requirements.

In October, 2015, the United States Court of Appeals for the Second Circuit ruled in favor of the petitioners, finding that, indeed, EPA did act capriciously and arbitrarily. VGP 2.0 was remanded "to EPA for proceedings consistent with this opinion." However, the Court allowed the 2013 VGP to remain in place until EPA issued a new VGP.

Fast forward to 2018, five years later, and the imminent release of VGP 3.0, expected as a draft. The new permit will need to address and correct a range of substantive issues. The Court commented extensively on how EPA's evaluation of on-shore treatment was inadequate. It will be interesting to see how EPA's proposals might expand in VGP 3.0 considering LCA's assessment of on-shore possibilities. Hopefully, these will be changes in coordination with the policies and demands set by the Coast Guard, changes that will most assuredly be reviewed under the microscope by all parties involved and interested.

The Advent of CVIDA

Finally, it's important to mention the third major policy arena for ballast water regulations. In fact, it should be considered the most important arena: the U.S. Congress, the theoretical boss of the EPA and the Coast Guard. Unfortunately, in 2017, legislative work on ballast issues never really left the dock. Therefore, as 2018 starts, Congress' work is dormant, so far unproductive, although this legislation could reappear in 2018.

Thomas Rayburn,
LCA's Director of Environmental & Regulatory Affairs

S 168 and HR 1154 – the *"Commercial Vessel Incidental Discharge Acts"* – are companion bills introduced in the Senate and House in January and February, 2017. Many commercial stakeholders liked the CVIDA bills. Specifically, they liked that the U.S. Coast Guard would officially become the lead agency on ballast discharges. And, the prospect of uniform program management, replacing the multiple cooks now in the policy kitchen, was equally appealing. They viewed it as protective: standards would be reviewed every 10 years, states could seek more frequent reviews depending on real-world data and conditions, and, critically, once a vessel owner spent the money on a U.S. Coast Guard approved ballast treatment system, there would be assurances that the investment was sound, that the system was in compliance from the Great Lakes to New Orleans.

As noted, the bills never received hearings. In the Senate, S. 168 was folded into the Coast Guard reauthorization bill – S 1129. Despite its much broader scope, that bill, too, did not draw legislators' attention. For ballast water compliance, mariners will have to take some steps in 2018. Caution is the wise course.

***Tom Ewing** is a freelance writer specializing in energy and environmental issues.*

A CRUISE SHIP THAT MOVES THOUSANDS OF PASSENGERS

And a large-scale project where we were on board from the beginning

Why does the world-renowned Meyer Werft shipyard team up with Viega time and again for numerous projects of this scale? In addition to the extremely reliable piping systems made from copper, copper alloys or plastic materials, Viega also supplies the know-how to go with them. **Viega. Connected in quality.**

Meyer Werft shipyard, Papenburg, Germany

viega

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Designing a Marriage Made in Heaven

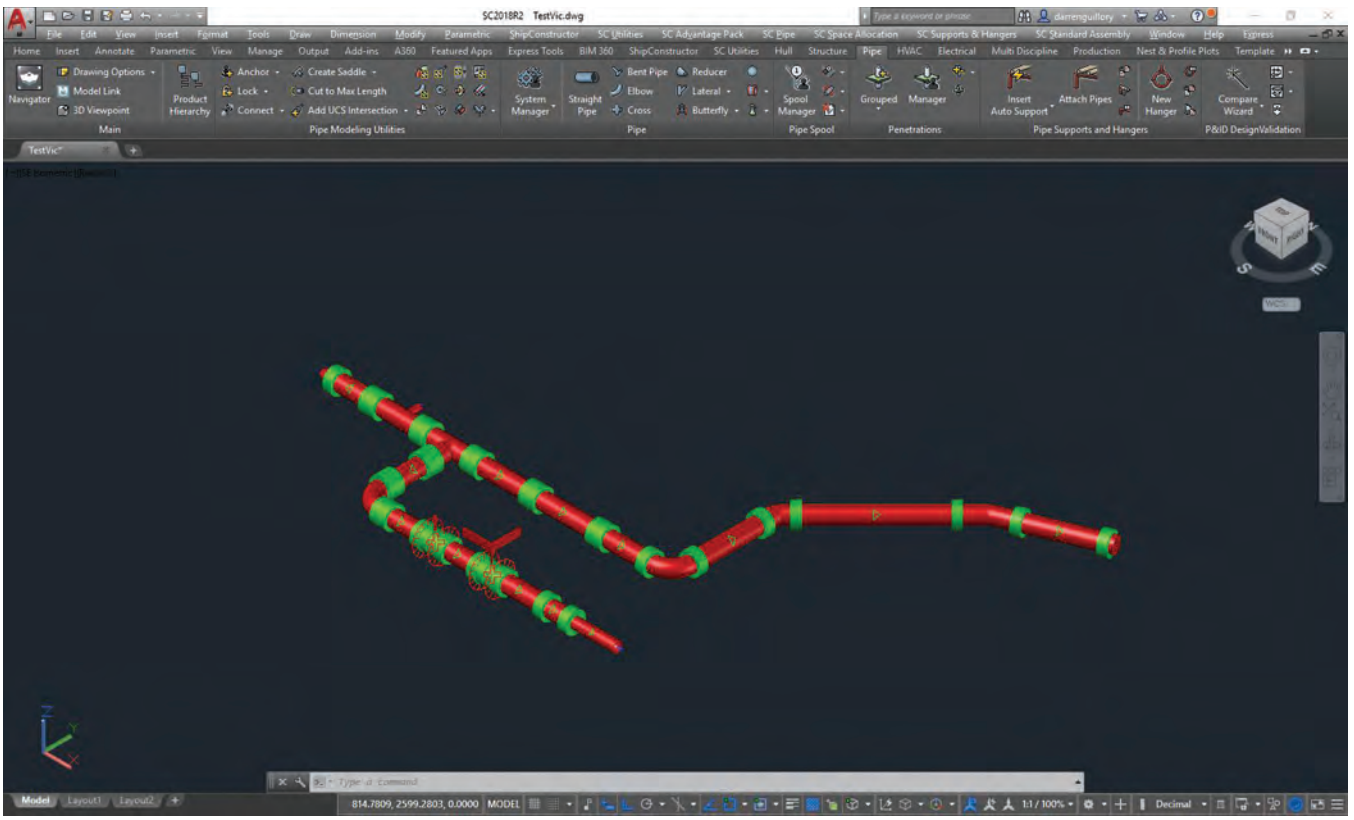
Victaulic's collaboration with SSI's Autodesk ShipConstructor promises a streamlined design process, easier access to Victaulic piping specifications and proof positive that marrying hardware data and existing design technology can save time, money, weight and headaches for boat designers and shipyards alike.

By Joseph Keefe

Is Victaulic's time-tested turnkey approach to pipe joining right for you? That depends on a lot of things, but if better design options and a measurable benchmark of Total Installed Cost Savings would benefit your bottom line, then you've got nothing to lose and everything to gain by trying. And now, Victaulic's catalog content inclusion in SSI's ShipConstructor software gives naval architects and shipyards the convenient ability to ask, "What if?"

In a nutshell, Autodesk ShipConstructor Pipe software helps you draft, design, and document building systems. As you create more accurate designs and increase productivity within a familiar AutoCAD-based environment, the importing of Victaulic content provides front end comparisons and advantages for any newbuild or retrofit project.

Introduced by Victaulic and SSI at the 2017 International Workboat Show, the release of native Victaulic content for MEP CAD – including IPS range couplings and



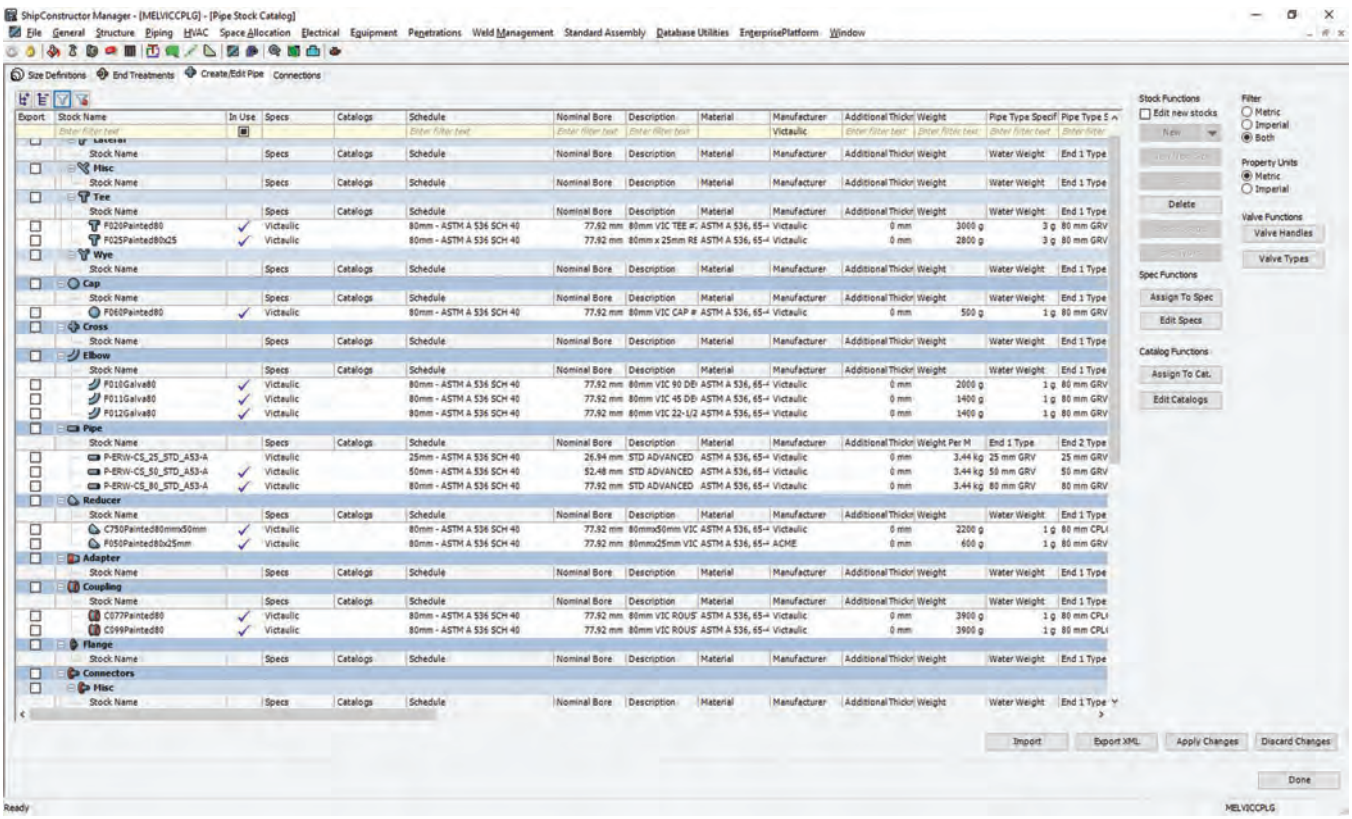
"It's a win for Victaulic because it gives far more market exposure to their awesome products. It's a win for the end user as it reduces costs in many ways, and for ShipConstructor, it makes our product offering better, as well. It's a 'win-win' all around. From our side, we're always trying to better our software – this is one way to do just that."

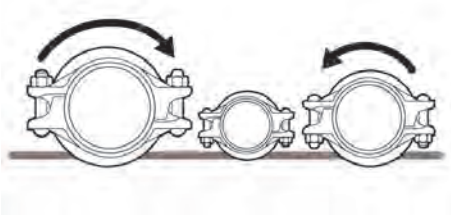
– Darren Guillory, Technical Solutions Specialist at SSI ShipConstructor Software

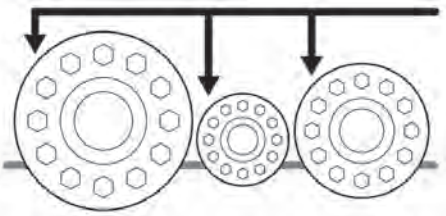
fittings, valves, strainer and flange adapters – is a 'win-win' for everyone. Darren Guillory, Technical Solutions Specialist at SSI ShipConstructor Software, explains, "It's a win for Victaulic because it gives far more market exposure to their awesome products. It's a win for the end user as it reduces costs in many ways, and for ShipConstructor, it makes our product offering better, as well. It's a 'win-win' all around. From our side, we're always trying to better our software – this is one way to do just that."

ADVANTAGE: SSI & VICTAULIC

Leveraging a new and more convenient data source, designers now have a new tool at their disposal. Able to be loaded and imported in both metric and imperial versions, the financial advantages of integrating Victaulic's catalog into SSI's sophisticated but easy to use software quickly become apparent. "For shipbuilding," says Kenneth Verlinden, Victaulic's Virtual Design EMEIA & Content Manager, "We aim at weight savings, for in-







"You have accurate manufacturer's content, so, if you are doing it traditionally, and you have Victaulic in mind, if somebody has to do the conversion then you always run the risk that you miss something or you have too much material. Using CAD software like this, you have all the parts and nuts and bolts, so to speak, you have all the information in a report and send it to a Victaulic representative and then, you can get an accurate pricing estimate."

– Kenneth Verlinden,
Victaulic's Virtual Design EMEIA & Content Manager

stance, because shipbuilding involves to a large extent, flanges. And a flange has a weight associated with bolts and nuts. And, of course we have a time savings with Victaulic over flanging."

SSI's Guillory adds, "When it comes to catalog and equipment items that are inside of the ShipConstructor environment, each one of those catalog items can be pulled into a reporting system. Since that data is in the catalog, you can do a comparative weight study if you wanted to. Hence, if you are retrofitting from a standard piping system to a Victaulic system, you can see the difference in both the weight and space savings that you would achieve."

Ultimately, the vessel owner gets a more quickly designed, cost-effective vessel that proceeds through the assembly process with fewer of those dreaded and expensive "change orders."

That said; the biggest benefactors will first be the design firms and shipyards. Guillory continues, "For sure, because you already have the advantage of using ShipConstructor, and being able to easily import these catalogs into your design. It also gives Victaulic a marketing advantage because estimators at these yards and design agents may go with this because they can get from design to production, that much faster."

FOLLOW THE MONEY

The one thing that users won't see within the software and its Victaulic catalog add-on involves the cost differentials between a traditional flanging system and that which Victaulic brings to market. That's because cost typically is an estimating or front office function. In terms of the time savings of how much more quickly a Victaulic system can be put together, that doesn't show in the software. "The Victaulic grooved system is always going to take less time," says Victaulic's Verlinden. And, as any shipyard executive knows, time is money.

Is importing Victaulic's product data into SSI platforms difficult? Not really, says SSI's Guillory. The collaboration includes a 3D component, which can be especially important when looking to retrofit BWTS systems onto existing tonnage. "Yes, and being that ShipConstructor runs on top of the autodesk product, we can export directly to

the Navisworks product and represent what you are building, in spec, with as accurate as possible models for design and/or review."

Victaulic's role in the equation doesn't end at the insertion of its data into the SSI environment.

That's because, eventually, this collaboration will make for more accurate proposals and more dynamic pre-bid documentation. "You have accurate manufacturer's content, so, if you are doing it traditionally, and you have Victaulic in mind, if somebody has to do the conversion then you always run the risk that you miss something or you have too much material. Using CAD software like this, you have all the parts and nuts and bolts, so to speak, you have all the information in a report and send it to a Victaulic representative and then, you can get an accurate pricing estimate."

The advantages run even deeper, says SSI's Guillory. "When Victaulic goes out to market, typically an SSI user or a company using SSI design tool, the engineering company typically has to build their own catalog. With Victaulic having this available to import quickly, it saves the individual user from having to go from part to part within the catalog. If your weight constraints are specific and you are designing or adding your catalog or you are transcribing from a catalog that you have on your desk as opposed to getting it directly from the manufacturers who developed this catalog, it is a huge cost savings."

LEGACY HARDWARE & SOFTWARE: A MARRIAGE MADE IN HEAVEN

The new collaboration between Victaulic and SSI goes live for customers in the first part of April. The melding of Victaulic's legacy hardware into a standard, well-known industry software package is a natural progression of Victaulic's forward-thinking vertical integration process. That's because, while Victaulic remains solidly connected to a rich and varied past, it also looks constantly ahead to emerging and established technologies alike. SSI's Guillory says that's exactly the path to be on.

"That's the key. It gives the customer the flexibility to go with the Victaulic toolset if they so desire, and SSI doesn't keep an inherent pipe catalog in it so the Victaulic option provides greater flexibility and ability to access a specific pipe set."

Since the 1920s, Victaulic couplings have demonstrated their value in countless maritime applications with early approvals from Lloyds' Register and Bureau Veritas, among others. These products are mainstream parts of the marine sector, their use limited only by the imagination of designers, builders and operators who constantly find new applications to improve their bottom line. And, now, designers won't have to work nearly as hard to make that happen.

'Traditional' piping methods (such as welding) can take years of experience to become efficient and productive. Conversely, and with Victaulic grooved products, the learning curve is shortened to a matter of days. That time savings, coupled with a streamlined design process enabled by clever collaboration with a mainstream software provider, might just be a game changer, going forward.

At Victaulic, vertical integration at its base definition involves delivering innovative pipe joining solutions that leverage a one-stop-shop approach of in-house control of all tools, material production, training, service, sales, and everything in between. Augmenting all of that is Victaulic's Cost and Labor Analysis, Weight Analysis, Jobsite Training, and Installation Inspection that accompanies each sale. Add to that, the convenience of design CAD/CAM software integration? That's a marriage made in Heaven.

'Best of the Best Welds' Help Metal Shark Boats Succeed, Expand

Louisiana-based shipbuilder eliminates preheat and saves time with Dynasty 400 TIG welders.

By Andrew Pfaller

As a well-known shipbuilder specializing in the design and production of vessels, Metal Shark Boats doesn't shy away from tackling tough and diverse jobs. It's a philosophy that has fueled the company's growth from small shop to major industry player.

Launched more than three decades ago as a small family-owned operation crafting custom fishing boats, the transition to Metal Shark Boats began in 2003 after the company was approached to produce aluminum patrol boats and work boats for military and law enforcement customers.

Building on its reputation for vessel production for the U.S. military and allies around the world, Metal Shark has expanded its focus to include state, local and commercial operators in a range of markets, including fire rescues, law enforcement, passenger vessels, pilot boats, specialty vessels and recreational boats. The Louisiana-based company now has more than 400 employees and nearly 1,000 boats in service.

The 2014 opening of a second facility — a shipyard in Franklin, Louisiana, with direct access to the Gulf of Mexico — helped further the company's expansion into passenger vessels and large ships, including ferries and survey boats. Metal Shark now has the capability to build vessels up to 250 feet long.

"We continue to diversify our business, to where we are able to build larger, more capable vessels," says Greg Lambrecht, Metal Shark executive vice president. "Because of our engineering-centric capabilities, we're not afraid to tackle any job that comes our way. We can design and build whatever the customer wants."

With a focus on engineering and a large in-house design team of naval architects and marine engineers, Metal Shark offers a full portfolio of its own designs and the ability to customize each one to meet a wide range of needs.

Quality and meeting customer needs are the driving forces for Metal Shark. Even on jobs with demanding turnaround times, the company won't sacrifice quality or customer satisfaction for speed. Dynasty 400 TIG welders from Miller Electric Mfg. Co. allow the company to weld thicker materials without preheating — saving time and improving productivity.

Tackling intricate builds or projects with demanding timelines requires the right personnel and the right equipment to turn out high-quality finished products. Metal Shark recently invested in five Dynasty 400 TIG welders from Miller Electric Mfg. LLC. The machines allow the company to weld thicker materials without preheating — saving time and improving productivity, while still maintaining strict quality requirements.

The best of the best welds

Metal Shark's Franklin Shipyard facility was designed to accommodate the latest serialized production methodologies. Three separate assembly buildings enable the weather-independent construction of vessels up to 200 feet in length. The facility also has protected deep water berths, crane-in/crane-out launch facilities, over 8,000 square feet of office space for engineering, project management, and administrative staff, and room for storage and staging. A new 160-ton Marine Lift transporter facilitates the movement of boats around the yard and to water for launch. Metal Shark's Franklin yard is one of the most modern and capable shipyards along the Gulf Coast.

Quality and meeting customer needs are driving forces for Metal Shark. Even on jobs with demanding turnaround times, the company won't sacrifice quality or customer satisfaction for speed.

"We always keep an eye on what's best for the customer, what's best for the quality," Lambrecht says.

As Metal Shark transitioned from a small boat production facility to a shipyard, welding became even more critical to the operation. It was important to build a workforce of skilled welding operators and choose the right welding equipment and processes to help them produce high-quality finished welds to meet codes, inspections and customer demands. Metal Shark operators use TIG welding on aluminum and stainless steel for many of the vessel builds.

"We need the best machines with the best settings to be able to keep up with the quality of all the boats," says Blake Stovall, TIG welding operator and supervisor at Metal Shark's Franklin Shipyard. "Quality and consistency are really important. We do a lot of the main features of the boats that everybody is going to see, so we want the best of the best of welds."

Eliminating the need for preheat

Producing the high-quality welds means staying on the leading edge of welding technology and solutions. Metal Shark has for many years used Miller welding equipment in its operation, including Dynasty 350 TIG welders.

Taking the next step to invest in Dynasty 400 TIG welders provided the company with more amperage and greater versatility. The extra amperage of the machines delivers more heat on demand for welding operators, allowing them to eliminate preheating when welding thicker materials. "We don't have to really use preheating as a source of heat before we weld, because of the extra amps that the 400 offers," says Karl Prados, general manager and CWI at Metal Shark Boats. "Start time is cut in half."

Eliminating the preheat process saves significant time for Metal Shark, and allows welding operators to keep their hood down and remain focused on the weld.

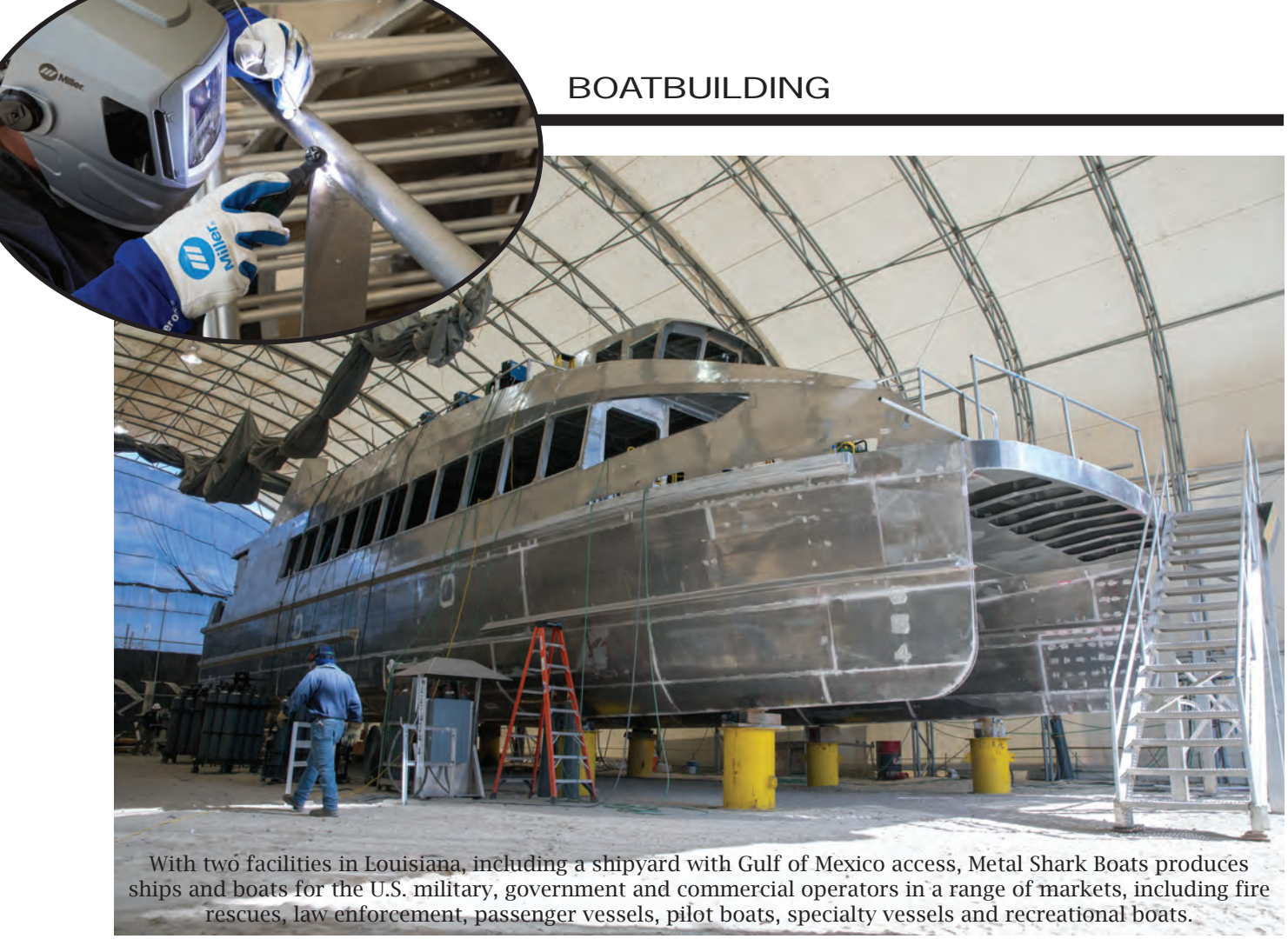
"That can be the difference between 30 minutes of preheating or just taking off and welding," Stovall says. "Because we're welding on so many different thicknesses, we keep our amperages pretty high, so if we need the heat it's there, rather than having to go back and forth to the machine."

Tailoring the arc

Achieving the best results when welding aluminum requires the ability to fine-tune and control the arc. With the Dynasty 400 TIG welders, Metal Shark welding operators can easily adjust arc characteristics for specific applications and electrodes. Balance control provides adjustable oxide removal, which is essential for creating the highest quality aluminum welds. In addition, operators can use frequency to control the width of the arc cone and improve directional control of the arc.

"The machines help us with the quality, because we do it right the first time around," Stovall says. "We don't want to go back and do any repairs."

Another technology helps keep the machines cleaner — saving time while also reducing noise. The Fan-On-Demand cooling system in the welding power sources operates only when needed. Compare this to other cooling systems that run constantly — even when the operator isn't welding — which means the system fans are constantly pulling dust particles, dirt and contaminants into



With two facilities in Louisiana, including a shipyard with Gulf of Mexico access, Metal Shark Boats produces ships and boats for the U.S. military, government and commercial operators in a range of markets, including fire rescues, law enforcement, passenger vessels, pilot boats, specialty vessels and recreational boats.

the machine.

"We have a lot of dust and sand in the atmosphere," Stovall says. "It helps keep the machine cleaner because it's not running constantly."

Adding to the machines' quieter and cleaner operation, as well as its versatility, is the Cooler-on-Demand feature in combination with the Coolmate 3.5 cooler, which connects to an integrated 120-volt dedicated-use receptacle for power. A power switch on the machine activates the receptacle to help prevent failure when using a water-cooled torch, while the Cooler-on-Demand feature operates the auxiliary cooling system only as needed. This function not only reduces noise and minimizes the airborne contaminants being pulled through the cooler, but it also helps lower energy use.

The right equipment for quality welds

Training operators on the new machines was a simple transition for Metal Shark. The easy-to-use interface offers intuitive operator control, while program memory features nine independent program memories that maintain and save operator parameters.

"The Dynasty 400s are so user friendly. It makes it easier for training, and it makes it simple to get a good quality weld," Prados says. "After 20 years in welding, I've never found a machine that welds as good as the Dynasty. The quality is better than anything we've ever tried."

Choosing the right equipment helps Metal Shark welding operators produce high-quality welds and meet customers' demands — factors that have been critical to the company's growth and success.

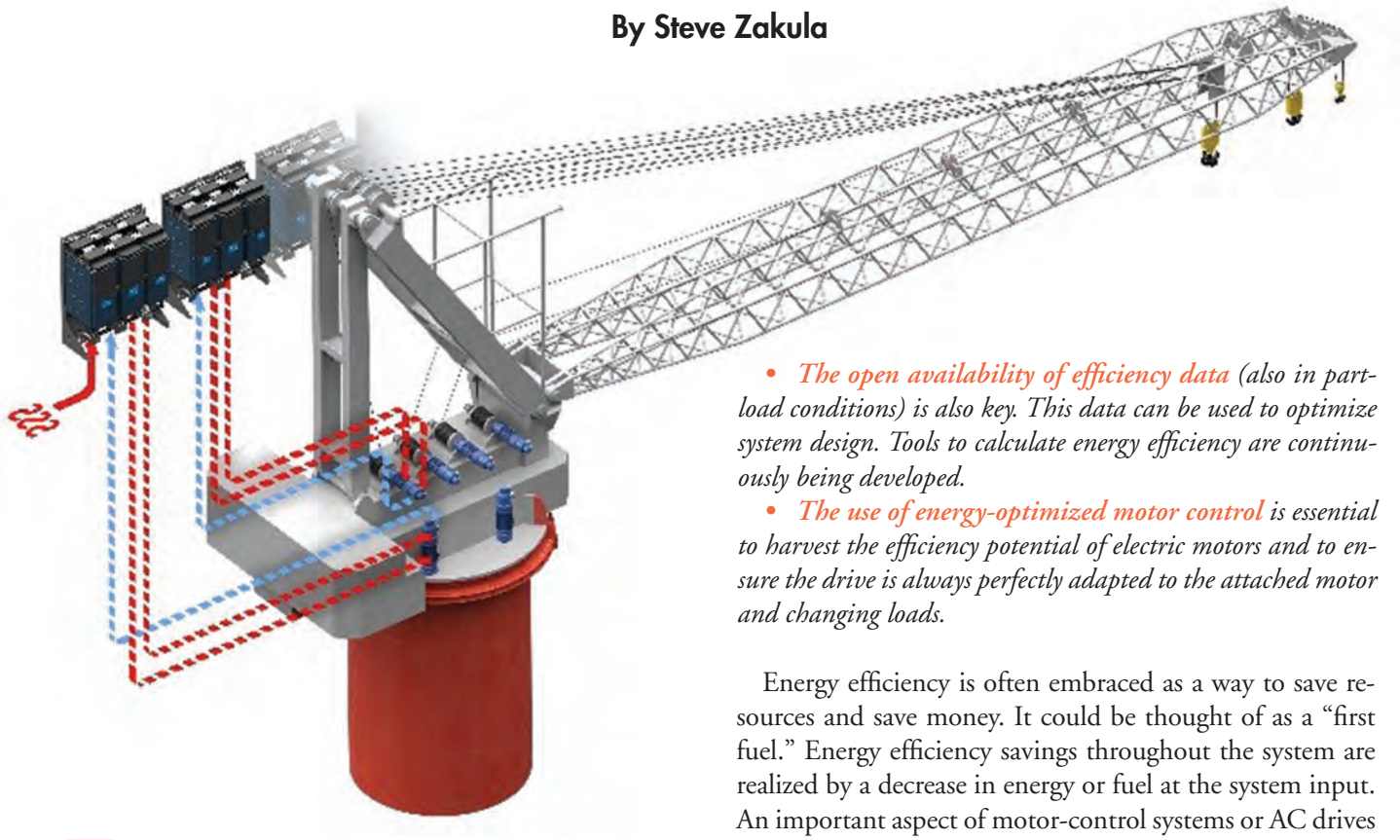
"Working with Miller through this entire thing has been a key to our success," Lambrecht says.

Andrew Pfaller *is a Product Manager at Miller Electric Mfg. LLC, a global provider of welding equipment and manufacturing. Based on a foundation of real-world welding, Pfaller achieved a BS in Welding Engineering Technology prior to starting his career as a Welding Engineer at Miller in 2012. Andrew is an AWS CWI and manages the current portfolio and leads customer-back new product development for the TIG Solutions Division.*

Factoring Life Cycle Variables Enables Intelligent Motor-Drive Purchases

Cranes and winches in particular can benefits from this practice.

By Steve Zakula



Early electric motors were operated at one speed, guided by available current and voltage and often drive belt and pulley systems that mechanically controlled system speed and power. As motors evolved, efficiency improved, mostly by changing output control from mechanical to electrical and eventually leading to the creation of modern adjustable speed drives (AC drives).

Today, the largest potential for electric motor energy savings lies in system- and process-level optimization. Many different measures can be taken to improve the performance of processes and systems, but AC drives have the most important role to play. Cranes and deck winches are some of the most common places to start. System-level optimization is possible thanks to several key elements in AC drive technology:

- *Motor independence: Drives that are independent from control systems and motor type provide options when selecting the motor technology (induction, permanent magnet or high-efficiency synchronous reluctance) and motor manufacturer that best suits an application to ensure peak performance and optimized energy consumption.*
- *The open availability of efficiency data (also in part-load conditions) is also key. This data can be used to optimize system design. Tools to calculate energy efficiency are continuously being developed.*
- *The use of energy-optimized motor control is essential to harvest the efficiency potential of electric motors and to ensure the drive is always perfectly adapted to the attached motor and changing loads.*

Energy efficiency is often embraced as a way to save resources and save money. It could be thought of as a "first fuel." Energy efficiency savings throughout the system are realized by a decrease in energy or fuel at the system input. An important aspect of motor-control systems or AC drives is the power consumption required to perform a given task. Energy has an assigned cost and reduction in energy use or increased efficiency can result in operational savings.

Although traditional return on investment analysis may evaluate these systems, other approaches such as total cost of operation (TCO) looks at expenses across the life of the system including energy, downtime, maintenance and repair, wear and replacement and disposal costs. There are often technological low-hanging fruit, such as the installation of AC drives, but purchase decisions still warrant a cost benefit analysis that factors total life cycle costs. All relevant factors should be evaluated including negative collateral effects that stack up against advantages.

When discussing efficiency, it is important to remember that a drive should be used to optimize the performance of a motor. Any drive can control the speed of a motor, but not all drives can get the best efficiency out of a motor. For higher efficiency the focus should be on advanced drive control. By accessing key operating parameters, such as maximum torque per ampere, advanced drive controls reduce power

consumption and improve performance of the system.

- *Hardware features built into the drive (such as DC chokes) result in a more efficient system. This built-in functionality also reduces costs and eliminates the installation space required for external components.*
- *Intelligent heat management is another target of system-level optimization. Features such as back-channel cooling and availability of liquid-cooled drives result in significantly reduced heat loads in switchrooms. This enables the use of small air conditioning systems to optimize space requirements, improve efficiency and drive down costs.*

It is important to distinguish between motor, controllers and drives. A motor is the mechanical or electrical device that generates the rotational or linear force used to power a machine. It converts electrical energy to mechanical energy. There are mainly three types of electric motor:

- ***DC motors:*** *Historically the first type of widely used motor. System (motor and drive) initial costs tend to be less.*
- ***AC synchronous:*** *The rotation of the rotor is synchronized with the frequency of the supply current and is ideal for driving equipment at a constant speed and for use in high precision positioning.*
- ***AC induction (asynchronous):*** *The most common type of AC motor in industry, which uses electromagnetic induction to generate torque.*

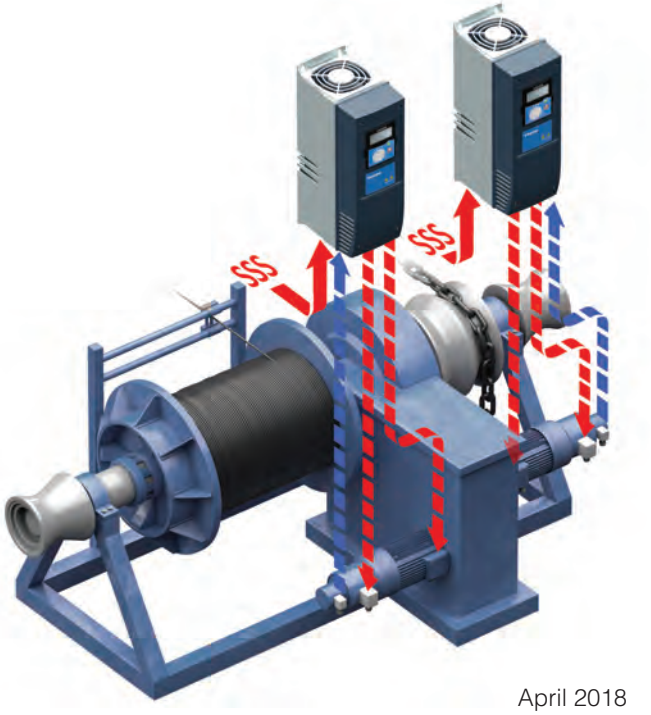
Motor-drive system selection often reaches a critical juncture when deciding between relying on prepackaged motor-drive systems or creating a custom solution that fine-tunes the motor, drive, controller and feedback components to fit a specific application. While prepackaged motor-drive combinations provide a single point of purchase, be aware that in the long term they can become costly in breakdown and retrofit situations.

All motor-drive combinations have advantages and drawbacks. Initial cost, power consumption, serviceability and life cycle costs are some factors to consider. Motor independence means you can select any combination of suppliers to achieve maximum motor performance. Drives that can adapt to different motors yield positive factors that influence TCO. These factors include:

- ***Flexible logistics:*** *The ability to accommodate changing customer specifications and new technological trends over the entire lifetime of the application.*
- ***Quick changeover:*** *A change to an alternative supplier or alternative motor technology is often the best solution.*
- ***Freedom from supplier dependency:*** *Over the lifetime of a motor-driven application, special and non-standard motor dimensions can limit maintenance efficiency. When faced with multiple installations there is an advantage to having the same motor-independent drives installed throughout the entire plant. There is a lessened spare parts inventory, simplified staff training and more straightforward maintenance.*
- ***A future-proof solution:*** *Using automatic motor adaptation, motor-independent drives can deliver optimal performance of any motor both now and throughout the lifetime of the application. Motor-independent drive suppliers continually test new motor technologies in order to develop new algorithms for compatibility. Independently optimized components adapt completely to a variety of applications. OEMs, for example, can therefore design the highest-performance drive and motor system for a niche application.*

Choosing the right motor and drive combination doesn't have to be a complicated, stressful task. Once the ideal motor for an application has been sourced from a trusted supplier, there's no reason to make any changes to that scenario. However, some changes are possible, changes that will provide more options, reduce potential downtime, simplify maintenance and lower life cycle costs, simply by choosing a motor-independent AC drive.

Steve Zakula *is an electrical engineer who has been in the drives industry for 25 years. He has focused on applications, sales and marketing. He is a Senior Product Marketing Manager for Danfoss Drives. Reach him at steve.zakula@danfoss.com.*



Sennebogen 870 R-HD Material Handler Boosts Paducah's Productivity

Located at the confluence of the Tennessee-Tombigbee Waterway, the Ohio River and the Cumberland River and just upstream from the Mississippi, the City of Paducah is an important hub in the inland waterways network. In 2015, newly appointed Paducah-McCracken County Riverport Authority Executive Director Bill Miller's first priority was to upgrade the port's infrastructure.

"Our 20 year old lattice boom crane was past its useful service life," he said, adding, "So the Board for the Riverport Authority authorized a bid spec to replace it with the best available equipment." Today, a new E-Series SENNEBOGEN 870 R-HD purpose-built material handler serves the stream of barge traffic that flows through port's bulk berthing area.

In service since mid-September 2017, the 870 R-HD was chosen, in part because it met the port's operational goals of speed, parts availability, service and an eco-friendly performance. Among the newest of SENNEBOGEN designs, the distinctive look of the 870 is notable for the massive 'Green Hybrid' hydraulic cylinder mounted between its two main boom lift cylinders. In a unique application using conventional and simple hydraulic engineering, the Green Hybrid system captures boom energy on every down movement of the boom and stores it safely in secure and protected containers at the rear of the machine. The energy is then released to assist the next lift of the boom. According to Sennebogen, this energy recovery process reduces the 870's fuel consumption by as much as 30%.

The 870's energy efficiency helped to meet the Riverport's environmental objectives. Its green performance is further enhanced by its Tier 4F compliant 355 HP (261 kW) Cummins diesel engine which adds another level of environmental protection.

Beyond the environmental advantages, and in the short time that the 870 has been operating, it has more than proven its production capability. Fitted with a 5-yard clamshell bucket and a bent boom with a total reach of 66 feet, the operators can easily reach down 50 feet below the cell to clear out barges filled with sand, aggregates and fertilizers. With local river water levels varying widely, making sure the boom could reach no matter the variance between low and high water was a critical requirement.

Brandeis Machinery, the SENNEBOGEN distributor in Kentucky introduced the operators and maintenance to the 870's service requirements of this ultra-quiet heavy duty performer. Today, the Sennebogen crane reduces operating costs by completing loads in a normal 8-hour shift, eliminating the need for overtime hours to empty the barges. That's because operators have adapted quickly from the previous lattice boom crane to the new hydraulic technology, is more responsive and user friendly. With better control and the cab being equipped with a floor window and able to extend out over the hold, it's easier to see into the load and there is less spillage during cargo operations. Bill Miller sums it up by saying simply, "Improvements like the 870 R-HD help us to further enhance the region's abilities to service new industries and expand our current business partners." **www.sennebogen-na.com**

Credit: Sennebogen

Coating Selection Delivers Fleet Uniformity – Even After Touchups

A 10-Tug build project leads to federal standard color update for Great Lakes Towing Company.

By Rick Gallenberger

Attention to detail enables uniformity. And when you're refreshing a renowned tugboat fleet with a 117-year history, you want to ensure a uniform look across all vessels to portray a strong brand image. Doing so means achieving uniform coloring throughout the fleet. It also means having uniform colors on each vessel between dry dockings – such that maintenance coatings don't stand out and make others question your quality.

That's why Great Lakes Shipyard (GLS) focused on color uniformity when it started building 10 new Stan Tug 1907 ICE tugboats for The Great Lakes Towing Company (GLT). Both Cleveland, Ohio-based parties worked carefully with Sherwin-Williams Protective & Marine Coatings – another Cleveland company – to recalibrate GLT's Federal Standard colors, which had drifted over time. The three companies also collaborated to color match alkyd maintenance coatings with the polyurethane coatings used to coat the new vessels, ensuring any touchups would blend right in.

Now GLT is realizing fleet uniformity as GLS constructs the 10 new tugboats, the first to be built in the United States to meet new U.S. Coast Guard Subchapter-M Regulations. GLS delivered the first vessel, the CLEVELAND, on June 30, 2017. The shipyard is building the remaining tugs over five years with each vessel conforming to GLT's new color standards due to the judicious efforts of the shipyard, owner, and coatings supplier.

Recalibrating GLT's Federal Standard Colors

Entering the tugboat build project, GLT's primary Federal Standard colors were Red #11350 and Green #14066. However, when comparing color-matched samples from Sherwin-Williams to GLT's existing fleet, the parties observed a disparity. This color drift had likely originated when GLT switched maintenance coating vendors years ago.

"We compared the coating samples prepared to our Federal Standard colors to our existing tugs and noticed a difference," said Joe Starck, President of both GLS and GLT. "What we thought was our color standard had actually changed over time, so it was time to recalibrate." Sherwin-Williams then fine tuned the mixing specifications to match GLT's fleet, ultimately arriving at Red #11105 and Green #14062 for GLT's new Federal Standard colors.

Ensuring Uniform Maintenance Colors

While standardizing fleet colors, the companies also addressed color matching between shipyard-applied coatings and maintenance coatings. Initially, GLT had specified SeaGuard 1000 Marine Enamel – a high-gloss, modified alkyd – for coating the new tugs and for performing touchups in service. The single-component coating would be easy to maintain with a pail of the exact same product onboard the vessel – and the colors would obviously match.

However, due to the high-profile nature of the Damen tugs, GLS wanted to achieve better color and gloss retention than what a standard alkyd offers. The shipyard selected Acrolon 218 HS Polyurethane, a multi-component acrylic polyurethane that provides excellent color and gloss retention, including in marine service. The maintenance coating would still be the SeaGuard 1000 alkyd.

Selecting different coatings for the shipyard application and maintenance touchups introduced the potential for disparities in color and sheen, as alkyds and polyurethanes have different formulation attributes. Through several iterations and consultations with GLS and GLT, Sherwin-Williams was able to get the alkyd and urethane coatings to match perfectly.

"We had to look ahead for future field maintenance operations to ensure our colors would be consistent. Oth-

erwise, we would have ended up with more color drift, which we had just solved," said Starck.

Covering Every Square Inch

A three-man applicator crew from GLS coated the CLEVELAND in various stages, as the shipyard fabricated the tug in two modular units – the hull and the pilot house. Following this construction method, compared to building the vessel as one complete unit, offers advantages for corrosion protection. Vessels built in one piece often have difficult-to-reach areas that applicators may miss or not coat sufficiently, which increase the potential for corrosion.

After metalworkers fabricated the two modules, coating applicators prepared the steel to SSPC standards to remove any contamination, promoting a strong coating bond. Applicators next primed both modules with corrosion-resistant Macropoxy 646 Fast Cure Epoxy coating at 5.0-6.0 mils dry film thickness (DFT). Then, they brush-applied an additional accent-colored stripe coat of the coating on all welded seams for added corrosion protection.

The shipyard next welded the two modules together and stripe coated the disturbed areas. Finally, applicators coated the entire vessel as one unit for a continuous layer of corrosion protection. Applicators spray-applied a 3.0-6.0 mil DFT layer of Acrolon 218 HS over the entire vessel, using the approved Red #11105 for the pilot house and Green #14062 on the freeboard and bulwarks. GLS also used Acrolon 218 HS in other ancillary colors for deck areas and safety markings.

Due to some quick additional color matching, GLS was also able to spray-apply a continuous coating layer in the vessel's engine room to enhance corrosion protection there. The shipyard decided on a whim to coat the room's floor using the same deep blue color as the vessel's MTU engines. On a Saturday morning, GLS called Sherwin-Williams with a request to match the engine color, which wasn't part of the original specification. The coatings supplier was able to match the color and sheen and provide materials on the same day of the request, allowing GLS to stay on schedule. Doing so allowed the shipyard to coat the engine room before installing equipment, which meant applicators faced limited obstacles and were able to ensure complete coverage.

"Sherwin-Williams matched the engine color and sheen perfectly. The engine looks like it is part of the boat," said Starck. "It was only a few gallons of paint, but the quick turnaround made all the difference in beautifying the engine room, while also ensuring every square inch is protected."

Towing Ahead

GLS is currently the only U.S. shipyard authorized to build Damen's Stan Tug 1907 ICE design. The CLEVELAND will serve as the basis of design for future Damen builds, including the additional nine nearly identical vessels for GLT. Based on its experience with Sherwin-Williams, GLS has a trusted local coatings supplier that will likely make the specification list for additional Damen tug builds, in different potential Federal Standard colors, of course.

"Partnering with Sherwin-Williams brought three strong Cleveland companies together to enhance ship building, repairing, and assist operations throughout the Great Lakes region," said Starck. "They demonstrated the technical service capability to address our color drift and match new-build coatings to maintenance coatings, as well as the ability to be responsive to fast turnarounds."

With the towing company's new Federal Standard colors on file with Sherwin-Williams, GLT tug operators can now obtain color-matched maintenance coatings at any port where a company paint store is located, ensuring ease of maintenance.

Rick Gallenberger *is Great Lakes Regional Marine Specialist for Sherwin-Williams Protective & Marine Coatings. He is NACE Level I Certified and has been with Sherwin-Williams for 29 years, including the last six years as a dedicated marine representative. He works with fleet and vessel owners to help protect their assets, along with servicing shipyards and contractors to promote efficiencies with their coating procedures. He can be reached at Rick.J.Gallenberger@sherwin.com.*

All Photos: courtesy of The Sherwin-Williams Company

RIBCRAFT Delivers for Edgartown, MA

RIBCRAFT recently delivered a specialized 25' RIBCRAFT 7.8 to the Edgartown Harbormaster, who provides search and rescue operations, routine patrols, and mooring management duties to the town. This RIB, designed for year round all weather operations, expands the Harbormasters capabilities while providing a safe and reliable vessel for their officers. Featuring a two person console enclosure, the 7.8 provides excellent open deck space, easy access for boardings, unobstructed views, and a comfortable platform for long hours on the water. Powered by a 250HP Yamaha, the RIB will reach speeds in excess of 50mph while still providing unparalleled safety and unsurpassed performance. Features of the 25' RIBCRAFT 7.8 include a forward positioned three-sided console enclosure with hard top, safety glass windshield, and canvas drop down sides. *Other equipment includes:*

Tow Posts (fore and aft)	Tube mounted swim ladder	Dark grey Hypalon tube
Mid Ship Tie-Off Bollards	Electronics (VHF, GPS, Radar, Hailer/Siren)	250 HP Yamaha Outboard

First of Three ATBs for Vane Bunkering

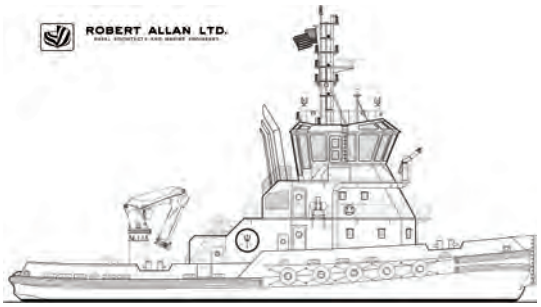
Vane Brothers Company continues to expand its fleet with new construction. This February, the marine transportation company took delivery of the first of three new ATB tugs from the Conrad Orange Shipyard in Orange, Texas. The first boat is the Assateague, named for a barrier island located in Maryland and Virginia. Designed by Greg Castleman of Castleman Marine, each 110-foot by 38-foot tug is being mated to an 80,000-barrel barge designed by Bristol Harbor Group and being built by Conrad Industries of Amelia, Louisiana. *The ATB Units at a glance …*

LOA: 405'	Coupling System: Beacon-Finland JAK 700	Gangway: Schoelhorn-Albrecht
Beam: 74'	Deck Capstans: Coastal Marine Equipment	Class: ABS-A1 TUG, AMS, ABCU
Gears: Reintjes WAF 873	Engines: 2x Cummins QSK60M (EPA Tier: 3)	Generators: 2xCummins QSB7-DM

First Passenger Ferry to Receive Cummins QSK95 Propulsion

Azam Marine has selected two Cummins QSK95 propulsion engines to provide main propulsion power for their next passenger ferry, making Kilimanjaro VII the first QSK95 powered passenger ferry in the world. The QSK95 is the newest and most powerful Cummins engine for the marine market offering a power output previously exclusive to medium-speed marine engines with power ratings from 3200 hp to 4200 hp for propulsion, auxiliary, generator and diesel electric applications. The QSK95 brings the advantage of a lower capital cost, a more compact installation and exceptional fuel efficiency when compared to other engines in this class. Extended service and more cost-effective rebuilds add a further economic advantage for high-hour, hardworking vessels such as passenger transport, tugs, inland waterway towboats, crew boats, dredges and government patrol vessels. Using the QSK95 will allow Kilimanjaro VII to carry more passengers while maintaining similar top speeds as its smaller sister ship. The vessel was designed by Incat Crowther.

Gulf Island Fabrication to Build TundRA 3600 for SLSDC



The Saint Lawrence Seaway Development Corporation (SLSDC) has awarded a construction contract for a new TundRA 3600 ice class tug to Gulf Island Fabrication, to be built at their shipyard in Jennings, LA.The SLSDC is a wholly owned US government corporation tasked with operating and maintaining the St. Lawrence Seaway within the territorial limits of the United States. The tug's typical duties include icebreaking/ice-management services, handling navigation aid buoys, and pushing the SLSDC's buoy and gate lifter barges. The tug is also capable of secondary roles in fire-fighting and pollution response. The shallow draft tug will be classified by ABS as an Ice Class 1A tug, and incorporates an ice-breaking bow form. It is powered by a pair of EPA Tier 4 compliant engines with SCR after-treatment, to deliver a bollard pull of approximately 65 long tons via controllable pitch Z-drive propulsion units. The vessel is equipped with a heavy duty deck crane, a stern roller, shark jaws, and a tugger winch for ease of handling aids to navigation on the aft working deck. Production design of the tug is underway, with delivery of the vessel expected in the summer of 2019.

Kitsap Transit Approves $15 Million Contract for Two AAM Ferries

Kitsap Transit's board recently approved a $15 million contract with All American Marine (AAM) for the construction of two Rich Passage-class passenger ferries. The design of the new vessels is based upon the successful ultra low wake AAM built, Rich Passage 1. AAM is the licensed builder of Teknicraft Design hulls in North America. Teknicraft's patented hydrofoil-assisted hull design is proven to have a low wake wash energy signature that will not degrade the sensitive shore lines of Rich Passage. The two new vessels are currently dubbed "RP-2" and "RP-3" after their sister ship, Rich Passage 1, which established the vessel class. Rich Passage 1 was built by AAM in 2011 as a research vessel for a demonstration study to prove that high

speed passenger ferry service could safely operate through Rich Passage without causing shoreline erosion. Extensive wake wash testing and beach monitoring has shown that the Rich Passage 1 is a viable solution. The new boats will fill the need for additional service with one vessel and the other available as a spare or to fill in where needed.

MBTA, STV 'Champion' New Addition to MBTA Fleet

As part of a continued effort to invest in Boston-area water transportation, the Massachusetts Bay Transportation Authority (MBTA) recently welcomed a new high-speed catamaran ferry, Champion to its fleet with support from STV. Champion is the first new passenger ferry vessel procured by the MBTA. It was also the first new water-borne vessel procurement supported by STV, which has a long-standing history of providing procurement support services for rail and bus vehicles to MBTA and other transportation agencies throughout North America. Champion is a 150-passenger, jet-propelled, high-speed catamaran built by Gladding-Hearn Shipbuilding and supported by federal funding. The new ferry enjoys a variety of ADA features .Champion also boasts EPA Tier III engines, environmentally-friendly LED lighting, bike racks, padded interior seats, passenger tables, convenience outlets and a concessions area. Other amenities include state-of-the-art navigation electronics, an on-board video recording and surveillance system, and a modern passenger information system that combines entertainment with audible and visual route/stop information.



U.S. Coast Guard

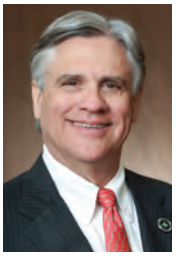
Schultz Zukunft


Bell



Huntington Ingalls Industries

Smith Stabler


Langenstein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Schultz Nominated to be 26th Coast Guard Commandant

Homeland Security Secretary Kirstjen M. Nielsen has announced the nomination by President Donald J. Trump of Vice Adm. **Karl L. Schultz** to be the 26th Commandant of the U.S. Coast Guard. Schultz, the commander of the Coast Guard's Atlantic Area, currently serves as the operational commander for all Coast Guard missions from the Rocky Mountains to the Arabian Gulf, spanning across five Coast Guard Districts and 40 states. Pending confirmation, he is expected to relieve Commandant of the Coast Guard Admiral **Paul F. Zukunft** in a change of command ceremony June 1, 2018.

Bell Named President & CEO Rolls-Royce North America

Rolls-Royce announced the appointment of **Tom Bell** as President and CEO of Rolls-Royce North America, a post he will hold alongside his current position as President – Defense. Bell's appointment follows the decision of Marion Blakey to retire at the end of June after serving a three year term.

HII Announces Senior Leadership Changes

Huntington Ingalls Industries announced that **Michael Smith**, executive vice president, strategy and development, is moving to HII's Technical Solutions division, where he will serve as president of the SN3 business. The company also announced that **Scott Stabler**, executive vice president, internal audit, is moving into a new role as HII's executive vice president and chief transformation officer. Smith joined HII in 2014 as corporate vice president. Before joining HII, he worked for BAE Systems. He is a graduate of Stanford University, where he earned a bachelor's degree in industrial engineering and a master's in engineering management. Stabler joined Newport News Shipbuilding in 1984. Previously, he earned a bachelor's degree in mechanical engineering from North Carolina State University and a master's degree in business administration from the College of William and Mary.

Langenstein Appointed to Port of New Orleans Board

Gov. John Bel Edwards appointed **William H. Langenstein**, III to the Board of Commissioners of the Port of New Orleans. Langenstein will serve a five-year term. With the Port's acquisition of the New Orleans Public Belt Railroad, Port Commissioners also serve as directors of the New Orleans Public Belt board, Langenstein will become NOPB's newest director with this appointment. Langenstein is an attorney at Chaffe, McCall. He earned a Juris Doctorate from Loyola University New Orleans in 1977 and received his Bachelors of Science in Accounting from Louisiana State University in 1974.

GulfMark Promotes Rubio to CFO

GulfMark Offshore announced that **Samuel (Sam) R. Rubio** will be promoted to the position of Chief Financial Officer upon completion of the filing of the Company's Form 10-K. Rubio joined GulfMark in 2005 and has over 35 years of experience in accounting at both operating division and corporate levels as well as the management of accounting organizations. He holds a Bachelor of Business administration degree from Sul Ross State University and is a Certified Public Accountant.

Lumitec Expands Sales Team

Lumitec announced the appointment of **Carmen Marchionni** as Director of Sales. Marchionni brings more than 25 years' experience in the Technology and Manufacturing sectors. Prior to joining Lumitec, Carmen held Regional Vice President positions at Zones, Inc. and Datalink and was the founder of Open Systems Solutions. Carmen holds an Electrical Engineering degree from Drexel University.

Hurtigruten Appoints Mercier as Americas National Accounts Director

Hurtigruten has promoted **Beth Mercier** to Director, National Accounts for the Americas. Mercier has over 10 years of experience in the travel industry. She was most recently Hur-


Mercier


Sotzing


Brass


Nemeth


Hudspeth

Eymard Battaglia

tigruten's Director of U.S. Explorer Sales, based in Seattle. Over her career, she's managed increasing areas of responsibility in nationally-recognized tour operator, hospitality, and expedition cruising companies.

Sea Machines Adds Director of Engineering

Sea Machines Robotics announced that it has hired **Chris Sotzing** as director of engineering. Sotzing now has responsibility for development and deployment of the company's Sea Machines 300 technology system, as well as managing the engineering team. Sotzing joined Sea Machines from SeeByte, where he served as an engineering manager supporting unmanned vehicle technologies in Boston. He earned his Ph.D. in autonomous underwater vehicles from Heriot-Watt University and his undergraduate degree in computer science from Colby College.

Seaspan Appoints Brass as CFO

Seaspan Shipyards has appointed **Christof Brass** as Chief Financial Officer. Christof brings over 20 years of experience delivering large, complex programs for multinational companies. His industry background also includes contributing to the profitable growth of aerospace and defense programs at Airbus Group.

MJP Employs Marketing Manager

Marine Jet Power (MJP) has welcomed **Kelsey Nemeth** to the MJP team. Kelsey will be responsible for overall brand development and marketing initiatives worldwide. She most recently served as Marketing Coordinator for Brunswick Commercial & Government Products, where she was responsible for developing and executing all corporate marketing efforts. Kelsey holds a Bachelor's Degree from The University of Alabama.

Hudspeth Joins BAE

Joe Hudspeth has joined BAE Systems as Director of Business Development, Global Marine, for the Power and Propulsion Solutions division. Hudspeth spent the previous 12 years at All American Marine, helping to grow the business into one of the top aluminum boat builders in the country.

Bollinger Announces Promotions

Bollinger Shipyards announced the promotions of two key leaders. **Jerome Eymard** has been promoted to the position of Director of Human Resources, and **Rachael Battaglia** to the position of General Counsel. Eymard has a Bachelor of Science in Human Resources and a Master of Business Administration from Nicholls State University, and received his Senior Professional in Human Resources (SPHR) certification in 2012. He joined Bollinger in 1999. Battaglia has a Bachelor of Arts degree from Nicholls State University and a Juris Doctorate degree from Loyola University. Rachael joined Bollinger in 2011, and was promoted to Senior Counsel in 2016.

Bug-O Systems adds Thayer to Senior Sales Team

Scott Thayer has joined BUG-O Systems as Director of Sales and Marketing on February 26, 2018. Scott brings with him nearly 30 years of experience in the welding industry and has a strong knowledge of BUG-O products. In addition to his sales experience, he is a Certified Welding Inspector as well as a Certified Welding Educator.

SSI to be Acquired by Executives

CEO **Darren Larkins** and President & CTO **Denis Morais** will acquire ownership of the shipbuilding software development company SSI from the company's founder Rolf Oetter. For more than 17 years Larkins has met with shipbuilders around the world and he co-invented the company's Database Driven Relational Object Modeling software technology, now at the heart of SSI's products. Morais has been internationally recognized for his published blogs, articles and


Thayer

Larkins Morais


Massa


Dudson

Pierson DeVilbiss


SUNY CMA

papers and continues to provide insights on innovative solutions for the marine industries.

NC Ports Welcomes Director of Carrier & Trade Development

North Carolina Ports announced the addition of **Benjamin M. Massa** as its new Director of Carrier and Trade Development. Previously, Massa served as Commercial Director, AVP Sales and Marketing for United Arab Agencies. During his time with UAAI, Massa was responsible for all import and export Sales and Marketing activities for UASC in the Americas cluster. Massa also spent six years with the Jacksonville Port Authority.

Dudson Joins Incat Crowther

Incat Crowther has named **Ed Dudson** as Managing Director of its UK business and as a board member contributing to overall business direction. Ed brings with more than 25 years of experience in the design and construction of high performance vessels including fast ferries, wind farm vessels, offshore vessels and patrol boats to his new role.

Two Global Vice Presidents Elected to Industry Associations

Global Diving and Salvage announced that **Daniel Pierson**, Vice President of Operations has been re-elected to the Association of Diving Contractors International (ADCI) board for a three-year term. In addition, Global Vice President of Casualty and Emergency Response, **David DeVilbiss** has been elected as the new American Salvage Association (ASA) Vice President.

SUNY Students Sweep CMA Research Competition

The top three prizes for Connecticut Maritime Association's 2018 Research Competition were awarded to SUNY Maritime College graduate students. Each year, the CMA hosts a competition sponsored by D'Amico Shipping Group that awards students for maritime-themed research presentations. This year's winners, all SUNY Maritime graduate students, were **Andreas Stasinopoulos**, of Greece; **Tajae Harripersad**, of Trinidad and Tobago; and **Erika Stetson**, of Astoria, NY. Stasinopoulos was awarded the third-place prize. Stasinopoulos' research paper focused on voyage profile analysis and virtual arrival practices that would reduce fuel consumption and carbon dioxide emissions. Harripersad, who placed second, investigated the impacts of port privatization in the business of shipping. Stetson won the top prize. Her paper was a New York Harbor case study that focused on maximizing marine bunker barge fleet efficiency.

Silver Ships Hires Lobree as Contracts Manager

Silver Ships, Inc. has announced the hiring of **Shawn Lobree**, a retired U.S. Navy captain, as Federal Contracts Manager. Lobree has more than 25 years of military experience in maritime operations, human resources, information technology, shipbuilding and repair. He earned a degree in Economics from Florida State University. He has also earned an M.S. in Information Technology Management (Naval Postgraduate School) and an M.A. in National Security and Strategic Studies (Naval War College).

SENER Names Sierra CEO of U.S. Operations

The SENER engineering and technology Group has named **Mercedes Sierra** CEO of SENER in the United States. Mercedes joined SENER in 1985, and in 2012, she was appointed Head of Innovation at SENER, a position she now leaves to assume the new position as SENER CEO in the United States, headquartered in Los Angeles, CA.

ABS Classes First Hybrid GoM OSV

ABS has been selected by SEACOR Marine to class the first offshore support vessel (OSV) in the Gulf of Mexico to operate using hybrid power. SEACOR requested the BATTERY-Li notation for its Maya OSV currently operated by MEXMAR, SEACOR Marine's joint venture in Mexico. The OSV is being upgraded to use lithium battery power, with modifications expected to be completed in May

Lobree

Sierra

Buzby

Bouchard Scholars

(L-R) Lawson, Linscott, Bezency & Spalding

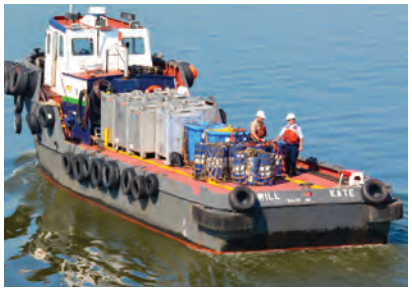
2018. SEACOR has engaged ABS to provide the optional BATTERY-Li notation, on three additional OSVs operated by MEXMAR, planned to upgrade to a similar battery system. The conversion to hybrid power for SEACOR Azteca, SEACOR Warrior and SEACOR Viking is expected to be completed in July 2018.

Military, Transportation Leaders Tout Jones Act on Capitol Hill

The House Armed Forces Subcommittee on Seapower and Projection Forces and Subcommittee on Readiness held a joint hearing on Thursday, March 9 during which MARAD Administrator Admiral **Mark H. Buzby** and U.S. Transportation Commander General Darren W. McDew discussed the significance of the Jones Act for national security readiness. Congressman Duncan Hunter asked, "… Without the Jones Act, without the Maritime Security Program, without cargo preference, our ability to project the force is in jeopardy. Is that still the case or is that changed?" Admiral Buzby replied, "Absolutely, sir. The Jones Act really is the linchpin. It is foundational to our merchant marine as it is today. It's the ships; it's the mariners, which are critical."

Texas A&M Students Awarded Bouchard Transportation Scholarships

Bouchard Transportation Co., Inc.


Vane Brothers Company


Coles


World Marine of Alabama


USCG

of Melville, New York is giving a new scholarship to Texas A&M University at Galveston to establish the Morton S. Bouchard Jr. Memorial Scholarship. It is named in honor of Bouchard Transportation's former President and Chief Executive Officer, Morton S. Bouchard Jr., who is the father of Bouchard Transportation's current President and Chief Executive Officer, Morton S. Bouchard III. This fund has provided Texas A&M Galveston with four scholarships per year for a period of five years. The 2018 Bouchard Scholarship recipients are **Sonny Lawson**, **Leah Linscott**, **Caitlin Bezency**, and **Asher Spalding**.

Vane Launches 'Vane Launch'

The Vane Brothers Company has launched VANE LAUNCH as a new division that builds upon the company's existing launch service offerings while taking advantage of enhanced synergy with Vane Brothers' bunkering operations. Among many service offerings, VANE LAUNCH delivers ship's stores and supplies, including fresh and frozen foods; transports passengers on U.S. Coast Guard-inspected vessels; delivers lube oil bulk and package products via launch or truck; delivers non-potable water; and, as of 2017, is authorized to remove USDA-regulated garbage from vessels.

Shipping Needs an Attitude Adjustment -Transas Chief

Speaking last month at the 2018 Transas Global Conference in Vancouver, Transas CEO **Frank Coles** laid out his vision for the maritime industry's future – from safer, greener and more efficient ships to a world without freight forwarders. As has come to be expected from the Transas CEO, Coles did not hesitate to offer a healthy dose of constructive criticism – particularly in the direction of those he sees as a hindrance to industry-wide progress, be it ship owners and operators, freight forwarders or regulators. As Coles outlined the maritime sector's various economic, technological and environmental challenges, a key theme was that the industry often stands in the way of its own progress to impede the disruption that the Transas chief sees as not only beneficial but absolutely necessary. "Maritime operations and its infrastructure seem to be changing at a snail's pace. We seem to be content to have old-fashioned ships and old-fashioned business infrastructure sitting alongside modern logistics," Coles said. "There's been some progress, but it hasn't been enough, and does not go fast enough."

World Marine Drydocks & Repairs USACE Dredge

World Marine of Alabama (WMA) has completed work on a contract valued at over $14 million to drydock and repair the Dredge Wheeler, a hopper dredge owned and operated by the U.S. Army Corps of Engineers. The contract was awarded in September; arrival was delayed due to emergency dredging assignments following Hurricane Harvey. World Marine's work package on the 35-year-old ship was comprehensive, including significant hopper and hopper door steel renewals, installing two new hydraulically-actuated weirs, and installing a new emergency generator. Machinist crews assisted with rebuilding the vessel's bow thruster, replacing one of the vessel's tail shafts and overhauling the vessel's CPP system.

Schoellhorn-Albrecht Wins Subcontract for ESG's OPC Project

Schoellhorn-Albrecht has been awarded a subcontract from Eastern Shipbuilding Group for the design and manufacture of deck machinery, deck fittings, accommodation ladder system and structural castings for the U.S. Coast Guard Offshore Patrol Cutters. Specifically, Schoellhorn-Albrecht was selected for the Deck Machinery, Deck Fittings, Accommodation Ladder System and Structural Castings including the Shaft Strut and Stern Tube. The Offshore Patrol Cutter is the U.S. Coast Guard's largest shipbuilding program. The U.S. Coast Guard's current contract calls for ESG to build 11 OPC's to replace the medium endurance cutters.

AkzoNobel's Intercept 8500 LPP Saves Fuel, Reduces CO2

Operators are saving fuel costs and reducing carbon emissions with AkzoNobel's patented biocidal antifouling coating Intercept 8500 LPP, part of the International product range. The coating, which has seen rapid adoption among customers with over 100 applications since its launch in March 2016, has been estimated to have saved vessels $25.5 million in fuel costs and 274,000 metric tons (MT) of CO2.

www.international-marine.com/Intercept

Biofouling Demands Selektope Antifouling

The effects of intense hard fouling on idle vessels can have great impact on a newly applied hull coating and on a vessel's performance in sea trials. Hempel's GLOBIC 9500S includes antifouling ingredient Selektope, an organic, non-metal compound that repels barnacles on hulls by temporarily stimulating the barnacle larvae's swimming behavior. Selektope does not compromise the chemical structure, color or other biocides of marine coatings.

www.selektope.com

selektope®

Gill's Blackwater Level Sensor for Marine Sewage Tanks

Gill Sensors & Controls' new Blackwater Level Sensor technology was developed to meet increased regulatory requirements for both black and gray water discharge, and address the reliability and maintenance issues with current Blackwater tank content measurement solutions. Gill's Blackwater Level Sensor 7014 features a technology break-thru with a simple probe and no moving parts, providing an accurate new device for solid waste measurement.

www.gillsc.com

BOLL & KIRCH BWMS Receives US Coast Guard Certificate

BOLL & KIRCH recently helped SunRui Marine Environment Engineering to qualify for the US Coast Guard (USCG) certificate. SunRui's BalClor BWMS system, which relies on BOLL & KIRCH's innovative ballast water filtration technology, has now been certified by the authority. The performance of the BOLLFILTER Automatic is based on a compact and robust design which makes it extremely durable and easy to maintain.

www.bollfilter.com

AkzoNobel, Royal Philips Partner on Antifouling Coating

AkzoNobel has partnered with Royal Philips to create a biocide-free, fouling prevention technology that uses UV-LED light-emitting diodes in a protective coating. Fouling increases hydrodynamic drag, fuel consumption and stack emissions. The technology pairs AkzoNobel's surface protection/adhesion capabilities with Royal Philips' knowledge in UV-LED light. With a lifetime of 35,000 hours, any vessel can be protected throughout a full docking cycle.

www.akzonobel.com

Trelleborg's Next Generation Firestop Material

Trelleborg's next-generation Firestop fire-resistant material is thinner and lighter than any current passive fire protection materials. The newly formulated compound reduces both costs and lead time, and can easily be molded in all shapes and profiles. The passive fire protection material used to protect personnel and equipment by minimizing fire escalation. Firestop also protects equipment from vibrations, collisions, and explosions.

www.trelleborg.com/offshore

Virtual Buoy Solution Ensures Safe Navigation

EIVA's solution ensures safe navigation by marking channels, shoals and wrecks during harbor expansions and construction projects. NaviSuite Perio replaces marker buoys with virtual buoys managed via a software user interface. The virtual buoys display to AIS users as actual buoys at a given location in the water through a land based AIS transmitter. The plug and play solution supports all AtoN marking types.

www.eiva.com

MobileOps Platform Bolsters Safety, Maintenance and Compliance

The MobileOps Platform is a cloud-based subscription solution that includes both a Web Application and an online-capable iPad application called Voyager. Companies choose MobileOps because it is easy to use, cost effective and backed by great customer service. Deploying MobileOps across a fleet of vessels bolsters safety, maintenance, and regulatory initiatives. MobileOps is easy to use and features collaborative management-crew dynamics.

www.mobileops.co

Monico's Mobile Messenger Enhances Marine Monitoring

Monico Monitoring's Mobile Messenger (m3) helps integrate engines and critical assets into overall monitoring systems. m3 is an OEM-oriented solution for high-volume applications, preconfigured with the ability to communicate over proprietary CAT Data Link and convert this information into S.A.E. J1939 or Modbus RTU. With a limit of 50 parameters, m3 is ideal for customers who only need a small number of parameters monitored.

www.monicoinc.com

Dual-Action PAC Keeps Crew Comfortable in Extreme Environments

Dual Action Personal Air Conditioners (PACs) from Vortec keep crew comfortable and productive. A PAC generates cold or hot air flow to the worker, along with a cooling/heating vest which diffuses the air flows around the worker's torso. Durable, plasticized vests are available in three sizes do not restrict movement, absorb sweat and can be worn under other protective clothing like welding jackets.

www.vortec.com

Phase Technology's DFA-70Xi Diesel Fuel Analyzer

PAC's Phase Technology DFA-70Xi is a '4-in-1' analyzer that tests diesel fuel viscosity, density, cloud and pour point. The multi-function DFA-70Xi automatically performs all four critical tests in less than 25 minutes. With just the touch of a single button, the analyzer delivers real-time results via a 15" color touch screen display, with standard data exporting capabilities, including easy connection to LIMS systems.

www.paclp.com

Twin Disc Enhances Joystick with Variable Idle

Twin Disc's Express Joystick System and Express Positioning technologies usher in a new era of vessel control for commercial operators. The state-of-the-art combination has been enhanced with a Variable Idle Mode. Engine idle is automatically lowered to reduce noise and vibration, and increase fuel economy, especially when station-keeping. In times of critical maneuvering, it can be set to maintain a higher idle for an even more immediate response.

www.twindisc.com

JMP Adds YANMAR Replacement Pumps

JMP Marine manufactures sea water pumps and strainers, and proven quality flexible impellers for OEM and aftermarket. JMP Marine has expanded its product line to include six new quality replacement pumps and impellers that fit 63 of Yanmar's more popular models. JMP replacement pumps are manufactured to ISO 9001, are self-priming with higher-than-average flow capacity and built to last from cast bronze.

www.jmpusa.com

Water Rescue Training Dummy in Hi-Vis Orange

When complying with SubM requirements or preparing for MOB scenarios, Emerald Marine' OSCAR Water-Rescue Training Dummy provides realism. Available in high-visibility orange to keep track of the device in fast-moving water and heavy seas, it's ideal for commercial mariners, oil and gas platform crew and other rescue personnel. OSCAR replicates a lifeless 180 lb. 6' adult that floats at chest level as an unconscious MOB victim would.

www.emeraldmarineproducts.com

When it Comes to Moving Fluids, Albin Delivers

Albin Pump Marine features a line of 12 General Purpose Pumps that deliver reliable performance, at an appealing price point. Albin Flexible Impeller Pumps are self-priming and available in 12V or 24V. Used for pumping a wide range of viscous fluids, including oil, diesel, antifreeze and chemicals, they offer reversible flow. High-performance motors are protected with polymer casings, and feature stainless steel shafts.

www.albinpumpmarine.com

Seastreak Ferry with DELTA "T" Technology

Seastreak's Commodore-class catamaran ferry is launching with Delta "T" Systems/Dinak modular dry stack engine, generator exhausts, and ventilation equipment. The Incat-Crowther-designed vessel is being built by Gulf Craft of Franklin, Louisiana. Delta "T" Systems/Dinak exhausts are modular. Installation is straightforward and fast. Clamped together, not welded, reducing onsite labor costs, components are manufactured from polished 304 and 316L stainless steel, with rock wool insulation.

www.deltatsystems.com

DNV GL JDP Drives Battery Safety, Adoption

Classification society DNV GL has launched a Joint Development Project (JDP) designed to advance the understanding of the use of lithium-ion batteries in the shipping industry. More than a dozen partners from the value chain have joined the initiative, including flag states, research institutions, battery and propulsion suppliers, fire detection and extinguishing system providers, vessel operators and yards. The project will wrap up in 2019.

www.dnvgl.com/maritime

Carboline Tech Service Podcasts

Carboline Technical Service has launched a series of informational podcasts. In each episode the team discusses common industrial coatings and linings products, problems, solutions, and painting and testing techniques. Topics range from Carboline product spotlights and new product announcements to industry standards from NACE, SSPC, and ASTM to what is required to make a successful tank lining recommendation.

www.carboline.com

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Contact:
Administrative Manager
Email:kimberly.aldridge@dynegy.com
55 Shalland St Milford, CT, 06461 United States

Job Requirements:

- High School diploma, GED, trade school, military service (Navy, Coast Guard. Merchant Marine plant engineering watch standing), technical training school graduate or college graduate with a BS in Engineering (Mechanical, Electrical, Marine, Facilities)
- Gas turbine with heat recovery combined cycle power plant experience preferred.
- Must possess a valid driver's license with an acceptable driving record.
- Must have basic computer skills and have functional ability in the use of Microsoft Outlook, Word and Excel.

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- Minimum of six years of experience as an Operations and Maintenance Technician in a power plant or equivalent technical based position in a marine, cogeneration, or utility/merchant type electricity generating plant; gas turbine based preferred.
- Knowledge of and ability to understand fundamental principles related to physics, mathematics, AC & DC electrical theory, heat transfer and fluid flow, thermal dynamics and chemistry.
- Knowledge of power plant safety, policies and procedures, especially in area such as chemical handling, high-energy systems, lockout tag-out, confined spaces, incipient fire suppression, first aid, rotating machinery, and heavy equipment.
- Proficiency and experience in the fundamentals of water steam cycle chemistry and other relevant plant chemistry applications.
- Team player with good communications skills.
- Ability to maintain confidentiality.

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Salary: $ TBD , Full Time , Engineer
Category: Vessel Operations
Skills:
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EXPERIENCE
Must hold either a Stationary Engineer License (or equivalent state certification) or a U.S. Coast Guard Assistant Engineer's License (Unlimited Assistant or Assistant Engineer-Limited with a minimum 3000hp rating.)

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Marine Marketplace

NEW PRODUCTS

Marine Marketplace

NEW PRODUCTS

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41	Creative Systems	www.ghsport.com	(360) 385-6212
21	Detyens Shipyards Inc.	www.detyens.com	(843) 308-8000
C3	DMW Marine Group, LLC	www.dmwmarinegroup.com	(610) 827-2032
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25	Metals USA	www.metalsusa.com	(800) 523-3340
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33	PYI Inc.	www.pyiinc.com	(425) 355-3669
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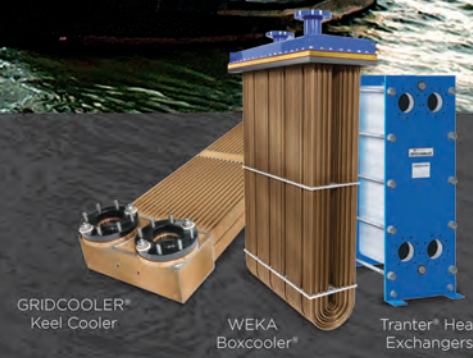

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