The Information Authority for the Workboat • Offshore • Inland • Coastal Marine Markets

Volume 29 • Number 9

Marine News

SEPTEMBER 2018

www.marinelink.com

Offshore Annual

A rising tide floats all boats

Insights
John Rynd, Tidewater Inc.

Inland
Olmsted Online Just in Time

Offshore Wind
Headwinds Buffet Green Energy

PERFORMANCE HAS A NAME.

For decades, Cummins has provided dependability and performance to marine operations around the world. And our legacy of innovation continues with our new X15 engine solutions.

The perfect size for inland waterway applications, the X15 gives you reduced fuel consumption, without reduced performance; and is an efficient option for a new build or a repower opportunity. Plus, it's backed by a 2-year warranty and our world-class support network in over 190 countries.

Innovative solutions from a name you can trust. No matter the vessel, Cummins will keep you Always On.

Contact your local authorized Cummins dealer or learn more at CUMMINSENGINES.COM/MARINE.

AMERICAN MADE WORKHORSES

BARGE-MOUNTED TELESCOPIC

Deploys from transport position in seconds so you're ready for work anywhere on the river.

RAZERTAIL® TRUCK UNLOADER

Portable equipment unloads trucks directly to barges or other conveyors.

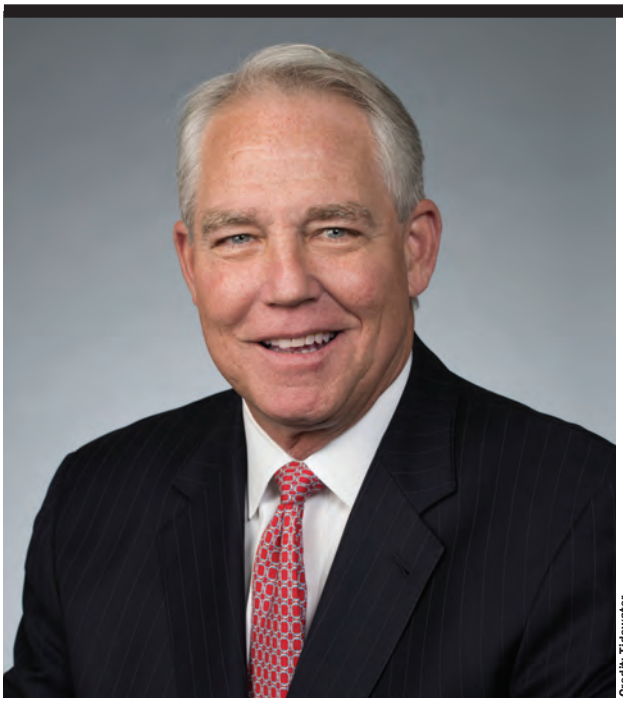
UNLOAD UP TO 5,000 TPH

Compared to trucks, conveyors use no fuel, no manpower and automatically build stockpiles.

SUPERIOR®

+1 (320) 589-2406
WWW.SUPERIOR-IND.COM

CRUSHING EQUIPMENT	SCREENING EQUIPMENT	WASHING EQUIPMENT	**CONVEYING EQUIPMENT**	ROCK FACE TO **LOAD OUT**	CONVEYOR COMPONENTS	PORTABLE PLANTS	CONSTRUCTION MANAGEMENT	AFTERMARKET SERVICES



Credit: Tidewater

Credit: CWind

Features

ON THE COVER

A high tech offshore energy support fleet – here and across the big pond – awaits the offshore recovery that now appears imminent. As we await this eventuality, there is more than enough sector drama fill in the gaps. The story begins on page 30.

Image credit: AdobeStock © DonVictoriO

An open letter to the United States inland maritime market.

USA Towboat Company
123 River Road
USA

BUSINESS AREA	ABB Marine & Ports
FROM	Edward Schwarz
CELLPHONE	954 224 8680
E-MAIL	edward.schwarz@us.abb.com
DATE	September 01, 2018

Those who desire status quo are quickly surpassed by those who are open-minded and not fearful.

Dear US Towboat Owner,

Aging fleets, falling contract rates and increased operating costs due to new regulations require major decisions that will have a long-lasting impact on the growth or even survival of your business. As a result, you are faced with some very difficult decisions about the future investments of your fleet. One such critical question to consider is ***should I build new vessels and, if so, what type of a vessel?***

After extensive research of the US Inland Market (including a review of the power consumed by over 500 US towboats for 1 year) ABB Marine & Ports in America has developed a diesel electric propulsion solution, the ETB (Electric Tow Boat). The ETB, designed specifically for US inland requirements, will help vessel owners comply with new regulations and, at the same time, reduce non-value operating costs thus improving your competitiveness and profitability.

Some ABB ETB highlights include:

- **No need for Tier 4 engines** - *typically a cheaper EPA solution without the need for urea*
- **Standardized engines for different HP vessels**- *the same engines can be used across the whole fleet*
- **Significantly less engine maintenance costs –** *due to running generators at ideal load and RPM*
- **High efficiency through a wider design point** – *significant reduction in fuel costs- up to 30% savings*
- **ABB US service** – *ABB US service group is trusted with some of the world's highest day rate vessels*
- **Redundancies eliminate single point failure-** *increased vessel operational reliability then today*

I have met with many inland vessel owners and shipyards about our research and have received positive feedback. I would also like to share my findings with you. If you are interested in learning more about our ETB solution and how we can support you in both driving down your CAPEX and OPEX costs, please visit our website www.new.abb.com/marine/ETB and/or let me know when we can talk.

A smooth sea never made a skilful sailor but together with ABB we can navigate through the rough seas!

Edward Schwarz
VP Sales, New Builds

ABB Inc. Marine & Ports
3700 West Sam Houston
Parkway South
Houston, 77042, Texas
United States of America

ABB Inc. Marine & Ports
11600 Miramar Parkway
Miramar, 33025, Florida
United States of America
www.abb.com/marine

MarineNews

(ISSN#1087-3864) (USPS#013-952)
Florida: 215 NW 3rd St., Boynton Beach, FL 33435
tel: (561) 732-4368; fax: (561) 732-6984
New York: 118 E. 25th St., New York, NY 10010
tel: (212) 477-6700; fax: (212) 254-6271
www.marinelink.com

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

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

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

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

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

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**

TO SUBSCRIBE:
Subscriptions to ***Marine News*** (12 issues per year) for one year are available for $60.00;
Two years (24 issues) for $95.00.
Send your check payable to:
MarineNews, 118 E. 25th St., New York, NY 10010.
For more information email Kathleen Hickey at:
k.hickey@marinelink.com

Departments & Analysis

MarineNews (ISSN# 1087-3864) is published monthly (twelve issues) by Maritime Activity Reports Inc. 118 E 25th St. New York, NY 10010-1062. Periodicals Postage Paid at New York, NY and additional mailing offices. POSTMASTER: Send all UAA to CFS. NON-POSTAL AND MILITARY FACILITIES send address corrections to Marine News 850 Montauk Hwy, #867 Bayport, NY 11705.

WE POWER YOUR BUSINESS

engines, inc.™

RELIABLE POWER FROM 40kW TO 250kW

When reliability is critical you need an engine you can depend on. That's why we use **John Deere PowerTech™** engines which are durable, fuel efficient, and easy to maintain. They are also backed by the support of one of the strongest engine and equipment companies in the world.

On the inland waterways, your generator set powers your business. When you choose a power generation package from **engines, inc.**, you can rest assured that you are getting the best engineered package available anywhere. You also get access to the most reliable 24/7 support structure in the business. Our skilled staff and our extensive dealer network will provide you with reliable service and support that you can count on.

24-HOUR SERVICE LINE
870-268-3799

With over 150 years of collective experience in our shop and over 75 years of partnership with John Deere, we are, without a doubt, your best choice for Generator Sets and Propulsion Engines on the inland waterways. Our experience distinguishes us and our integrity sets us apart. When everything is on the line you can count on us: **We Are Your Power Source.**

engines, inc.
Jonesboro, AR • 800-562-8049
Conroe, TX • 936-441-5592
www.enginespower.com
24-Hour Service Line
870-268-3799

JOHN DEERE
POWER

AUTHORIZED JOHN DEERE ENGINE DISTRIBUTOR

keefe@marinelink.com

It was about four months ago that I sat down to plot a course line for future *MarineNews* editions. And, if just one thing gave me pause, then it was the prospect of assembling our Offshore Annual folio in the midst of one of the more pronounced energy downturns in recent memory. I asked myself: *would there even be anything to write about?* As it turned out, I needn't have worried. There is more than enough news happening right now in this sector. Some might even call it drama.

If the announced merger of Tidewater and GulfMark, both of whom had only recently and successfully emerged from restructuring, wasn't enough to digest, then the surprise offer by Harvey Gulf to make its own play for GulfMark roiled the waters even further. As the long depressed offshore energy support market begins to stir from its slumber, many unanswered questions are outstanding as this edition of *MarineNews* goes to press. That said; our regular **INSIGHTS** entry, this month featuring Tidewater President & CEO John T. Rynd, might just give you the information you need to divine what might come next. It promises to be a wild ride. As usual, you can find that dialogue starting on page 16.

Separately, but also digging into the weeds of today's offshore markets is *MarineNews* contributor Barry Parker, who sees a brighter path ahead for the offshore sector. It's also a complicated one. That's because as Consultants Westwood Energy declared in August, 'Don't Look Now, But the Gulf of Mexico Jackup Market is Doing Pretty Well,' they also noted that utilization for jackups in the U.S. Gulf has risen to 44%. It isn't Heaven, but it possibly foreshadows better times ahead. And, there's nothing like a bidding war for offshore assets to further underscore that likelihood. The story begins on page 30.

We also look inward this month, specifically towards the inland waterways and arguably the biggest piece of (good) news to hit inland operators and shippers in more than a decade. As the Olmsted Lock and Dam project mercifully comes to an end after more than 30 years of frustratingly slow progress, cost overruns and more than a few mistakes, Olmsted is finally poised for success. That's something to celebrate. And, with that inland anvil finally deep-sixed, the pace of progress for the balance of the nation's 50-year old waterway infrastructure might just be poised to quicken. We'll be watching as it unfolds.

Finally, and at a time when the specter of trade wars and midterm elections provides just enough uncertainty to prevent the masses from predicting what will happen next, I myself have a good feeling about the direction of both the offshore and inland sectors. On the other hand, and since I typically use the time-honored Keefe family tradition of *'buying high and selling low,'* maybe you should form your own opinions. The September edition of ***MarineNews*** – chock full of analysis from the SME's who truly matter – is a great place to start that prickly process.

Joseph Keefe, Editor, keefe@marinelink.com

PEACE OF MIND

TIME FOR AN EMISSION OR POWER UPGRADE?

Louisiana Cat understands how important uptime is for your business, your crew and your bottom line. Now you can have peace of mind with the industry's best financing rates on Marine Engine Repower Packages.

Call us today or request your quote online!
Offer expires December 31, 2018.

BUILT FOR IT.

866-843-7440

www.LouisianaCat.com/Marine

This offer is for Cat Access Account credit card customers. Not a Cat Access Account customer? Visit www.CatAccessAccount.com to apply for your credit card now.

CERTIFIED BY DNV·GL MSA AWARD "PLATINUM"

85 SINCE 1933

Louisiana CAT

Authors & Contributors

MarineNews
September 2018
Volume 29 Number 9


Balsley


Ewing


Parker


Gehrke


Laskay


Luthi


Reams

Alexander Balsley is an environmental engineer and has been a project manager at RDC since 2010. He is primarily involved with RDC's Oil Spill Response program and is a subject matter expert in this field. Balsley has an M.S. in Environmental Engineering from Worcester Polytechnic Institute, and a B.S. in Civil and Environmental Engineering from Northeastern University. He is a registered Professional Engineer in Massachusetts.

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

Barry Parker of bdp1 Consulting Ltd provides strategic and tactical support, including analytics and communications, to businesses across the maritime spectrum. The company can be found online at **www.conconnect.com**

Heath Gehrke is the Director of Operations for the Cape May – Lewes Ferry. He manages a staff of over 350 permanent and seasonal employees. He is a licensed U.S. Coast Guard Master and a Commander in the U.S. Naval Reserve.

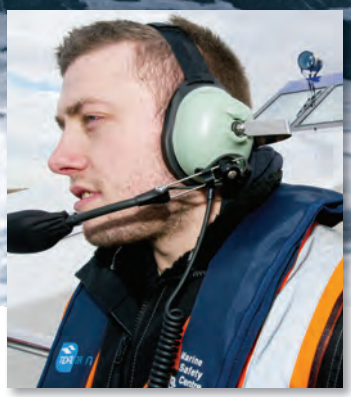
Mr. Norman Laskay is Of Counsel with Dufour, Laskay & Strouse, Inc., a full service marine surveying firm, with its main office in New Orleans, Louisiana. The company started in 1968 and has expanded its appraisal, insurance claim and cargo business and opened offices in Houston, Tampa, and Jacksonville. Laskay is a graduate of Maine Maritime Academy with a B.S. in Marine Transportation and has served as a deck officer for several Gulf Coast based steamship lines. He is a published author, has served on the Machinery and Technical Specialties (MTS) Committee of the American Society of Appraisers for 12 years where he is now an Emeritus member. He is also a Certified Marine Surveyor (CMS) with the National Association of Marine Surveyors (NAMS).

Randall Luthi is the President of the National Ocean Industries Association (NOIA), an offshore energy trade group located in Washington, D.C.

Buddy Reams is NACE International's first Chief Maritime Officer, a position he started in April 2016 after retiring from nearly three decades of service to the United States Coast Guard. He leads the development of corrosion control programs and services to meet increasing demand from all maritime industries including notably the shipbuilding, shipping, and offshore sectors. Prior to joining NACE International, his last assignment was as Chief of Maritime Prevention Operations for the Seventh Coast Guard District. Reams holds Bachelors and Masters of Science degrees in Naval Architecture & Marine Engineering from the US Coast Guard Academy and University of Michigan. He also holds a Master of Science in Industrial Operations Engineering from the University of Michigan.

View Video

David Clark Digital Communication Systems... Just Add Water.



The Simple-to-Use Communication System, Ideal for Off Shore Service Vessels

Contact David Clark for rugged, reliable and proven communication solutions to enhance the situational awareness, efficiency and safety of crew members on board off shore service vessels, patrol boats, fire boats, tugs and all manner of workboats.

Call **800-900-3434** (508-751-5800 Outside the USA) to **arrange a system demonstration** or visit **www.davidclark.com** for more information.

Scalability

Versatility

Simplicity

David Clark

WWW.DAVIDCLARK.COM

An Employee Owned American Company

Offshore Energy Support: Mergers, Bankruptcies – and Resurgence [?] – Oh, My!

A glimmer of hope in the offshore energy markets – especially here in the Gulf of Mexico – has oil support operators and their clients alike looking to a better tomorrow. It has been a long time since anyone could say that. Multiple bankruptcies have dogged offshore service firms as low oil prices dampened the economics of deepwater drilling. That could be about to change. The recent rebound in the price of crude oil, the emergence of slimmer, hopefully more profitable offshore companies and some interesting developments on the merger side foretell – if nothing else – some excitement in the weeks and months to come. As always, VesselsValue.com has the data, some analysis, and possibly – the answers to at least some of your questions.

The Offshore Energy Support Sector Today – According to VesselsValue.com

Norway, a key player in the demanding North Sea market, is home to some of the most advanced and high value Offshore assets. For example, the GOM region is likely the busiest global region due to the high number of Offshore assets present. The relationship for China and Singapore is a slightly confusing one. There is a high number of Offshore assets owned by these countries, however this ranges from small AHTS vessels to advanced Jack Up Rigs. This means either low value assets or extremely high value assets, and not much in between which explains the average numbers. The high numbers for Switzerland are explained by the fact advanced Drillship owner, Transocean is registered there.

The abrupt way in which the offshore party ended in 2014/15 mean that owners now have many now idle old OSVs on their books. No one knew the downturn would be so severe, but market analysts were quick to point to the high number of these older vessels as one of the principle problems with the overall market.

Older vessels (15 years or older), which are often low spec, face a challenging and costly period, finding their asset values aligning with (or being lower than) the costs associated with reactivating and reclassing their vessels. Charlie Hockless, VesselsValue's Head of Offshore, explains further, "I am in agreement with the consensus that a large number of these stacked OSVs will not return to the market, but widespread scrapping still seems far off for some time. Looking forwards, the OSV space is poised for significant movement over the coming number of years. OSV demand will recover. Those with modern, high quality tonnage are in a strong position to ride the market up (utilization/rates/values), provided their vessels are in good working condition."

For the MODU side of the equation, 2017 was a year of mergers and acquisitions, with two particular market moves standing out. First, Borr Drilling acquired the whole of Transocean's North Sea Jack Up assets. The second came when ENSCO preyed on a struggling Atwood Oceanics to snap up their whole floater operation. These strong market moves made in 2017 would suggest optimism from the drilling industry. However, despite all the headlines, active rig utilization has remained about the same.

Hockless continues, "We know that a large proportion of floaters are laid up, and it is unknown how the assets themselves will be reactivated. This asset class is not meant to be inactive. Regarding Jack Ups, there is a huge number of older rigs ripe for the scrapyard. 2018 will hopefully be the year that the 1970s/80s Jack Up becomes extinct. This means we should look out for on next year's global rig fleet is the number of rigs proportionate to value. It will also be interesting to see how the significant orderbook of Jack Ups in delivered as shallow water drilling continues to recover."

Orderbooks: OSV and OCV

For OSV's, the condition of these orders remains unclear and it is likely a number of these orders will be cancelled or forgotten about, however many will still end up on the water. The oil price is strengthening and if it remains strong, offshore demand will strengthen with it. Vessel supply, which has been the undoing of the industry over the downturn, comes into question as Newbuilds on order are not fit for delivery and vessel scrapping increases. The fleet size will be deciding factor in the speed of the recovery.

Just like with all offshore, the OCV sector has suffered during the oil price crash and subsequent reduction in offshore oil exploration and production. However we see the OCV sector recovering well, and indeed leading the overall offshore sector, as this vessel type has suffered slightly less due to a better supply and demand balance. On the supply side OCV's were rarely ordered speculatively due to bespoke nature of the industry. The growth of opportunities for OCV vessels in renewables as this sector is relatively new and going through a rapid expansion provides an increased level of demand. This is coupled with an increased industry focus on Decommission-

POWERFUL INSIGHTS INTO YOUR FLEET'S PERFORMANCE

The market-leading FUELTRAX smart, self-contained fuel management solution connects you to every vessel, anywhere in the world.

Accurate and secure data insights, delivered in real-time, enable you to make informed decisions—fast. Achieve optimal fleet performance with reduced fuel costs, increased uptime, and complete fuel security.

Enhance the performance of you fleet. Talk to FUELTRAX today.

Compliance | Security | Performance

fueltrax.com

FUELTRAX®

Self contained smart maritime solutions

ing. The more niche areas within the sector such as Pipe layers and Cable layers find their values varying heavily. This is due to the project based nature of the industry.

Tidewater & GulfMark – and HGIM, too

The hottest news of the year is probably the proposed merger of Tidewater and GulfMark, eclipsed only perhaps by Harvey Gulf's party crashing at the 11th hour. VesselValue's Charlie Hockless weighed in, expressing his opinions on the merger, saying, "I was quite surprised, as both companies had effectively tackled the downturn by successfully restructuring. Survival seemed to be a formality for Tidewater and GulfMark. Now that the merger is complete, I can certainly see the advantages. New Tidewater will be the largest OSV owner on the planet by sheer number of OSVs owned. However the new combined fleet closes the gap between Tidewater and Edison Chouest Offshore, which remains in the pole position by fleet value. If this downturn has taught us anything, big companies survive. The new Tidewater will be a dominant player for years to come." If it comes to fruition, that is. Harvey Gulf and Shane Guidry hope to have something to say about that.

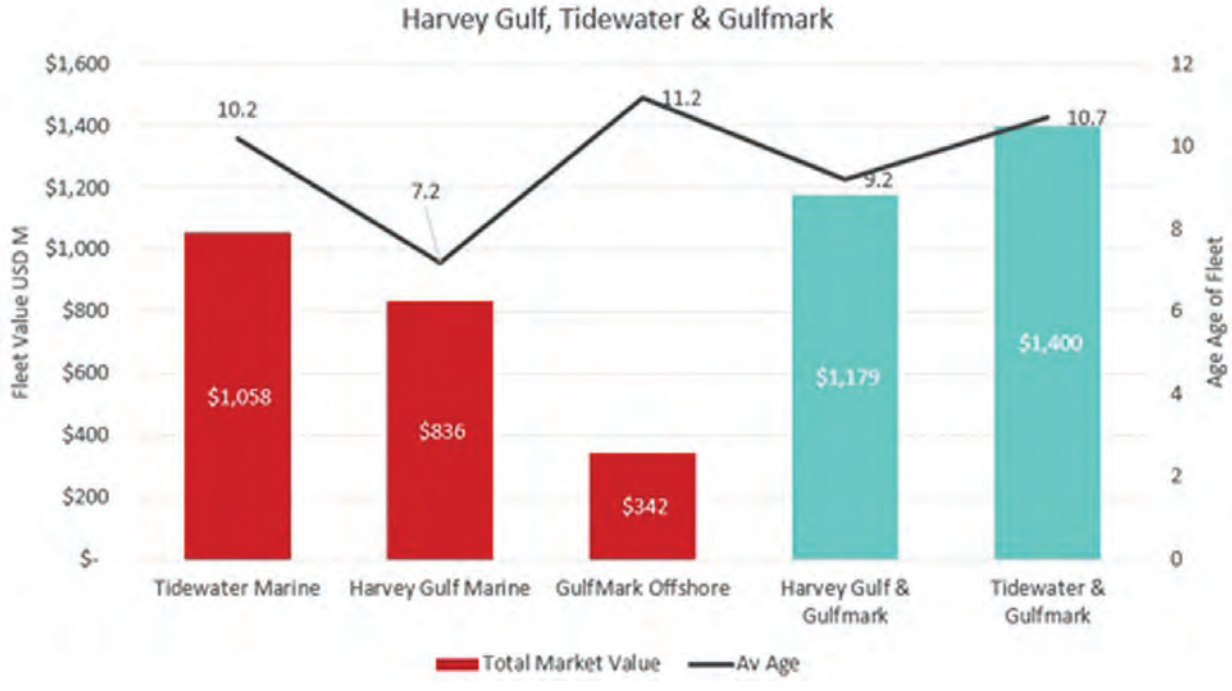
GulfMark Must Choose: Size or Specialty – VesselsValue.com

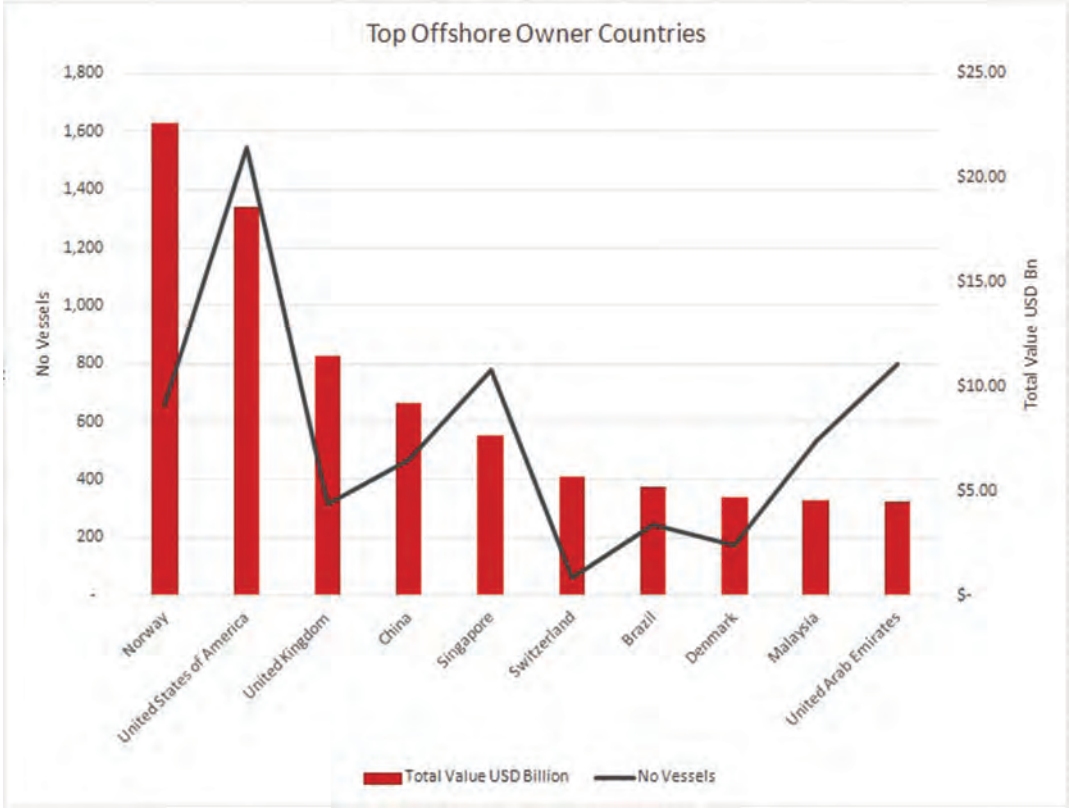
Coming hot off the heels of July's announcement of a merger deal between offshore services firms Tidewater and GulfMark, rival Harvey Gulf offered its $836 million fleet in a competing deal to merge with GulfMark. Now, says VesselsValue, GulfMark is left to weigh its options. "With a combined fleet size of 274 vessels, a merger between GulfMark and Tidewater would lead to one of the largest OSV fleets in terms of overall size with an average age 10.7 years old," said Matthew Freeman, VesselsValue Director. "If a merger would materialize between Harvey Gulf and GulfMark, it would mean a smaller overall fleet size of 129 vessels but with an average age of 9.2 years old." Freeman continues, "The Harvey Gulf fleet consists of 57 OSVs and six OCVs (a sector that GulfMark does not currently have a presence in), so the main questions here are size over specialty and what the future holds." And, as ***MarineNews*** went to press, no one – not even VesselsValue – really knew the answers to any of those questions.

Tidewater, Harvey Gulf and GulfMark Fleets

Owner	# Vessels	AVG Age	Total Market Value
Tidewater Marine	208	10.2	$1.058 billion
Harvey Gulf Marine	63	7.2	$836 million
GulfMark Offshore	66	11.2	$342 million

Owner	# Vessels	AVG Age	Total Market Value
Tidewater and GulfMark	274	10.7	$1.4 billion
Harvey Gulf and GulfMark	129	9.2	$1.179 billion





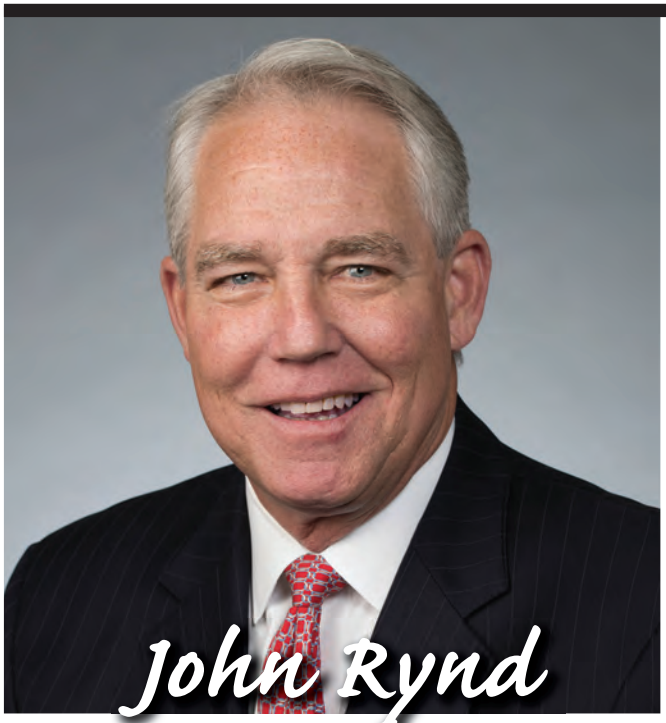
Tidewater, Harvey Gulf and GulfMark Fleets

Owner	No Vessels	Av Age	Total Market Value
Tidewater Marine	208	10.2	$ 1,058
Harvey Gulf Marine	63	7.2	$ 836
GulfMark Offshore	66	11.2	$ 342

Owner	No Vessels	Av Age	Total Market Value
Tidewater & Gulfmark	274	10.7	$ 1,400
Harvey Gulf & Gulfmark	129	9.2	$ 1,179

Top Global OSV Owners after Tidewater Marine and GulfMark Offshore Merger

Company	Total	
	Number of Vessels	Total Value USD m
Edison Chouest Offshore	220	$1,924
Tidewater Marine & GulfMark Offshore	273	$1,381
Solstad Farstad	100	$930
Nam Cheong International Ltd	71	$754
Bourbon	242	$735



President, CEO and Director, Tidewater Inc.

Mr. John Rynd graduated from Texas A&M University with a Bachelor of Arts degree in Economics. He previously served as Chief Executive Officer and President, and as a director of Hercules Offshore from 2008 through 2016. Prior to his time with Hercules, Mr. Rynd spent 11 years with Noble Drilling Services, Inc., where he served in a variety of management roles. Earlier in his career, he served in various roles of increasing levels of responsibility with Chiles Offshore and Rowan Companies. Beyond this, Mr. Rynd served as Chairman of the National Ocean Industries Association (NOIA) from 2014-15 and currently holds an Ex-Officio position on the Executive Committee. He serves on the Board of Directors of Fieldwood Holdings LLC, and was on the Board of Directors of Hornbeck Offshore, Inc. from 2011 to February 2018. Today, he presides over what could soon become the largest operator of OSV vessels on the planet. Tidewater already owns a spot near the top of that pyramid. These are exciting times in the offshore energy support industry. And, while no one knows what will come next, the recovering offshore markets beckon to those who believe it will come back soon. John Rynd is one of them. Listen in this month as he weighs in on this complicated, but important marine sector.

It was just about one year ago that Tidewater itself emerged from Chapter 11 Bankruptcy. Shortly thereafter, GulfMark did the same. This month, you announced an agreement to merge with GulfMark. What has changed in one year that allowed you to embark upon this exciting, aggressive path?

The path that led us to Chapter 11 was a long one. Choosing this approach ultimately allowed us to structure the business in such a way as to maximize its financial strength, which is, and will be, critical as the offshore supply vessel market begins to stabilize and then continues the slow march toward a new market equilibrium, with vessel demand again balanced with vessel supply. Post-restructuring, the company is essentially in a zero net debt position and quarterly operating results are approaching a cash flow break even. The company also has significant available liquidity and no significant near-term debt maturities, so we should be well-positioned for a still challenging global OSV market. Looking to the future, a more vibrant OSV market will require significant investment to reactivate currently idle equipment. Post-restructuring, the company has the financial resources to make that investment.

GulfMark undertook the same set of activities, for many of the same reasons. Each company has been working on ideas and concepts independently throughout the downturn related to enhancing productivity and shore-based scalability. By leveraging the combined talents of both organizations, we are convinced no other OSV company in the world will have higher safety and operating performance or operate as efficiently at those levels.

Why should the market trust the prospect of the merger between two stakeholders that only recently themselves emerged from Chapter 11?

The combined company will have the largest fleet, broadest operating footprint, and strongest financial profile in the OSV sector. These are all key metrics that we feel position the company for an industry recovery that seems to be getting some traction. The fact that both companies worked through the process of restructuring and emerged with strong balance sheets and low leverage is an underlying enabler for the combination.

"We are one of only a handful of companies with both the operational and financial profile to provide cost-effective global solutions to our customers through the ups and downs of the oilfield cycle."

Tidewater announced your appointment as President and Chief Executive Officer and Director a little more than five months ago. It has since been a busy time at Tidewater, culminating in this month's GulfMark merger announcement. That said; what was the primary reason to pursue this merger?

We've been saying for some time that we believe we are well positioned to both lead and benefit from the consolidation of the OSV industry. We are one of only a handful of companies with both the operational and financial profile to provide cost-effective global solutions to our customers through the ups and downs of the oilfield cycle. GulfMark is another such company. One of the key aspects of our strategy since our reorganization last year has been to optimize our fleet to enhance safety, meet the increasingly complex needs of our customers, and of course, be in the best position to capitalize on a market recovery. The combination with GulfMark accelerates our progress towards these goals. The bottom line is that this transaction creates the largest and strongest global OSV company by all key metrics, including fleet size, fleet quality, operating footprint, enterprise and equity value.

Tidewater owns and operates one of the largest fleets of Offshore Support Vessels in the industry. Combined with GulfMark, it will be the largest. What will change in terms of your business plan – for both parties – and what will stay the same?

The scale of the combined company will allow us to sustain our commitment to maintaining an industry-leading fleet that is best-suited to our customers' offshore exploration, development and production activities, which are increasingly moving into deeper waters and more remote regions of the world. Increased scale also enables us to better anticipate and adapt to changes in the global oil and gas markets. The combined company will be better positioned to achieve and sustain market leadership during both healthy and challenging market conditions, allowing us to operate with an enhanced focus on longer-term trends. What won't change is our commitment to safety, compliance, and providing quality services. We will continue to focus on driving down costs, maintaining our balance sheet strength, and retaining liquidity. This is key; as we are, and will continue to be, prepared to fund the reactivation of vessels from our stacked fleet to respond to customer opportunities.

Unique perhaps in the GoM, Tidewater has many assets under both foreign and U.S. flag. That gives you flexibility in where you place your assets, where you compete, etc. But it also involves adhering to Jones Act rules for ownership, control, etc. Does anything major have to occur in this way as you hopefully consummate the merger?

Both companies being Jones Act compliant on a standalone basis means that the merger to be straight forward in this regard. Jones Act Warrant holders of the combined company will continue to be required to prove their U.S. Citizenship to convert their warrants into Common Stock.

What percentage of your combined future fleet will remain as Jones Act qualified? Will you keep that split, increase it or decide to venture out into more international markets?

The combined company will have a larger Jones Act fleet, but the percentage of the overall fleet that remains U.S. flagged going forward will ultimately depend on where we see opportunities to put the vessels to their highest and best use. We've mentioned, for example, that Tidewater's broad footprint in areas such as West Africa and the Middle East gives the combined company the option to redeploy certain GulfMark assets into these areas to improve utilization.

Looking at current GulfMark and Tidewater areas of operation around the globe, it is clear that the two firms compete in certain markets, but in just as many if not more, they do not. This bodes well for the new firm, does it not?

We feel strongly that it does indeed bode well for the combined company. Tidewater has the broadest operating footprint in the OSV sector today, and the combination with GulfMark further strengthens our combined presence in the Americas and the North Sea.

This combination of two offshore heavyweights, if consummated, will create a global offshore support vessel leader, positioned to capitalize on significant cost synergies and superior growth opportunities as the OSV sector recovery gains traction. Detail those 'cost synergies,' and more importantly, where they will emanate from.

The opportunity to operate a larger fleet with a more efficient cost structure over a broader operating footprint is a major benefit of the proposed combination. Both com-

panies have been working on specific synergies related to this combination since the merger discussions began earlier this year. We highlighted during the merger announcement that we are very confident in achieving $30 million in cost synergies. Much of this is related to the rationalization of shore base support and corporate overhead. Our teams are working on a detailed integration roadmap now, so we are prepared to put these plans into motion as efficiently as possible following the completion of the merger.

Talk about your combined fleet. You'll start out with 275 vessels. How many are actually in service today, and many are idle? Benchmark the fleet against the competition.

Taking into account statistics reported for both companies as of June 30, there are 173 vessels currently active, and 98 stacked. The average age of the combined company's currently active pro forma fleet will be one of the youngest at about 9 years. Taking into account stacked vessels, some of which won't return to service as we continue the process of rationalization, the overall pro forma fleet average age is approximately 10 years.

The US Energy Information Administration recently predicted that Brent crude oil spot prices will average $73/bbl in the second half of 2018 and will average $69/bbl in 2019. Is that enough to sustain an offshore recovery of any magnitude?

In our view, which is consistent with that of our customers, commodity prices have been above the level required to support investment offshore for some time. Coupled with the work the offshore service sector has done to reduce costs and improve efficiency, the environment would appear to be good for increased investment offshore. It is really not a question as to whether an offshore recovery will take place, but when.

Dissimilar operating cultures can often be the biggest obstacle to any successful merger. Both firms are Gulf Coast-based. That's a good starting point. How would you assess the similarities between GulfMark and Tidewater in this way?

The two companies do indeed have a lot in common. Not only are we both Gulf Coast-based, but we also have substantial expertise operating internationally, with corporate and local management experienced with the complexities of dealing with varied laws and regulations, as well as customer requirements. Maintaining this talent and expertise will be important, as well as ensuring that we leverage the best processes and systems from each company to realize as much value from the combination as possible.

The call for more consolidation of the OSV industry has been heard for some time. Your proposed transaction carries this trend to reality. How much more consolidation is likely in the sector and if more is to occur, would the new Tidewater consider other similar opportunities?

More consolidation is needed in the OSV sector, but our view is that it's likely to be limited in the near term due to the significant leverage among the majority of vessel owners. We have been fairly vocal about our intent to pursue M&A for much of the past year, and that any transaction had to 1) come with assets that would be accretive to the quality of our existing fleet, 2) not significantly re-lever our balance sheet and 3) preserve our currently strong liquidity position. The combination with GulfMark checks all of these boxes. The transaction with GulfMark has been structured specifically to ensure that the combined company would be positioned for organic growth opportunities (through funding reactivations of currently idle equipment) and additional M&A. Until more companies work through the process of restructuring their debt the opportunities for additional acquisitions is fairly limited, but we will continue "aggressive window shopping."

Some analysts have said that even when the price of crude oil rebounds to a more positive level – something it seems to be headed for at moment – that there is so much tonnage laid up in the U.S. GoM that it might take as long as 24 months to bring it all out. That might keep rates depressed for a longer stretch. What are your thoughts on that scenario?

It certainly would seem to be a likely scenario. We feel that the ability for currently-stacked vessels to return to work will depend quite a bit on the timing and level of de-

mand improvement, however. As demand increases, rates will also need to reach a point where they make sense for owners to invest in reactivating vessels. It's not an insignificant sum of money to reactivate a vessel – particularly if it has been stacked for several years – and with many owners being highly leveraged and with little cash, there will be pressure on customers, at least in some cases, to fund reactivations with lump sum mobilization payments. With this being said, we've already seen reactivations in the North Sea with an improvement in activity before rate increases. In our view this has been a primary factor in keeping rates lower than they would otherwise be with the improvement in seasonal demand.

Another area of concern for industry is the number of newbuilds in the pipeline that might impact the market when they are delivered. For example, the containership market is certainly struggling in this way. How many OSV's are on order, how many of those would be for the combined company, and what does this mean for the sector itself?

The latest estimates indicate that about 215 OSVs remain in the pipeline for delivery over the next year or two. As a percentage of the overall fleet, and with the rate of attrition increasing (and hopefully accelerating), the net impact of these new deliveries with respect to the overall global OSV sector isn't expected to be significant. However, many of these vessels are under construction in Chinese shipyards, and these have tended to be delivered into the South East Asian market. As the most over-supplied and highly fragmented region, adding vessels to that particular market doesn't help the situation. We recently took delivery of our newbuild deepwater PSV, the U.S. flagged Youngs Tide. This vessel was the last new construction commitment for Tidewater.

Similarly, another school of thought says that while there are a great many OSV's and similar type service vessels in layup, a good number of those are too old to economically bring out into service again. Would you agree and if so, what percentage of that layup fleet will likely never see service again?

Our view, which is in line with several respected analysts that we follow, is that currently stacked tonnage that is 15 years or older is simply uneconomic to reactivate. Based on estimates available from the few data sources that cover these statistics in detail, there are currently about 1,000 vessels older than 15 years in the global OSV fleet. This equates to about 30% of the fleet. Over and above these vessels, there are likely a subset of the remaining fleet of a more recent vintage that have simply been stacked too long with little to no maintenance that will require too large of an investment to compete effectively in the markets in which they're located.

The combined company, in theory, will be better positioned to build upon GulfMark's strong track record in the recovering North Sea region. How so and why there in particular?

GulfMark is considered one of the premier OSV owners and operators in the North Sea region, with a strong track record of quality services and Tier 1 vessels. Bringing the GulfMark and Troms Offshore teams and vessels together strengthens both the size and quality of the combined fleet in the market. The transaction is not predicated upon a North Sea led OSV recovery, but clearly the combined company will be a primary beneficiary if that is how things play out over the coming quarters.

Where will you see the biggest challenge in market penetration and/or recovering day rates?

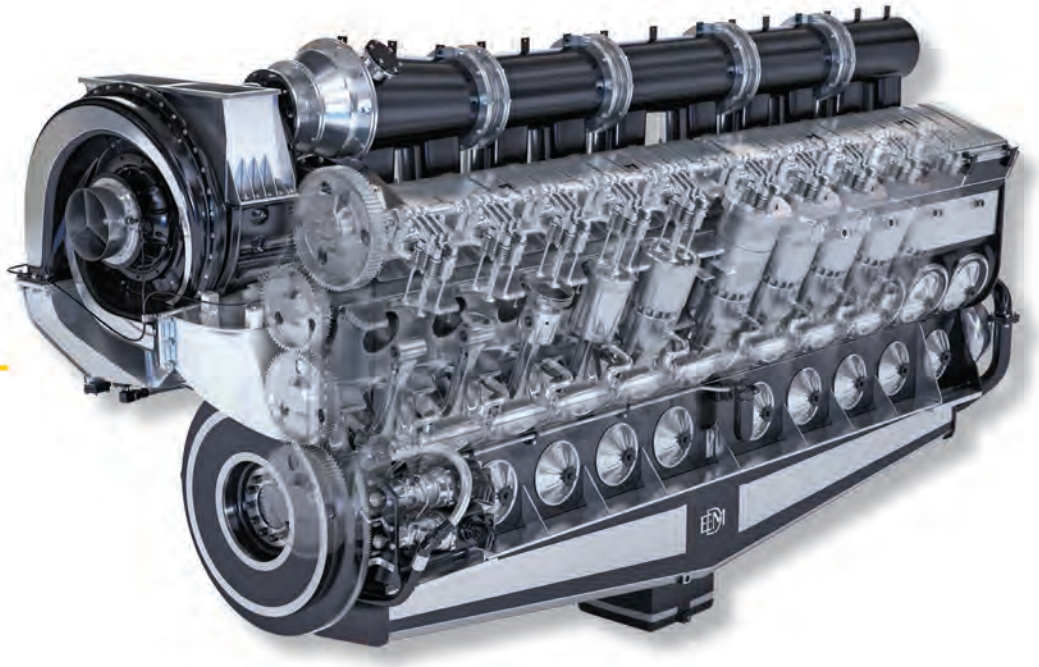
I mentioned during our recent earnings call that we are experiencing rate pressure in the Middle East as a result of tonnage relocating into the market from Asia. With activity already high in the region, we don't anticipate a material improvement in the rates for some time. Mexico is another area where we are seeing rates adjust downward with the increase in available supply. From a market penetration standpoint, Brazil is likely going to remain one of the markets with the highest barriers to entry. With an improvement in activity and demand over the next few years, the first equipment that is likely to win work will be locally-built and flagged tonnage. Owners with equipment complying with these requirements will be the earlier beneficiaries of an improvement in that market, followed by owners of foreign-flagged vessels as supply tightens over time.

You talked about the new Tidewater's 'big lens' into the world markets. What does that lens tell you, why, and what could it mean for the sector as a whole?

We are seeing a few markets with relatively stable high utilization – such as the Middle East – as well as utilization improving in several markets with seasonally higher activity levels. With this being the case, rates have the potential to move higher, particularly given the limited number of currently inactive vessels that are still current with relevant class certifications and that are otherwise available to work on a prompt basis. With Tidewater's exposure to essentially all major offshore markets globally, we are not relying on one or two markets improving to make us successful.


DISCUSS
DEBATE
EXPLORE
BUILD
SNAME 2018
MARITIME
CONVENTION
October 24 - 27
Providence, RI
You Gotta
GO!
COMPLIMENTARY
EXPO-ONLY PASS
snameconvention.com/register
CODE: ME02

Marine Systems, Inc.



The E 23 (IMO II-EPA T3) and E 23B (IMO III-EPA T4F) are available in 8, 12, 16 and 20 cylinder configurations with power ratings from (1675 hp) to (5500 hp).
*"Please consult MSI for specific application ratings"

ABS · DNV·GL

TWO CYCLE ADVANTAGE

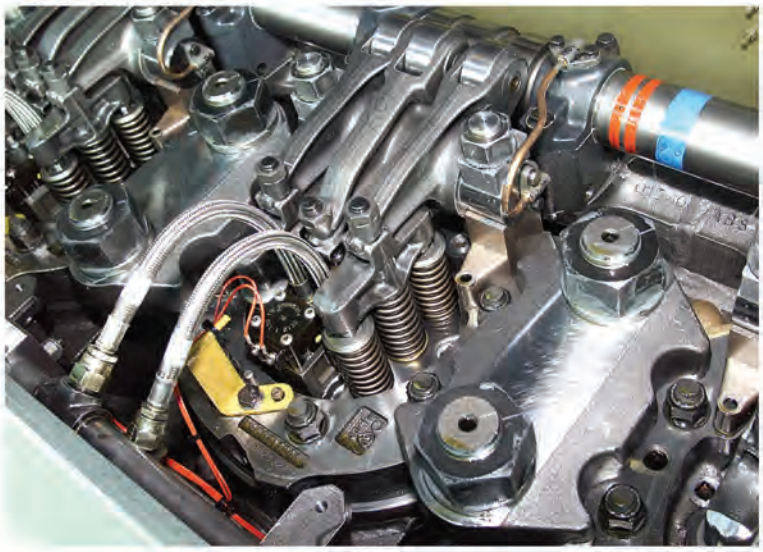
ENDURING DESIGN. LEGENDARY HERITAGE.

BEST IN-CLASS TRANSIENT RESPONSE

- E 23 offers the performance of a high speed engine with the durability advantage of a medium speed engine.
- Ample power margin throughout the entire operating speed range allows for optimized engine sizing and a single speed reduction gear.
- Avoids engine lugging under demanding vessel maneuvers.
- Accepts 100% block load in constant speed applications.

TOTAL COST OF OWNERSHIP ADVANTAGE

MAXIMUM UPTIME.



PARTS – LABOR – FLUIDS

Downtime is expensive. EMD engines are designed to minimize the amount of time needed for maintenance and repairs in order to maximize your productivity, keeping operational costs to a minimum.

- **Reduced fuel consumption over previous models due to EPA T4F / IMO III technologies and low idle speed.**
- **Easy non-invasive inspection of cylinder components for simple predictive condition-based maintenance.**
- **Simple overhauls to minimize downtime – Power Assembly (head, liner, piston, rod) can be removed and replaced as one unit.**
- **Closed loop dosing control system optimizes (Diesel Exhaust Fluid) DEF usage.**
- **No oil change required between overhauls unless indicated by oil sample analysis.**
- **Lowest life cycle cost per horse power / hours of operation.**

Ph: (985) 223-7100 • www.marinesystemsinc.com

ESI MARINE SYSTEMS, INC. MSI

Smarter Energy Policy
Will Broaden Offshore Recovery

By Randall Luthi


Luthi

For the past few years, depressed commodity prices, stricter regulatory requirements and competition from onshore development at home and from other countries offering attractive offshore lease and royalty terms have had severe impacts on new exploration in the U.S. Gulf of Mexico. Thankfully, the tide appears to finally be turning.

In August, Gulf of Mexico Lease Sale 251 drew increased competition for offerings and $178 million in high bids, $53 million more than previous sale held in March. The results of the August sale reaffirm the paradoxical state of an offshore energy industry in slow recovery mode; the future is bright, but shifting out of reverse takes time.

The operating environment in the Gulf shows tangible signs of improvement pointing to an industry that is poised to shift into high gear – oil prices are higher, rig rates and supply chain prices are more competitive, companies have improved the efficiency of their operations and revisions to overly burdensome regulations are in the works.

The Trump administration has introduced several major changes aimed at improving conditions offshore, a lower shallow-water royalty rate, upcoming revisions to the well control rule, pending updates to bonding and decommissioning requirements and a proposed expanded offshore leasing program.

In 2017, the Trump administration proposed expanding the offshore areas open to oil and gas exploration to include 90% of the U.S. outer continental shelf (OCS). The proposal includes 47 lease sales between 2019-2022 and would replace the Obama administration's restrictive 2017-2022 offshore leasing program, which needlessly locks up 94% of the OCS.

The National Ocean Industries Association (NOIA) has long advocated for expanded access to our nation's offshore resources. Having so much of our OCS closed to oil and natural gas development is incredibly shortsighted and puts the U.S. at a strategic disadvantage, especially as other countries, like Russia, China, Norway, Canada and Mexico are developing energy projects off their shores to meet rising global energy demand.

However, finding and producing oil and natural gas is only half the battle. In addition to increased access to the OCS and more lease sales, the U.S. needs a regulatory regime that encourages offshore energy development and companies need a clear and stable regulatory environment to turn raw resources into the energy that powers our daily lives.

Aiming to encourage producers to increase investment in the Gulf of Mexico, in 2017 the Trump Administration lowered royalty rates in shallow water areas from 18.75% to 12.5%. The deep-water royalty rate remains at 18.75%. The lower shallow water royalty rate seems to be having a positive impact toward revitalizing that segment of offshore energy development. Bidding activity in the August 2018 Gulf of Mexico lease sale showed renewed interest in shallow water tracts.

Progress is also being made towards reversing onerous additional financial security, or bonding, requirements issued by the Obama Administration in 2016. Implementation of the new requirements are currently on hold as the Bureau of Ocean Energy Management (BOEM) works on proposed revisions expected to focus attention on leases that


Credit: AdobeStock_DonVictorIO

lack a clear and financially secure chain of ownership. The proposal is expected to be issued by the end of this year.

Also expected out this year is a revised version of the blow out preventer (BOP) and well control rule also issued in 2016 by the Obama Administration. After industry expressed concerns that the rule included provisions that did not increase safety, but would rather increase risk, the Bureau of Safety & Environmental Enforcement (BSEE) issued an amended version in May 2018 seeking feedback from industry and the public. NOIA and allied trades submitted comments in August 2018 recommending that BSEE replace a prescriptive drilling margin requirement with a performance-based standard, requesting that BSEE align its proposed BOP revisions with the 21-day testing interval outlined in API Standard 53 4th Edition, and recommending that Real Time Monitoring be applied to operations using subsea BOPs and surface BOPs from a floating rig defined by API Standard 53.

The United States has an abundance of oil and gas and industry has the technology and the know how to tap these valuable resources. However, to keep up with growing energy demands, we will need all forms of energy, including offshore wind. With strong winds, a shallow continental shelf and close proximity to population centers, the Atlantic seaboard is driving strong interest in offshore wind development, and the offshore oil and gas supply chain stands to benefit. In fact, the construction and installation of Deepwater Wind's Block Island Wind Farm was aided by companies traditionally involved in offshore oil and gas work, including Montco Offshore and Gulf Island Fabrication, proving that offshore oil and gas and offshore wind can thrive together.

While the offshore energy future looks bright, not all segments of the offshore industry are seeing much increase in business currently. Changes must take effect to broaden the offshore recovery. Smart energy policy that includes increased offshore access, a regulatory regime that encourages and incentives offshore energy development will create jobs, spur broad offshore economic growth, strengthen our energy and national security and provide affordable and reliable energy for Americans and our allies.

Randall Luthi *is the President of the National Ocean Industries Association (NOIA), an offshore energy trade group located in Washington, D.C.*

Apples and Oranges When it Comes to Vessel Finance

Companies, lenders, and their auditors worldwide need vessel appraisals that can be relied upon when put into legal documents. As the offshore energy support markets awaken, this is more important now, than ever.

By Norman Laskay

Laskay

While a great deal of shipping finance is done at a 10,000' level, with bond deals and equity swaps, the value of the assets found on ground level are still very important. There are taxation issues, insured value, public reporting, and allocation of purchase price, where the value of individual vessels is important. Companies, lenders, and their auditors worldwide need vessel appraisals that can be relied upon when put into legal documents. How can an owner, lender, or auditor depend on values that may have been gathered from varied sources?

Uniformity in appraisal process started domestically with the collapse of the U.S. savings and loan market due to deregulation and fraud, among other causes. The involved parties, lenders and appraisers, in order to avoid direct government regulations, formed The Appraisal Foundation in order to self-regulate. This started in 1986 with multiple appraisal organizations starting to write the Uniform Standards of Professional Appraisal Practice (USPAP), and U.S. Congress, in 1989, passing the Financial Institution's Reform, Recovery, and Enforcement Act (FIRREA), officially making The Appraisal Foundation the overseer of appraisal standards and appraiser qualifications.

Today, in every state, any real property appraisal, residential or commercial, has to be done to USPAP standards by USPAP certified appraisers. While this began as the standard for real property, appraisal organizations followed suit and made USPAP the standard for any appraiser member, be they appraising gems and jewelry, antiques, factory equipment, construction equipment, entire factories or refineries, business organizations, or even intangibles, such as copyrights, patents, and stocks and bonds. Now U.S. banks have operational standards that require a USPAP compliant appraisal report for asset-based loans and other transactions that require auditing.

While the Appraisal Foundation and USPAP work well as a control within the United States, the scope of today's commerce has rapidly become worldwide. Abroad, a British group, the Royal Institute of Chartered Surveyors (RICS), which has been in existence for almost 150 years, has a set of ethics that are in many ways similar to USPAP. This is called the Red Book. While there are some RICS members all over the world, these scattered sources of unified organizational ethics cannot serve a financial web now connected to every country in the world.

This is where the apples and oranges come in. The United States and the United Kingdom have similar financial foundations and regulations, and with exceptions, a similar language. Once we move into many other countries, the similarities end. The Mideast looks at debt in a different way than the West. Japan has no history of asset based lending. So, how does a lender in London feel comfortable with an appraisal report from Zaire?

In the early 1980's, a group called The International Asset Valuation Standard Committee formed to develop consistent standards for worldwide real property appraisal. By 2008, it had morphed into the International Valuation Standards Committee. As of 2017, it included over 70 appraisal organizations worldwide, all who want their country and their appraiser members to have recognized appraisal reporting standards and ethics. When a lender anywhere in the world reads an appraisal report, they want to feel that the standards, language, descriptions, and ethics being used are apples to apples or oranges to oranges.

The current 2017 International Valuation Standards (IVS) are in most ways similar to USPAP and the RICS Red Book. While the ethics portions are very similar, the rules for the appraisal processes are not as tightly drawn to allow appraisers in some foreign countries to comply with local laws.

Beside the compliance with ethical standards and avoidance of bias, all compliant appraisal reports, be they USPAP or IVS, must be transparent so that even a third party reader can follow the process that developed the value or values, and even some well written appraisals may end up

being "cross-examined" by auditors in the case of appraisals involving ad valorem issues, allocation of purchase price in mergers and acquisitions, or other financial reporting situations.

While still rare, *Dufour, Laskay & Strouse* has seen requests for vessel appraisals from foreign banks that the appraisal report be IVS compliant. Having followed the formation of the international standards for almost a decade, compliance has not been a problem.

Though still not the worldwide standard, appraisal organizations in the major trading nations are moving to have their members, and their countries' laws, in line with the International Valuation Standards that produce ethical and transparent appraisal reports. Thus, all parties involved in an asset-based financial transaction can feel comfortable that the "apple," with its qualities in question, is indeed an apple.

Mr. Norman Laskay *is Of Counsel with Dufour, Laskay & Strouse, Inc., a full service marine surveying firm, with its main office in New Orleans, Louisiana. The company started in 1968 and has expanded its appraisal, insurance claim and cargo business and opened offices in Houston, Tampa, and Jacksonville. Laskay is a graduate of Maine Maritime Academy with a B.S. in Marine Transportation and has served as a deck officer for several Gulf Coast based steamship lines. He is a published author, has served on the Machinery and Technical Specialties (MTS) Committee of the American Society of Appraisers for 12 years where he is now an Emeritus member. He is also a Certified Marine Surveyor (CMS) with the National Association of Marine Surveyors (NAMS).*

On the Water:

Prime Career Opportunities for Women

By Heath Gehrke

Gehrke

Women make up only an estimated two percent of the global maritime industry. In the U.S., the statistics are a little better, with less than eight percent of ship and boat captain operator roles held by women. Still, for a female to have the opportunity to train up to ship captain is considered "unique." However, as predictions are being made that there will be a shortage of more than 140,000 deck or ship officers worldwide by 2025 (BIMCO/ICS), we will see more accomplished women take the helm and lead the industry forward. In fact, that's already happening.

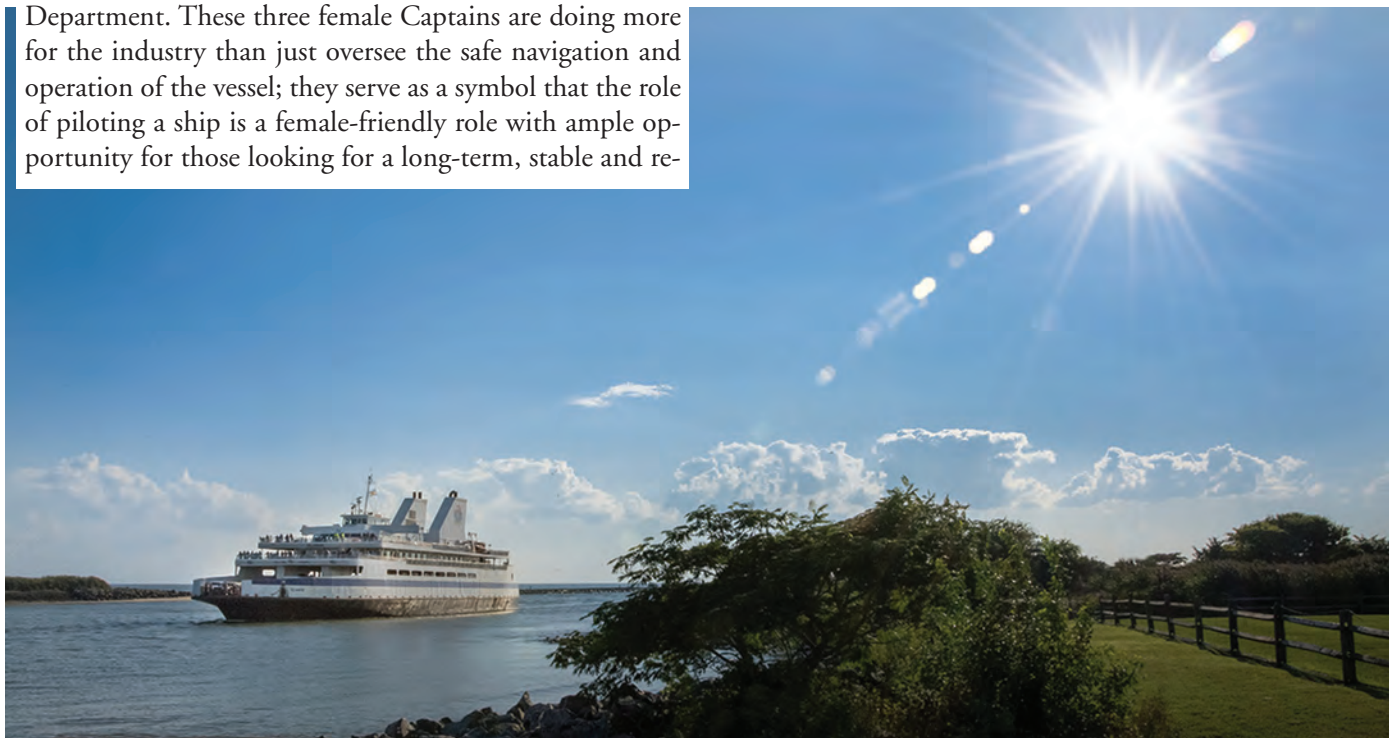
The Center Porthole

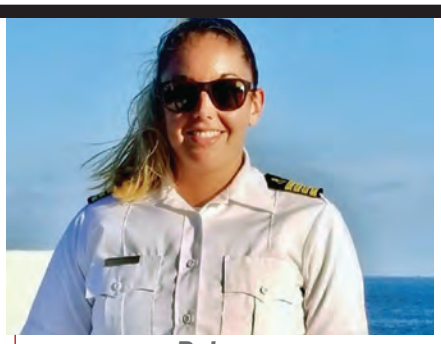
This past June, the Cape May-Lewes Ferry, made history by promoting three women: Meghan D. Palmer of North Cape May, and Melissa Velli and Sharon Lyn Urban, both residents of Cape May, to rank of Captain in the Marine Department. These three female Captains are doing more for the industry than just oversee the safe navigation and operation of the vessel; they serve as a symbol that the role of piloting a ship is a female-friendly role with ample opportunity for those looking for a long-term, stable and rewarding career path.

As Captains, Palmer, Velli, and Urban have earned all the requirements and qualifications to lead the entire vessel and crew, with each possessing a United States Coast Guard (USCG) Inland Masters License of unlimited tonnage and USCG First Class Pilot upon the Delaware Bay License of unlimited tonnage. Both Urban and Velli joined the Cape May–Lewes Ferry marine department as Ordinary Seamen in 1997 and 2003, respectively. They rose through the ranks – up the hawsepipe – serving as Able-bodied Seaman and Mate prior to their recent promotions. A graduate of the U.S. Merchant Marine Academy, Ms. Palmer was hired at the Ferry in November 2011 as a seasonal Able-Bodied Seaman. In addition to a Bachelor of Science degree in Logistics and Intermodal Transportation, Ms. Palmer also earned an Ocean's Unlimited Tonnage Third Mate's License during her time at the Academy.

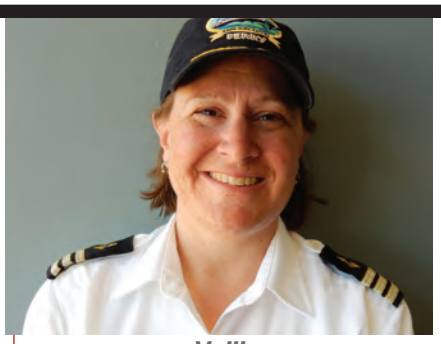
Big Roles; Capable Mariners

Palmer, Velli, and Urban are able to "sail up" as Captain





Palmer



Velli

Urban

when needed, supporting the three full-time Captains who service the Cape May-Lewes Ferry fleet which includes the M/V Cape Henlopen, M/V New Jersey and M/V Delaware. They are responsible for supervising the loading and discharging of vehicles and patrons on the car deck, serving as the on-scene leader during onboard drills and emergencies, completing the required records and logs during a shift, as well as assisting the Captain with overall vessel management. Each vessel can carry approximately 800 passengers and 100 vehicles on any one journey, with a crew consisting of ten marine personnel ranging from captain and chief engineer to ordinary seaman.

Recently, more women are being spotlighted in this role. On April 19, 2018, Ferry history was made with the first all-female bridge crew navigating across the Delaware Bay with Captain Sharon Urban and with Melissa Velli serving as Pilot, and Helmsman Paulette Nickels. Beyond the Delaware Bay, Fire Island Ferries in New York has crews composed entirely of female captains and deckhands, with women making up about a third of its summer staff of 200. All-female crews can be found on the Davis Park Ferry, from Patchogue to Fire Island, Sayville Ferry and North Ferry, from Greenport to Shelter Island. And the NYC Ferry has women making up 40 percent of the maritime workforce.

Unlimited Opportunity

For those who are willing to learn, or may have pulled themselves out of traditional career tracks, the opportunity for upward mobility is there. The industry is one where you can work your way up regardless of schooling or degrees. For example, Captain Sharon Urban started her career in food service, joined the Ferry crew and worked her way up the ranks.

Today women are breaking barriers in the maritime industry—they can have a successful career in seafaring while living a lifestyle that allows them to have a family and be home at night. As the industry experiences a large portion of the workforce approaching retirement, and local hires become more difficult to find, we must welcome this new talent with open arms.

***Heath Gehrke** is the Director of Operations for the Cape May – Lewes Ferry. He manages a staff of over 350 permanent and seasonal employees. He is a licensed U.S. Coast Guard Master and a Commander in the U.S. Naval Reserve.*

OFFSHORE OPTIMISM is Cautiously on the Rise

Credit: BSM

Following the path of oil prices, consolidation also follows myriad financial crises. What happens next isn't altogether clear, but the long, deep trough for offshore energy may finally be in our choppy wake.

By Barry Parker

In mid 2017, financial turnaround and financial repairs specialist Alix Partners made a bold statement regarding the beleaguered Offshore Service Vessel (OSV) marketplace. In a July 2017 report, following an analysis of 44 participants in the business, the restructuring team wrote: "The industry faces grave financial pressure, which is clear from recent bankruptcy filings and distressed mergers … Exploration and production (E&P) companies have drastically reduced their rig counts, causing demand for OSV services to plunge."

After slogging through considerable OSV doom and gloom, they added, "On the bright side, positive trends including M&A opportunities, effective cost reductions, and stronger capacity discipline are on the rise." Elaborating on business combinations, Esben Christensen, Managing Director and co-leader of AlixPartners' shipping team, remarked, "Operators who leverage the current market situation to successfully trim their balance sheets are likely better positioned to withstand a prolonged downturn and ultimately potentially drive the consolidation so badly needed within the sector." These prescient words are arguably coming home to roost.

GETTING FROM THERE TO HERE

Offshore exploration activity will depend on an amalgam of spot prices (driven by supply and demand) and the future outlook (as pictured in the "forward" pricing curves for oil futures and swaps). In broad terms, when spot prices are high, forward expectations also rise. Companies will then invest – including in exploration which drives OSV demand and newbuild activity – this happened with a vengeance in the period from 2011 to 2013. Like all maritime segments, the pendulum swings both ways; when oil prices fall, producers pull back on exploration and, where they can, they will "shut in" wells – freeing up capacity serving production, subsea well service, and others like seismic.

With falling prices in 2014 through early 2016, the large scale stacking of rigs and vessels serving the fields was inevitable. After OPEC opened its spigots in late 2014, spot prices plunged, reaching a nadir in early 2016, when prices for marker grades West Texas Intermediate (WTI) and Brent both bottomed at about $27 to $28/bbl. Oil production onshore was surging, even at the low prices, with a "contango" structure where prices for future delivery were

The Maritime Industry's Largest Social Media Presence

Maritime Reporter is a member of the Marine Media Network of websites, publications, and social media sources for news, editorial and information including the Maritime Network, the commercial marine industry's largest dedicated Linkedin group.

63,523
Facebook Page Likes

MARITIME REPORTER AND ENGINEERING NEWS

130,096
Linkedin Group Members (industry's largest)

THE MARITIME NETWORK

31,453
Twitter Followers

@ShipNews

Also part of the Marine Media Network

Page	Likes
Marine Electronics	33,528
Marine Technology Reporter	55,692
Maritime Global News	26,157
Maritime Jobs	46,011
Maritime Logistics Professional	30,947
Maritime Propulsion	22,477
Maritime Reporter & Engineering News	63,515
World Energy News	49,498

All stats from 01/02/2018

Credit: Harvey Gulf

down from 2011-2013 levels, but still exceeding those for nearby consumption. All stockpiles were filling up to the brim; and "floating storage" buoyed hires for large tankers.

But with low nearby prices portending a seemingly bleak future, offshore exploration was put on hold after the price plunge. The drop in E&P spending was dramatic, with Alix Partners writing (in Spring 2017), "… the total global E&P spending on OSV's has declined from USD $18.1 billion in 2014 to USD $14.8 billion in 2015 and USD $11.9 billion in 2016. That is a staggering 34% decline in just two years. Rates are down 60-65% in some markets, and utilization is down 40%." In early 2018, even as the upward move was clear, Rune Olav Pedersen, the CEO of Oslo-listed seismic exploration specialist PGS, told investors: "Faced with a lower oil price compared to 2014, our customers have changed their priorities."

The production and inventory data provide the backdrop for this story. Statistics from the U.S. Energy Information Administration (EIA) peg overall world oil production at 90.78 million bbl /day (mbd) in 2012, with a miniscule rise up to 91.28 mbd in 2013. The following two years saw production surge dramatically to 93.79 mbd in 2014 (a gain of 2.51 mbd) and 96.7 mbd 2015 (a gain of 2.91 mbd). Inventories swelled during this time; data

TIDEWATER – GULFMARK – HARVEY GULF INTERNATIONAL MARINE

Along the way to the $80/barrel oil that we saw this past Spring, the dire predictions of Alix Partners (which advised Tidewater in its restructuring efforts and also spearheaded the $3.8 billion reorganization of ultra-deepwater semisub and drillship owner Ocean Rig) were spot on. The "consolidation" piece, where companies combine, is now beginning to play out. If there was any doubt about the strengthening market, one need not look any further than at a bidding war emerging among three OSV owners in the U.S. Gulf.

In mid July, 2018 news emerged that Tidewater had made a "share for shares" merger deal to acquire Gulfmark Offshore equity, to be paid for with newly issued Tidewater shares. The two companies estimated that the value, to Gulfmark shareholders being bought out, at approximately $340 million; if the deal moves ahead, $100 million of Gulfmark debt would be repaid. The combined company would have the world's largest fleet of PSVs and anchor handlers, with 245 units (eclipsing Bourbon Corporation, which controls 185 units).

There are "subjects" on the deal. Tidewater shareholders must approve plans to issue more shares and GulfMark holders must vote to accept the shares; these votes would occur in late summer. In early August, another company that had re-emerged from a pre-pack bankruptcy, the privately held Harvey Gulf International Marine (HGIM), threw its hat into the ring with an unsolicited bid. HGIM was suggesting a "reverse merger" plan where it would acquire the already listed Gulfmark, for what HGIM estimated to be a nearly $80 million premium above the competing play. The situation is complex and the two offers don't lend themselves to an "apples to apples" comparison. Thus, it's not simply a matter of Gulfmark holders selling to the highest bidder. First, they must turn down the existing deal already negotiated.

Beyond this, and for its part, GulfMark issued a release that said, in part, "The GulfMark Board of Directors, with the assistance of outside financial and legal advisors, will review the Harvey Gulf unsolicited proposal in a manner consistent with its fiduciary duties and in compliance with its obligations under its merger agreement with Tidewater. GulfMark's Board has not made any determination as to whether the Harvey Gulf unsolicited proposal constitutes, or could reasonably be expected to result in, a "Superior Offer" under the terms of the Tidewater merger agreement.

At this time, the GulfMark Board of Directors continues to believe that the Tidewater merger is in the best interest of GulfMark stockholders and continues to recommend that GulfMark stockholders adopt the Tidewater merger agreement at the special meeting of GulfMark stockholders to be scheduled for this fall." **– Stay Tuned**.

Tidewater, Harvey Gulf and GulfMark Fleets

Owner	No Vessels	Av Age	Total Market Value
Tidewater Marine	208	10.2	$ 1,058
Harvey Gulf Marine	63	7.2	$ 836
GulfMark Offshore	66	11.2	$ 342

Owner	No Vessels	Av Age	Total Market Value
Tidewater & Gulfmark	274	10.7	$ 1,400
Harvey Gulf & Gulfmark	129	9.2	$ 1,179

GULF OF MEXICO

The bidding war for GulfMark Offshore is evidence of vitality in the offshore business generally; both Tidewater and GulfMark have worldwide footprints. Consultants Westwood Energy offered a view of the strength closer to home in their mid-August report, entitled *'Don't Look Now, But the Gulf of Mexico Jackup Market is Doing Pretty Well.'* Of course, it's all relative; while their measure of utilization for jackups in the U.S. Gulf has risen from a meager 21% at the beginning of 2018, to 44% in August, the improvement is far short of the 60%+ utilization seen in 2012 to early 2014. Terry Childs, from Westwood's RigLogix unit, projecting ahead to 2019 writes: "In a market where well-to-well contracts have generally been the norm, having nearly 70% of the fleet with 7-8 months of backlog is a welcome development for rig owners." As shallow water exploration activity (the bread and butter for the three legged fleet) kicks back in, demand for the vessels to serve them will also be rising.

compiled by the International Energy Agency (IEA) shows that stocks among its members (developed countries) had stood at around 2.7 billion barrels throughout 2012, 2013 and into the middle of 2014. By mid 2015, OECD stocks approached 2.9 billion barrels, with levels hovering at near 3.1 billion barrels well into 2017.

Even as the oil price turned upward, activity did not instantly return to the markets, as inventories (built up in 2014 and 2015) needed to be worked down. The EIA data shows meager worldwide production growth in 2016 and, following OPEC production cuts, in 2017, of 0.48 mbd (to 91.18 mbd) and 0.83 mbd growth (to 98.01 mbd overall).

For offshore exploration outfits, first and then for other offshore service providers, the situation was dire throughout the globe, with the nadir occurring in 2017, though early signs of trouble ahead were seen in Singapore. Following a tense summer of 2016, Swiber, a listed company, entered into "Judicial Management" (similar to "Administration" – in this case recently extended through November, 2018). A month later, in Norway, three firms- controlling 152 OSVs among them, Deep Sea Supply, Farstad Shipping and Solstad Offshore, agreed to merge. By May, 2017, a new company, rebranded as Solstad Farstad, listed on the Oslo Stock Exchange (active in the North Sea but also in the Mediterranean and Asia), emerged. In March 2017, another Singapore listed OSV owner, Ezra Holdings, filed for Chapter 11 bankruptcy in the U.S. The case is still grinding through the U.S. bankruptcy courts. In France, Bourbon Corporation, presently controlling the sector's largest fleet, reached a deal with its capital providers in April 2018. It can buy time, positioning for the market recovering, by temporarily delaying servicing its loans and leases, and defering interest payments to bondholders.

Esben Christensen, Managing Director and co-leader of AlixPartners' shipping team

Shane Guidry, CEO of Harvey Gulf International Marine, LLC

Among the U.S. listed players, GulfMark International took the a "pre-packaged" Chapter 11 bankruptcy route in a May 2017 filing, and came out the other end six months later, in November. In this arrangement, $429.6 million of outstanding bonds were converted into equity, with $125 million of new equity capital raised. The much larger Tidewater Inc. (NYSE: "TDW") had seen its business decline to the point of being forced to enter into a similar pre-packaged bankruptcy filing, also in May 2017, with its restructuring of approximately $1.6 billion of debt finalized two months later.

Separately, Hornbeck Offshore Service (NYSE: "HOS") dodged the bankruptcy bullet with very adept financial footwork. In June 2017, it refinanced its $200 million credit facility with a new credit facility providing for up to $300 million of term loans. Importantly, the "runway was extended"; the new credit has a maturity in 2023 – three years farther into the future than the first set of loans.

BRIGHTER OUTLOOK

Fast forward to 2018: the offshore oil world has continued to see a brighter outlook, after a multi-year stretch of reduced activity, and oversupply. Market strength is slowly bringing increased activity offshore, especially vessel-intensive exploration. Amidst talk of OPEC increasing its production (lest prices move above the $70-$80/bbl "sweet spot" for developed economies), inventories had retreated to levels below their 5 year averages, with overall OECD stocks (as reported by IEA) now at to around 2.8 billion barrels. The EIA production estimate for overall 2018 (part actual and part forecast) shows a healthy gain to 100.16 mbd (output gain of 2.15 mbd), and a further gain in 2019 up to 102.54 mbd overall production (a gain of 2.38 mbd).

Looking to the future, where OSV activity typically lags Final Investment Decisions (FID), the brighter outlook translates into real future business prospects. Consultants

Rune Olav Pedersen, CEO of Oslo-listed seismic exploration specialist PGS

Rystad Energy, in a June 2018 'Oilfield Service Outlook,' say "… at $75 oil have resulted in a pick up of the global oilfield service industry. Investments will rise and oilfield service purchases will grow on average by 8% towards 2021." The Oslo-based expert adds: "The current tailwind in the oil market is likely to propel 100 new offshore projects to be sanctioned in 2018. This compares to only 60 projects in 2017 and less than 50 in 2016."

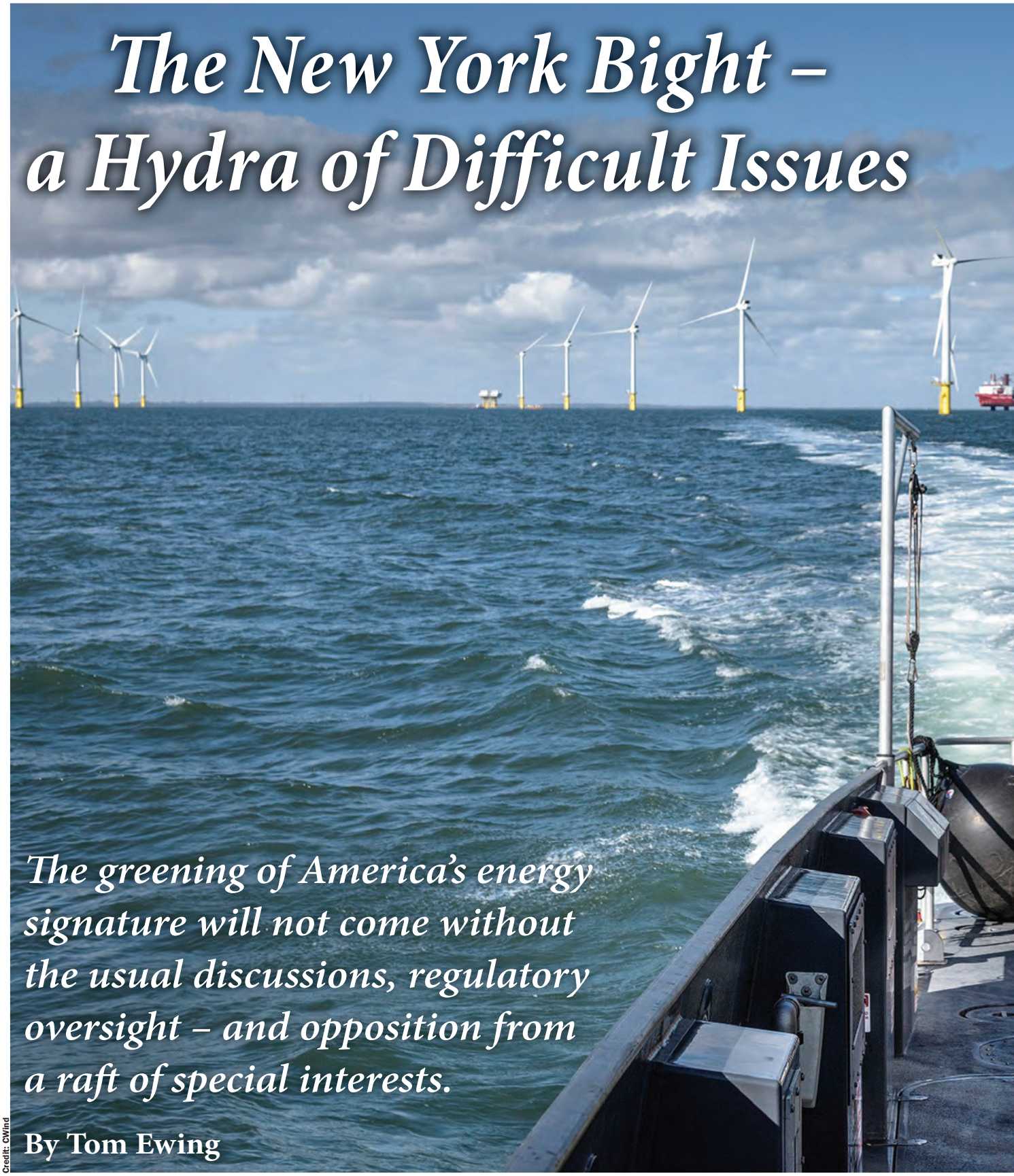
The service providers are feeling the optimism. In a late July earnings conference call, reporting 2018 Q2 results, Patrick Schorn, Schlumberger's Executive Vice President, told investors: "… once the recovery starts, we obviously start seeing it on land and we clearly are now having very clear evidence of what is happening in the shallow offshore … Equally, we are preparing ourselves further for deepwater to start gaining as well." Similarly, the re-organized Baker Hughes ("BHGE"), its Chairman/ CEO, Lorenzo Simonelli, told listeners on its Q2 call "… as I go around and also speak to the customers and as you look at people starting to firm up their plans for 2019, you are starting to hear more about CapEx increases and projects moving forward."

THE SHAPE OF THINGS TO COME

Interestingly, in announcing its 2017 re-financing, Hornbeck said: "The New Credit Facility may be used for working capital and general corporate purposes, including the acquisition of distressed assets and/or the refinancing of existing debt, subject to, among other things, compliance with certain minimum liquidity (cash and credit availability) requirements." Reinforcing that train of thought, In April 2018, Hornbeck bought four OSV's from Aries Marine, a supply boat operator based in Lafayette, Louisiana.

Barry Parker, bdp1 Consulting Ltd provides strategic and tactical support, including analytics and communications, to businesses across the maritime spectrum. The company can be found online at www.conconnect.com

The New York Bight – a Hydra of Difficult Issues



The greening of America's energy signature will not come without the usual discussions, regulatory oversight – and opposition from a raft of special interests.

By Tom Ewing

Credit: CWind

Amidst an atmosphere of possible resurgence in the domestic offshore oil energy, maritime stakeholders are also reminded that there is more than one kind of energy available for development off the four collective coasts of the United States. That process is underway in the Great Lakes; it has already happened off of New England. To that end, and last April, the Department of the Interior's Bureau of Ocean Energy Management (BOEM) published a 'Call for Information and Nominations.'

This 'Call' started a formal process for BOEM to gather information about developers' interest in commercial wind energy leases in the Atlantic outer continental shelf. More specifically, this meant within sections of the New York Bight, the portion of the Atlantic extending northeasterly from Cape May Inlet in New Jersey to Montauk Point on the eastern tip of Long Island. The comment period was first set to close at the end of May, but it was extended to the end of July.

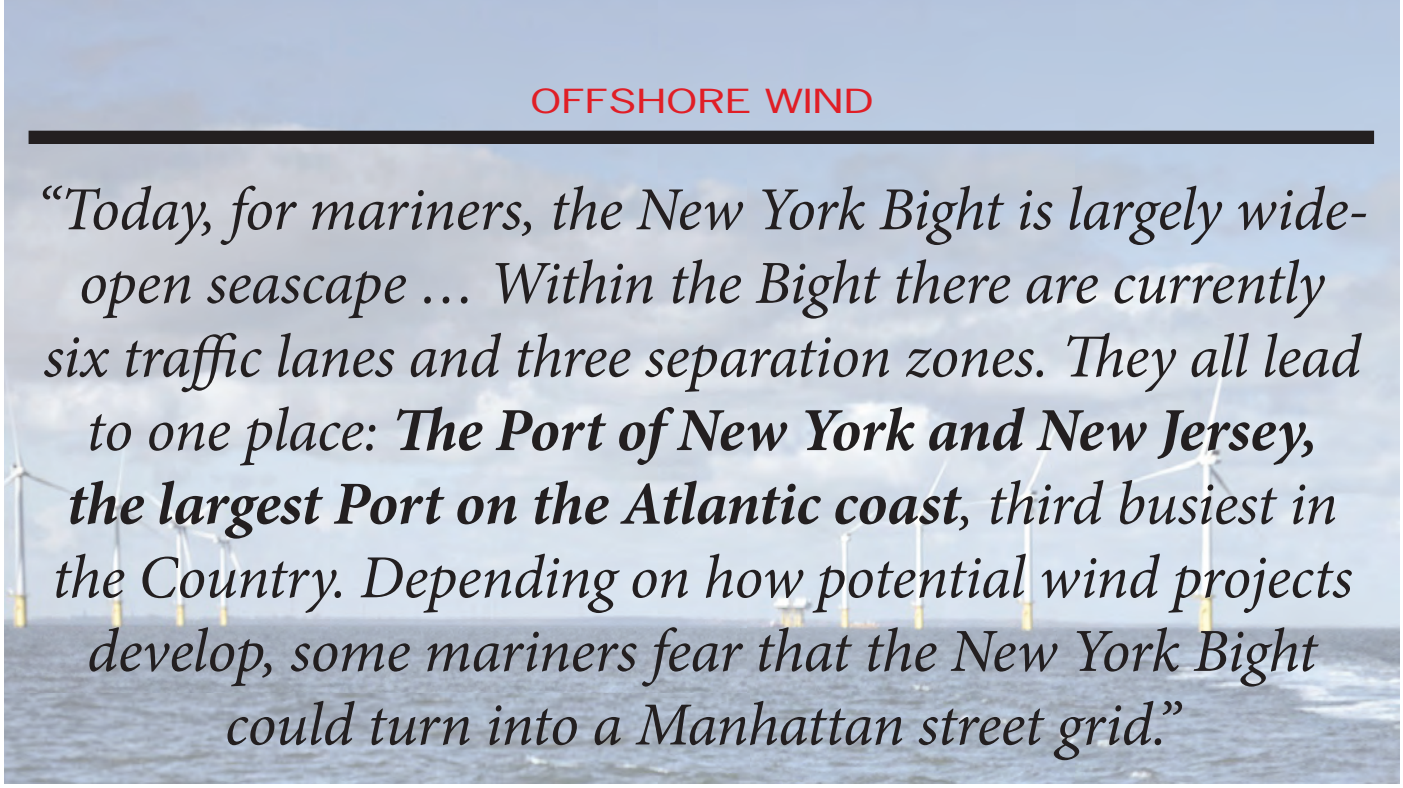
BOEM will use the comments to first gauge the interest among energy project developers, and secondly, to assess the broader concerns associated with possible wind energy projects within the Bight. There already is interest in this set of Call Areas. In December 2016, for example, BOEM received an unsolicited lease request from PNE Wind USA, Inc. (PNE) for 40,920 acres offshore New York. PNE seeks a lease to develop a 300–400 MW project, primarily within the Call Area Fairways South. Beyond this, BOEM's map lists Statoil, US Wind and Ocean Wind as also having interests in various lease areas.

Curiously, offshore wind – that long awaited renewable source of energy – has as many detractors as its dirtier fossil fuel cousins.

Stepping into the Bight

Potential wind energy areas (WEAs) comprise just a portion of the total Bight. Nevertheless, it's a big portion, approximately 2,047 square nautical miles. The Call Areas were developed in conjunction with New York State's interests in getting started on offshore wind energy projects. BOEM writes that "based on a power density ratio of 0.01 megawatts (MW) per acre, New York's goal of procuring 2.4 gigawatts (GW) of offshore wind energy by 2030 could likely be accommodated by developing just 14% of the call areas presented. Development of approximately 18% of the Call Areas would be required to meet New York State's recommendation that BOEM designate four 800 MW lease areas (3.2 GW of capacity)."

Today, for mariners, the New York Bight is largely wide-open seascape. Navigationally, though, it does have limits. The entire length of Long Island, for example, on the At-



"Today, for mariners, the New York Bight is largely wide-open seascape … Within the Bight there are currently six traffic lanes and three separation zones. They all lead to one place: ***The Port of New York and New Jersey, the largest Port on the Atlantic coast****, third busiest in the Country. Depending on how potential wind projects develop, some mariners fear that the New York Bight could turn into a Manhattan street grid."*

lantic side, is a "regulated navigation area." A "precautionary area," SE of Cape Cod, starts [two] 250 mile east-west traffic lanes and a formal separation area which lead directly into the Call Areas. Within the Bight there are currently six traffic lanes and three separation zones. They all lead to one place: The Port of New York and New Jersey, the largest Port on the Atlantic coast, third busiest in the Country. Depending on how potential wind projects develop, some mariners fear that the New York Bight could turn into a Manhattan street grid.

As one would expect, BOEM sought comments from a wide range of ocean-related interests. Just some of these stakeholders can be seen in figure 1.

At the close of the comment period, BOEM had received 130 comments. Most of the comments, indeed, express support for off-shore wind energy but that support is almost always followed by a big "BUT," contingencies and caveats qualify almost every comment. With BOEM, the NY Bight Call presents as an energy project. In fact, it's a tangle of projects. For the maritime industry, the NY Bight Area Call portends a set of issues that mariners will be confronting again and again for years to come. It is worth a look at Figure 1(below) to understand the issues and what's at stake.

What's at Stake

BOEM coordinates with the U.S. Coast Guard (USCG). Readers may recall that in 2015 the USCG completed its Atlantic Coast Port Access Route Study, a set of Marine Planning Guidelines (MPG) that recommended a 2 nautical mile (nmi) parallel buffer between the outer or seaward boundary of a traffic lane and offshore structures, and a 5 nmi buffer for a Traffic Separation Scheme entry or exit. Based on these MPGs, BOEM writes that some portions of the Call Areas may be placed off limits depending on information received about safety and historic routes of vessel traffic.

The Coast Guard's Call Area comments are written by George Detweiler, Office of Navigation Systems, but signed by Michael D. Emerson, Director, Marine Transportation Systems (MTS). Detweiler writes that the Coast Guard has "several equities" tied to offshore renewable energy. Top concerns include:

- **Implementing and undertaking basic CG duties:** *protecting infrastructure, emergency management, navigation safety, and maritime security. "The Coast Guard will adapt to the changing environment in order to accommodate maritime commerce," Detweiler writes, "but will generally oppose priorities that place undue strain on the MTS,*

Figure 1

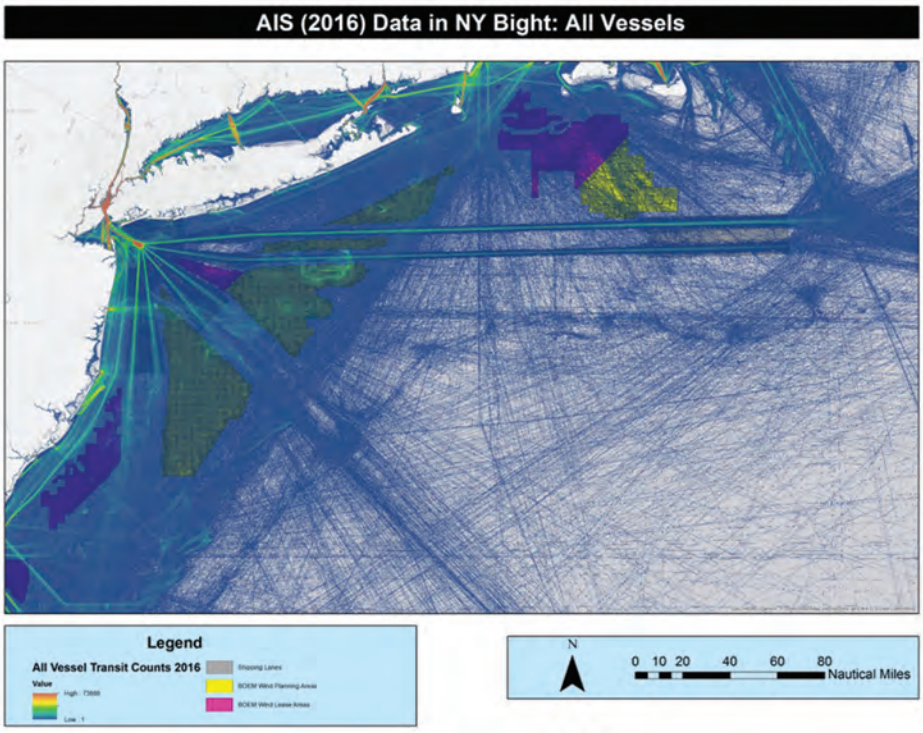
Fisheries	Navigation	DoD and USCG Training Areas
Avian Species	Recreational Port-to-Port Transit	Bathymetric Conditions
Marine Protected Species	Port-to-Fishing Location Transit	Cables
Visual Impacts	Commercial Vessel Port-to-Port	Other Existing Infrastructure

reduce navigation safety or impede execution of our statutory missions."

- **Operationally, the Bight presents complicated maritime territory:** *Detweiler's comments include six schematic maps – pictures worth at least a thousand words – to demonstrate how heavy this traffic is and the constancy of vessel routes. (See AIS 2016 Data in NY Bight.)*
- **The Ports and Waterway Safety Act:** *authorizes the CG to designate shipping fairways that keep areas free of fixed structures. The Call Area request comes at a time when the Coast Guard is developing a regulatory initiative to convert traditional high-density maritime traffic routes into shipping safety fairways.*

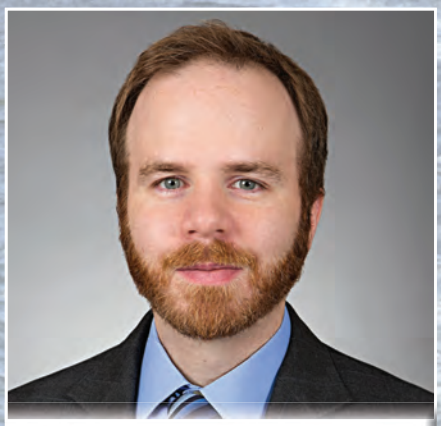
Maritime trade groups are closely watching these energy related developments. Brian Vahey is Senior Manager, Atlantic Region for The American Waterways Operators (AWO). A particular concern for Vahey is tug movements from Barnegat, NJ (20 miles north of Atlantic City) to Montauk, on the eastern tip of Long Island. This transit is a common, northeast routing that cuts through almost the middle of the proposed wind energy areas. Vahey notes that BOEM seeks to accommodate traditional tug routes heading to New York Harbor and he suggests a similar carve-out for traffic from mid-New Jersey to Long Island, suggesting a 9-nm-wide lane through the proposed WEAs.

That suggestion might make sense from a maritime safety and efficiency standpoint, but at the same time, it highlights tough policy questions: how much ocean territory can you place off limits and still meet the parameters necessary for affordable, large-scale yet efficient (not to mention clean and renewable) energy production? To what extent should one



Michael D. Emerson,
Director, Marine Transportation Systems (MTS)

Edward J. Kelly,
Executive Director of the Maritime Association of the Port of NY/NJ



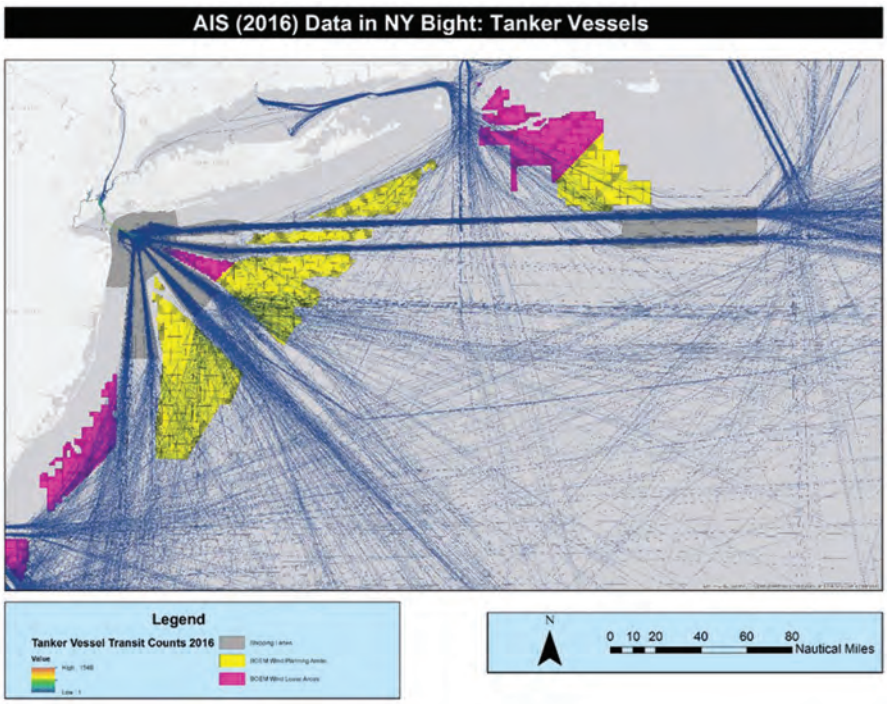
Brian Vahey,
Senior Manager, Atlantic Region, American Waterways Operators

set of concerns take priority over another?

Edward J. Kelly is Executive Director of the Maritime Association of the Port of NY/NJ. Kelly cites many Call Area issues needing close attention. Kelly asks BOEM to make the safety of marine navigation "the overriding factor when considering offshore development."

Kelly refers to what he calls "funneling," compressing vessel traffic into smaller and increasingly limited spaces. These smaller spaces present new challenges and risks, from operational and speed changes to, of course, collisions with other vessels or energy structures, a calamitous prospect for any vessel but one with particularly ruinous overtones for an accident involving oil shipments. Mariners could try to avoid restricted spaces by operating further offshore, again, though, that presents consequences.

Kelly cites another concern likely not too familiar to the general public. He notes that many of the proposed WEAs are located where large vessels must transfer from heavy fuel to low-sulfur fuel "and in the event of even a temporary power loss, will be subject to immense sail-effect and sea-surface drift potential." To his point, the state of California, an early adopter of the so-called ECA areas that Kelly references, had more than its share of 'loss of propulsion' incidents. Arguably, the teething era for that sort of thing is coming to an end.



Separately, the North American Submarine Cable Association adds its own perspective to the discussion, saying, "Renewable energy projects on the New York Bight OCS pose significant risks to submarine cable infrastructure. Submarine cable installation, operation, and maintenance activities require spatial separation from other cables and other marine activities – including offshore wind projects – as recognized by various industry standards and recommendations. Absent

sufficient spatial separation and coordination, wind energy projects threaten submarine cables with direct physical disturbance and impaired access to submarine cables both at the surface (for cable ships) and on the seafloor (for cables)."

Meanwhile, Rutgers University, since 1992, has operated the Rutgers Center for Ocean Observing Leadership (RUCOOL) focusing on "understanding the interactions between physics, chemistry, and biology in the world's ocean and the corresponding impact on human society." The Center presents analysis on a number of Call Area issues, from projected wind speeds to fisheries.

Rutgers' expansive comments touch upon many things, including the domino-like line-up of issues characterizing the start-up of a new industry. "The High Frequency (HF) Radar Network operated in the Mid Atlantic, utilized by the US Coast Guard (USCG) for search and rescue and by NOAA for oil spill response, will be impacted by the deployment of offshore structures. These impacts can be mitigated with real-time information on the turbine movement."

Over the Horizon, but on the Radar

Next steps for BOEM, according to a spokesperson, include staying in touch with affected states and stakeholders to identify potential offshore wind development sites. BOEM is analyzing the comments and nominations that submitted in response to the Call. This Fall, BOEM will hold public meetings with affected stakeholders to discuss the feedback received and the analysis as it stands at that time.

At a time when offshore wind finally seems ready to flourish on this side of the pond – decades after it has been proven at least operationally feasible offshore Europe – it is also clear that the regulatory process that would allow it to happen will be no less onerous than that which has historically dogged the oil industry. It might just prove to be harder.

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

Fouling Control on Workboats

As the domestic offshore energy industry stirs ever so lightly, the task of reactivating long-dormant vessels – some with extensive hull fouling – will become Job ONE. That's easier said than done.

By Buddy Reams

CARE AND PRESERVATION OF SHIP HULLS: WORKBOATS VS. DEEPWATER VESSELS

Never before has there been such a wealth of data on the processes relating to the fouling of ship hulls. The formation of biofilms and subsequent micro- macro-and biofouling has been examined in minute detail and the effects of various coatings have been carefully documented for many classes of ships and marine environments.

The relation of hull condition to fuel efficiency has also been examined in detail. For oceangoing vessels, there are opposing processes: on one hand, the faster the ship moves through the water, the slower the growth of marine life on the hull; on the other hand, the more marine life grows on the hull, the more resistance against ship speed.

It has been estimated by the Clean Shipping Coalition that a fuel savings of 15 to 20 percent could be realized if the "best available" coating technology were matched to vessels, properly applied and maintained. The corresponding decrease in emissions is also worth considering. Even a small amount of smooth surface disruption on a ship propeller or hull can produce enough turbulence to reduce fuel efficiency. Hence, the motivation for controlling hull fouling is significant.

Another important consideration is the effects of biofouling on the marine ecologies of ports. The deepwater vessels that transport cargo across vast oceans also have a propensity to transport viable marine life. These invasive species can upset the regional ecologies and the mechanisms for transporting these are regulated by the International Maritime Organization (IMO).

Herein lays the important question: how much fouling can be tolerated by deepwater vessels as compared to workboats? The key elements include hull efficiency, and the effort to reduce emissions, and the other is Invasive Aquatic Species (IAS).

DEEPWATER CONCERNS

The IMO has established comprehensive guidance with respect to biofouling. For oceangoing vessels, it is critical for all stakeholders – ashore and on board – to keep hulls free from fouling. This impacts both economic and environmental bottom lines. Ballast tanks also need to be managed, as these can be breeding grounds for invasive species;

Sailor scraping barnacles from the bottom of a rigid-hull inflatable boat aboard an aircraft carrier.
U.S. Navy photo by Mass Communication Specialist Seaman Apprentice Christopher Frost/Released

a much greater challenge for deepwater vessels compared to brown water workboats.

One resource available to ship owners regarding this issue is the encyclopedic nature of catalogues of marine species that are observed on ship hulls by various research organizations. Another resource is the 2017 pictorial standard for underwater evaluation of biofouling, published by NACE International, which is designed to facilitate more consistent descriptions of the degree of biofouling on a vessel hulls. No less important is the impact of fouling and biofouling on anticorrosion coatings. Hence, the newly released standard practice authored by NACE is an essential tool for marine corrosion specialists.

According to the standard, "the rates of biofouling accumulation vary considerably, depending on the suitability, age and physical condition of the coating system(s) applied to the hull, the voyaging, anchoring and lay up patterns of the ship, and the geographical regions where these take place." Therefore, the need for a pictorial standard and knowledgeable marine corrosion engineers to evaluate the conditions of coatings of ships is imperative.

For deepwater vessels, both fuel costs as well as the rapidly evolving enforcement of BWTS installations encourages timely and close attention to management of coatings. On the other hand, workboat coating management can be haphazard because increases in fuel costs may be tolerated as the transport of invasive aquatic life is typically not an issue.

There is less margin for error with deepwater vessels as compared to workboats. Sophisticated coating technologies are carefully selected, applied and monitored. Ocean-going vessels incur huge losses when in port not only because of lost revenue but also because the increased potential for fouling and corrosion when not in use.

WHAT ABOUT WORKBOATS?

The typical operating profile of a workboat differs greatly from deepwater vessels. Workboats can include slow speed and layup vessels as well as medium-range vessels with speeds up to 20 to 25 knots. They can include coastal tug and barge fleets as well as cruise boats and ships for the military where there are long lay-up periods.

Regardless of the class of vessel, fouling control is essential to hull maintenance. The common denominator between workboats and deepwater vessels is the care and preservation of the hull. Fouling and biofouling can shorten the life of anticorrosion coatings, requiring expensive downtime and shortened life cycles of workboats. In this regard, there is little difference between coatings for workboats and deepwater vessels. That said; workboats typically have easier and more frequent access to divers and hull cleaners.

If the owner of a workboat entrusts the application of coatings to unskilled or unqualified contractors, the reliability may be compromised from the outset. Even though the same high-quality coating may be used as on a deepwater vessel, the reliability of that coating is highly dependent on its proper application.

TYPES OF COATINGS

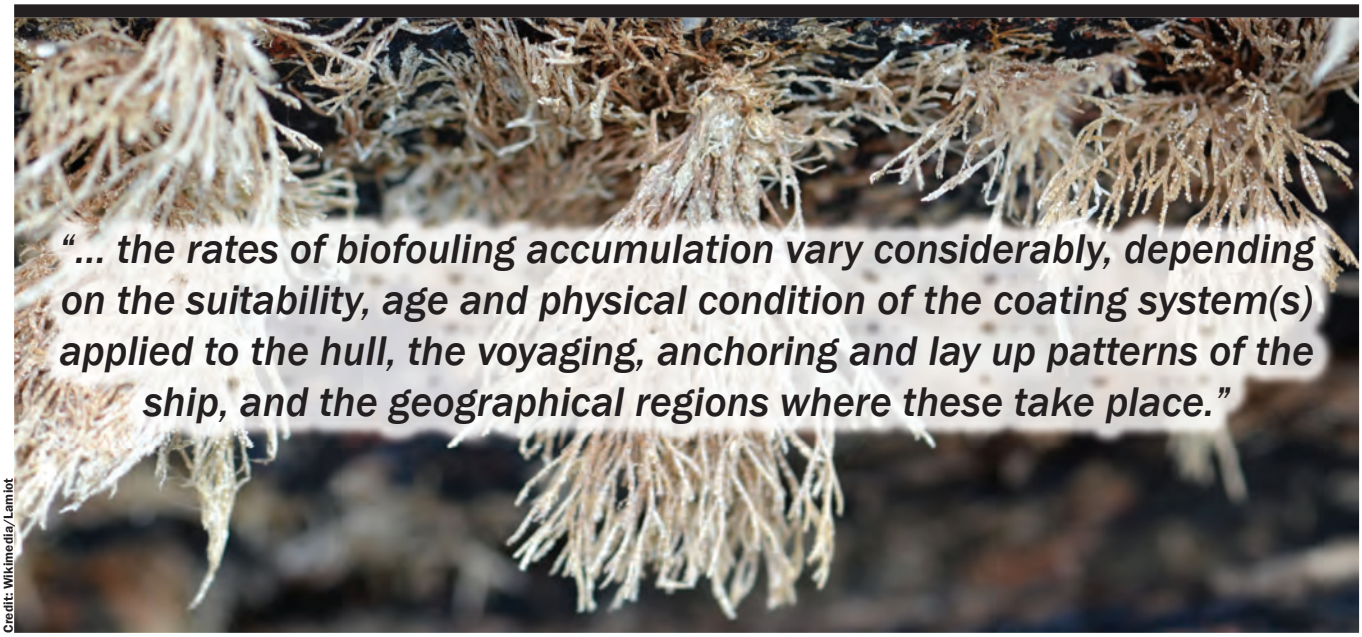
The two basic purposes of coatings are to protect the hull from rusting and, secondly, to protect the anticorrosion coating from fouling and biofouling. Marine life can have a detrimental effect on the protective paint on ship hulls; the anticorrosion coating is the last line of defense. Once this coating is compromised, the steel hull is exposed and the vessel could be damaged beyond repair. For this reason, control of fouling may be even more important for workboats, because these vessels are more often idle and so are more susceptible to fouling and biofouling.

Fouling-control coatings include Anti-Fouling (AF) coatings and Foul-Release (FR) coatings. The former rely on biocides; the latter rely on mechanical properties to decrease adhesion strength. AF coatings typically are sacrificial coatings. They gradually wear off to the expose fresh layers of biocide agents. The development of coatings today must also take into account the release of toxic substances into the environment, from surface preparation efforts to paint application. Use of various coatings must be balanced against the other downstream consequences such as fouling, increased GHG emissions, etc.

Code Representing Degree of Biofouling

Code	Degree of Biofouling
L	Light microfouling ("thin slime")
M	Medium microfouling ("moderate slime")
H	Heavy microfouling (thick algal slime/emergent beard)
1	Up to 1% coverage by macrofouling
5	Up to 5% coverage by macrofouling
10	Up to 10% coverage by macrofouling
15	Up to 15% coverage by macrofouling
15+	> 15% coverage by macrofouling

Source: NACE International



Credit: Wikimedia/Lamiot

Silyl-based AF coatings are less dependent than others on a vessel's movement through the water. Self-polishing AF coatings are characterized by a biocide release rate. This is the polishing rate for the coating. It should be noted that standard acrylic resin-based AF coatings can decrease roughness over time as a consequence of the polishing effect but will experience increased fouling as the biocide content at the coating surface decreases over time. A roughness reading can be taken at drydock and by divers evaluating the fouling degree in service to characterize the roughness of the coating and this can be related to fuel cost.

Knowing the vessel's operating profile, it is possible to build a system that provides a five-year antifouling performance. Software can be used along with the operating profile to calculate film thickness. In this manner, the AF coating can be tailored to the needs of the customer, providing a much better fuel economy by controlling the roughness of the hull.

The method used to clean the ship hull is another important factor to consider. The cleaning schedule and methods depend upon an intimate knowledge of fouling processes. The adhesion of marine life to the ship hull depends on the type of coating as well as the species. The cleaning method chosen will depend on the degree of fouling or biofouling and the potential for the cleaning method to damage the various layers of coating. There will typically be several cleaning cycles before a new coating needs to be applied. The various degrees of adhesion of marine life to ship hulls and optimal cleaning methods have been recently reviewed by Oliveira and Granhag in "Matching Forces Applied in Underwater Hull Cleaning with Adhesion Strength of Marine Organisms" [4]. There are no standards, nor widely agreed upon methods related to hull cleaning. This "wild west" situation can best be solved by standardization which would be greatly facilitated by the creation of a hull cleaners association.

CONCLUSION

Perhaps the best investment workboat operators can make is to consult with a hull performance specialist on the best practice for his or her particular class of workboat based on the climate and working conditions the workboat is under. This can help ensure that a coating is applied according to manufacturer specifications and also develop a hull cleaning regimen that will maximize the life of the coating and the workboat. The recommended policies will be recouped in fuel savings, reduced downtime and longer vessel 'up-time.'

Advanced coating technologies developed for deepwater vessels are also available for workboats. However, their proper application and management requires a well-trained specialist in the area of marine corrosion at every stage of coating management.

Buddy Reams *is NACE International's first Chief Maritime Officer, a position he started in April 2016 after retiring from nearly three decades of service to the United States Coast Guard. He leads the development of corrosion control programs and services to meet increasing demand from all maritime industries including notably the shipbuilding, shipping, and offshore sectors. Prior to joining NACE International, his last assignment was as Chief of Maritime Prevention Operations for the Seventh Coast Guard District. Reams holds Bachelors and Masters of Science degrees in Naval Architecture & Marine Engineering from the US Coast Guard Academy and University of Michigan. He also holds a Master of Science in Industrial Operations Engineering from the University of Michigan.*

SHIPPINGInsight

NEW VENUE I NEW FORMAT I NEW IDEAS
NEW OPPOTUNITIES I NEW ERA

7th Annual Fleet Optimization & Innovation Conference and Exhibition

SHIPPINGInsight 2018

REGISTER NOW - UNIQUE MATCHUP - PARTNERSHIPS STILL AVAILABLE

October 16 - 18

Stamford Hilton
Stamford, CT

Three days not to be missed!

(203) 255-4686

www.SHIPPINGInsight.com

OLMSTED: Online & Open

After more than 30 years of frustratingly slow progress, cost overruns and more than a few mistakes, Olmsted is finally poised for success. That's something to celebrate.

By Tom Ewing

It is official: The U.S. Army Corp of Engineers (USACE) wants Olmsted operational by October. After more than 30 years, the ribbon cutting to officially open the Olmsted Locks and Dam took place on August 30. The very old (1929) upstream locks and dams – Nos. 52 and 53, which Olmsted is replacing – will be dismantled by December 2020. Before that happens, Olmsted's performance will be tested and confirmed. On the Ohio River at Olmsted, IL, about 10 miles north of Cairo, IL, where the mighty Ohio flows into the mighty Mississippi, this crucial piece of American infrastructure is finally almost in place.

M/V Steve Golding goes through Olmsted Locks in late July

Credit: USACE

The Agony of Olmsted

To say that the 2,596-foot Olmsted dam is situated on a vital section of the Nation's inland waterways would not give full weight to the importance of this critical infrastructure. The tonnage passing through this section, over 90 million tons annually, exceeds every other section of America's inland navigation system. Olmsted isn't just about critical transportation – its operations are integral to the entire Midwest economy.

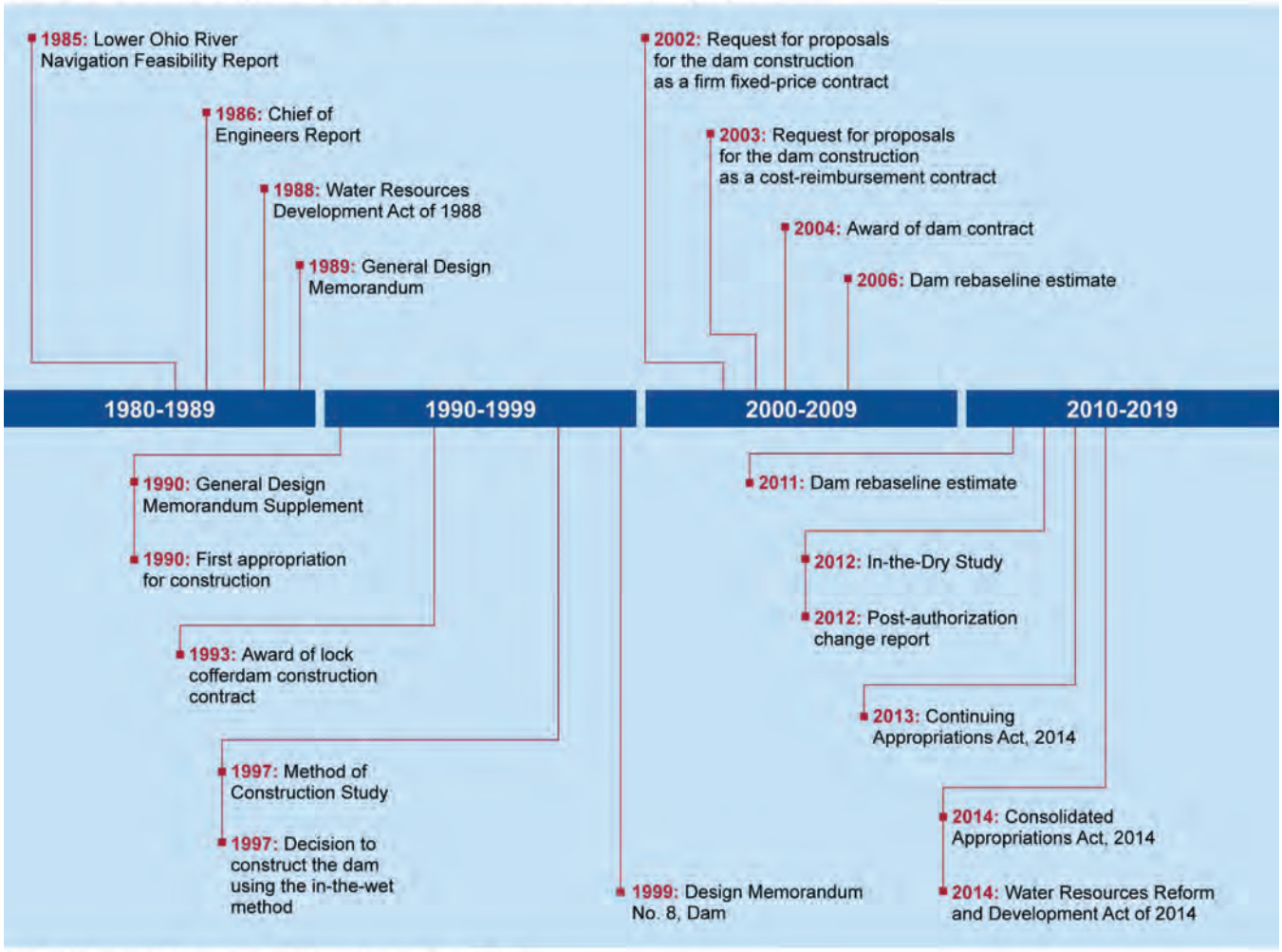
Olmsted was first authorized within the Water Resources Development Act (WRDA) of 1988 at a cost of $775 million, with construction estimated to take seven years. An appropriation for construction was first made in 1990 but the Corps did not award money for a construction project until 2004 – 14 years later. The 1990s were given over to technical analytical work regarding a construction method – evaluating the more traditional "in-the-dry" method, using cofferdams which block the flow of water around a site, versus a newer, but less familiar "in-the-wet" method, more difficult but promising more flexibility and a lower final cost. 'In-the-wet' was chosen in 1997, and a new construction estimate was arrived at: six years. But, even the in-the-wet decision didn't deliver much certainty. It was repeatedly re-examined, even as late as 2012 – eight years after initial project funding.

Contracts were also a challenge. In 2002, the Corps requested proposals for construction as a firm fixed-price, but received no offers, because according to subsequent Corps' analysis, the construction method was innovative, the river conditions were too risky, and a potential contractor could not get bonding.

In 2003, the Corps offered a cost-reimbursement contract, receiving two offers. In 2004 – sixteen years after authorization – a contract was awarded to Washington Group/Alberici (WGA) Joint Venture. The winning proposal was $564 million. Still another new construction estimate (8 years) was arrived at. Nevertheless, the project continued to flounder.

In 2006 and again in 2011, new baseline estimates pro-

Figure 3: Timeline of Key Events in the Olmsted Locks and Dam Project, 1985–2014



Source: GAO analysis of U.S. Army Corps of Engineers information. | GAO-17-147

"The opening of Olmsted will represent true modernization on the inland waterways and will provide reliability and operational consistency that commercial carriers and shippers have waited a long time for."

– Deb Calhoun, Senior Vice President, Waterways Council, Inc.

A typical wicket gate. A total of 140 of these were placed across the river where they meet the tainter gates.

Credit: Tom Ewing

jected cost increases – by $81.6 million in 2006 and by a whopping $551.1 million in 2011 and increased the construction schedule by 4 to 5 years. There were many reasons, some external to the project. Everyone had an excuse. The 2005 hurricane season, which included Katrina and Rita, created a scarcity of barges and cranes when the contractor was trying to mobilize equipment and barge prices doubled. From 2002 to 2007, fabricated steel prices increased about 300 percent, cement 90 percent, and fuel about 300 percent. Insurance and bonding costs soared by 230 percent.

Fundamentally, it was the numerous struggles with in-the-wet construction that checked early project momentum. The dam portion of the project, for example, included precast concrete shells, building blocks weighing up to 5000 tons each, moved from a fabrication site, via a rail sled, to a catamaran crane barge – the largest in the world – and then moved upriver, and lined up at a 30-foot depth across the river bottom, an underwater task demanding ¼ inch tolerances.

In many ways, the Olmsted project was remarkable; arguably the civil engineering equivalent to the Manhattan project. Nothing was off the shelf, just about everything had to be invented and developed.

In every aspect, Olmsted demanded an extensive and expensive learning curve.

Angst on the Hill

Naturally, Olmsted's challenges attracted Congress' attention. In 2012, it was clear that Olmsted would exceed its maximum authorized cost. The Corps prepared a PACR – a "post authorization change report," seeking to increase the authorized cost to $2.918 billion, approved by Congress in 2014. There were many related funding issues. Olmsted was gobbling up all of the money in the Waterways Trust Fund; leaving very little for other critical projects. Congress' 2014 legislation limited how much Trust Fund money could go to Olmsted, from a 50% Fund share to 25% and then to 15%.

Critically, Congress also declared that Olmsted should get no less than $150 million/year until it was finished. These funding and policy shifts paid off. Work on Olmsted had been plagued by unpredictable and intermittent funding – sometimes work was deliberately slowed or delayed because of money issues. Once predictability was set, the project's schedule smoothed out. Since the 2012 PACR, Olmsted stayed within the time and budget constraints of this critical reset. The PACR ceiling was $3,099,000,000. The 2016 total estimated cost: $3,059,266,000.

Around the Next Bend in the River

The Corps estimates that Olmsted will produce average annual national economic benefits of more than $640 million. Operation and maintenance costs will be reduced. New locks mean fewer delays. Olmsted's two 1200 x 110-foot locks will eliminate transit double-locking. Most tows on the Ohio – a towboat and 15 barges – measure 1150 feet by 105. Now, these sets will not have to break up and refleet. Lockage time will drop to less than an hour, compared to five hours through Locks and Dams 52 and 53 (when they work and often, they do not at precisely the wrong moment).

In 2017, late year infrastructure failure(s) at Lock 52 was unquestionably one of the biggest domestic maritime stories of the year. At one point, average delays of 65+ hours were being experienced by a queue 58 vessels and 658 barges waiting their turn. Another unscheduled maintenance issue saw Lock and Dam 52 closed for almost nine days in September. If time is money, then Olmsted is solid currency.

Illinois-based Garry Niemeyer, President of the National Corn Growers Association, presents a concise cost-benefit summary: He pays $0.40/bushel to ship corn via barge. Via train? $0.80. And, even worse via (environmentally inferior) trucks: $4.00.

Lessons Learned

There were many lessons learned from Olmsted. In fact, and as part of the Water Resources Reform and Development Act (WRRDA) of 2014, Congress required the Corps to develop a Lessons Learned report. An extensive document, it spans the gamut from Dam Design, Contracting & Acquisition and, of course, Dam Construction.

Future projects, says the USACE, need to evaluate the risk of "less than optimum or uncertain funding" and impacts on innovative construction methods. Olmsted's current leadership stressed that US lawmakers must adopt predictable financing to pay for mega-projects like Olmsted. Stop-and-start funding does not work. That's because unrealistic estimates resulted in inaccurate costs and overly optimistic schedules which ultimately provided poorly reflected project risk.

Moreover, the USACE recommends working with the Corps' Walla Walla Cost Engineering Center of Expertise to develop, sooner not later, dependable costs and timelines. Changes to final design need input from contractors. Plans developed by government architects and engineers had little input from contractors and changes led to delays and cost increases. To that end, projects expected to take more than five years need an annual review to monitor:

- *Staffing turnover and loss of 'historical knowledge.' Managers need to "build the bench behind them and sustain technical competency."*
- *Changes in regulations/requirements (safety manuals, environmental requirements, technical regulations, security requirements, etc.)*
- *Outdated technology and possible requirements for updates. Olmsted is newly complete, but this 'new' project starts with some equipment and material that is already 15-20 years old.*

The most important lesson learned? That comes down to lessons applied on future projects. And, as much scrutiny as Olmsted (justifiably) received, it is all but certain that the next project will be watched just as closely to ensure that 'lessons learned translate into efficiencies earned.' On an inland river system that promises countless uncertainties lurking around every bend, that's one lesson stakeholders can take straight to the bank.

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

Answering the Call for Environmental Answers

The Coast Guard has developed two separate mitigation system prototypes specifically designed for inland and offshore environments and tested them in the Kalamazoo River and Lake Huron.

By Alex Balsley

Whenever there is a need for oil, there will always be a risk of oil spills. This is no less true for bituminous sands, commonly known as oil sands or tar sands. Oil sands are mostly found in Alberta, Canada, and comprised of bitumen, sand, clay and water. They are typically viscous, with a texture similar to peanut butter. Alberta's oil companies transport their product to coastal refineries outside of landlocked Alberta. One method of transport involves adding diluents, such as natural gas condensates, to oil sands to reduce viscosity and make transportation by rail or pipeline easier. The new product blend is called diluted bitumen, or dilbit.

Today, scientists and researchers continue to study dilbit's properties as well as its fate and behavior if spilled into the environment. Dilbit's characteristics are similar to that of crude oil, but real world experience demonstrates that it behaves differently during a spill incident. In 2010, approximately 877,000 to 1 million gallons of dilbit flowed into the Kalamazoo River from a burst pipeline. Over 20 miles of shoreline were affected, making it one of the largest inland oil spills in U.S. history. Responders faced the atypical challenge of trying to mitigate the impacts of moving, sunken oil. The U.S. Environmental Protection Agency (EPA) On-Scene Coordinators and Oil Spill Removal Organizations (OSROs) tried several approaches to recovering the moving, sunken oil with varying degrees of success. It was evident that a better mitigation approach was needed not only for oil spills in rivers and streams, but for other potential dilbit or non-floating oil spills in the nearshore and large lake environments.

FINDING A BETTER WAY

In 2016, the U.S. Coast Guard Research and Development Center (RDC) took on this challenge and began projects to identify, design, and test new methods for responding to non-floating oil spills, including detection and removal of sunken oil on the bottom and suspended in the water column. With funding support from the EPA through its Great Lakes Restoration Initiative (GLRI) program, the Coast Guard developed two separate mitigation system prototypes specifically designed for inland and offshore environments and tested them in the Kalamazoo River and Lake Huron, respectively.

The inland mitigation system prototype was test deployed in the upstream portion of Morrow Lake in Kalamazoo, Michigan, in April 2018. This location was selected due to its proximity to the Great Lakes where GLRI stakeholders would have an opportunity to observe the equipment and ask questions of the project team. Lake Huron was selected as the test site for the offshore mitigation system prototype for the same reason.

The inland mitigation system prototype includes a 75-foot barrier that consists of three separate 25-foot segments connected to each other. It was designed to deflect moving, sunken oil toward the shoreline, for use in fast waters with a current up to 3 to 4 knots. This design is intended to allow an easier recovery of sunken oil since it would be diverted to an area with minimal current. Two segments of the barrier (total of 50 feet) are 3 feet high with the last segment (25 feet) nearest the shoreline measuring 2 feet high to account for the decreasing water depth and lower current. The angle of barrier deployment (or angle of deflection) relative to the shoreline is dependent on the river current; the higher the current, the less the angle. This ensures that the barrier's fabric material is not exposed to damaging levels of pressure exerted by the river current.

The barrier itself is comprised of X-Tex fabric and high-density polyethylene (HDPE) material with scour flaps made rigid by strips of fiberglass on both the upstream and downstream sides of the barrier. The primary purpose of the scour flap is to prevent oil entrainment, which is likely in regions of high current. The bottom of the barrier is weighted with steel link chains while the top is equipped with flotation to help keep the barrier upright during deployment.

In the Kalamazoo River, RDC tested two different anchoring methods for the inland barrier system, which are dependent on bottom substrate type and water depth. If the river is relatively shallow (less than 10 feet) and has a

sandy bottom, the upstream portion of the barrier can be anchored to a post driven into the river bottom with the downstream end tied to a tree or other suitable fixture on the shoreline. In deeper waters or areas of river with harder bottom substrates, the upstream end of the barrier can be anchored to a Jersey barrier with the other end of the barrier tied to the shoreline. RDC was able to learn lessons about deployment and retrieval of the barrier and monitored several aspects of the barrier's performance including position, motion, sag, scour, and tension using load cells, Global Positioning System (GPS) units, and video cameras.

The inland mitigation system is fully deployed in the Kalamazoo River. The bright orange marking on the barrier helps to identify its position from above water.

OFFSHORE FOCUS

After conclusion of the inland barrier system field test in Kalamazoo, focus shifted to testing the offshore mitigation system prototype in Lake Huron near Port Huron, Michigan. U.S. Coast Guard Cutter Hollyhock, a 225-foot seagoing buoy tender, was used to deploy the offshore prototype, which was designed particularly for lower current environments (less than 2 knots) and for the purpose of collecting oil in a "U-shaped" configuration rather than deflecting (like the inland barrier system). This prototype is made up of four separate 50-foot sections that were connected for a total length of 200 feet. The barrier itself is made up entirely of HDPE, is approximately 3 feet high, and can be attached to the lake bottom with anchors and stakes with help from divers. Similar to the inland barrier system, it is weighted down with steel link chains, but the top is tied to buoys so that the barrier is able to stay upright as it is being deployed to the lake bottom.

Over the course of three days in May 2018, RDC tested barrier deployment in two different locations of the lake, one in a low current area (less than 1 knot) and another with slightly higher current. RDC collected lessons learned on how the barrier could be best deployed and retrieved. The barrier's performance was monitored with video cameras and a sonar instrument.

TODAY'S RESEARCH YIELDS TOMORROW'S RESPONSE STRATEGY

RDC continues to analyze its findings and will present preliminary results on these first two prototypes in New Orleans this November. RDC is also working to develop a third inland mitigation system prototype for testing at the same location in the Kalamazoo River in April 2019. After the third and final test is completed, RDC will report findings and recommendations about each of the three prototypes. The report will be made available to the public in September 2019.

RDC will end the project by developing a job aid that will describe equipment and tactics useful for detection, monitoring and response options for oil sands products response. This will be available to the public in 2020 and provide the full options for responding to oil sands products spills. With the development of these three prototypes to mitigate the impacts of moving, sunken oil, the Coast Guard will be armed with greater knowledge on methods to respond to these types of oil spills.

The Coast Guard Research and Development Center (RDC), located in New London, Connecticut, is the Coast Guard's facility for performing research, development, test and evaluation in support of the service's major missions. RDC is responsible for evaluating the feasibility and affordability of mission execution solutions and providing operational and risk-management analysis at all stages of the acquisition process. RDC also operates a Maritime Test Facility in Mobile, Alabama.

Alexander Balsley *is an environmental engineer and has been a project manager at RDC since 2010. He is primarily involved with RDC's Oil Spill Response program and is a subject matter expert in this field. Balsley has an M.S. in Environmental Engineering from Worcester Polytechnic Institute, and a B.S. in Civil and Environmental Engineering from Northeastern University. He is a registered Professional Engineer in Massachusetts.*

Gladding-Hearn Delivers New Generation Pilot Boat to VPA

The Virginia Pilot Association has taken delivery of a Chesapeake class MKII launch from Gladding-Hearn Shipbuilding. The MKII, a new generation of the shipyard's Chesapeake class launch, is the Virginia pilots' eighth Gladding-Hearn pilot boat. Since the Chesapeake class was introduced by the Somerset, Mass. shipyard, 20 have been delivered to U.S. pilot associations. The latest improvements incorporate the performance benefits of Volvo Penta's IPS 3 pod system, which provides for higher speed, lower fuel consumption, and more comfort. With a deep-V hull designed by C. Raymond Hunt & Associates, an EPS control system and three-axis joystick increases the boat's overall maneuverability alongside a ship and when docking. The financial incentive for pilots to optimize fuel economy, vessel handling and comfort led the shipyard to install a Humphree Interceptor automatic trim-optimization system on the MKII launch.

LOA: 56 feet	Genset: 12 kW Northern Lights	Propulsion: (2) Volvo Penta D13-700, EPA Tier 3
Beam: 17.2 feet	Fuel: 800 U.S. gal	Radar: (2) Furuno TZT-14" MFD dis play
Draft: 4.11 feet	Speed (loaded): 32+ knots	Other: heated deck and handrail system

ESG Inks Tug Contract with Bisso Offshore

Eastern Shipbuilding Group has signed a new contract with Bisso Offshore, LLC for the construction of two (2) Robert Allan Ltd. RApport 2400 Ship Handing Tugs with escort capability. Bisso Offshore, LLC is one of Eastern's long term customers and has taken delivery of four (4) previous modern Z-drive tugs from Eastern since 2006. These two new Robert Allan RApport 2400 design tugs have been customized by the designer and owner to provide specific operational features while also meeting new EPA Tier 4 and USCG Sub-M requirements.

ESG Conducts Final OPC Critical Design Review for USCG

Eastern Shipbuilding Group (ESG) has successfully conducted its Final Critical Design Review (FCDR) with the United States Coast Guard on 29 June 2018 for the Offshore Patrol Cutter (OPC) Program. This accomplishment comes after a week of discussions, demonstrations, and design presentations by ESG's design team to the USCG and Department of Homeland Security (DHS). The purpose of the FCDR is to verify that the OPC detail design is integrated and internally consistent with the USCG requirements and points towards the exercise of the contract option for construction of the first hull USCGC ARGUS.

Construction of the lead vessel is anticipated to start after the contract option is exercised with delivery in 2021. The OPC is designed to conduct multiple missions in support of the nation's maritime security and border protection. The contract includes options for production of up to nine (9) vessels and has a potential total value of $2.38 billion dollars.

Nugent Sand company Orders DSC Marlin Class Dredge

An agreement for a new Marlin Class electric dredge purchase between Nugent Sand Company of Louisville, KY and DSC Dredge, LLC was recently confirmed. DSC Dredge, LLC will produce a fully electric powered cutter head suction dredge that will mine to a depth of 80-feet, with estimated production of 700 tons/hour. This new Marlin Class dredge will be delivered to a mine site which has been operated by Nugent Sand Company for over 30 years. This DSC Marlin dredge will operate in a pit currently being dry-mined down to the water table. The dredge will feed a dewatering wheel before material is conveyed to the processing plant.

Bay Ship and Yacht to Build Hydrogen Fuel Cell P/V

Bay Ship and Yacht Co. has won a contract to build the first hydrogen fuel cell passenger vessel in the USA for Golden Gate Zero Emission Marine (GGZEM), a Bay Area company on a mission to eliminate maritime pollution. The vessel is expected to be delivered and in service by September 2019. The seventy-foot, all-aluminum ferry will operate on the San Francisco Bay, and will be managed by the Red and White Fleet. Golden Gate Zero Emission Marine was awarded a $3 million grant by the California Air Resources Board (CARB) to build the vessel. This zero-emission vessel will be the first of its kind in the U.S., and proves that businesses with an elevated environmental consciousness can create viable, cost effective solutions to mitigate climate change. The vessel is powered by dual 300 kW electric motors using independent electric drivetrains from BAE Systems. Power is generated by 360 kW of Hydrogenics proton exchange membrane fuel cells and Li-ion battery packs.

Crowley Takes Delivery of First LNG-Powered ConRo Ship

Crowley Maritime Corp. has taken delivery of El Coquí, one of the world's first combination container/roll on-roll off (ConRo) ships powered by liquefied natural gas (LNG), from shipbuilder VT Halter Marine Inc. El Coquí is the first of two Commitment Class, LNG-powered ConRo ships being built for Crowley's shipping and logistics services between Jacksonville, Fla., and San Juan, Puerto Rico. Construction of sister ship Taino is well underway at VT Halter Marine's shipyard in Pascagoula, Miss., and she is scheduled to enter service later this year.

Name: El Coqui	Builder: VT Halter	Cruising Speed: 22 knots
LOA: 720 feet	Propulsion: LNG	Vehicle Capacity: (mixed) 400
DWT: 26,500 tons	TEU Capacity: 2,400	Designer: Jensen Maritime

John F. Aylmer, 84 – Merchant Mariner, State Senator, College President

John ("**Jack**") **F. Aylmer** died peacefully at home on July 8th 2018. He graduated in 1957 from the Massachusetts Maritime Academy with a Bachelor of Science degree. He financed his college education by operating a tug boat for New England Dock & Dredge Co. After graduation, Jack entered the U.S. Navy and served as First Lieutenant and Gunnery Officer aboard the USS Mattabasset in the Mediterranean during the crisis in Lebanon. Later, he worked for 7 years as a Merchant Marine Officer on oil tankers. He served in the United States Navy Reserve for 23 years until his retirement as Commander in 1994. In 1966, Jack was elected to his first of two terms as Selectman of the Town of Barnstable. He earned a Master's degree in Education from Bridgewater State College in 1969. In 1970, he was elected to his first of six consecutive terms in the Massachusetts Senate, and spent the next 10 years as State Senator, serving as Assistant Senate Minority Leader and on the Senate Ways and Means Committee. Jack attended Suffolk Law School and secured his Juris Doctorate in 1977. In 1981, he was appointed as Rear Admiral, U.S. Maritime Service and the President of his alma mater, the Massachusetts Maritime Academy and served in that capacity for 10 years. Upon his retirement as President of Massachusetts Maritime, Jack served as a Director on various bank boards and continued his support of many charitable organizations.

US Coast Guard

(L to R) McDonald, Chao & Locke

Nolan

The Great Lakes Group

Rigolo Buccigrossi Eiber

Your nation needs you ... now more than ever in our history

The words of General **Darren McDew** rang true to Massachusetts Maritime Academy's nearly 400 graduates on a beautiful, albeit rain soaked, Saturday this past June. General McDew, who received an honorary doctorate at the 2018 Commencement, leads the United States Transportation Command and, in that role, oversees the nation's projection of force wherever it is required in the world. Joining General McDew in receiving honorary doctorates were Dr. **James S.C. Chao**, Foremost Group Founder, Honorary Chairman and accomplished Master Mariner; the Honorable **Karyn Polito**, Lieutenant Governor of Massachusetts; and MMA Board Chair-emeritus and 1987 graduate, Mr. **Wayne Mattson**. On the Dias joining the many other dignitaries and accompanying her father was former MARAD deputy administrator, former US Secretary of Labor and current US Secretary of Transportation, the Honorable Elaine L. Chao. The Commencement marked the largest graduating class in MMA's 127 year history.

TOTE's Nolan Honored with Award

Tim Nolan has been honored with the Herb Brand Award at the Maritime Council of NY/NJ's 56th Annual Dinner Dance. The Herb Brand award is one of three awards given to champions of the U.S. Maritime industry. Nolan and TOTE were instrumental in delivering relief from the U.S. mainland to Puerto Rico following Hurricane Maria in 2017. Nolan was recently named the President and CEO for TOTE.

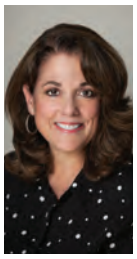
The Great Lakes Group Adds to Management Team

The Great Lakes Group has added three to its management team. **Thomas Rigolo** has been named Shipyard General Manager; **Kirsten Buccigrossi** is the new Director, Marketing & Communications and **Emery Eiber** was named Quality, Health, Safety, Security, and Environment (QHSSE) Manager. Rigolo is a senior shipbuilding executive with 25+ years of experience. Buccigrossi has over 12 years of operations, logistics, and marketing experience in the maritime industry both afloat and ashore. Eiber is a 2015 SUNY Maritime graduate with a Bachelor of Engineering in Mechanical Engineering and a USCG 3rd Assistant Engineers license.

Charters Promoted to VP at NOIA

Tim Charters has been promoted to Vice President of Governmental and Political Affairs at the National Ocean Industries Association (NOIA). Tim joined NOIA as a Senior Director in June of 2017, after serving as Vice President of Governmental and Regulatory Affairs at the National Stripper Well Association. He has 20 years of Congressional experience including roles as Staff Director of the Energy and Mineral Resources Subcommittee of the House Natural Resources Committee, as Director of Policy Coordination for the full Natural Resources Committee, and as Legislative Director to Rep. Steve Pearce (R-NM).


Charters


Stevens


TecNiq
Thornton Lanier Shaffer


Farley


Coda


Seaspan Shipyards
Lamarre Anttila

Stevens Joins Hurtigruten Americas as VP of Sales

Hurtigruten has appointed **Christine Stevens** as Vice President of Sales for the Americas to be based in its Seattle regional headquarters. Stevens brings 30 years of cruise industry expertise to Hurtigruten and will lead the entire sales organization.

TecNiq Adds Key Staff

TecNiq has hired three staff to fill key roles. **Terri Thornton** and **Darryl Lanier** join the company as sales associates for the light duty trailer market. **Kevin Shaffer** has been named national sales manager. Shaffer comes to TecNiq from Intertek Testing Services where he was sales manager for its transportation technologies division. Shaffer earned a BA from Western Michigan University. Thornton was previously an engineering manager at Kurtzon Lighting and Paramount Industries. Lanier was previously a manager at Leaders Marine.

Former AWO Chairman Earns Public Service Award

The Coast Guard recently awarded **James Farley** a Meritorious Public Service Award in recognition of his outstanding contributions to navigation safety, environmental stewardship and homeland security during his decades-long involvement with the American Waterways Operators (AWO). This award is the Coast Guard's second highest public service award, and was presented at the annual AWO business meeting in April.

Ports of Indiana names CEO

Vanta E. Coda II has been named as the Ports of Indiana's next chief executive officer. Coda returns to the Ohio River Valley with 25 years of experience in maritime and multimodal operations on the Great Lakes, Gulf of Mexico and Ohio River. He most recently served as the executive director for the Duluth Seaway Port Authority, operating in the busiest port district on the Great Lakes. He is a graduate of the University of Kentucky, with a BA in history and political science.

Seaspan Shipyards Adds Two to C-Suite

Seaspan Shipyards announced that **Mark Lamarre**, who most recently served as Chief Executive Officer of Australian Shipbuilding Company, has been named Chief Executive Officer of Seaspan Shipyards. Previously, Lamarre worked at Bath Iron Works. He holds an MBA from Boston University and a BA from Syracuse University. Separately, Seaspan also announced the appointment of **Jari Anttila** as Chief Operating Officer. With 25+ years of experience in shipbuilding and industrial operations, Anttila joins Seaspan from Philly Shipyard, where he served as Senior Vice President. Prior to that, he held positions as Executive Vice President, Chief Operating Officer and Senior Vice President with Meyer Turku in Finland.

BHGI Welcomes LaForest

Bristol Harbor Group, Inc. (BHGI) has introduced **Teri LaForest** as its most recent addition to its naval architecture and marine engineering practice. Teri joins BHGI as a Naval Architect. She holds an MSE in Naval Architecture and Marine Engineering from the University of Michigan.

US Department of Commerce Appoints DSC's Wetta to Presidential Advisory Council

Secretary **Wilbur Ross**, United States Department of Commerce, has appointed **Bob Wetta**, President and CEO of DSC Dredge LLC to serve on the President's Advisory Council on Doing Business in Africa. Wetta named **Charlie Sinunu**, DSC's Director of International Dredge Sales, to his staff and they will help identify commercial opportunities for the United States in the region.

EBDG Adds Technical Staff to Seattle Office

Elliott Bay Design Group (EBDG) has added two professionals to the Seattle office. **Alina Shrestha** joined EBDG as a contractor in 2017 and is now a full-time naval architect. **John Moser** is a recent graduate from Texas A&M University at Galveston and joins EBDG as a marine engineer. Prior to obtaining his degree, John was a firefighter in Central Texas and he is an Iraq War Veteran. As a junior member, John will develop analyses, drawings and technical reports and provide engineering support to project managers.

Green Marine Elects Chairman of the Board

President and CEO of the Port of Cleveland, **William Friedman**, was


LaForest


Wetta

Shrestha Moser


Friedman


Baczkowski


Caccavale

elected chairman of the Green Marine's Board of Directors. Friedman has been on the Green Marine Board since 2013. The Port of Cleveland is one of the environmental program's founding members. Six other senior executives comprise the remainder of the Green Marine Board of Directors, including Mark Barker, President, Interlake Steamship Company, **Brandy D. Christian**, President & CEO, Port of New Orleans **Craig H. Middlebrook**, Deputy Administrator, St. Lawrence Seaway Development Corporation, **Allister Paterson**, Executive Vice President and COO, CSL Group, **Ron Tursi**, President, Guardian Ship Management and **Sylvie Vachon**, President and CEO, Montréal Port Authority.

VT Halter Appoints Baczkowski as President and CEO

VT Halter Marine named **Ronald Baczkowski** President and CEO for VT Halter Marine. Baczkowski joined the United States Marine Corps in 1990 and retired with the rank of Brigadier General in 2012. He joined VT Systems in 2016 and was mostly recently Vice President of Business Development.

HII Names Caccavale as VP at Newport News Shipbuilding

Huntington Ingalls Industries (HII) has promoted **Bryan Caccavale** to vice president of strategic sourcing for the company's Newport News Shipbuilding division. Caccavale joined Newport News in 2002 and has held many leadership positions, including service as director of business management for aircraft carrier construction, overhaul and inactivation, where he supported the CVN 80 and 81 multi-ship procurement strategy. He began serving as director of strategic sourcing in April.

Dometic Introduces Commercial Marine Product Manager

Dometic has named **Guido Wolfs** as Product Manager for its commercial marine business. Wolfs has been appointed to work closely with boat builders, owners and fleet operators to better understand and meet the needs of Dometic's clients. Wolfs' background includes project management roles in the marine industry in the electrical and HVAC sectors.

21 Graduate from Webb Institute

On Saturday June 16, 2018, Webb Institute awarded 21 Bachelor of Science degrees at its 122nd Commencement Ceremony. Each student received a dual degree in Naval Architecture and Marine Engineering. Webb's Class of 2018 will spread out across the Country and the world to begin graduate work or start their professional careers in the marine industry. Notable employers include: Metal Shark Boats, Resolve Marine Group, Stolt Tankers, General Dynamics NASSCCO, and Viking Systems.

HGIM Announces New BoD

Harvey Gulf International Marine has announced a new Board of Directors to serve following the company's emergence from Chapter 11 proceedings. The Board includes **Shane Guidry**, who remains as Chairman of the Board and CEO for HGIM Corp. **Mark Burns** brings over 35 years of management and operational experience in the marine and energy industries. Most recently he served as Executive Vice President and COO of Ensco. **Alan Crain** has 40 years of experience across various sectors of the international oil and gas industry. He retired as SVP, Chief Legal and Governance Officer of Baker Hughes Incorporated in 2016. **Sherman Edmiston, III.** has more than 20 years of experience working with companies undergoing major transitions as a principal investor, investment banker and advisor. **Peter Frank** contributes extensive investment banking and financial experience to the company. He is a Senior Managing Director on the Black Diamond Private Equity Team. Steve Orlando founded the Allison Marine Group in 1995. James Swent, III has served as a Board member, CEO, and CFO of medium to large publicly-traded companies.

Viega Names Herrero as Marine Program Manager

Viega LLC recently hired **Jesus Herrero** as marine program manager for its Shipbuilding and Offshore division. Herrero has more than 20 years of experience in the engineering and marine industries. Prior to joining Viega, he worked as a mechanical engineer at Ingalls Shipbuilding, a division of Huntington Ingalls Industries. He


Wolfs


Webb Institute Graduates


Guidry


Herrero


Jensen


Cardona


Hendricks

earned a BS in mechanical engineering from the University of Dayton.

Jensen Appointed to Port NOLA's Board of Commissioners

Gov. **John Bel Edwards** has appointed **Jack C. Jensen Jr.** to the Board of Commissioners of the Port of New Orleans. Jensen will serve a five-year term. In 1983, Jensen founded Transportation Consultants Inc., also known as TCI Trucking and Warehousing (TCI). Today, TCI is the largest independent trucking and warehousing company in the New Orleans region. Jensen received his bachelor's degree from the University of New Orleans.

CPV Manufacturing Names Cardona as Director of Engineering

CPV Manufacturing announced today that **Robert Cardona** has been named Director of Engineering. Cardona has 32 years of experience in manufacturing. He has four patents and played a significant role in the design of systems and components for the Aegis Radar System. He received his BSME from Drexel University.

Hendricks Elected as Little Rock Port Authority Board Chair

The Little Rock Port Authority Board of Directors has elected **Melissa Hendricks** as chair of the Board of Directors. Hendricks was first appointed to the Little Rock Port Authority in 2011. During her time on the Little Rock Port Authority Board, Ms. Hendricks has served as treasurer, vice chairman and chair of the external affairs committee.

In-Mar Solutions: Alu Pilot Chairs & Deck Rails

In-Mar Solutions offers a complete line of Alu Design & Services Marine Pilot Chairs and Deck Rails. There is a standard line in addition to the option for custom designs to suit specific needs. Sleek, modern design and maximum utility and comfort are emphasized.

www.inmarsolutions.com

Vesconite Celebrates 60th Anniversary

2018 marks the 60th anniversary of VescoPlastics and Vesconite, its first engineering plastic. The company's line of thermopolymers is used in the marine and pump sectors. VescoPlastics has warehouses and stocking agents on every continent, and serves customers in over 100 countries. Self-lubricating Vesconite and Hilube are advanced ultra-low friction polymers, offering dimensional stability and load strength, and a wear life up to 10 times that of bronze.

www.vesconite.com

GustoMSC, Barge Master Provide US Offshore Wind Solution

GustoMSC and Barge Master have developed a cost-effective, motion-compensated feeder solution for installing the first wave of US projects. The integrated Jones Act compliant approach allows a motion-compensated platform BM-T700 to be placed on a US flagged offshore vessel or seagoing barge. This feeds the wind turbine components fast and safely to offshore installations, to be installed by a wind turbine installation jack-up.

www.GustoMSC.com / www.barge-master.com

Vestdavit Multi-Boat Handling System Wins US patent

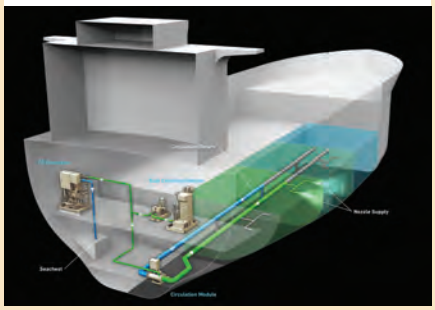
Vestdavit has secured a U.S. patent for its MissionEase multi-boat handling system. MissionEase is a more efficient and safer transfer method for RHIBS, USVs and other craft within mission bays between their storage and the davit launch areas. Mission bays allow boats and other equipment to be stored, maintained, prepared and launched safely from a protected area within the ship's profile.

www.vestdavit.no

Envirocleanse inTank BWTS Applies for USCG Type Approval

Envirocleanse LLC has submitted its application to the US Coast Guard for Type Approval of its patented inTank Ballast Water Treatment System. This BWTS is the only applicant to date which treats ballast water during the voyage, with no disruption to cargo and ballast operation – including gravity discharge of isolated top-side tanks. Another benefit is that no filter is required.

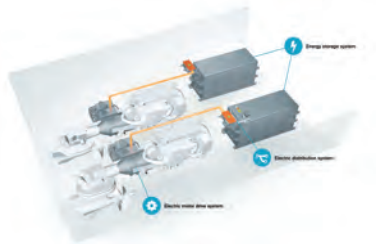
www.eco-enviro.com



MJP's Next Generation of WaterJet Propulsion – X Series

Marine Jet Power's (MJP) latest advancement in waterjet technology is the X Series. The new range of waterjets capitalize on MJPs successful duplex steel product line by offering a highly efficient, highly durable product at a much lower price point. The unique technology reduces power demand by 20 percent and reduces weight by up to 10 percent compared to axial flow jets.

www.marinejetpower.com



Volvo Penta's Hybrid Marine Propulsion Concept

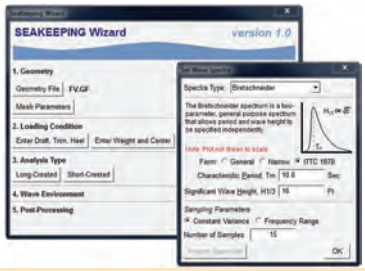
Designed to enable zero emission running for marine vessels, Volvo Penta has unveiled a hybrid concept for its IPS propulsion system. The electric-only mode allows entry into environmentally sensitive zones, as well as offering enhanced onboard comfort and boat handling characteristics. Designed to extend further IPS's advantage, the hybrid variant will also bring additional benefits, including lower noise, vibrations and running costs.

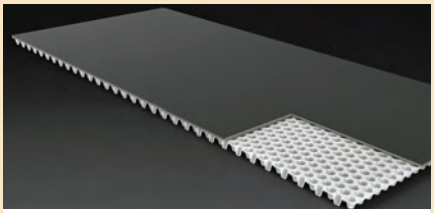
www.volvopenta.us/brand/en-us/home.html

New Module for GHS

The new GHS SeaKeeping Optional Module is based upon a linear, 6-degree-of-freedom, frequency-domain, strip-theory method with variable heading and forward speed terms. The module is fully integrated with GHS, meaning loading condition and hydrostatic information is automatically accessed. This also means SK requires few input parameters, offering ease of use. Comprehensive reports include a summary of input parameters followed by sections for each mode.

www.ghsport.com/sk.htm





Shock Defender Matting for High Speed Craft

Viconic Defense has launched a shock-mitigating boat matting product called Shock Defender. Leveraging proven energy absorbing technology for blast-mitigation and vehicle occupant survivability solutions, the low-cost boat matting provides superior shock-mitigation on high speed watercraft. Working with the Navy's NAVSEA Combatant Craft Division (CCD) the Shock Defender technology has underdone rigorous testing including shock attenuation, salt water immersion, solar radiation and surface friction.

www.viconicdefense.com

Dixon Valve's Safe, Efficient Loading Arms

Dixon Valve & Coupling Company's Loading Arms are used in the transfer of liquids and dry materials in a wide range of industrial applications. Engineered for long-life performance as well as ease of use, their design allows for smooth movement and minimal effort to balance arms in multiple positions. D or ball handles can be attached for easy maneuverability when connecting the arm at the manifold.

www.dixonvalve.com/loadingarms

Nylacast Chock Liners Optimize, Enhance Moorings

The patented Nylacast Chock Liner helps to deliver multiple advantages to vessels, and can be fitted without any hot work or dry docking, to all chock and vessel types. The Chock Liner allows for the accommodation of HMPE rope with lower risk of abrasion and wear. Suitable for polyester, polypropylene, polyester and nylon ropes, it works any time a specific synthetic pennant passes through the fairlead.

www.chockliner.com

Viega MegaPress Stainless, MegaPress CuNi add USCG, ABS Approvals

Viega has obtained ABS type approval and an acceptance letter from the USCG for Viega MegaPress Stainless and MegaPress CuNi piping systems. These join previously approved MegaPress and MegaPressG systems for use with carbon steel and galvanized pipe, providing a full line of materials—carbon steel, galvanized, stainless and copper nickel. Viega applications include compressed air, sprinklers, cooling water, low-pressure steam, fuel, lubes and more.

www.viega.us

VESSELS FOR SALE / BARGES FOR RENT

NEW PRODUCTS

Marine Marketplace

NEW PRODUCTS

Marine Marketplace

NEW PRODUCTS

PROFESSIONALS

ADVERTISER INDEX

Page	Company	Website	Phone#
3	ABB Inc. Marine & Ports	www.new.abb.com/marine/ETB	Please visit our website
25	AER	www.aersupply.com	(281) 474-3276
35	Ahead Sanitation	www.aheadsanitationsystems.com	(337) 330-4407
27	All American Marine	www.allamericanmarine.com	(360) 647-7602
39	Beijer Electronics	www.beijerelectronics.com/x2marine	(801) 924-5435
C2	Cummins Commercial Marine	www.cumminsengines.com/marine	Please visit our website
9	David Clark Company	www.DavidClark.com/Marine	(800) 298-6235
27	Detyens Shipyards Inc.	www.detyens.com	(843) 308-8000
41	Ebac Systems	www.ebacusa.com	(757) 873-6800
5	Engines, Inc.	www.enginespower.com	(870) 268-3700
11	Fueltrax	www.fueltrax.com	(281) 209-3480
35	Hilliard Corp.	www.hilliardcorp.com	(607) 733-7121
58	In-Mar Solutions	www.inmarsystems.com	(225) 644-7063
C3	J.A. Moody Inc.	www.jamoody.com	(610) 647-3810
7	Louisiana Cat	www.LouisianaCat.com/Marine	(866) 843-7440
22,23	Marine Systems, Inc	www.marinesystemsinc.com	(985) 223-7100
57	McDonough Marine Services	www.mcdonoughmarine.com	(504) 780-8100
29	Metal Shark Boats	www.metalsharkboats.com	(337) 364-0777
C4	R.W. Fernstrum & Company	www.fernstrum.com	(906) 863-5553
33	Scienco/Fast Systems	www.sciencofast.com	(866) 652-4539
45	SHIPPINGInsight 2018	www.SHIPPINGInsight.com	(203) 255-4686
21	SNAME	www.snameconvention.com/register	Please visit our website
1	Superior Industries	www.superior-ind.com	(320) 589-2406
39	Superior-Lidgerwood-Mundy, Corp.	www.lidgerwood.com	(714) 394-4444
13	Teufelberger Fiber Rope Corp.	www.teufelberger.com	(800) 333-6679
41	The Springfield Marine Company	www.springfieldgrp.com	(417) 616-6707
15	Tidewater Marine	www.tdw.com	(504) 568-1010
17	Waterman Supply	www.watermansupply.com	(310) 522-9698
13	YANMAR America Corporation	www.yanmar.com/us	Visit us online

The listings above are an editorial service provided for the convenience of our readers.
If you are an advertiser and would like to update or modify any of the above information, please contact: nicole@marinelink.com

PIMA VALVE, LLC.

SAME COMMITMENT TO QUALITY, ON TIME DELIVERY & EXCELLENT CUSTOMER SERVICE.

EXCITING TIMES AT PIMA VALVE

- Manufacturer of a wide variety of multi-turn bronze products (Gates, Globes & Swing Checks plus much more)
- 50+ Years in Business
- Veteran Owned Small Business
- 50+ Seasoned Employees
- Dedication to Quality & ISO Compliant
- Valves on Every Navy Ship Class - Complete line of Mil-Spec Products All S & V
- Competitive Pricing
- 100% American Made Valve

NEW!

NEW EQUIPMENT

At PIMA Valve, we hydrotest every single valve before it gets approved to ship to our customers. We are pleased to announce that a second state-of-the-art tilting valve tester hydro stand has been added to our floor that has the ability to test our valves from 2" – 16".

NEW!

NEW PRODUCT

PIMA is in the process of designing and manufacturing a 10 inch 100# Globe Valve B135GE to Navy Drawing Standards NAVSEA 803-1385511. Contact sales@pimavalve.com for details.

DID YOU KNOW?

PIMA STOCKS LIMITORQUE ACTUATORS

PIMA is an authorized distributor of Navy Parts & Units for Limitorque, a division of Flowserve. PIMA stocks Limitorque HH325 hydraulic actuators. Limitorque Inquiries can be sent to Adlink@pimavalve.com

JA MOODY is your direct and largest national stocking source for PIMA Valves. For sales inquiries please contact sales@jamoody.com

COME VISIT JA MOODY & PIMA VALVE'S BOOTH!

FMMS
September 18-20
Virginia Beach, VA

Fleet Maintenance & Modernization Symposium FMMS

INTERNATIONAL WORKBOAT SHOW

WORKBOAT SHOW
November 28-30
New Orleans
Convention Center

J A MOODY MARINE SALES & SERVICE

NEED A QUOTE? INQUIRES CAN BE SENT TO SALES@JAMOODY.COM
WWW.PIMAVALVE.COM | WWW.JAMOODY.COM

PIMA VALVE, LLC & JA MOODY ARE AFFILIATED COMPANIES

ISO 9001:2015 CERTIFIED

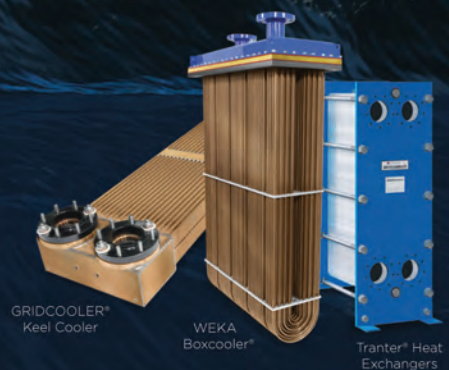
YOU DON'T WORRY ABOUT KEEPING YOUR COOL — UNTIL YOU LOSE IT.

Get it. Never lose it.

Expect peak cooling efficiency.
Expect trusted dependability.
Expect expert support.

R.W. Fernstrum Cooling Solutions.

fernstrum.com | 906.863.5553 | sales@fernstrum.com



FERNSTRUM®
R.W. Fernstrum & Company

R.W. Fernstrum & Company is an ISO 9001:2015 Certified Company