MARITIME LOGISTICS PROFESSIONAL

November/December | Volume 7, Issue 6

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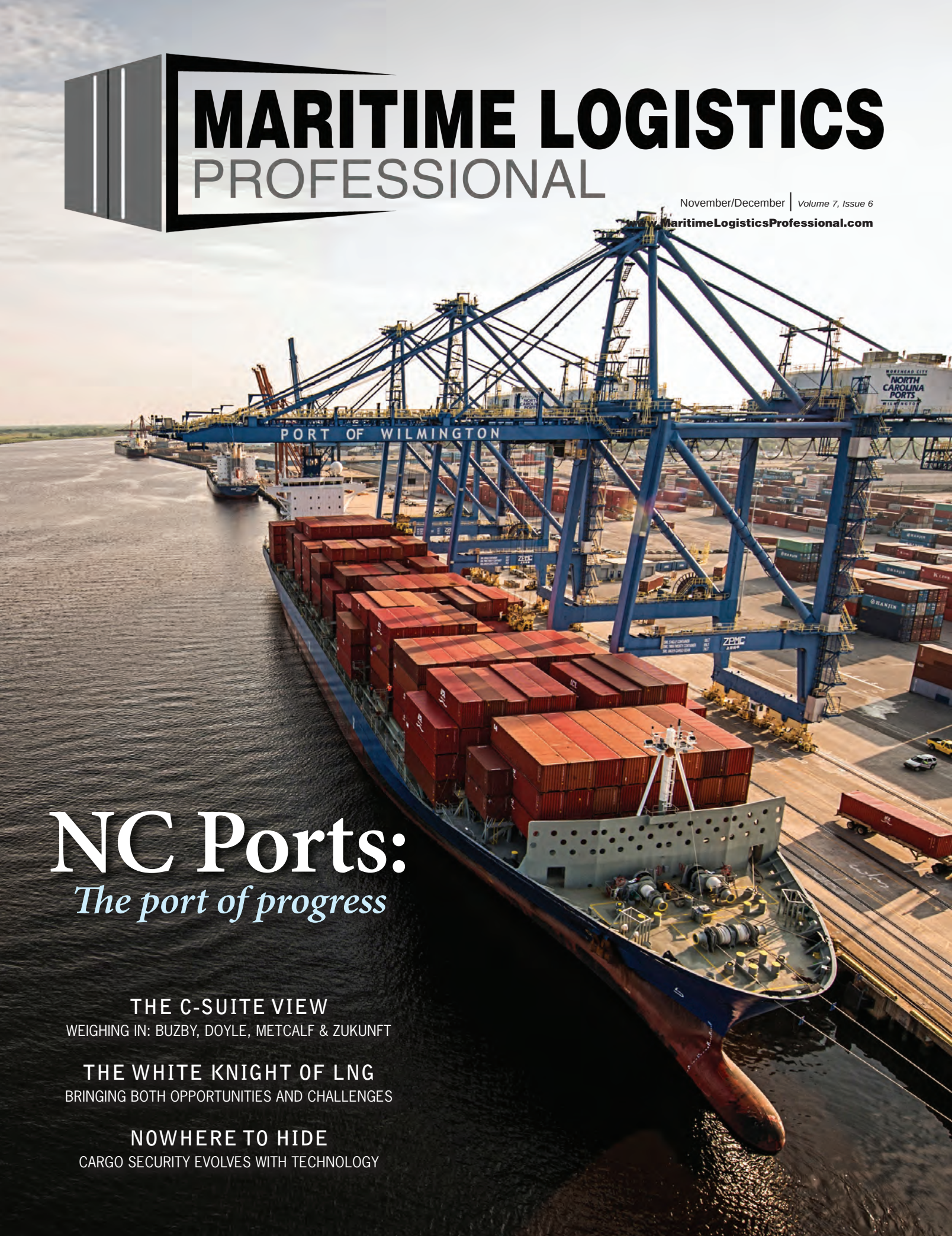

NC Ports:
The port of progress

THE C-SUITE VIEW
WEIGHING IN: BUZBY, DOYLE, METCALF & ZUKUNFT

THE WHITE KNIGHT OF LNG
BRINGING BOTH OPPORTUNITIES AND CHALLENGES

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"As we face budget challenges, and we always face budget challenges, but if you start cashing in your people – very difficult to get those assets back on budget again. People are our most valued resource."

– Admiral Paul Zukunft,
25th Commandant of the
Unites States Coast Guard

See *MLPro's Executive Interview* **on page 24**

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1


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3


4

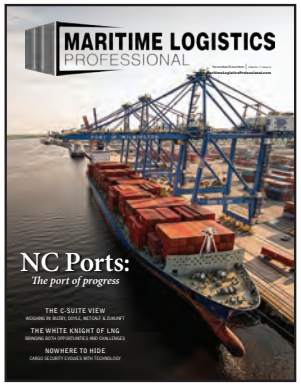
1 **William P. Doyle** is a Commissioner with the U.S. Federal Maritime Commission. Doyle was named in December as The Dredging Contactors of America's new Executive Director and Chief Executive Officer (CEO). He is expected to assume that post in January. The thoughts and comments he expresses here are his own and should not be construed to represent the position of the Commission or his fellow Commissioners.

2 **Jaakko Elovaara** is the CEO and co-founder of Youredi and drives the company's strategy and execution. Jaakko has two decades experience in the business software industry in North America, EMEA, and APAC. Prior to Youredi, Jaakko spent time at IBM, Microsoft, Basware, Itella, and Fujitsu.

3 **Vincent Lagarrigue** is Director of Trelleborg Oil and Marine.

4 **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**

ON THE COVER



On the Cover

North Carolina Ports beckon to shippers, local farmers and liner companies alike to consider a sea change. That message is already yielding considerable fruit. The story begins on page 32.

Image: NC Ports

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HQ 118 E. 25th St., 2nd Floor
New York, NY 10010 USA
Tel +1 212 477 6700
Fax +1 212 254 6271

URL www.MaritimeLogisticsProfessional.com
Email trauthwein@marinelink.com

Editor
Joseph Keefe
keefe@marinelink.com
+1 704 661 8475

Contributing Writers
William P. Doyle
Patricia Keefe
Barry Parker
William Stoichevski

Publisher
John C. O'Malley
jomalley@marinelink.com

Associate Publisher/Editorial Director
Gregory R. Trauthwein
trauthwein@marinelink.com

Production
Nicole Ventimiglia
nicole@marinelink.com

Corporate Staff
Vladimir Bibik, IT
Mark O'Malley, Public Relations
Esther Rothenberger, Accounting

Subscription
Kathleen Hickey
marprocirc@marinelink.com

Advertising Sales
VP Sales

Rob Howard
howard@marinelink.com

Northeast
Jean Vertucci
vertucci@marinelink.com
+1 212 477 6700

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30 FEATURED PORT

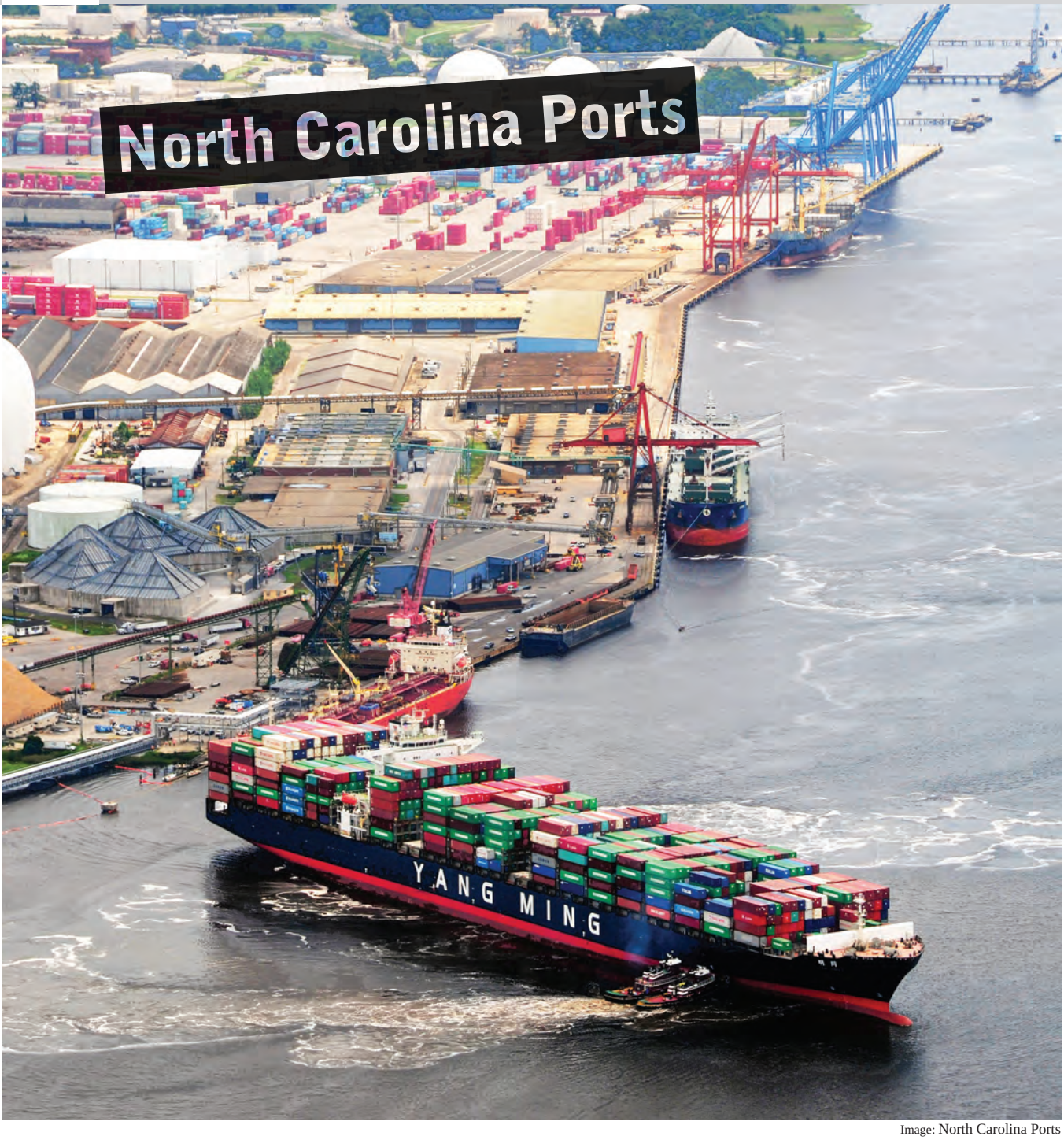

Image: North Carolina Ports

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MACDONNELL

Editor's Note

Full Speed Ahead

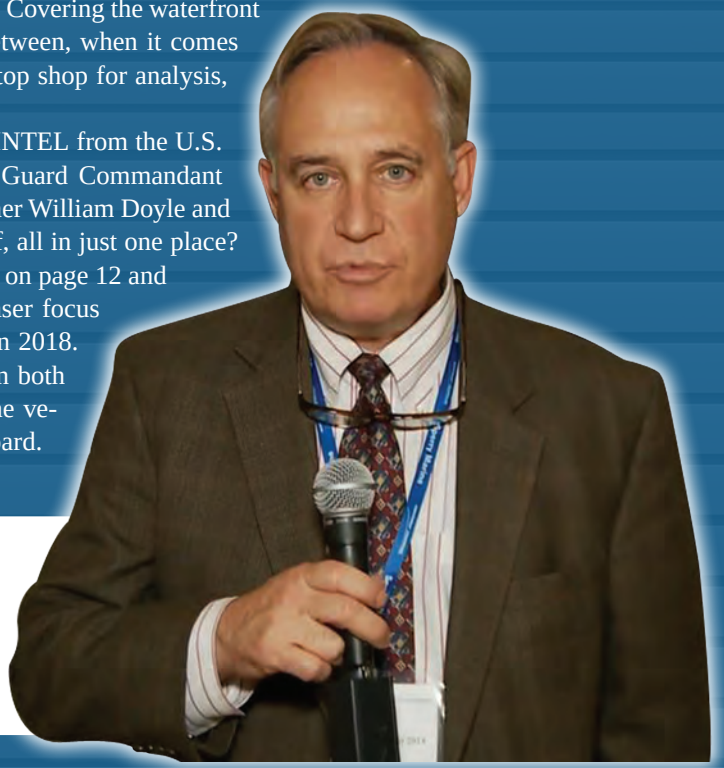
2017 was a busy year for intermodal logistics stakeholders. For many ports and liner companies, it was an equally good one. Arguably, the results have matched the considerable hype surrounding the expanded Panama and Suez Canals. U.S. ports continue to ramp up infrastructure and deepen channels and the promise of the so-called mega post-Panamax tonnage is here on our doorstep. Separately, Richard Greiner of international shipping adviser Moore Stephens reported this month that 'shipping confidence' is at its highest rating in the past three-and-a-half years. That's a good place from which to kick off 2018.

Maritime Logistics hinges on ports first, but it doesn't end there. That said; this edition's port focus – North Carolina Ports – might surprise you. Nevertheless, and far from being the Atlantic seaboard's biggest, the port of Wilmington alone can claim to be the most efficient. And, if today's cargo and TEU numbers at Tarheel State gateways don't wow you, consider that in just one short year, the ports have grown from serving just 5 Carriers and 12 Carrier-Port-Pair Options to 15 Carriers and over 65 Carrier-Port-Pair Options. Eying the prize represented by the nation's largest cold chain agricultural market – lurking just outside the gates – NC Port executives are excited about what comes next. That story begins on page 30.

Also in this edition, and with the IMO's so-called '2020' deadline looming large in the porthole, shipowners and bunker infrastructure providers all have difficult decisions to make. One possible solution is the use of LNG as fuel, something that brings with it a sea bag of issues of its own. Addressing LNG's logistical 'chicken and egg' aspect, as well as the nuts and bolts of safely transferring that fuel as bunkers, ***MLPro*** brings you up to speed quickly.

Closer to home here at ***Maritime Logistics Professional*** magazine, we also saw a busy year, starting with our first year of ramping up to six editions. Since its inception as a quarterly magazine nearly seven years ago, this BPA audited B-to-B logistics publication has seen its share of change, evolving and growing to where it is today. Covering the waterfront from infrastructure to shipping finance and everything in between, when it comes to the global intermodal supply chain, ***MLPro*** is your one-stop shop for analysis, news and emerging trends.

For example, what if you could listen in and get the latest INTEL from the U.S. Maritime Administration's ADM Mark Buzby, U.S. Coast Guard Commandant ADM Paul Zukunft, long time Federal Maritime Commissioner William Doyle and the International Chamber of Shipping's CEO Kathy Metcalf, all in just one place? **Look no further:** that coverage – and much more – kicks off on page 12 and continues throughout just this edition alone. That kind of laser focus on the industry's most important influencers won't change in 2018. Beyond this, our first edition of the year will be produced in both print and electronic formats. Hence, you can now choose the vehicle that's right for you. I'm happy you chose to come on board.



Joseph Keefe, Editor | **keefe@marinelink.com**

MARITIME LOGISTICS PROFESSIONAL

2018 EDITORIAL CALENDAR

JANUARY/FEBRUARY
Cruise Shipping Trends

- Maritime Carriers: Cruise Shipping
- Port Logistics: Intermodal Connections
- Finance: Managing IT Spending
- Emerging Trends: Shipboard Connectivity
- Tech: e-Vetting Tonnage for Quality
- Product: Maritime Security Providers
- Special Report: Port Security

BONUS DISTRIBUTION
Seatrade Cruise Global
March 5-8, Fort Lauderdale, FL

MARCH/ APRIL
IT & Software

- Maritime Carriers: Bulk Carrier Sector Report
- Port Logistics: Regulatory Impact Report
- Finance: the Cost of Big Data
- Emerging Trends: Supply Chain Transparency
- Tech: SATCOM Solutions
- Product: Terminal Operating software
- Special Report: Terminal, Yard Management

MAY/JUNE
Container Ports

- Maritime Carriers: Top 25 Ocean Liners
- Port Logistics: Competing for Market Share
- Finance: Vessel Valuation Evolves
- Emerging Trends: Combating Cyber Threats
- Tech: Vessel Management Software
- Product: Container Handling Equipment
- Special Report: End-to-End Turnkey Logistics

JULY/AUGUST
Port Infrastructure & Development

- Maritime Carriers: Coastal Commerce
- Port Logistics: Dredging & Infrastructure
- Finance: P3 Projects
- Emerging Trends: Tanker Logistics Evolve
- Tech: Port Security & Cyber Protection
- Service: Dredging Contractors
- Special Report: Port Planning Simulation

BONUS DISTRIBUTION
SMM 2018: Sept 4-7, Hamburg, Germany
Breakbulk Americas: Oct 2-4, Houston, TX

SEPTEMBER/OCTOBER
Liner Shipping & Logistics

- Maritime Carriers: Shifting Alliances & Ports
- Port Logistics: Equipment Evolves
- Finance: Operator Consolidation Continues
- Emerging Trends: Liner Alliances
- Tech: Hybrid & Long-Distance Learning
- Product / Service: e-Commerce Platforms
- Special Report: Managing Your Mariners

NOVEMBER/DECEMBER
Regulatory & Environmental Review

- Maritime Carriers:
- Port Logistics: LNG Bunkers / Infrastructure
- Finance: The Cost of Green
- Emerging Trends: Manage & Track Emissions
- Tech: Supply Chain Management
- Service Providers: Liquid Bulk Storage
- Special Report: MARPOL Annex VI (2020)

All information may be subject to change

FMC Approves Filings by the New York Shipping Exchange (NYSHEX)

In December 2017, the U.S. Federal Maritime Commission voted to allow the New York Shipping Exchange (NYSHEX) to move forward with two agreements it filed pursuant to the Shipping Act.

The first filing is based on an agreement by ocean common carriers to participate on the NYSHEX Exchange Board. This authorizes the parties to develop, manage, market and operate a digital freight contracting process, called the New York Shipping Exchange, through participation on the Board of NYSHEX. Parties to the agreement are CMA CGM SA; Hapag Lloyd AG; Mitsui O.S.K. Lines, Ltd.; COSCO Shipping Lines Co., Ltd; and COSCO Shipping Co., Ltd.

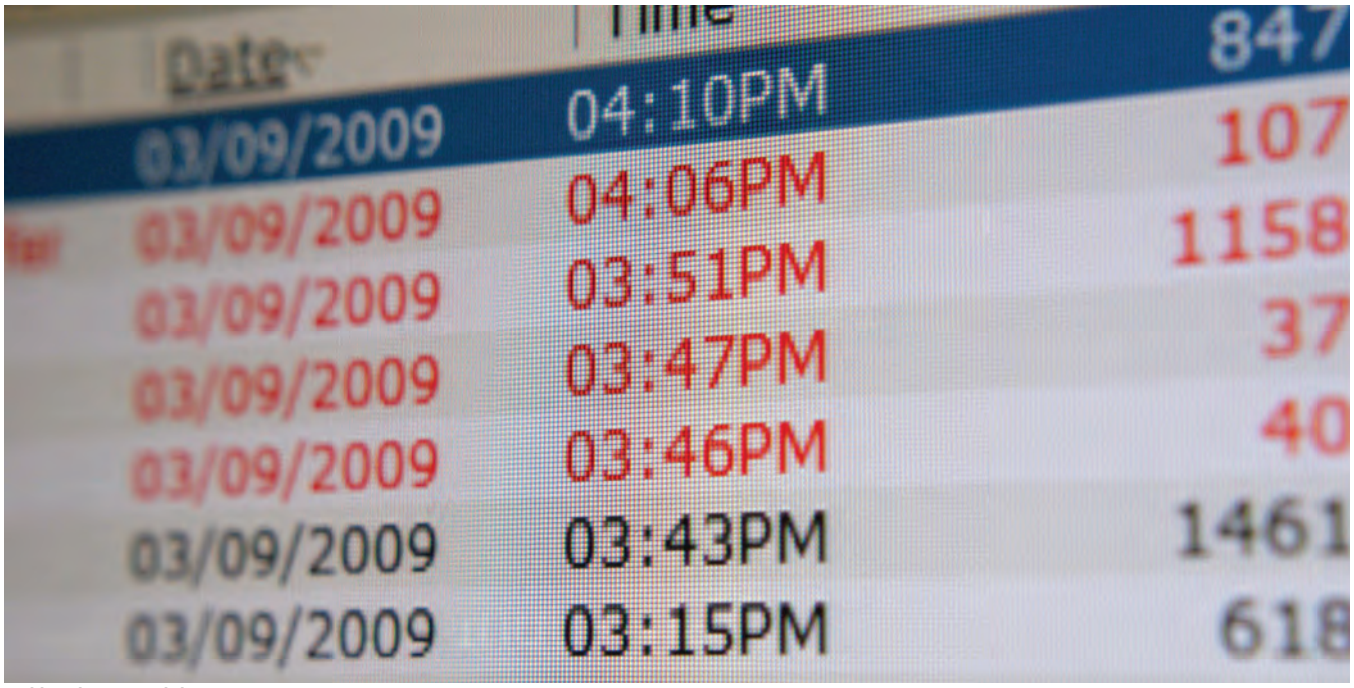
The other filing is an agreement by ocean common carriers authorizing the parties to agree on language and terms to be included in the NYSHEX Forward Contract, which shall be used by a carrier party when contracting with a shipper via the NYSHEX Exchange.

I have been following NYSHEX for several years. NYSHEX officials have visited the Commission from time to time to brief Commissioners and staff as it was building out its program. I like the idea and concept of the NYSHEX. The system places responsibility on both ends – with the ocean carrier and the shipper (i.e., beneficial cargo owner (BCO)). In January of 2017, NYSHEX completed its pilot program for digital bookings. NYSHEX shipped over 500 TEU's under a pilot and beta testing program with a select group of ocean carriers and shippers.

- **How it Works**

The way the exchange works is there would be a fixed "all-inclusive" rate for a guaranteed number of slots and containers. The shipper would collect a penalty if the carrier does not meet its contractual obligation. A penalty also exists for the shipper if the shipper cancels the booking. Each booking is its own service contract agreement that would automatically be filed with the Federal Maritime Commission.

Ocean carriers would pay a $5 per twenty-foot-equivalent (TEU) transaction fee. The shippers and non-vessel-operating common carriers (NVOCC) would use NYSHEX free of



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The digitalization of cargo bookings is moving forward.

> *... THE NYSHEX PLATFORM IS DESIGNED TO HELP SHIPPERS MAKE RESERVATIONS AND TO REDUCE THE UNCERTAINTY TO CARRIERS AS A RESULT OF SHIPPERS FAILING TO DELIVER THE VOLUME OF CONTAINERS THAT THEY HAD PREVIOUSLY COMMITTED TO SEND. ADDITIONALLY, THE CARRIERS ARE HELD RESPONSIBLE TO THE SHIPPERS WHEN THE CARRIERS DO NOT LOAD THE CONTAINERS AS PREVIOUSLY AGREED AND INSTEAD LEAVE CONTAINERS ON THE DOCKS.*

charge but the shippers and NVOCCs must be pre-approved with NYSHEX in order to participate.

In a nutshell, the NYSHEX platform is designed to help shippers make reservations and to reduce the uncertainty to carriers as a result of shippers failing to deliver the volume of containers that they had previously committed to send. Additionally, the carriers are held responsible to the shippers when the carriers do not load the containers as previously agreed and instead leave containers on the docks.

Shippers can book container slots on ships through an electronic portal. The portal is monitored by NYSHEX to determine whether the booking is fulfilled by shipper and carrier. The carriers and shippers negotiate and execute their own contracts. The rules are clear: If either party fails to fulfill its obligation, the shipper or carrier, depending on who is at fault, would forfeit between 30 to 40 percent of the agreed shipping cost. This would be an automatically generated penalty through the NYSHEX exchange eliminating the need for either side to chase the other for the default payment.

- **Looking Ahead:**

The Commission's approval enables the carriers to take two rotating seats set aside for carrier representatives on the nine-member governing board. Importantly, two other seats on the board will be filled by shippers. These seats would be filled by either BCOs or NVOCCs.

The Commission will monitor the NYSHEX agreement moving forward nonetheless. The FMC will need to monitor "forward exits" where a shipper obtains a profit on the resale of space. The reason for this concern is that the shipper could perhaps manipulate the market by increasing freight rates. The Commission, will also monitor the Board's ability to revise any aspect of the operation of NYSHEX including the forward contract, the trading rules, and membership requirements; for example, changes made to NYSHEX's legal and compliance protocols.

The Commission conducted a review of filed agreements under 6(g) of the Shipping Act. This entails determining (a.) if the agreement results in a significant reduction in competition (b.) whether it is likely to produce an unreasonable reduction in transportation service, or (c.) an unreasonable increase in transportation cost. The answer is no to all questions; therefore I voted to allow the agreements to move forward.

NYSHEX is an early entrant to the concept of digitalizing the maritime transportation and logistics chain. There are start-ups attempting to form every day. NYSHEX has been at it since around 2012, building its platform and digital portal, running beta tests and pilot programs. It appears to be a platform that can be used effectively and be a useful, additional tool for the greater supply chain.

The Author **William P. Doyle**

is a Commissioner with the U.S. Federal Maritime Commission. Doyle was named in December as The Dredging Contactors of America's new Executive Director and Chief Executive Officer (CEO). He is expected to assume that post in January. The thoughts and comments he expresses here are his own and should not be construed to represent the position of the Commission or his fellow Commissioners.

Kathy Metcalf

Kathy J. Metcalf graduated from the US Merchant Marine Academy in 1978 with a Bachelor of Science degree in Marine Transportation and Nautical Sciences. A leader even back then, she was a part of the first co-educational graduating class at Kings Point. Upon graduation, she sailed for five years as a deck officer on crude oil and product tankers with Gulf Oil Corporation and Sun Company. During this period, Ms. Metcalf also participated in a shipboard/shoreside management development program with both companies, leading to her assignment ashore with Sun Company as the Fleet Safety and Health Coordinator.

Eventually, she was elevated to the position of Manager, State Government Affairs for Sun's Midwest operations area. In this capacity, she was responsible for the design and implementation of a proactive government relations strategy including interface with state legislatures and regulatory agencies, communications with diverse business lines including refining and marketing, terminals and pipelines and interaction with Sun's federal government affairs professionals.

In 1997, she joined the Chamber of Shipping of America as Director of Maritime Affairs for the Chamber of Shipping of America (CSA); the primary maritime trade association representing U.S. based commercial shipping interests in international, federal and state forums. She has testified before Congressional committees, federal and state regulatory agencies and has attended numerous sessions of the International Maritime Organization (IMO) initially as the American shipowner representative on the U.S. delegation to the Marine Environment Protection Committee (MEPC) and the Maritime Safety Committee and currently as the American shipowner representative on the International Chamber of Shipping (ICS) delegation.

She took the reins as President & CEO of CSA in January 2015. Metcalf has been with CSA for almost 20 years and brings a solid background of seagoing service and shore responsibilities with shipping companies that serve CSA's membership well. In this edition, she weighs in on a host of issues facing today's shipping and logistics community.

Summarize 2017 for shipping companies: the good, the bad and the ugly. And, at the same time, tell us what's looming large in the porthole for 2018.

2017 has been a year of mixed outcomes. Internationally and domestically, the shipping industry is in a multiple year downswing and our hope is that this will begin to change in 2018. Market-based pressures and demands across all type of shipping present significant challenges to shipowners and charterers who are necessarily focused on the bottom line. One positive aspect of 2017 is the result of the Trump Administration's regulatory reform initiative which has resulted in far less regulatory initiatives being undertaken by the US government. Looming large in 2018 and beyond is the continued need for compliance with regulations at all levels of government and future requirements relating to the 2020 global cap, full implementation of the ballast water convention and U.S. ballast water regulations, and ongoing discussions on greenhouse gas emissions from ships and what the appropriate reduction targets should be in the short term (2018), medium term (2023) and long term (2030 and beyond).

CSA has been involved with the ballast water treatment & invasive species question since the very beginning. With the IMO backing off its timelines, and the Coast Guard holding firm (on theirs), what will your advice now be for your members stakeholders?

My advice has not changed much in light of the Convention entering into force September 2017 and the USCG program going full speed ahead. The most important consideration is to determine the implementation date for a given vessel. Assuming a shipowner has done nothing to identify a suitable system, the next step is to identify the operational needs of the vessel as well as its design. Shipowners on a per vessel basis need to look at needed flow rates, footprints of the various systems, typical transits to assure sufficient transit time to meet the holding time requirements of a particular system, power requirements, installation and maintenance feasibility, sampling and monitoring requirements, and chemical han-

President & CEO, Chamber of Shipping of America

dling and storage requirements to name a few. Narrowing down systems suitable to a particular vessel configuration is the most important first step. The next step is to determine if a particular system has a type approval, whether it is issued by the United States or another country. If it does not have a US type approval, it is critically important for the shipowner to determine if the manufacturer is engaged in seeking a US type approval. If not, cross that system off your list.

Taking all of the above into consideration, it's time to engage in negotiations with manufacturers that produce systems that meet the operational needs of the vessel in question. These negotiations obviously will include price, but equally as important should include discussions on availability of the system and traditional contract terms relating to warranty, service and maintenance. From the shipowner's perspective, planning for preparation of the ballast water management plan is critical including contingency planning if the system, once installed, fails to operate while a vessel is in transit. Once a system is selected, the shipowner needs to prepare a timeline for installation presumably during a regularly scheduled drydocking and determine if the vessel's implementation deadline can be met. If not, the vessel owner will need to apply for an extension although it is worth noting that extensions are harder to come by these days given the fact that a number of systems have received US type approval. A successful extension application must show why none of the current systems with U.S. type approval can be used and provide a timeline for how the vessel owner will assure compliance by the implementation deadline.

A well-informed colleague, Debra DiCianna from Choice Ballast Solutions has put together a simple list of generic considerations and advice. In her words, vessel owners should (1) expect the unexpected (2) develop a compliance strategy including considerations for system design and installation and contingency planning (3) document all discussions with system manufacturers, engineering firms and drydocks including any operational issues noted (4) keep up to date with all developments and (5) team with trusted partners.

CSA Advocacy extends to foreign flag and domestic operators and membership. What is the common glue that holds this unique group together and what one issue – if you can distill it down to that – do they share that concerns all of them?

The primary goal of our members is to assure that they are compliant with all legal requirements in all locations to which they trade. As a membership based organization, our primary goal is their primary goal and much of our communications with members relate to implementation requirements for existing regulations and providing compliance advice for a particular issue in general but also from time to time, providing customized compliance advice on a specific issue unique to a situation encountered by one member. A secondary goal is to provide "heads up" briefings to our members on new requirements which we see coming down the road and develop a Chamber position on how we can influence the development of these new requirements so the final result is economically feasible, operationally practical and takes into account the most important issues of vessel and crew safety and environmentally responsible operations.

CSA in Action: If you had to choose one mission of your many daily tasks, where do you provide the most value for your membership? Why, how and can you give us specific examples?

CSA's goal is to ensure that our members know what they have to do to remain compliant today, and what they may have to do in the future. With the avalanche of new requirements both internationally and here in the US, it is critical that they have the necessary information to make informed business decisions. For us to be successful in this mission requires CSA to be at the forefront of all discussions relating to international deliberations (IMO) and U.S. state legislative and regulatory initiatives. CSA staff work very hard at maintaining the critical network and interfaces with Congress, USCG, EPA, NOAA and the State Department. In this role, our primary aim is to be seen as a trusted industry advisor capable of providing the in-

> MY ADVICE TO SHIPOWNERS IS EVALUATE EACH VESSEL IN THEIR FLEET TAKING INTO ACCOUNT REMAINING USEFUL LIFE, EXPECTED TRADE PATTERNS AND THE PROJECTED COSTS ASSOCIATED WITH THE 2020 GLOBAL CAP FUEL.

dustry perspective on any initiatives which may impact the US maritime industry. Specific examples of this type of work include providing testimony at key Congressional hearings, participating in the US rulemaking process by providing written and oral comments and participating in IMO deliberations as a member of the International Chamber of Shipping delegation.

The 2020 global sulfur cap: You are keenly aware of the pressures facing your membership as they make difficult environmental decisions in an equally challenging charter market. That said, most of the overt pressure seems to be exerted on the shipping community, and far less on the bunker providers, refiners and shoreside infrastructure that someday must step up to provide the resources to help shipping comply. What advice would you give your owner members as they contemplate a deadline which is just one short year away?

The first principal in meeting the challenges of the 2020 global sulfur cap is the recognition that information is everything. CSA has been involved in these discussions since their inception and provided regular briefings to our members as the issue further develops. While the ship is the point of compliance, discussions particularly those at IMO, have attempted to bring this issue to the forefront through discussions with bunker providers and refiners. CSA has analyzed studies relating to fuel availability and provided opinions on the conclusions reached in these studies. While the 2020 sulfur cap is a non-issue for vessels engaged in the domestic trade since they already have to comply with the 0.1% sulfur fuel required in the North American and Caribbean Emission Control Areas, vessels engaged in international trade, regardless of flag, will need to make smart business decisions on how to comply with the 2020 cap. CSA has briefed its members on three specific paths to compliance – use of alternative fuels, installation of scrubbers or use of 0.5% global cap compliant fuel, taking into account the respective costs associated with each of the three compliance strategies. My advice to shipowners is evaluate each vessel in their fleet taking into account remaining useful life, expected trade patterns and the projected costs associated with the 2020 global cap fuel.

Safety: it is a big part of your organization, you give out awards annually for those high performers who 'walk the walk' and 'talk the talk.' Beyond the awards, though, where does CSA get involved in that important area?

Safety and environmental performance are two of the biggest performance indicators for CSA and its member companies. In order to assist our members, we stay involved in discussions relating to best practices and areas for improvement as well as regulatory initiatives at the international and domestic levels. Our members have safety management and environmental management systems which are continually under review with an aim toward progressive improvement, whether required by regulation or not.

Focus: When it comes to CSA, what keeps you up at night, why, and what are you doing about it?

The ever increasing multitude of issues which impact marine transportation keeps me up a night. CSA's staff is small and we work very hard in keeping up with relevant issues and providing timely information to our members on how they are developing. There is no doubt that we could use at least one additional maritime professional on our staff. In order to have a budget that will permit this, we are continuously engaged in seeking new member companies to join the Chamber and receive the value that current members enjoy.

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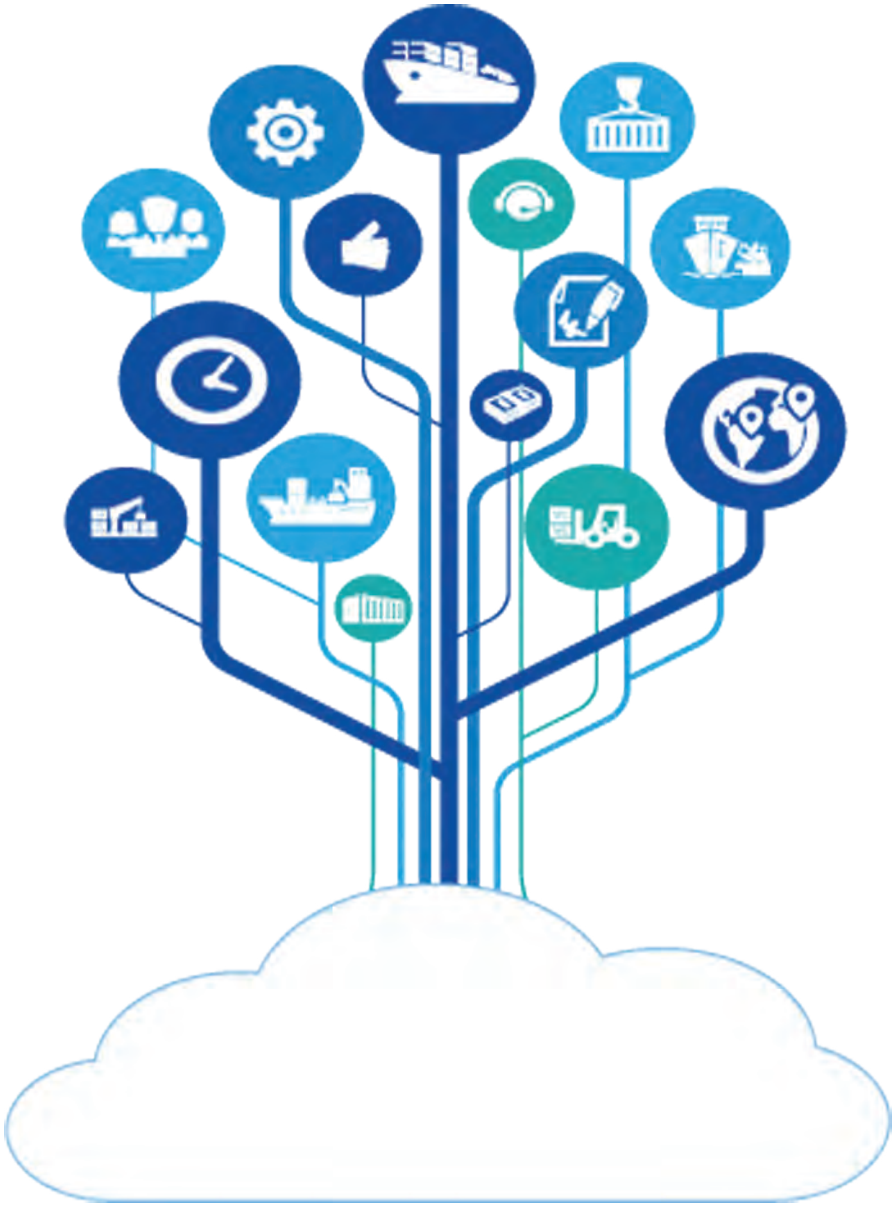


All images courtesy YourEDI

Data is at the heart of today's business processes and operations. Exploiting the insights derived from the data holds unparalleled opportunities for the global ocean shipping industry to overcome its significant inefficiencies. One firm, Youredi helps industry stakeholders to digitalize and automate processes with modern cloud-based integrations. Investing in digitalization does not only reduce costs and improve operational efficiencies but helps companies to better meet the demanding and growing customer expectations.

Ocean Shipping: Key Pillar of global Economy

Shipping goods by the sea is far the most popular and cost-effective method of delivering products. Hence, more than 90 percent of all world trade is carried by ship. Consequently, the industry's performance has a straightforward effect on the global economy. However, utilizing legacy technologies – often tailored systems with own proprietary message formats – causes inefficiencies in the processes, making the global maritime shipping industry less competitive and/or efficient. The lack of modern technology is preventing the industry stakeholders from sharing data in real-time across multiple parties and make better sense of the available information. Modernization must happen to improve the competitiveness of the global shipping industry and

Powering the Future of Global Ocean Shipping

its impact on the economy.

To this end, Youredi enables quick connections and message translations between supply chain partners and customers. Integrating with communities, carriers, shippers, consignees and the systems that they use, Youredi provides global scale, speed, and agility. This seamless real-time flow of 100% accurate data provides organizations the ability to analyze and optimize all their supply chain processes. This range of solutions spans big data, IoT, and analytics.

Overcoming Operational Inefficiencies

The first step to increased efficiencies is for Industry to overcome its heavy reliance on legacy tailored systems, Electronic Data Interchange for Administration, Commerce, and Transport (EDIFACT) messaging format, and other proprietary message formats. Adding a modern integration layer to the current systems will make message sharing regardless the format faster and easier, allowing stakeholders in the industry to share data automatically in real-time both externally and internally.

Many core legacy systems that industry participants are using have been in place for decades. This risk-averse industry needs to tackle the challenges of inefficient systems and messaging formats. Deploying a cloud-based data integration solution removes the risk from the equation: there is no need to own or operate software and hardware to automate real-time data sharing between different applications and systems. All the information exchange happens in the cloud seamlessly while maintaining high security.

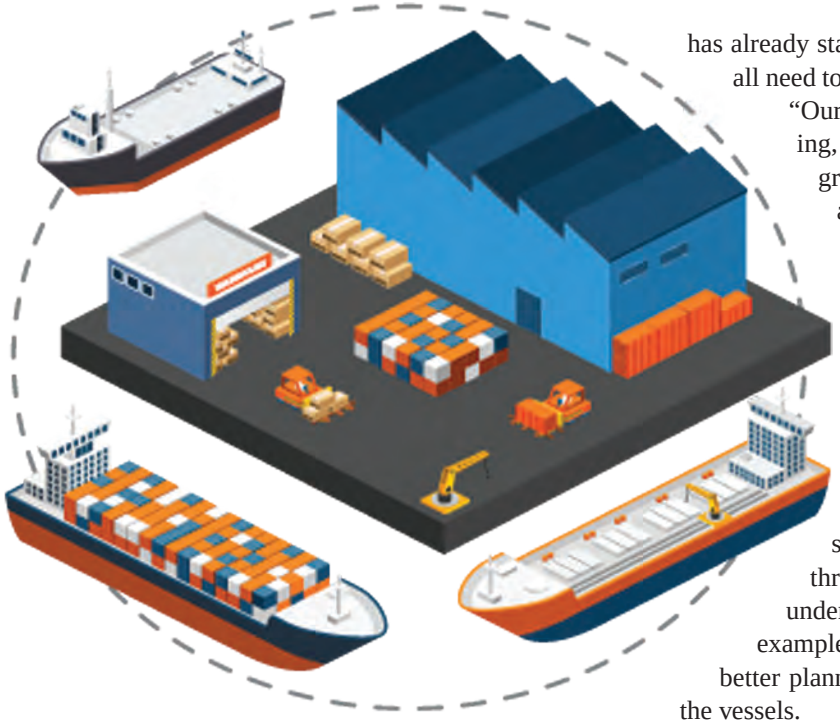
Youredi is one such provider of a cloud-based Integration Platform as a Service (iPaaS) solution with a focus on global supply chains and logistics. The company has been helping stakeholders of the global ocean shipping industry to overcome some of their major obstacles related to bookings, schedules, eVGM, and container tracking. Some of the main issues, such as carrier to terminal coordination, difficulties with terminal operations, coordination across carrier alliances, supply chain visibility, information sharing, and predictability could be easily avoided by utilizing a cloud-based integration platform. Industry participants need to prioritize their digitalization, develop a holistic digital transformation strategy, find the right technology provider, and execute it across all segments of the business.

> *MUCH OF THE PROCESSES ARE STILL BASED ON PAPER AND HUMAN INTERVENTION. THIS IS SLOWING DOWN THE OPERATIONS AND IT IS EXTREMELY EXPENSIVE. WITH INTEGRATIONS, SYSTEMS AND APPLICATIONS CAN BE CONNECTED RAPIDLY. THIS HELPS TO AUTOMATE AND DIGITALIZE PROCESSES, WHICH IS SPEEDING UP OPERATIONS. THE OUTCOMES ARE CLEAR: LESS MANUAL LABOR MEANS MORE EFFICIENT PROCESSES WHICH IS SAVING TIME AND IMPROVE MARGINS.*
>
> **– DEAN BAXTER, SVP, YOUREDI**

For its part, Youredi helps some of the biggest stakeholders in the industry to become more competitive by supporting their digital transformation with a wide range of vital services. This includes help with data management, transfer, transformation, and translation, as well as orchestrating processes between partners and systems."

Real-Time Data Sharing: Visibility & Predictability

Real-time data sharing is a must for better coordination between different stakeholders. When data is shared in real-time, processes then become seamless and more efficient, adding a



layer of visibility and predictability to all the operations. But, the utilization of legacy systems is only one part of the challenge. The bigger issue is the large variety of different data formats used in the industry. Youredi connects systems and applications, utilizing technology that takes care of the translation process during the information transfers. Additionally, it is also possible to validate the data and enrich it according to the rules of the customer.

EDIFACT is the most widely used messaging format in the ocean shipping industry. Dealing with EDI is a burden for the industry, as this format is too restrictive. Data and system integration can free the industry from its heavy reliance on EDI. For example, EDI messages are often full of inadequate or missing data. At many firms, human labor is used to correct the data quality which is slowing down processes.

"Much of the processes are still based on paper and human intervention. This is slowing down the operations and it is extremely expensive. With integrations, systems and applications can be connected rapidly. This helps to automate and digitalize processes, which is speeding up operations. The outcomes are clear: less manual labor means more efficient processes which is saving time and improve margins." says Dean Baxter, SVP, Youredi.

IoT: Internet of Things Will Reshape the Industry

Emerging technologies will have a significant impact on shaping the future of the industry. Cloud services, automation, data and system management are a few that the industry has already started to utilize. That said; these cloud services all need to be implemented across all business processes. "Our technology will most improve decision-making, increased cost efficiencies and gross margins, greater transparency and visibility into processes and shipments, and faster end-customer delivery," adds Baxter.

Also according to Baxter, the Industrial Internet of Things (IoT) could further improve the visibility and traceability of shipments, allowing companies for better supply chain planning with insights derived from data. Recently, Youredi has been developing a track and trace solution, utilizing Internet of Things (IoT) sensors and devices. These sensors can deliver information of the shipments through a gateway. The information is vital for understanding the status of the goods, which is for example critical in case of perishables, and allows for better planning and optimizing loading and unloading of the vessels.

Dean Baxter explains, "Our IoT Track and Trace solution will help with accurate planning and forecasting and improve decision-making related to supply chain planning. Greater transparency and visibility into processes and shipment will result in fine-tuned processes and faster end-customer delivery."

Technology and digital transformation can help to keep up with the pace of the growing economy and satisfy the needs of partners for better digital services. Despite some emerging trending technology trends, cloud-based data integration is still the simplest way to revolutionize the operations and processes of an aging industry.

Predicting the future is difficult, but we are confident to say that technology will have the power to shape the future of the ocean shipping industry. Those participants of the industry that are navigating their development initiatives right will have a major advantage compared to those that don't start their digitalization journey soon enough. The global ocean shipping industry is an important part of the emerging world economy, but the infrastructure requires development.

The Author **Jaakko Elovaara**

is the CEO and co-founder of Youredi and drives the company's strategy and execution. Jaakko has two decades experience in the business software industry in North America, EMEA, and APAC. Prior to Youredi, Jaakko spent time at IBM, Microsoft, Basware, Itella, and Fujitsu.

DOMESTIC MARITIME POLICY

BY JOSEPH KEEFE

> *"THAT LINKAGE, WHERE THE JONES ACT FITS IN, AND WHERE CARGO PREFERENCE FITS IN, OR THE MSP FITS IN, THEY ARE ALL PART OF THIS ECOSYSTEM THAT HAS TO EXIST. PEOPLE ARE VERY HAPPY JUST TO PLUCK PIECES OUT, NOT REALIZING IT'S GOING TO COLLAPSE THE WHOLE THING. IT'S A VERY TENUOUS CONSTRUCTION WE HAVE RIGHT NOW.*
>
> **– MARK BUZBY, U.S. MARITIME ADMINISTRATOR**

All images courtesy: MARAD

An hour with the new U.S. Maritime Administrator, Rear Adm. Mark H. Buzby, USN, Ret., is as informative as it is refreshing. Sworn in on August 8, 2017, Buzby served as president of the National Defense Transportation Association, a position he has held since retiring from the U.S. Navy in 2013 with over 34 years of service. A 1979 graduate of the U.S. Merchant Marine Academy, Buzby earned his Bachelor of Science in Nautical Science and U.S. Coast Guard Third Mate License. He was commissioned in the US Navy in June 1979, is a graduate of the Joint Forces Staff College and holds master's degrees from the U.S. Naval War College and Salve Regina University in Strategic Studies and International Relations respectively.

When it comes to the maritime industry, there isn't too much Buzby hasn't done on the water, ashore and everywhere in between. Arguably, Buzby brings to the Marad c-suite one of the deepest and most relevant experience skill sets of anyone who has filled that role in recent memory. For example, his leadership at National Defense Transportation Association closely parallels his mission focus at Marad, and his Military Sealift Command experience complements his efforts to ensure that the nation maintains a robust sealift capacity – in times of peace and war. Finally, the USMMA graduate has promised to right the ship at his alma mater, while also bringing a keen understanding of both naval and merchant marine operating procedures to an office that must cater to both.

As Buzby settles into his chair at the U.S. Maritime Administration, a raft of issues await his attention. And if one of his predecessors once labeled Marad as "America's Maritime Cheerleaders," Buzby made it immediately clear that it won't be business as usual. He intends to do more than advocate. That won't be easy, especially given the paltry budget he operates with. That said; an hour sitting across the desk from him at DOT headquarters made it clear that if anyone can accomplish something of substance for the collective domestic waterfront, then he, guiding an enthusiastic team, will be the one to do it.

Buzby last month weighed in on a half dozen issues, showing surprising depth in all phases of his missions, just a few short weeks after arriving at Marad. His approach in addressing the most pressing matters of the day is both pragmatic and honest, and you get the feeling he means exactly what he says.

Manning Crisis Looming

Perhaps the most interesting, if not surprising messages coming out of Marad today is the urgent need to solve what Buzby characterizes as the coming manning crisis. With record numbers of unlimited tonnage licenses now in play, it is seemingly easy to dismiss those worries. But, Buzby says that would be a mistake. And, the first place to address those worries are at the six state maritime academies (SMA) and at the U.S. Merchant Marine Academy at Kings Point. The federal and state schools have their own unique issues to deal with; the critical need to replace aging training ships at the SMA's and at Kings Point, needed repairs to a tattered reputation that started with a less than satisfactory accreditation audit.

Buzby, a Kings Point graduate, says that we need all of them to thrive. "We absolutely do. We need them coming out of Kings Point and we need them coming out of the other six schools," he said, adding quickly "This adds a level of concern and crisis to the whole school ship issue, because if we lose the school ship, that's a big chunk of people that I lose. It's all connected. And that's the biggest challenge that I see coming is trying to put light on all of the linkages that exist in this industry."

Buzby points to the sealift mission in support of TransCom as the ultimate mission, which leads us back to the academies and the school ships, who exist in part to ensure that the nation has enough of a pool to call upon them in war time to execute that mission. And, he warns, that tinkering with one part or another of the domestic waterfront, is a mistake. "That linkage, where the Jones Act fits in, and where cargo preference fits in, or the MSP fits in, they are all part of this ecosystem that has to exist. People are very happy just to pluck pieces out, not realizing it's going to collapse the whole thing. It's a very tenuous construction we have right now."

Turning back to the manning crisis, one of Buzby's most pressing issues involves the replacement of the training ships

USMMA Aerial

that ultimately produce 75% of the nation's deep draft licensed mariners. Because there simply isn't a 'ghost fleet' anymore from which Marad can find replacements, a new way of thinking is in play. Buzby says, "We can't use the model that we've used in the past. We have to approach this in a much different way. Building the purpose-built ship would be the ultimate way to do it if we were really serious. But thus far, we have not done that. So the fall back – if we don't build a purpose-built ship – is to go on the market, and it's going to have to be a foreign-built, existing used ship because, because there aren't any in the US inventory that could fulfill that. Buying a foreign ship and modifying it in a U.S. yard – we're doing that homework now. We have to look at it. We can't depend on a 320 million dollar brand new ship. We just can't depend on that so we have to have a fall back, and it's what we plan to do."

Asked if he thought that the newly designed National Security Maritime Vessel (NSMV) class could get funded and built, he pointed to some creative financing options that might work if traditional funding did not. "I think that there still is a possibility. It may not be through a traditional procurement path. If we're looking to get regular construction money out of the Navy or out of Congress to the tune of 320 million dollars, we may have to get that quite incrementally, or we may not be able to get that at all, in which case we may have to look at maybe a build-lease kind of option. And we've done that before. We built the first afloat pre-positioning ships that way."

Actually, in one of the first definitive statements about the issue to date, Buzby all but promised that he would get the ships. "We're looking at multiple options how to make this work, but the key to it is we know we have to replace school ships. Absolutely, we have to."

At the same time, Buzby conceded that sounding the warning bell about a mariner shortage was a tough sell in a market awash with mariners and too few billets to accommodate them all. He added, "It is quite cyclical. I really don't know where it's going right now. I'm hoping that it will start to cycle back. You know, we're starting to see a little bit of glimmer of hope, especially in the container market. But it may be that in the short term to retain them, they may have to do some other sorts of jobs just to keep their hand in it and keep the pool alive. It's not the best way to do it, but you gotta do what you gotta do."

Kings Point Turns the Corner?

Buzby arrives at Marad as his alma mater is recovering from what could kindly be described as a rough two or three years, punctuated by a sexual harassment scandal and arguably more serious, the very real possibility that the school's accreditation would be lost. Shortly after our discussions in Washington, Buzby announced that the school had achieved full accreditation. It was also clear that restoring the school's reputation and making sure that it was functioning at a high level was one of his most important priorities.

Buzby was reluctant to talk about the pending budget in great detail, but he did indicate that Marad would be asking for more money for Kings Point. "We've got a 70 year old plant up there, most of it constructed in 1943. And we've got 60 million dollars of backlogged maintenance – deferred maintenance – over the years. We've done some capital improvement programs where we just redid all the barracks, the mess hall, and we're just getting ready to go to town on our first academic building – Samuels Hall – which we're going to convert into a kind of a state-of-the-art simulator center."

Buzby adds, "We're working through that, but as I walk around the campus, it's getting a little threadbare in places and we need to infuse some more dollars into it. It's a federal service academy, for God's sake."

In somewhat of a surprise announcement, Buzby also told ***MLPro***, "I'm anxious to get GMATS going again." GMATS was the continuing education Global Maritime and Transportation School that was shut down suddenly by the Department of Transportation in 2012 as of July 2012. Back then, GMATS employed 30 full-time employees, operating as a non-appropriated funded instrumentality (NAFI). Buzby has plans to bring it back, and bring it back big.

"It's [GMATS] an important component to have that con-

TITLE XI: "IT STILL HAS AN IMPORTANT ROLE TO PLAY.

It's gotten probably a lot of bad press in years when they've had a few of those failures, but if you look at the raw numbers, it's about an 8% failure rate across all of those loan guarantees across the life of the program. That's very, very consistent with bank and major lenders failures. Yes, there have been some stumbles, but there's been a lot more successes and a lot more ships that are out there right now, sailing today as part of the fleet are Title XI guaranteed right now."

– Mark Buzby, U.S. Maritime Administrator

tinuing education piece as part of what I envision the academy being, soon, someday, as our nation's center of maritime excellence. I think it really needs to be the place – in consonance with the state academies who all would be feeding that center of excellence, each with their own area of excellence focus, because each one of those academies has an area where they really excel in," he insists, adding for emphasis, "I would like to see a system where we all feed into a center of excellence where we do our big thinking about the industry. That's where we talk about our R&D, applying technology to our industry going forward – where we do graduate-level studies for defense-related skills."

He points to the need for commercial ships that are going to be part of any future sealift mission in a contested environment. "How do they know what to do? What are the things that we're going to be asking of them?" asks Buzby, who also says he has no desire or intention of competing with union schools – one of the chief of the chief concerns about GMATS, before it was shuttered. "I'm not looking to compete with them. There are certain things that rightfully need to be taught again, and that's what GMATs or a GMATs-like entity can do. And I really want to push forward with that. I really intend to do that."

Title XI & Shipbuilding, Cargo Preference … and more

According to Buzby, the Title XI Shipbuilding program continues to be an important part of the nation's ability to spur investment in U.S. flag vessels. He points to Title XI grants for Crowley to build their two new LNG-powered ConRos at VT Halter. He defends the program by saying, "It still has an important role to play. It's gotten probably a lot of bad press in years when they've had a few of those failures, but if you look at the raw numbers, it's about an 8% failure rate across all of those loan guarantees across the life of the program. That's very, very consistent with bank and major lenders failures."

Answering the program's many critics, he replied, "Yes, there have been some stumbles, but there's been a lot more successes and a lot more ships that are out there right now, sailing today as part of the fleet are Title XI guaranteed right now."

The discussion turned the various proposals on the Hill that would tie LNG exports to US flag tonnage.

Buzby says that it is a great goal to reach for. "So to get a larger fleet that's brought on – again, it's cargo – you make more cargo available, it's another way to do cargo preference. And we're working very hard with the administration right now to see about expanding cargo preference from 50% where it is today, to something greater than that, which would equate to more ships, which would equate to more mariners, more mariner jobs," he explained.

Asked if he would settle for a foreign-built LNG vessel as long as it was US-flagged, since exports wouldn't require a Jones Act compliant vessel in the first place, he shook his head 'no.' "That would probably have to be a point of discussion. I obviously would prefer to support the shipbuilding industry, because that's a very important part of this whole metric. We need that capacity and not just repair capacity, but build capacity. Because if we ever were to get into a major dust up whereby we were using our sealift fleet, including the commercial MSP side, it's going to be a contested environment this time, which we have not seen since World War II, which means there are going to be losses, which means we're going to have to replace ships. We don't have that capacity now. And we can't afford to give up any more capacity that we have. I think is an important part of our national security."

The Jones Act

Buzby's approach to defending the Jones Act is simple enough: 'Another challenge is to get people to understand that the Jones Act is not just as a jobs program for one industry. It's an investment in our national security. People only see it

for what it is and that's allegedly something that costs more to people, to consumers. And without any appreciation for all of the rest of it, and we've never had much success in telling the rest of that story – how it all connects, We need to figure out a better way to tell that story, to make people understand that it's not just 'special interest funding,' which is what a lot of free trade folks and economists would like to portray it as."

The Jones Act, says Buzby, is a program that ensures security across the shipbuilding sector, across the manning pool sector, and across the availability of ships sector. "It covers three very, very important key areas of our national security. We need it. Absent it, we would have even a more serious problem, manning-wise, and we'd have a bunch of defaults on Title XI loans because just about all those ships are out there, you know, funded by Title XI."

In the end, Buzby also points to the internal security issues that the introduction of thousands of foreign seafarers onto coastal and inland waterways would pose. All of that, he says, comes into play and is failed to be understood by the general public. "Telling that story, or finding a better way to tell that story, I think is our challenge," he adds. And, with as many as four bills floating around on the Hill with various degrees of restriction of the Jones Act, he says that this is no time to get complacent.

Connecting the dots: Inland Infrastructure, Marine Highways & Blue water Ports

Buzby is adamant that the Marad he runs will speak for the entire waterfront, and not just deep draft ports and larger tonnage. "People, when they think of Marad, essentially, think of blue water and think of ocean shipping. And I think it's part of my responsibility, is to continue to put a spotlight and focus on the inland piece and its criticality, as well. So that's been a part of my job of advocating for the industry, advocating for this part of the industry, also."

For example, he says, the lack of understanding of the criticality of the national lock system and the condition of most of that lock system throughout the inland waterways is a big problem. Circling back to his message of connectivity, he explains, "It's awareness that's been lacking thus far in the importance of that part of our shipping system. Blue water is critical, obviously, but the day-to-day inner workings of our maritime highways, with the lock system, is critical to that."

As the Trump Administration makes many promises in terms of infrastructure improvements, Buzby and Marad hope that some of that some of that love comes to the waterfront. That said; he and the team hadn't yet seen any of the detailed plans across any of the modes. To that end, he told ***MLPro***, "We certainly made our case upstairs, and will continue to lobby that that ports, the infrastructure of our ports, the main gateway of our trade in this country is through our gateway ports. It only makes sense that we pay attention to that infrastructure and not just the seaward entry, but the landward departures, and the seaborne departures, so that maritime highways exiting from those gateway ports, and the rail connections, and the highway connections – it all needs to fit together. And we're clearly going to be advocating that that needs to happen. But in terms of specific details – those haven't been developed yet. We're making our voices heard."

Selling the Message: Representing the Entire Waterfront

Buzby likes to say that the U.S. merchant marine flag says, 'In Peace and War.' "It must exist in both – in the peacetime side in order for it to be there in the wartime side. We're not just going to magically flip a switch and have a bunch of ships and mariners show up and start doing this mission. They've got to be there – they've got to be constituted – now," he says emphatically, adding, "We've slipped to such a level that we are truly right on the ragged edge. We, right now, we're saying we're 1,800 mariners short, based on a study, a manning study that Congress directed us to put out. We have enough to man up MSP fleet, the Jones Act fleet and the RRF guys. We have enough to man all those up and get them out the door. But, four months down the road when we start having attrition losses, when we start having to turn people over that are going to come ashore, and then we run into a problem which we think is to the tune of about 1,800 people."

As this edition of ***MLPro*** goes to final layout, the news President Trump had signed into law the National Defense Authorization Act for Fiscal Year 2018 (H.R. 2810) brought a little bit of sunshine for Buxby, and Marad. For example, the bill authorizes $50 million in funding to support that all important National Security Multi-Mission Vessel (NSMV) Program; another $33 million for the Title XI loan guarantee program; and $35 million for grants to small shipyards and maritime communities. Beyond this, it includes measures to prevent sexual violence and harassment with regard to midshipmen enrolled at the US Merchant Marine Academy.

Getting stakeholders to listen to his message is the next challenge. "I think the only way that we realistically do that, to have a coherent maritime policy that we can all rally around. And [former Maritime Administrator] Chip Jaenichen did a good job amalgamating that, pulling it together, and as he tried to push it up through the bureaucracy. But, it was kind of toward the end of the administration, and there wasn't a bunch of interest, so I got it back," explained Buzby.

He continued, "We have to have something we can all at least sign up to. We're going to dust that off, make sure that it still makes sense, that it is in line with the current administration's views and outlook, and that the assumptions are correct still, and then start getting people signing on board with it. We have to be able to talk to the same message, sign up for the same thing. So that's coming. That will be coming soon – the early part of '18. That's my goal to try and get that moving." After an hour of listening to him talk, I like his chances.

EXECUTIVE INTERVIEW

Maritime Logistics Professional *Profile*

Admiral Paul Zukunft

25th Commandant of the Unites States Coast Guard

All images courtesy U.S. Coast Guard

By Joseph Keefe

As we face budget challenges, and we always face budget challenges, but if you start cashing in your people – very difficult to get those assets back on budget again. People are our most valued resource.

Admiral Paul Zukunft,
Unites States Coast Guard

Admiral Paul Zukunft

assumed the duties of the 25th Commandant of the U.S. Coast Guard on May 30, 2014. Shortly after he settled in, *MLPro* caught up with him to see what would come next. More than three years later, he welcomed us to his office one more time, with the end of his term as commandant looming large in the proverbial porthole. Back then, the Commandant's focus always seemed to come back to just one thing: people. That hasn't changed.

The intervening 40 months have seen a lot of water under the bridge for the nation's fifth uniformed, military service; some of it routine, some expected, and still more events that no one could've predicted. A perfect storm of natural disasters rocked the nation in the recent past, 2017 saw the IMO back off from an aggressive ballast water compliance schedule and the Coast Guard step up to an unexpected leadership position. And, an aggressive recapitalization plan for the Coast Guard has gotten underway under Zukunft's stewardship.

In November, ADM Zukunft held forth on many topics, but once again, the view from the Commandant's office focuses tightly on the competence, headcount and wellbeing of his personnel. The Commandant – now far closer to the end of his term than the beginning – also has worked to bring up the visibility of Coast Guard, especially where it can be compared to its four sister services. Listen in as he provides a report card for the Coast Guard during his command, identifies the big challenges ahead, and what it will take to conquer those missions.

We are well into our first year of the new administration. There is big focus on homeland security, and most people look at that and they see walls and people building walls and that sort of thing, worried about that sort of interdiction. How has that policy push impacted the Coast Guard, its missions and/or resources?

Well, there are a few areas that concern me. There was the executive order to restore military readiness, which called out military readiness of Army, Air Force, Navy, Marine Corps and left the Coast Guard out of it. Then there was another piece for securing our borders and, of course, we secure the borders miles and miles before the southwest border. So there's no mention of the Coast Guard in there, as well. So I admit that we really need to do a better job in getting our message out and that's exactly what we have been doing.

So in terms of all of that, then, what you're telling me is that nobody's come in here and said, 'You've got more missions now?' None of that's happened?

No. And part of it is I think there's just not a widespread awareness of the United States Coast Guard. And we recall that during the three natural disasters we had with Harvey, Irma, and Maria. But even within that context, it's not widely understood that we are a member of the armed forces – that we are not the National Guard; we are not the Red Cross. We are a full time service with a broad set of military missions.

Okay. Let's switch gears. I've been covering ballast water for almost 20 years. Until now, I wouldn't have thought that you could have used leadership in terms of ballast water with the United States in the same sentence, but when the IMO put the brakes on and the Coast Guard did not, that metric changed. But, tell us from your standpoint exactly where we stand in U.S. waters.

I'll be at the IMO General Assembly towards the end of this month. I spoke at the last General Assembly in 2015 that we were going through certified independent labs to come up with a treatment system that would basically kill any organisms that may reappear as an invasive species in the United States. And obviously the cost of an invasive species is enormous. Through gross tonnage voting, the IMO has come up with a less stringent standard than we have here in the United States. And that's going to roll out pretty quick. But the fact that many of these countries do trade with the United States, that we have set a higher threshold – we've got six certified systems right now and there's a number of others that are still undergoing laboratory tests that cover everything from liquid bulk carriers to containerized shipping. So it covers the whole spectrum. The systems are out there. When I am at IMO I will reiterate where the United States stands when it comes to ballast water treatment and to protect our ecosystems.

Let's talk about the offshore patrol cutters. That's underway and I see where Eastern has moved to the next stage. How many do we know that we're going to get in terms of appropriation and funding. And when are you going to see the first one?

The first award, the program of record, is for 25. The first award, awards to the first nine. Long lead-time materials are

in this past year's budget and we expect to see the first one hit the water in 2021.

Are you excited about that boat?

Extremely excited. We are under a lot of scrutiny. In fact, to the point where those having oversight of me and the Coast Guard, were saying, "Well, maybe Coast Guard, you should lessen your requirements to make sure that you can get this in an affordable range." And we've learned from the past that if you start lessening the requirements, you deliver a less capable platform. A platform that is going to be in service a minimum of three decades – if not more – into the future. And I can't forecast what that future's going to hold for us, but I would imagine, as I like the say, "the sun never sets on the Coast Guard." We're literally deployed around the world, and more and more combatant commanders are asking for more Coast Guard, all over the world. We're very active in ACom as we are in SouthCom, as well. I'm delighted that we were able to hold to our requirements. We've got Eastern Shipbuilding who has delivered a proposal that is well within the affordable range, and as we roll these platforms up, I'm highly confident that these are going to meet our operating requirements.

Let's talk about another platform: a much needed ice breaker and the one that we all want to see built – but cost of that vessel might reach or exceed a billion dollars, according to the people that want to do it. When Admiral (Allen) was here, he told me that one of the big obstacles to that particular platform was the fact that funding was tied up to an extent, with the National Science Foundation, and trying to get that funding to the point where everybody agreed on what they wanted in that platform was a big deal. How close are you to getting some funding so that we can actually see the end of the tunnel for starting one of these?

In 2017, there was a 150 million dollar appropriation. We now have awarded to five shipyards to do what are called history studies – this is looking at either new or commercially off-the-shelf designs to do ice trials, which they basically do those in a tank. In fact, I just visited one in Helsinki four days ago. And it does replicate on a much larger scale, you know, with this design to meet our operational requirements. So those ice trials are actually much farther along in that timeline, and we stood up an integrated program office with the United States Navy. That 150 million dollars is not in our appropriation – it is actually in the Navy ship building appropriation. And that only buys you a little over a third of an icebreaker.

So you're leveraging NavSea's capabilities here and then eventually hoping to move on to your own design and then get it under your own auspices.

Yes, so what we want to do is, once we lock in this initial design, and then build out this fleet of ice breakers. And so we've done multiple studies, and time and time again, the requirement is for six polar icebreakers.

I understand that there'll be a new Commandant this time

next year, and as you look ahead to the end here, or the beginning of the next chapter for you, what's the biggest thing on your plate and the Coast Guard's plate right now? If you had to say one thing – I know there are 25+ missions here – but if you had to look at one thing, what would you say is the toughest thing happening right now at the Coast Guard?

Well, it's not a challenge right at this moment, but it's great we're recapitalizing – really – at the most aggressive pace that I have seen in my over four decades of active duty service. But I'm paying attention to two things: What does it cost to sustain these new platforms in the out years? It's great if you get the money and the acquisition, but we're a service right now – the ONLY military service – that finds itself funded below the Budget Control Act floor. And that affects your annual operating expenses. And so we're not keeping pace, even under BCA. Right now, since BCA was introduced, we've realized about a 10 percent reduction in purchasing power and we continue to move in that direction, which is why, as a military service, we need to be funded as a military service. So we've got the operating expenses to sustain these new platforms, but the other big piece of that is our people. And sometimes it's tempting as you're trying to keep a major acquisition program alive, you have to make offsets, and then you start looking at offsetting salaries and offsetting people. And as soon as we, we even venture down that slippery slope, I wouldn't want to find myself where the Royal Navy was several years ago. I was approached by the first Sea Lord and 15 years ago they had decided to meet current year budget – and they wouldn't bring in any new people. So they shut down new accessions, 15 years go by, and those people who would be senior technicians are not there. There's a huge hole that had to be filled. They actually reached out to me and said, "Hey, I'm going to need about 40 of your mates – your senior enlisted technicians – to serve on our frigates, or else I'm going to have to tie up the frigates." It's a fully reimbursable service that we provide, but right now there are 40 members of the United States Coast Guard deployed on Royal Navy ships for 3-year tour lengths in order to keep the Royal Navy at sea. And they're a fleet who used to say "the sun never sets on the Royal Navy." So you can make some comparisons there, but one area we will not sacrifice is our human capital. As we face budget challenges, and we always face budget challenges, but if you start cashing in your people – very difficult to get those assets back on budget again. People are our most valued resource.

Okay, let's talk a little bit about those human resources. Let's talk a little bit about the Navy's woes in the last year or so with three or four bad accidents. Two questions here: With regard to your assets that you put at sea, are they being used in a manner that is in excess of what you would expect of normal service? And the second part of that involves the training going for your line officers? Are you comfortable with the level of competency in your line officers?

There's several questions there, Joe, I'll take them one at a time. I just met with the executive officer of the Coast Guard cutter Active – it's a 210-foot medium endurance cutter. It's 52 years old. But every time they put to sea, we have what we call "safe to sail" criteria. Maybe you have an inexperienced crew, maybe you have one of your primary systems are down, we have parts obsolescence and it's going to take a period of time before you can get it repaired. So if it's not "safe to sail," you don't get underway. I write a letter to every commanding officer that they have three KNOWs: the first KNOW is you've got to know your mission inside and out, whether it's search and rescue, counter-drug, migrants, national disasters, or you're working for a combatant commander in the Northern Arabian Gulf. You gotta know your mission. The next is you gotta KNOW your people, including their level of qualification. And then the third KNOW is knowing when to say no. Oftentimes it's easy to be consumed by the mission and a commander may feel like he doesn't have the top cover if they need to say "No." Crew fatigue, people aren't qualified, parts are wanting and you cannot safely put to sea – so say No. And I've got your back. I will cover you. So I just call it good risk management. We've built in risk management to every evolution that you do. Even if we're transiting somewhere, we go through navigation groups – who's on that watch team? Who's rested before they come on watch, and who is qualified? And if you add it all up – and what's the weather, what's the traffic, if you use the USS Fitzgerald – I've sailed through those waters. And in fact, I spent many a night on the bridge going through those waters – not in my rack – because I've been that junior officer, having to call the commanding officer once, twice, do I wake him up a third time? Never spending more time in doubt whether to call or not, rather than do the right thing. And they're a big part of your team. So that gets into the new officers coming in. They've got to build that trust – learn as they go, with their commanding officers. But they have to be operating in an environment where they are gonna make honest mistakes, where it's not fear of failure, but there's got to be a team effort. The commanding officer is really the coach. He is the go-to person, but you cannot have an adversarial relationship between the junior members of the ward room and the person who wear the cap with the scrambled eggs on it. Our Coast Guard Academy folks are getting all of the basics when it comes to navigation, to include how do we navigate if we have a loss of a GPS signal, so how do we use more traditional celestial navigation (in a light 15:55). So very confident. I'd have to go back, and I still remember, it's 37 years since we had a casualty that approached anywhere close to what happened on USS Fitzgerald or McCain. And it's not a case that we're not operating in high-risk waters that are also in very

dense areas, as well. So I think that in itself is a good news story for the Coast Guard because we're also operating a very old fleet, as well.

Back to the fleet itself – we talked about the old ships, we talked about the old equipment, and we talked about the operating budget. And a key thing in terms of operating ships is that if you're operating an older fleet, you're going need more maintenance on a daily basis. How do you think you're going to get there with this Congress?

Well, if we face challenges, then what you end up doing is you have to take those ships offline. You can make a business case of, you know, for every operating hour you're putting three maintenance hours. And at that point it's no longer sustainable. It's like that old Ford Falcon sitting in your garage. Maybe not even a Falcon, maybe one step down. So, you make those decisions and there's going to be a gap in areas that we can patrol. Right now we've had consecutive years with record removals of cocaine – most of well south of the border, off the coast of Panama, Guatemala, and the Eastern Pacific off the coast of Columbia, out by the Galapagos Islands. Nearly every day we're seizing a ton of cocaine destined for the United States.

Are you getting better at it or do you think there's just more volume coming?

It's both, Joe. The intelligence that we have on these, this last year, we extradited over 700 smugglers for prosecution here in the United States. They can plea bargain with a U.S. attorney by providing us valuable information that allows us to target the next shipment. So the intelligence is quite good. The other challenge is there is more cocaine coming out of Columbia than there has in any time in over a decade. Part of that is a result of the peace accords with the FARC. One of those provisions was when eradication was halted, cultivation took off and it has skyrocketed over the last couple of years.

You've been generous with your time. what else would you like people to know?

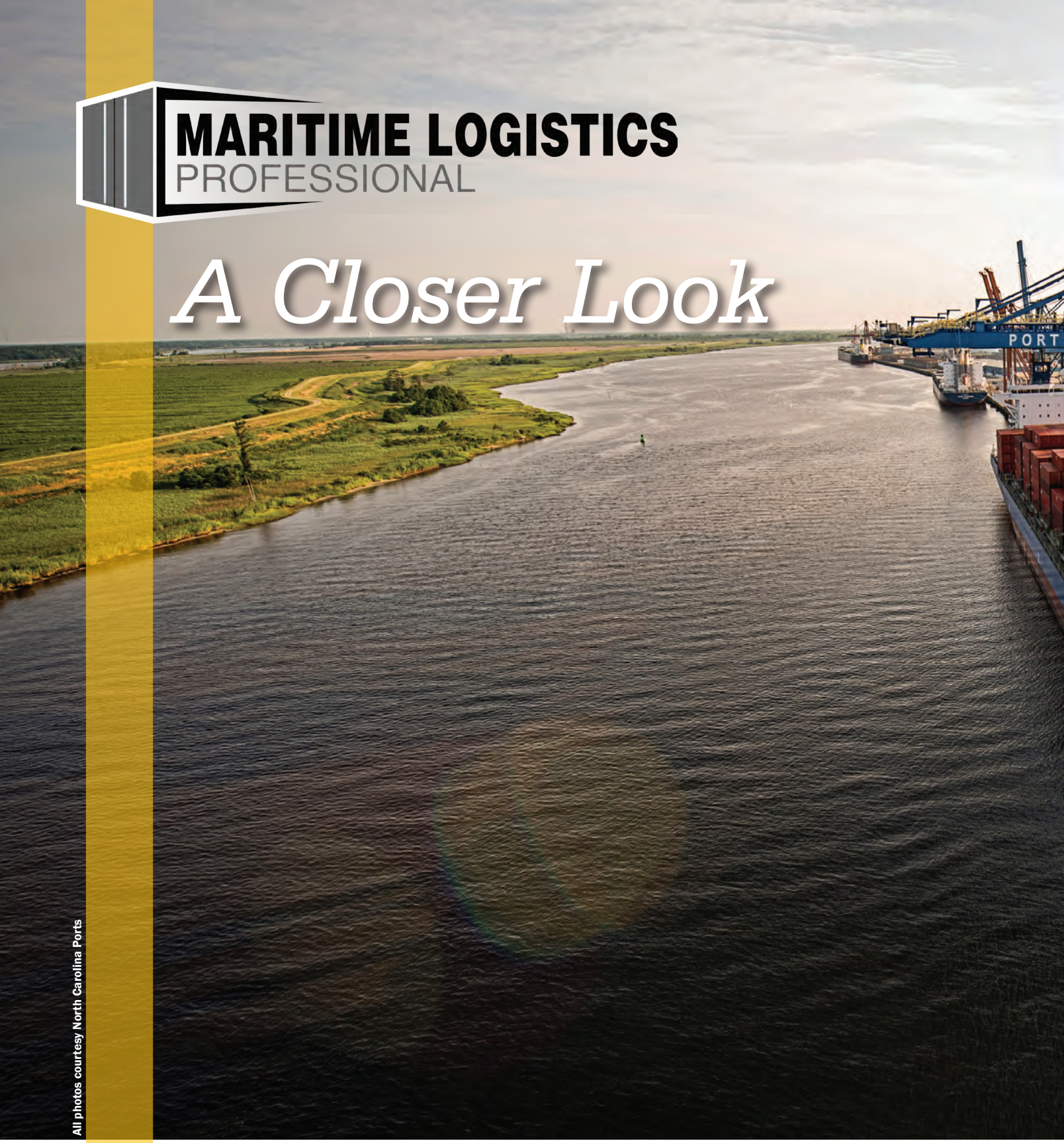
Okay, I'll just close with one. So what I've asked Congress to do is, you know, what do we need to make the Coast Guard whole? And without going through a whole litany, and we will provide a 20-year capital investment plan, here are all the things. And it might make someone's head spin, but I said, "It's as easy as this: I need 5 percent annualized growth in my operating budget." And eventually that would get me out of the hole that we're in right now which does keep, roughly keep pace with inflation, and some vestment in readiness, as well. Five percent. And then the other is I need about a 2 billion dollar floor for major acquisitions that would allow me to build ice breakers, allow me to build out the fleet, address a 1.6 billion dollar backlog in our shore infrastructure, and at the same time it allows me to bring 5,000 more Coast Guardsmen on to active duty and another 1,100 into our reserve component. So pretty straightforward for a military service that's budgeted only about 10.5 billion dollars a year. When I speak at Capstone and other programs at the various war colleges, the first thing I ask is, "What do you think is in my budget?" We're a military service, and they're all thinking, okay, 60, 70 billion. And when I tell them less than 11 billion dollars, their jaw drops. For a service that has four consecutive clean financial audit opinions, so not only are we budgeted, we can account for what we do. Our acquisition programs – less than 2 percent growth.

And you are a smaller organization than the New York City Police Department.

Ah, we're a little bit bigger. Not by much. But we don't get overtime. Overworked, but not overtime.

MARITIME LOGISTICS
PROFESSIONAL

A Closer Look



All photos courtesy North Carolina Ports

PORTS: **North Carolina**

NC Ports:

North Carolina Ports are poised to leverage a trifecta of variables, built on explosive growth in the southeastern United States, an ideal and uncongested location and the most powerful agricultural engine on the planet.

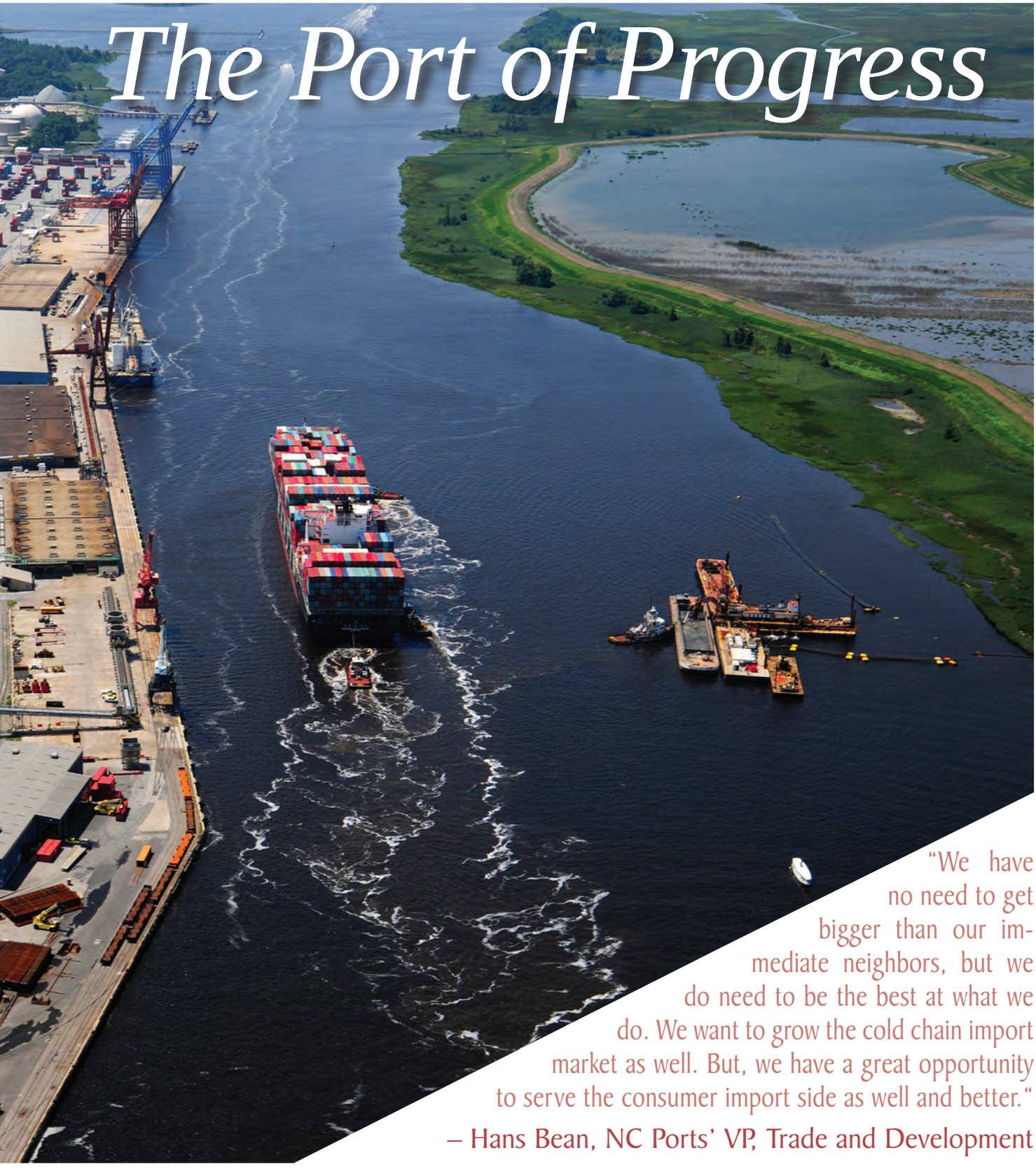
By Joseph Keefe

At the recent North Carolina Ports Cold Chain Summit, the port authority's leadership extolled the port's ongoing expansion, especially in way of catering to a growing, regional refrigerated transportation market. Located within 100 miles of the largest agricultural producing region in the country – and one of the most efficient in the world – it wasn't hard to see why. Nor is it rocket science to see what the long term potential for this gateway holds.

With the basic pieces in place, the attractiveness of North Carolina deepwater ports is manifested in a much simpler metric. Contrasting a recent drive up the Eastern Seaboard past Norfolk to Washington, DC that took three hours longer that it should have on the increasingly crowded I-95 corridor, this writer also made the 210 mile trip from the inland hub of Charlotte to Wilmington in less than three hours. Much of that north/south congestion is freight, and much of that is going to or from a port. Too often, that's not Wilmington or Morehead City.

Local freight, leaving the state for deeper and larger gateways, experiences terrific delays on that same I-95 highway. For this reason, and many other equally compelling reasons, North Carolina Ports is beckoning shippers, local farmers and liner companies alike to consider a sea change. That message is already yielding fruit. That's because North Carolina is home to the nation's premier agricultural engine, and the lion's share of that consists of so-called "cold chain" cargoes that are time sensitive, complex and constitute growth sectors in North Carolina.

The Port of Progress



"We have no need to get bigger than our immediate neighbors, but we do need to be the best at what we do. We want to grow the cold chain import market as well. But, we have a great opportunity to serve the consumer import side as well and better."

– Hans Bean, NC Ports' VP, Trade and Development

Location, Location, Location

The nation's 9th most populous state, growing faster than any other, North Carolina has embraced tax reform and a pro-business climate that is getting stronger. In November, Hans Bean, NC Ports' Vice President of Trade and Development, speaking to gathered shipping executives and customers at the Port's first annual Cold chain Summit, laid out the case for Tarheel State's supply chain plan. He defined what NC Ports hopes to be, and with a nod to larger ports to the north and south, the parameters of the long term strategic plan.

"We have no need to get bigger than our immediate neighbors, but we do need to be the best at what we do," explained Bean, adding quickly, "We want to grow the cold chain import market as well. But, we have a great opportunity to serve the consumer import side as well and better." Much of that opportunity is related to location and proximity to the low hanging fruit of rapidly expanding markets.

Bean and his team have done their homework. "Supply chains don't change overnight but we have some advantages here. Low haulage costs, favorable distances to inland markets, and short distance to customers. Wilmington is a gateway that provides that. And, we have room to grow." He also concedes, "Ports to the north and south of us have ambitious growth plans, but congestion in some of these ports is an issue. As for this port, we have to keep it user friendly, we cannot slip on any of our metrics, or on the favorable customer experience that we now enjoy."

Proximity alone won't sell the port to shippers who have other options, but the sheer size of local opportunity all within a stone's throw of the port means that its current efficiencies – superior dwell times, fast box move metrics, and low congestion – will be attractive incentives to shippers, if they can maintain those standards. As the local population explodes, there are few consumer markets anywhere that can match that growth. Bean insists, "Look at the grocery business here. It has, for a very long time, in most respects, been served by other gateways. I'm talking about the tropical north/south trades from the Americas."

Centrally located on the south central Atlantic corridor, NC Ports holds other advantages, as well. According to Bean, all the storms and related supply chain issues during the past year have customers are starting to look at diversification as it relates to supply chain disruptions. "You don't ever want to see that sort of thing happen, but it is a big part of supply chains. Diversifying options to a number of gateways will play a part in future port selections for shippers."

Supply chain disruptions come in many shapes and sizes. As some ports struggled in the wake of the liner alliance shuffle, NC Ports secured additional business. Bean explains, "The box market created turbulence but also opportunities for us. And so, you could say it was the worst of times but it set the stages for what hopefully be the best of times." In 2016, NC Ports hosted just five carriers serving 12 major markets globally. Fast forward to 2017, NC Ports had expanded its partnerships to 15 Carriers serving 65 destinations. That means more options for local customers, agriculture producers, and consumer markets.

Eyes on the (Big) Prize

There are plenty of good reasons to ramp up the supply chain in North Carolina, but none more compelling than a look at the state's agriculture industry. Simply put, North Carolina is one of the most intense agricultural regions in the nation, a top 10 producer in terms of market value of product alone. Significantly, most of that is produced between Raleigh and Wilmington, or within 100 miles of the port's gates. At November's Cold Chain Summit in Wilmington, Dr. Blake Brown, and economist and policy analyst put that potential into focus.

North Carolina's agriculture is a $12 billion industry annually, and its output diversity makes that number all the more important. Livestock makes up is 68% of those totals. One half of U.S. tobacco is grown here, a figure that has increased since 2004, and much of that product – North Carolina's number one cash crop – is meant for export.

Separately, hogs and poultry are both important to the local economy, comprising $7.2 billion of farm cash receipts. As a 'feed deficit' state, there typically isn't enough feed or grain for livestock. Hence, farmers regularly bring in corn from Brazil, in part because much of what comes in from the Midwest is more expensive. As feed prices have come down, a tough period for these producers has ended with a growing foreign demand. Poultry and hog producers have rebounded and grown. Both require an efficient transport for their products to global destinations.

As the third largest poultry producing state in the country, local poultry production and processing capability are both growing. Brown explains, "That poultry has to be shipped

NC Port's $200 million Expansion Plans at a glance …

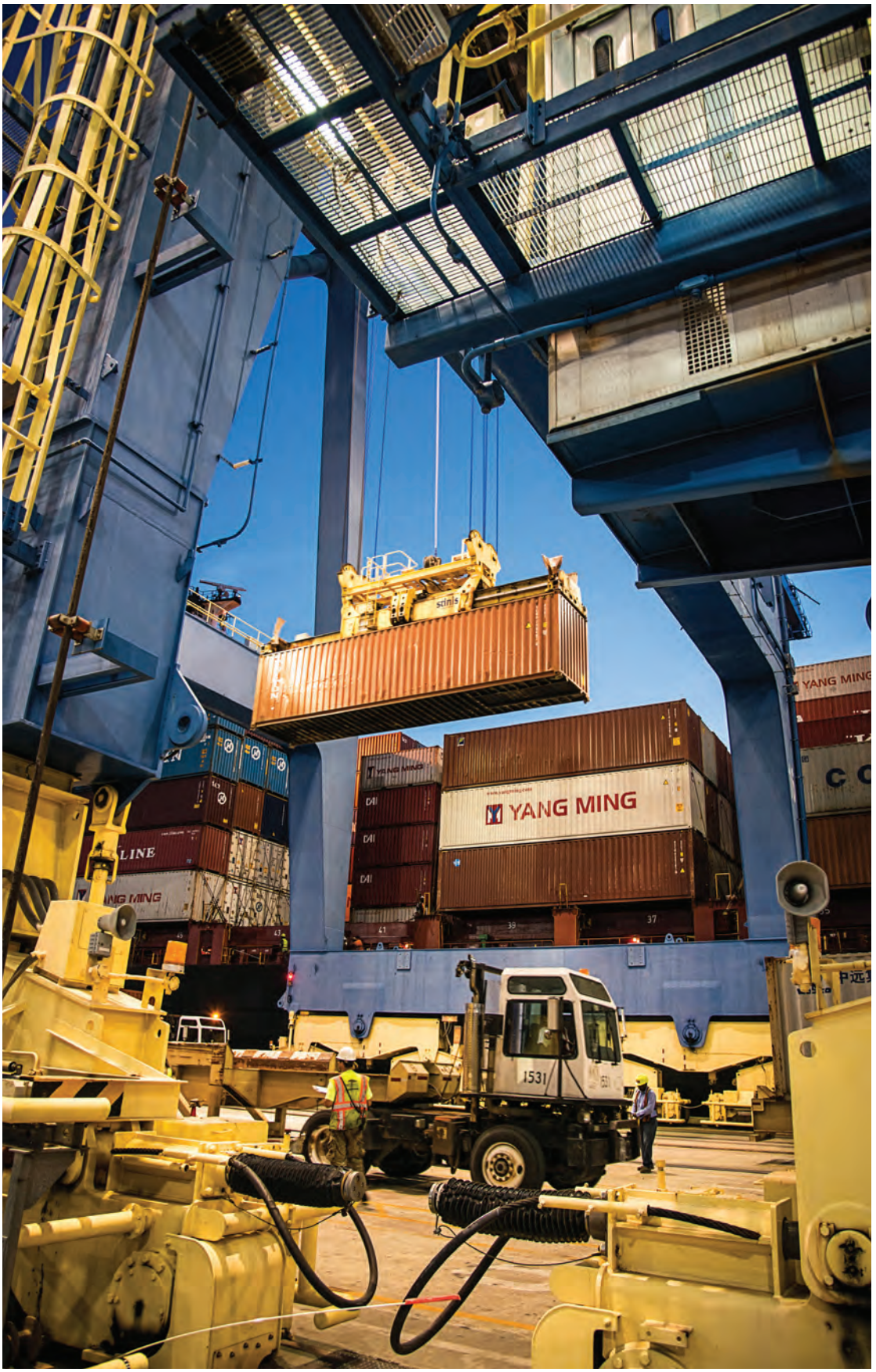
Enlarged Turning Basin to accommodate megaships	Purchase 2 ultra panamax sized cranes
Rebuilding, expanding berth number 7	Expanded, fully paved container yard
Rebuilding, expanding berth number 8	Additional Reefer Plugs & capacity
Technology Upgrades to Increase Efficiencies	Option for a third crane, possibly for later in 2018
Expanding (turning basin) to handle 15K TEU ships	Planned expansion of interchange gates

Paul Cozza,
NC Ports Executive Director

Greg Fennell,
NC Ports CCO

Brian Clark,
NC Ports COO

Hans Bean,
NC Ports VP, Trade & Development



somewhere. The demand is in developing countries where more income is now available and people want and need meat." As the number two turkey producer in the country, North Carolina is notably home to the largest turkey and chicken processing facilities in the United States, within a stone's throw of Wilmington.

Today, North Carolina poultry represents $545 million in exports, balanced by $662 million in pork exports. Not all of that is shipped through Wilmington. Local port officials hope that's about to change. With a good percentage of those companies are located within 50 miles of the port of Wilmington, Brown asks, "How much of an advantage would it be if they didn't have to send it to Norfolk or Charleston."

Central to all of these efforts is the importance of being able to cater to shippers who require climate controlled transport – the cold chain. Poultry and pork aren't the only products that need refrigeration. As much as 65% of local sweet potato and blueberry exports head for Europe. If that sounds like small potatoes, consider that local sweet potato production has more than doubled in the recent years and that North Carolina produces over half of the sweet potatoes in the country.

Reefer carriers are critical to this trade. As overseas competition also grows, output intended for export needs to be moved as quickly and as cheaply as is possible.

Infrastructure 101: Maintain & Increase Efficiencies

As the gateway expands, the need to serve all niches, and not just global markets, is paramount. To that end, the state has rail issues that NC Port officials are working hard to address. It wasn't too long ago that much of the state's grain feed came in from Brazil. It wasn't high domestic Midwest grain prices that were the culprit; it was high prices on the railroads. Infrastructure does matter.

Rail & highway access will also be key. Already enjoying low congestion, the future growth of the East-West I-74 corridor headed for the state's biggest city, Charlotte, will be important. In the meantime, an ambitious $200 million infrastructure improvement project is well underway. Largely thanks to the North Carolina General Assembly who appropriated funds (recently increased to $45 million annually) for upgrades to the ports; both Morehead City and Wilmington's physical footprint is on the move.

Brian Clark, NC Ports Chief Operating Officer, put the port's ambitious plans in perspective. At Wilmington alone, a 284 acre facility encompassing both general cargo and container operations, the port boast 2,600 feet of container berths. Today, the port can handle 750,000 TEU's annually, but hasn't reached full capacity yet. Nevertheless, NC Ports has no intention of sitting on its hands.

With refrigerated cargo capacity critical to the port's future, the port has about 300 fixed plugs, and the capability to bring in power packs to increase that capacity. Looking to the future (and eyeing all that agriculture output being shipped elsewhere), Clark told listeners; "We have the capacity to increase those fixed plugs within our physical footprint. We're looking carefully at what future volume will require in terms of capacity and we will grow that capacity accordingly."

15 reachstackers on site (and more on order) accommodates 10,000 TEU sized vessels. Clark adds, "That restriction – if you will – still represents a very good sized vessel – it is based on the turning basin in the channel. So the further expansion of the turning basin will help the port handle larger tonnage in the future." At the same time, Clark knows that one of the biggest positives for the port today is its highly touted crane productivity and quick gate turnaround times. Those metrics have to be maintained.

"Berth 9 today is our big vessel berth with those four post panamax cranes. Eventually, berths 7 and 8 will become our lead ship berths. We're already seeing elsewhere on the East Coast, 14,000 TEU ships in various ports. For us to remain competitive, we need to be able to handle those vessels in the future. Today, we see ships from 500 to 1100 feet LOA. There is a mix and all of those are equally import to us," explained Clark.

The first expansion of the turning basin was completed in July of 2016. An ongoing engineering review of the turning basin, to see if it can be expanded further to handle those 14,000 TEU ships, is underway. Well before that, new rails will allow super panamax cranes to travel the full length of the container piers. The container yard – currently a seven acre area – is being refurbished and better configured to handle the additional freight volume that the port expects will come.

Today & Tomorrow

For what it lacks in size and cargo volume, Wilmington more than makes up for that in terms of efficiency. Its 44 moves per hour average in terms of crane operations is second to none on the East and Gulf Coasts. Clark insists that it is the most efficient port on the east coast for truckers and in November, he told ***MLPro***, "Truck turnaround are always extremely important – a driver can do a full turn – in and out – in 20 minutes. Trucking companies serving this market are assured of being able to make multiple moves daily. Full moves are 32 minutes on average. We're efficient; we're quick, but most importantly, safe in handling and moving that cargo."

Just 25 miles inland from Cape Fear, shippers enjoy quick transits to and from the docks. Once alongside, dwell time for boxes isn't typically a problem. In part, that's because Wilmington has an adjacent property, just outside the main gates, where they store chassis.

What's happening outside the gates is just as important as anything they can do inside to improve efficiencies. Within the last six months, four landmark events all point to what will come next, starting with an impressive addition of a wide vari-

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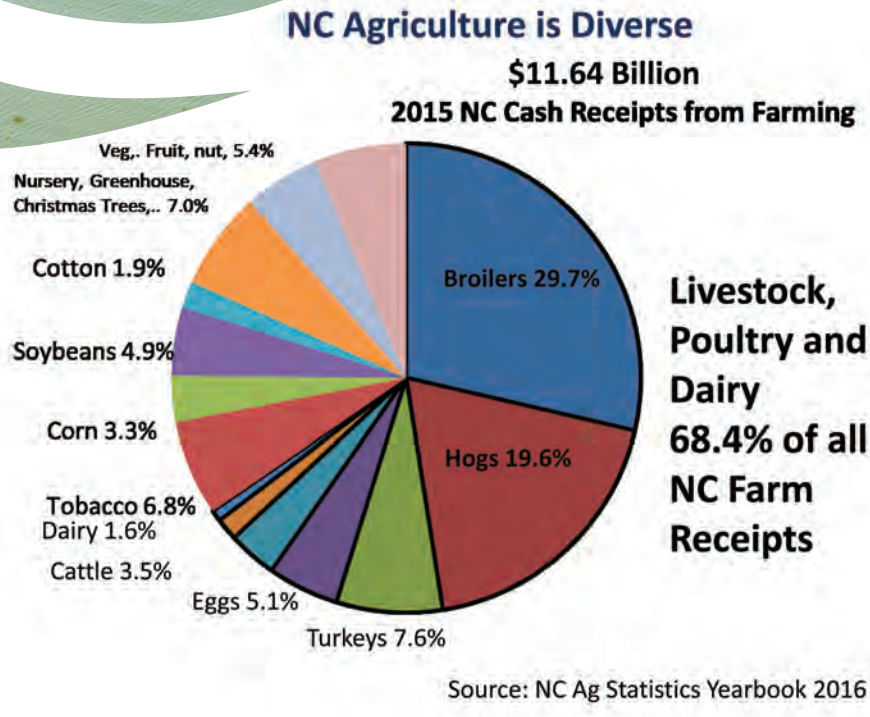
– Brian Clark, NC Ports COO



ety of container shipping companies to the Wilmington lineup.

In June, the inaugural port call of the ZIM Shanghai marked the fourth new container service activated at the Port of Wilmington in the last two months. With that event, North Carolina Ports had doubled its container services in calendar year 2017 and is set for unprecedented growth in its next fiscal year. ZIM added Wilmington to its Z7S all-water Asia-U.S. East Coast service rotation. This weekly service provides access to major markets all over Asia.

"This ZIM service will support legacy apparel, furniture and hardware industries throughout the Carolinas," said Paul Cozza, NC Ports Executive Director. Chief commercial Officer Greg Fennell added, "We've made a steadfast commitment to better serve the Carolinas. With four major container service activations in the last two months, we are preparing for record throughput in Wilmington."

Separately, Maersk Line and Mediterranean Shipping Company (MSC) introduced the TA2/NEUATL2 Europe-U.S. East Coast container service in early May, providing access between Bremerhaven, Felixstowe, Le Harve and Wilmington. A new partnership with THE Alliance was the addition of the EC2 all-water Asia-U.S. East Coast container service. This weekly service began calling on the Port of Wilmington, also in May. StreamLines, a division of Seatrade, known for its specialized refrigerated container operations, recently added the Port of Wilmington to its Blue Stream weekly service and began calling the port in June.

The good news continued in July. Since any port is only as good as the intermodal connections that stretch beyond its gates into the hinterlands, North Carolina Ports and CSX commenced a daily, intermodal rail service between Wilmington and Charlotte. This double stacked train, the Queen City Express, marks the return of intermodal rail to North Carolina Ports.

"The Queen City Express provides premier rail service over competing ports for existing and future container customers in one of the most significant economic centers in the Southeastern United States," said Cozza. "In addition, further establishing our inland terminal helps answer the request of many cargo owners asking for improved connectivity to international markets."

Beyond this, CSX will also provide future access to another intermodal rail terminal in Eastern North Carolina – the Carolina Connector. The Carolina Connector (CCX) will serve as a key transportation hub in the Southeast for containerized freight. CCX along with the Queen City Express will lower transportation costs for businesses while taking trucks off the road, thus reducing emissions. For the Port of Wilmington, increased volume doesn't necessarily bring more congestion.

In November, Crowley Maritime's announcement that it will begin offering weekly shipping and logistics services between Wilmington, Guatemala and Honduras served notice that a new lift-on/lift-off (LO/LO) service would provide customers an additional, more northwardly Atlantic Coast destination for cargo entering the U.S. from Central America, ultimately adding flexibility to the supply chain while reducing total landed costs.

Crowley, a longtime player in the Central American and Caribbean trades, gives foreign fruit and produce providers a new port of entry for their climate sensitive cargoes access to the U.S.-based firm's suite of logistics services for cargo of all types and sizes.

Finally, and integral to all of the incremental additions to Wilmington's capacity and port options, North Carolina Ports announced this month the implementation of both Phase One and Two to the U.S. Department of Agriculture's Southeast In-Transit Cold Treatment Pilot program. This will allow more direct imports of produce from across the Americas – and other countries in the Cold Treatment Program – including

fruits like blueberries, grapes, apples, pears and citrus.

Cold treatment is a process whereby perishable fruits have their pulp brought to a certain temperature in order to fulfill USDA quarantine requirements for fruits entering the U.S. What will separate the Port of Wilmington from others is the Port's ability to participate in Phase Two, which allows refrigerated cargo to finish its treatment schedule on terminal before being discharged.

"Phase Two opens up a totally new dimension for our Port and an option for importers to complete treatment after discharge, which is unique in the south/mid-Atlantic and only available at the Port of Wilmington at this time," said Hans Bean, adding, "The addition of NC Ports to the program allows the Authority to serve the North Carolina grocery sector with fresh produce with multiple logistical and economic advantages.

The Port of Wilmington has ample refrigerated container capacity with almost 300 plugs on terminal and the capability to add more. In addition to Wilmington's reefer capacity, the Port is also home to a 101,000-square-foot on terminal refrigerated warehouse – one of only a few in-port cold storage facilities in the country.

Port of Progress

It all adds up to progress. NC Ports create over 75,000 jobs and generate as much as $800 million in tax revenues, packing $14 billion in local annual economic impact. The only part that comes back to the ports is the $45 million from the NC General Assembly that annually funds local infrastructure goals. The ports are self-sustaining, and operate on port revenues with no other tax money in play.

Unusually, North Carolina Ports boast a remarkably balanced trade portfolio like no other. With traffic consisting of approximately 52% exports, balanced against 48% imports, not a lot of empty boxes leave the port. Local ports are uniquely positioned to leverage the vast potential of North Carolina's vast agricultural export machine as well as the import needs of an exploding population base in the prosperous southeastern United States and an increasingly demanding foreign appetite for U.S. produce and meat. NC Ports are betting on providing service to an expanding existing market that is crying out for a better supply chain. If so, help – and progress – is on the way.

Capital Improvement Plans: 14,000 TEU Ready

- $200 million total capital improvement plan
  - Turning basin expanded from 1,400 ft. to 1500 ft.
  - Berth 8 expansion
  - 3 new super post-Panamax cranes added
    - 22 across
    - 150 ft. height
- Refurbish container yard with additional 7 acres of container space
- Expanded yard capacity with additional new equipment
  - 4 new reach stackers, 3 more on order
  - Increase the speed and efficiency of loading/unloading vessels

Project	Status	Scheduled Completion
Turning Basin Expansion Project	Completed	July 2016
Berth 8 Replacement Project	Underway	March 2018
2 new SPP STS cranes operational	Underway	June 2018
1 additional SPP STS Crane operational	Underway	February 2019
Further Turning Basin Expansion Project	Underway	2019
Berth 7 Replacement Project	June 2018 Start	June 2019

PORT OF WILMINGTON - TURNING BASIN EXPANSION

More than Numbers:

The Port of Wilmington is strategically located on the East Coast of the United States within 700 miles of more than 70% of the U.S. industrial base. Recent and ongoing improvements to regional and national highway networks make surface transportation supporting the Port of Wilmington superior to neighboring ports. And CSX Transportation provides intermodal rail service with best-in-class transit times, as well as daily service for boxcar, tanker and general cargo services.

The Port of Morehead City, a breakbulk and bulk facility, is one of the deepest on the United States East Coast, and it's just four miles from the Atlantic Ocean. It's also within 700 miles of more than 70% of the U.S. industrial base. Interstates 95 and 40 are easily accessed via U.S. Highways 70 and 17. And train service is provided by Norfolk Southern. Located across the Newport River from the Port of Morehead City is Radio Island, a 150-acre site perfectly suited for a port industrial development, conveniently supplied with municipal water and sewer.

Together, the two ports represent a rare intermodal opportunity for Southeastern United states shippers and consumers alike. That's because if today's numbers don't wow you, consider that in just one short year, the ports have grown from serving just 5 Carriers and 12 Carrier-Port-Pair Options to 15 Carriers and over 65 Carrier-Port-Pair Options. Free of congestion, well connected, naturally deep draft and conveniently close to open sea lanes, North Carolina Ports are preparing for a tsunami of cargo, growth, exports and imports and the coming wave of opportunity. Today, *By the Numbers*, NC Ports look something like this:

NC Ports at a glance …

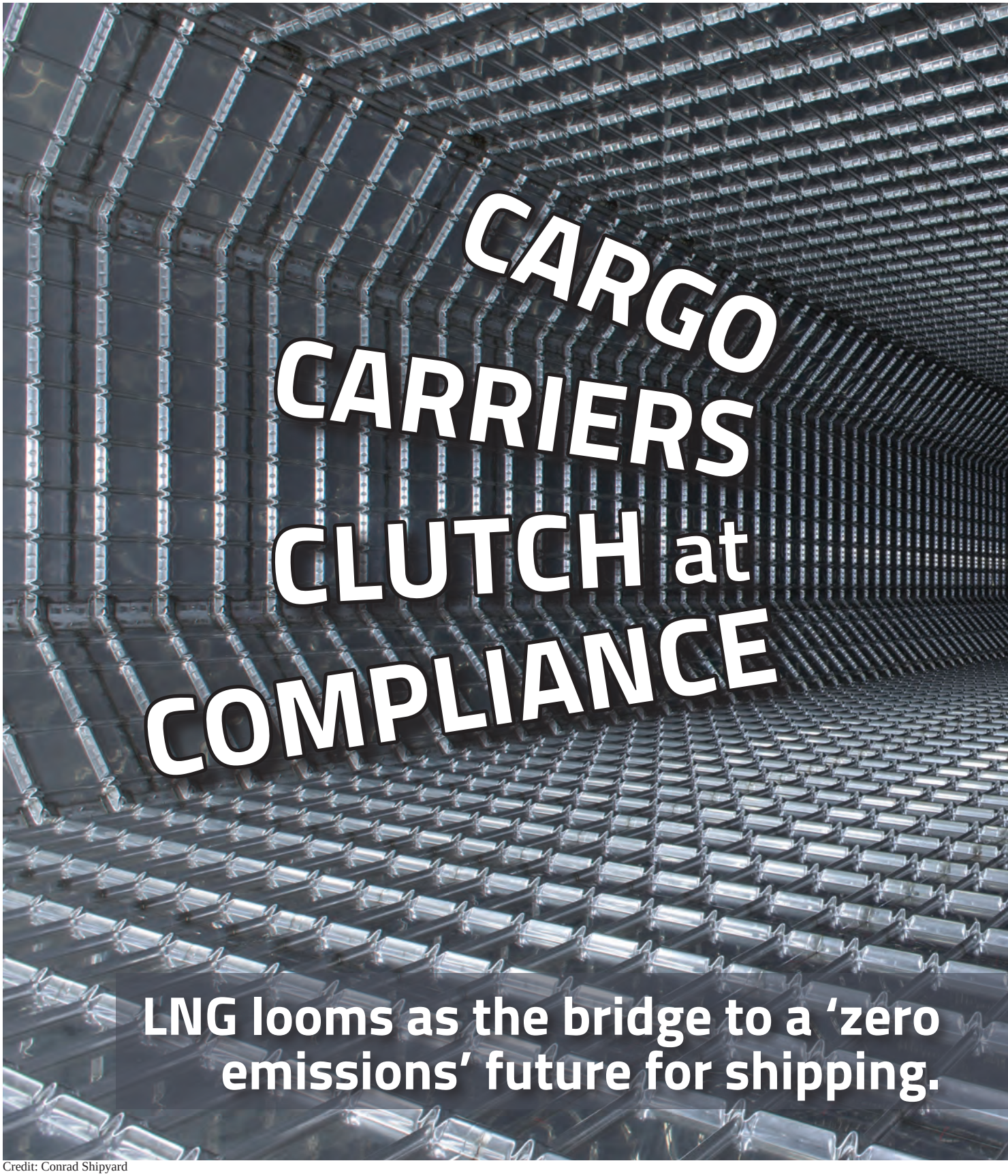
Cargo	Port of Wilmington	Port of Morehead City
Containers	1,782,661	***
Breakbulk	364,697	230,778
Bulk	1,782,189	1,226,573
Total TEU's	230,994	***
Total Tonnage	3,929,547	1,457,352

NC Ports as One
75,000: number of jobs generated by the ports
800: millions of dollars in tax revenues annually generated by the ports.
14: billions of dollars in economic impact in NC alone.
210: Employees
1,250: Net impacted indirect regional jobs

A Tale of Two Ports

NORTH CAROLINA PORTS

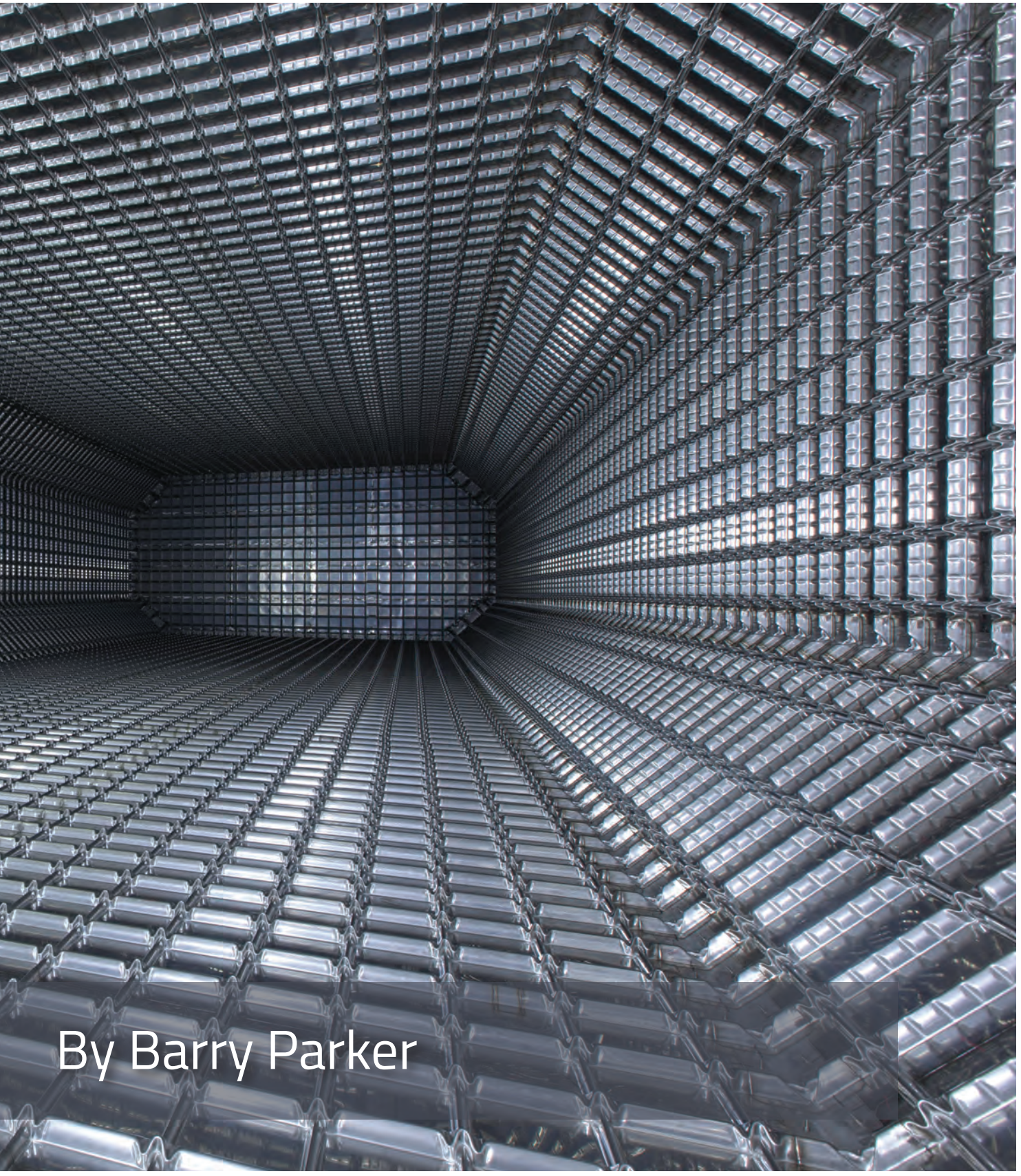
Port of Wilmington	Morehead City
284: Number of acres at the Port of Wilmington	128: Number of acres
2,650: Number of feet in container berths	4: Miles from the open sea
42.5: Controlling depth of navigation channel	45: Channel project depth in feet
1,150: Maximum LOA in feet of Boxships Allowable	9: Number of berths
10,000: TEU capacity of largest vessels calling	5,366: Wharf frontage in feet
750,000: TEU annual throughput capacity	1,000: Tons per hour cargo handling capability
6: Number of Box Cranes (4 post-Panamax)	150: Additional acres available for development
15: Reach stackers at Wilmington (3 on order)	700: Miles within 70% of U.S. industrial base
199: Fixed reefer plugs plus options for growth	1: Millions of square feet of covered storage
44: Crane productivity in moves per hour	43: Acres of open storage area
19: Minutes Turnaround for one truck transaction	2: Number of 115-ton-capacity gantry cranes



CARGO CARRIERS CLUTCH at COMPLIANCE

LNG looms as the bridge to a 'zero emissions' future for shipping.

Credit: Conrad Shipyard



By Barry Parker

The advent of industry wide tightening of allowable sulfur emissions is getting nearer. Suddenly, with the deadline now just one year away, the countdown clock will very soon be ticking much louder. Simply stated, the cap on allowable sulfur content in marine fuels, presently at 3.5% in many geographical regions, will be reduced to 0.5% in January 2020. The 0.1% sulfur cap, already in effect since 2015 in coastal Emissions Control Areas (ECAs) in Europe and North America, will remain.

As carriers struggle with deciding which is the best way forward to compliance, liquid natural gas – or LNG – has emerged as an attractive option, because it is *"…virtually sulfur-free…"* as oil major Shell explained in their brochure, *IMO 2020: What's next?*, a document aimed at marine fuel customers.

LNG as the White Knight?

In late 2017, the use of LNG as a fuel has seen a groundswell of support, and gained status as the next wave. The liner giant CMA CGM announced that a series of nine 22,000 TEU newbuilds, set to deliver from two Chinese yards in 2019-2020, will be dual fueled – with a plan of consuming LNG. Closer to home, Harvey Gulf International Marine, already owning six dual fueled vessels (which can burn LNG) along with an LNG bunkering terminal in southern Louisiana, announced a venture, Quality LNG transporters (Q-LNG) which will be building an Articulated Tug Barge (ATB) to transport LNG for charterer Shell Trading, to fueling stations around Florida and the Caribbean.

Separately, Tote Maritime, already an owner of two newly built LNG fueled container vessels, announced that two existing Ro-Ro vessels would also be converted to dual-fuel capabilities. Owners of vessels presently burning the most typical grades of the fuel widely used in slow speed marine diesel engines, Intermediate Fuel Oil (IFO; a blend of higher sulfur "residual" fuel and lighter distillates) are faced with three difficult choices to meet the new rules:

- ***Consume diesel fuel/gasoil with a low sulfur content;***
- ***Consume heavy residual fuel, with exhaust gasses cleaned with a scrubber; and/or***
- ***Switch to an alternative fuel, such as Liquid Natural Gas (LNG) or, perhaps, methanol.***

Location, Logistics … & LNG

One uncertainty surrounding all choices is price inputs to any business case for one choice over another. These are tied closely to questions of fuel availability. When prices of low sulfur fuels reflect scarcity, capital investment in scrubbers or in LNG propulsion (slightly more expensive than conventional diesel engines) look more attractive, with shortened payback times and/or increased incremental savings over time.

The path towards January 2020 presents many other uncertainties, including whether oil suppliers can (a.) make low sulfur fuels available at strategic bunkering locations and more importantly (b.) whether they can produce sufficient quantities of low sulfur distillate fuel in the aggregate. For owners choosing to install scrubbers (after an investment analysis), there are many questions about the slope of the installation learning

Credit: Clean Marine Energy

curve, and the efficacy of adapting a landside technology to the maritime environment. For owners choosing to build LNG fueled vessels, the most immediate question centers around availability of the fuel itself. It is here that the conundrum of 'chicken and egg' suggests that LNG fuel must be available as a pre-condition for LNG propelled vessels to enter a particular trade lane. Or, instead, does the fuel supply respond to LNG capable vessels calling (or hoping to call) at certain ports?

LNG fueling makes sense where trade routes are fixed and known well in advance. Not surprisingly, the first steps have been taken in environmentally hyper-conscious regions. While many ports are studying LNG fueling, its actual availability is limited. The World Ports Climate Initiative of the International Association of Ports and Harbors (IAPH) notes that LNG

When it comes to LNG bunkering, financial complexity matches logistical complexity. JAX LNG is a newly formed company owned by Pivotal LNG (a wholly owned subsidiary of Southern Company Gas), and NorthStar Midstream, LLC (under leadership of Tim Casey from K-Sea Marine and backed by funds that are managed by an infrastructure group within Oaktree, and Clean Marine Energy LLC). The principals of the latter include the van Reesema family, best known for their investment in the Jones Act tanker American Phoenix.

bunkering facilities are already available, or planned, at ports in Scandinavia and Northern Europe and some Asian ports.

In the United States, Jacksonville, Florida seems to be at the epicenter of the LNG-fueling map, but Harvey Gulf's foray into LNG bunkering happened first in the port of Fourchon, LA. Multiple ports along the U.S. West Coast – where political and regulatory pressure to achieve so-called 'zero emission' operations is tremendous – are said to be looking at ways to provide fuel for LNG consuming vessels.

An inchoate business/logistical model that seems to be emerging is that of a waterside liquefaction operation (where gas is cooled and transformed into LNG), tied to a terminal that handles local landside distribution, on-site marine fueling, and trans-loading into LNG barging across a broader distribution network. Importantly, the barges can also be used for marine bunkering operations. Integral to this new model is a long term supplier of gas.

Existing facilities in the U.S. and Scandinavia typically see LNG delivered by truck to vessels at a fueling dock. A more complete model, the recently completed Tornio Manga LNG Terminal on the Gulf of Bothnia in Finland, will receive gas in small tankers and has plans to provide LNG for vessels in the future. In North America, Harvey Gulf Marine's pioneering LNG fueling installation at Port Fourchon, part of a larger liquefaction and distribution project, will be serving the company's fleet of LNG fueled OSV's (several of which are on charter to Shell) and those of third party customers.

LNG bunkering barges are a movable link in the fuel supply chain, solving the 'chicken and egg' dilemma as they can move to where the ships are. In service now, a handful of these LNG bunker barges replenish their fuel inventory at a liquefaction facility and then move to where the customers are.

Seacor Holdings, for example, has acknowledged that LNG bunkering "…is starting to come into the market…" according to Chief Operating Officer Eric Fabrikant. Fabrikant says that Seacor looks closely at non-commoditized sectors of the market, and described LNG bunker barges as "a nascent space."

Early Adopters: Market Leaders

Among the oil majors, Shell has taken early and big steps in LNG fuel supply. Rotterdam is the base for its 6,500 cbm bunker tanker "Cardissa," which takes on LNG at the Gas Access to Europe (GATE) terminal, which in turn takes delivery of LNG in large quantities from oceangoing tankers that bring gas from the Mideast and Asia and then store it. A second vessel will be working out of Rotterdam, and placed on charter to Shell Western LNG BV. With Wartsila supplied cargo handling systems and tanks, the 3,000 cbm vessel that will be owned through French / Belgian consortium and then chartered by the oil major. Its smaller size will afford the additional flexibility to bunker vessels operating on Europe's inland waterways. The barge is being built in Romania and will be outfitted in the Netherlands.

Elsewhere in Europe, the world's first LNG bunkering vessel, the 5,000 cbm "Engie Zeebruge" went into service in Belgium in early 2017. The vessel (jointly owned by Mitsubishi Corp, NYK and two European gas companies) boasts customers that include United European Carriers, who also operates LNG fueled vessels calling in North Europe. In Scandinavia, the 5,800 cbm "Coralius" was delivered this past summer and will be serving the Skagerrak/Kattegat area and also the Bal-

Credit: Skangas

tic Sea. The vessel is owned by shipowner Anthony Veder and Sirius Shipping, and will be on charter to Skangas, a distributor serving Norway, Sweden and Finland. Skangas Chief Executive Officer Kimmo Rahkamo offered in a prepared statement, "It is a valuable add-on to our existing bunkering methods of trucks and terminals along the coast." Initially, the vessel loaded LNG at the Skangas production facility at Stavanger.

In the U.S. marketplace, the first strides have been taken by TOTE Maritime, which serves Jones Act routes linking the Pacific Northwest with Alaska, and Jacksonville with Puerto Rico. TOTE has deployed two NASSCO-built 3,100 TEU containerships, both with capability to be fueled by LNG, in the Puerto Rico (Jacksonville/San Juan) trades. Its Alaska division has announced plans to retrofit two roll-on roll-off vessels for LNG propulsion at the Seaspan Shipyard in Vancouver, with BC. MAN Diesel & Turbo undertaking the conversion. The retrofit to LNG propulsion, delayed partly due to scheduling changes in the wake of the "El Faro" sinking, will be completed by 2021.

Initially, the vessels are being fueled by LNG produced in a Georgia facility and then trucked to Jacksonville, in specially designed containers, where the carefully choreographed LNG bunkering operations take place under U.S. Coast Guard supervision. In the coming months, fueling will be conducted from a newly constructed 2,200 cbm LNG barge built at Conrad Shipyard. In late summer, TOTE Maritime's fuel provider, JAX LNG, has received a Letter of Acceptance (LOA) from the United States Coast Guard (USCG) for the operation of its waterfront LNG facility (which will include a small liquefaction plant) and the approval to conduct barge-to-ship LNG bunkering operations. According to TOTE, "Barge-to-ship LNG bunkering is scheduled to commence in early 2018."

The Way Forward: looking past existing markets

When it comes to LNG bunkering, financial complexity matches logistical complexity. JAX LNG is a newly formed company owned by Pivotal LNG (a wholly owned subsidiary of Southern Company Gas), and NorthStar Midstream, LLC (under leadership of Tim Casey from K-Sea Marine and backed by funds that are managed by an infrastructure group within Oaktree, and Clean Marine Energy LLC). The principals of the latter include the van Reesema family, best known for their investment in the Jones Act tanker "American Phoenix."

The barge "Clean Jacksonville," in turn, is owned by Wespac Midstream, part of the Oaktree family, and Clean Marine Energy LLC. Mr. Casey, in a prepared statement, revealed the longer term game-plan for the Jacksonville JAX LNG business, saying, "The facility will include a marine dock to load bunkering barges that will deliver marine LNG up and down the East Coast of the United States."

The Northeast Florida hub of the U.S. to Puerto Rico trades is also emerging as the fulcrum for the LNG bunkering business around the Caribbean. Crowley Maritime, also based in Jacksonville, will soon be placing two LNG powered container/ ro-ro vessels built at VT Halter, into service. These will be served by another liquefaction plant, Eagle LNG (backed by Texas-based Energy & Materials Group and gas supplier Ferus). Gas for this project, which could come on stream in 2019 if all approvals are in order, and for possible future facilities, will come from Exxon. In the interim, when the two vessels begin service in 2018, Crowley will be fueling from two cryogenic tanks, at the Talleyrand Marine Terminal in the port.

The recurring themes of the new business model are clear. A Ferus news item explains, "The produced LNG will be transported to markets in the Caribbean and Latin America for power generation. It will also be delivered to local and regional markets, including marine bunkering and high horsepower applications for domestic consumption." Crowley has already been supplying LNG, in tank containers, to Puerto Rico, through its Carib Energy subsidiary, acquired in 2013. Carib Energy is positioned to take on project management activities throughout the markets served by Crowley. While Crowley has not yet ordered LNG transporting barges, it is important to note that its wholly-owned naval architect, Jensen Marine, has created an ABS approved design for an ATB combo capable of transporting 4,000 cbm of LNG.

In the not too distant future, barges based in Jacksonville may also be supplying LNG to a new generation of cruise vessels that will deliver in coming years and will serve European and Caribbean markets. A deal already announced has fuel for two of Carnival Corporation's new LNG powered cruise ships (set to deliver in 2020-2022) supplied by Shell Trading through the new LNG ATB being built by Q-LNG and the Harvey Gulf connection. Carnival brand AIDA, operating out of northern Europe is already using LNG, supplied by Shell. Once further approvals are in place, barges based in Rotterdam and Zeebruge will form part of the supply line for AIDA, and for Costa Cruises (also a Carnival brand) which also has placed orders for LNG powered vessels.

Once stalled by low energy prices and the utter lack of infrastructure outside of a handful of shorter niche routes, LNG as a fuel is gathering a full head of steam in global markets. Further propelled by the looming 2020 deadlines, that momentum – regardless of what the price of oil settles at – is unlikely to be lost. If LNG isn't the final solution for shipping, certainly it is the vehicle that will take the waterfront ultimately to where they want to go. That ship sailed a long time ago.

The Author

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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Nowhere to Hide

Cargo Security goes high tech in its quest to account for cargo damage. Two different firms bring the same goals to the supply chain.

By Joseph Keefe

The need for vessel and cargo tracking has always been necessary. But, the methods and equipment to accomplish those tasks haven't always been available. Before the mid-1990's, for example, without AIS transmitters, a vessel that missed its 'LayCan' at a particular port by just a few hours could credibly misrepresent its position at sea, absent any corroborating evidence by its prospective charterers. And, there usually wasn't any. Hence, if you didn't know where the ship was, you probably didn't know where your cargo might be, either.

By 2002, AIS had gone global and the rest is, as they say, history. Entire voyage time logs can now be virtually constructed using AIS data, and savvy e-commerce and technology firms will happily (for a fee) provide you with myriad e-platforms to do just that, and more. On the other hand, while you might know where your container or cargo might be at a specific point in time, determining its condition is quite another. So, too, is the uncertain task of finding out what happened to it – and when that damage occurred – long after the fact. That's about to change.

SpotSee, a manufacturer of precision impact indicators and recorders, has developed a comprehensive line of devices that

introduce accountability and oversight into the shipping and handling stages of your supply chain. Separately, another firm, PEIR, introduced in September 2017 a verifiable process for recording the condition of equipment at the point of interchange between parties by establishing a photographic record of the event. Where PEIR concentrates on the condition of the container itself at each point in the supply chain, SpotSee equipment meticulously and continuous monitors a particular box for impact damage and anomalies, providing real time, time-stamped documentation to support a possible claim. Each, in its own unique way, brings accountability to the supply chain.

PEIR

An estimated 200 million container movements take place annually. Not all of them get from point A to point B in the same condition that they departed the loading yard. For example, a study of empty containers arriving at a depot in Minneapolis and Chicago showed that approximately 12% of the containers arrived with damage that would be not be considered normal wear or tear. As a minimum, that equates to several thousands of dollars when labor, materials and lost revenue of the container while it is out of service for repair are all taken into consideration. And, it usually the last carrier in the supply chain that gets left holding the bag – whether or not they were responsible for the damage. Often, this is the trucking company at the bitter end of the intermodal equation.

Addressing that issue, PEIR records the condition of a shipping container or chassis with photographic evidence at every point of user interchange. Photos don't lie and the old adage that "a picture is truly worth a 1,000 words" applies in this situation. Using this system is quite simple. Drivers and inspectors don't have to be versed in names of all the components of a chassis or container, they simply take a picture which is recorded, protected, and in blockchain technology.

Companies using PEIR will have irrefutable photographic evidence to prove that it was not done under their watch, or it was received in an already damaged condition. The entity that ends up getting 'stuck' with the bill for container damage is the company at the end of the shipment cycle that does not have proof that they did not cause the damage. This is typically after a shipment has made its way through the process and the container has been unloaded and is being returned empty to a container depot to be made ready for the next export shipment. Utilizing PEIR at every interchange point enables the transportation and logistics industries to unequivocally assign damaged shipping container costs to the rightful party based on irrefutable evidence.

HOW PEIR WORKS

The service is much like the 'walk around' of a rental car when the user is getting ready to leave the rental lot. The typi-

cal walk around review involves a very small picture of the item being reviewed, except that, with PEIR, it isn't necessary to write down the damage because it is now contained in photographic evidence. The PEIR 'app' is a very simple intuitive app to use. Like other apps, PEIR resides on the one's Apple or Android device which has a camera and internet connectivity.

The truck driver, depot employee or terminal employee will take a series of photographs on their Android or Apple device of the shipping container/chassis. Those pictures will be uploaded into PEIR's blockchain infrastructure.

Designed from the ground up to be easily integrated into other cloud based systems through API technology, PEIR security is robust, and its accuracy verifiable. When the user takes the set of photos for a given inspection, a cryptographic hash is computed. This hash is unique and, for all practical purposes, there is a zero chance that the same hash would reoccur on a different set of photos. And, if a dispute arises, PEIR recomputes the hash for a given inspection (set of photos) and compares it against the previously recorded hash for that inspection on the internal ledger (which itself has a publicly verified seal on the blockchain). If the hashes match, then the set of photos is genuine and not doctored.

That series of pictures is authenticated on the blockchain with time, date, and GPS location at an introductory price of just under a dollar per documentation (inspection). Implementing PEIR at every interchange point enables transportation and logistics companies to photographically document the condition of the container at each handoff point. With blockchain, that photograph is time stamped with the container ID, its geographic location (GPS coordinates), stored and made available to all parties as irrefutable evidence.

LOOKING BACK – AND NOW, AHEAD, FOR PEIR

Tom Burke, CEO and Founder of TCompanies Inc., the inventors of PEIR, started out in the trucking business. And it was there that Burke began to look for better ways to protect his company's bottom line. That's because container damage was a significant line item expense for his firm. He explains, "Not only was it a significant line item expense, but it consumed a significant amount of time to research and respond to claims. Most times, we ended up having to pay the invoice because we did not have sufficient evidence to prove that it was not our company that damaged the shipping container or chassis. I would say that, overall, it represented 1% of our gross revenue, an amount that could not get lost on our P&L sheet." That's because 1% in the trucking business is a big percentage.

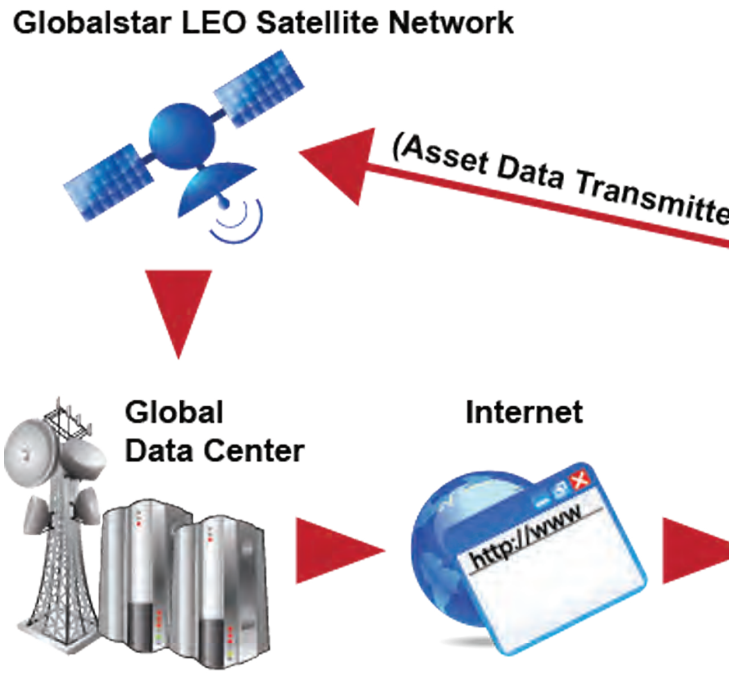
Beyond verifying container condition, there are additional benefits associated with the data collected by the PEIR app. For example, the data could be used to update container tracking on a real-time basis that is potentially maintained on the blockchain. This data could be used to update a TMS system or provide arrival notification texts or messages. For container depots, the PEIR interchange could be used to estimate repair costs on a container or chassis.

Pricing is as simple as $1 per box surveyed. That cost is for each point in the supply chain that PEIR is employed. PEIR's target market, according to Burke, is anyone or any entity that is either taking a shipping container into their responsibility and liability or passing that shipping container to another party. The firm is actively sourcing partners to help beta test PEIR through the end 2017, with the official launch planned for early in January.

SPOTSEE'S SHOCKLOG

As a global producer of precision impact indicators and recorders, SpotSee has, over time, developed a line of devices that introduce accountability and oversight into the shipping and handling stages of the supply chain. Like PEIR, SpotSee aims to take the guess work out of what happened to your box or cargo, leveraging technology to do it. Unlike PEIR, SpotSee's ShockLog is with you and your cargo over every mile of the journey. But, that's just the beginning.

The vision for SpotSee began nearly two years ago. Leveraging more than 40 years of experience helping customers monitor global shipments, providing connectivity to cargo to enable real-time response was a logical next step. The realiza-



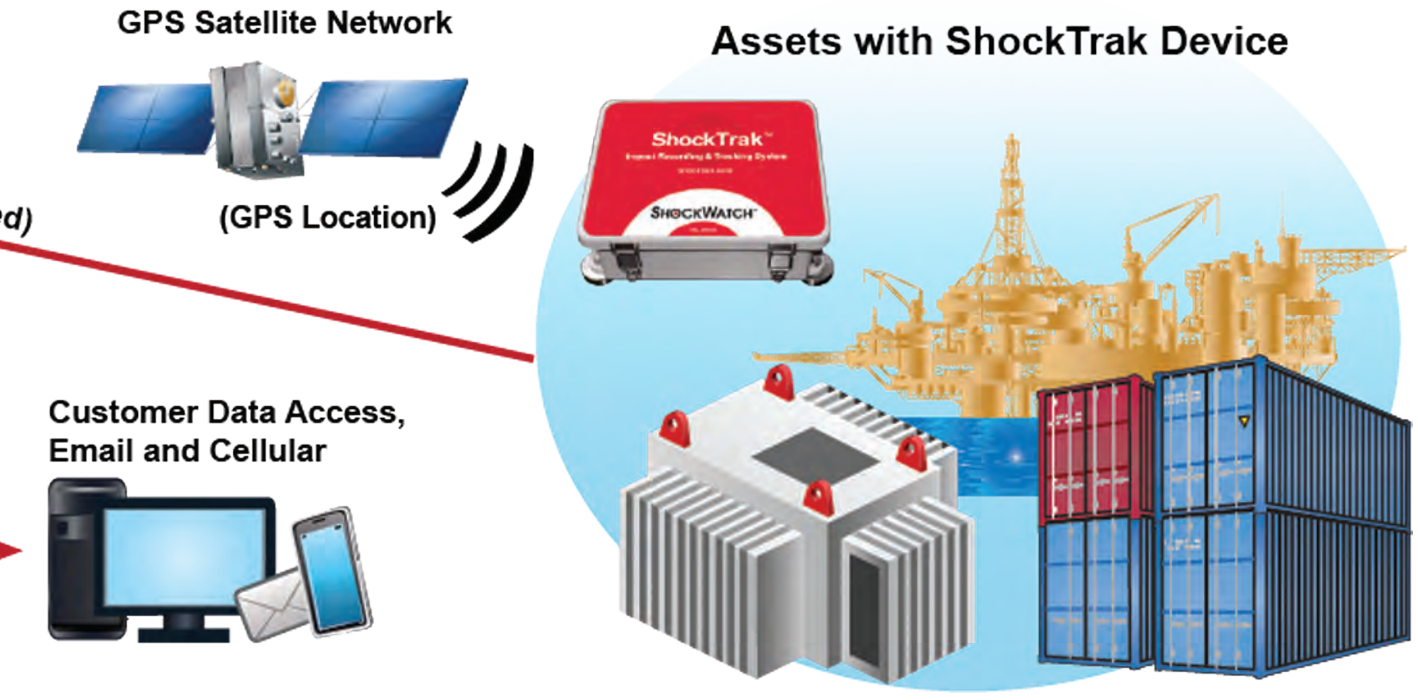
"At the end of the day, our mission is to give unbiased, virtual eyes to operations, maintenance, quality, logistics and supply chain managers around the globe."

– Tony Fonk, CEO, SpotSee

tion of this vision was a global IoT and connectivity platform that combines SpotSee offerings like ShockWatch, ShockLog, ShockTrak, WarmMark and OpsWatch to create a tracking network that helps customers spot damage to their assets and see it in real time.

Used in conjunction with companion tools, SpotSee impact indicators and recorders provide a prominent visual deterrent to mishandling. By registering potentially damaging impact events during transit, indicators and recorders allow supply chain managers to identify and respond to potential shipping hazards. And, when the cargo finally arrives at its final destination in less than perfect condition, ShockLog's documentation provides definitive proof of where the damage might've happened.

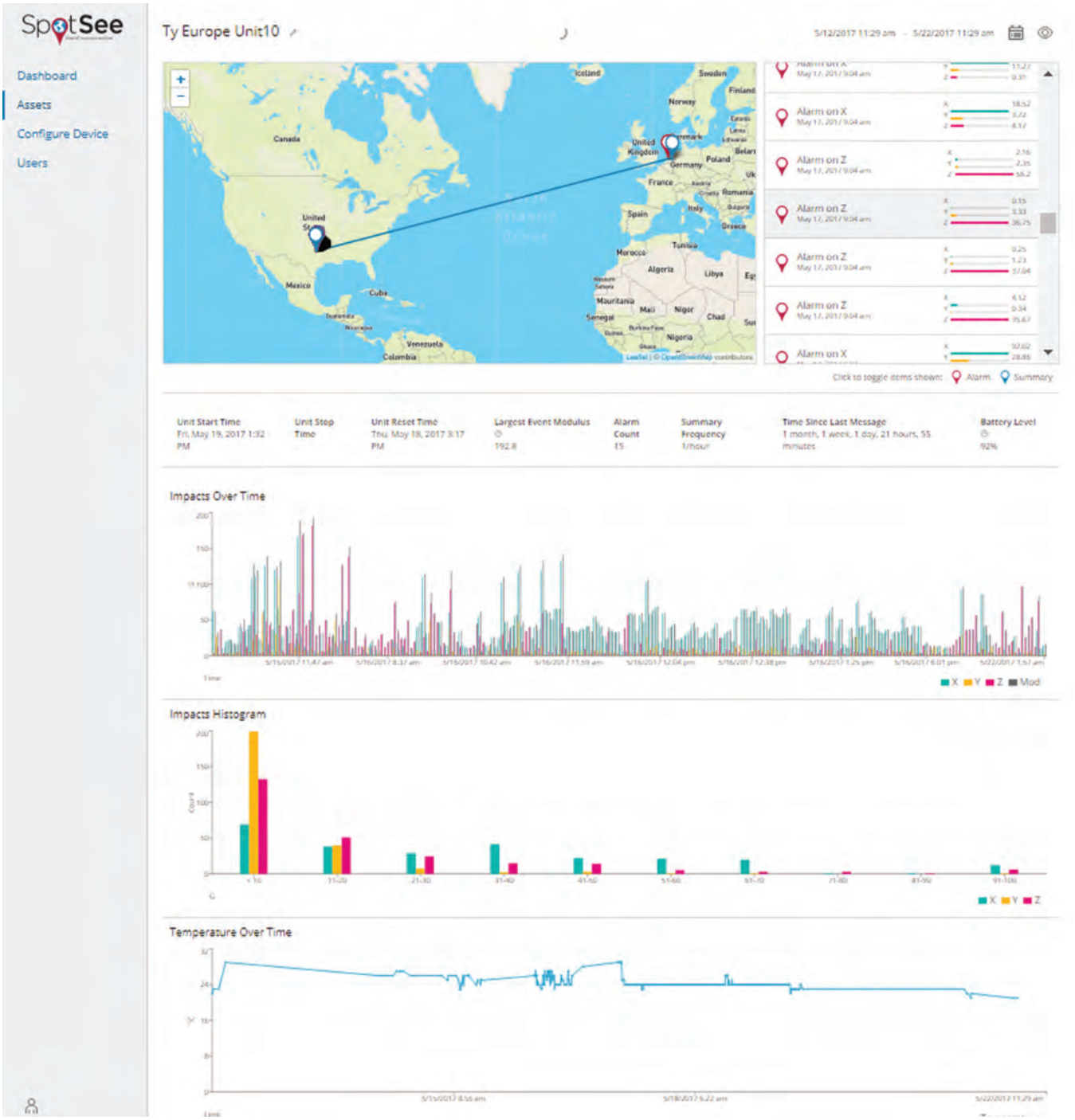
The advent of the modern shipping container helped to eliminate the vast majority of pilferage and theft on the waterfront. What it did not do was allow easy inspection of that locked box and its contents. All cargo is subject to hidden damage during transport. And, as the saying goes, "Locks only keep honest people out." At the same time, when a shipment is being monitored for mishandling, handlers are more careful.



SPOTSEE IN ACTION

According to SpotSee, companies have reduced their shipping damage by as much as 70% by employing ShockWatch solutions. Doing that takes real-time visualization of impacts, 'Best in Class' Impact Data, longer battery life and flexible settings and download capabilities. For example, and using off-the-shelf lithium batteries, SpotBot delivers more than 100 days of monitoring (set to hourly summary reporting). This represents a battery life that is more than twice (2X) the next best competitor.

The user easily defines impact settings specific to the product being monitored and SpotBot will deliver a location and time stamp of alerts from impacts over the threshold. After the trip, the user can easily download a PDF file with the top ten



"Like PEIR, SpotSee aims to take the guess work out of what happened to your box or cargo, leveraging technology to do it. Unlike PEIR, SpotSee's ShockLog is with you and your cargo over every mile of the journey. But, that's just the beginning."

largest impacts, a CSV file with the top 50 largest impacts, and a slot-time report from the SpotBot.

By using SpotBot to track cargo through the value chain, you can pinpoint issues during transportation so that they can be remedied and avoided in the future. The visibility to impact and temperature data that SpotBot provides can help you realize significant savings of both time and money by ensuring that your product reaches the customer without incident. And, with the capacity to record data for 870 events and 262,000-time slots, the device sends alerts whenever damage may have occurred so that the cargo owner can respond promptly.

Finally, the SpotSee cloud is where trip data is aggregated in real-time. The cloud features visualizations for multiple units. The graphs are easy to read and include data such as specifics of impact with locations, impacts over time, histogram, and temperature.

SPOTSEE CLOUD FEATURES

- ***Access to data from wherever you are with a dedicated web portal;***
- ***Real-time reporting and tracking of incidents;***
- ***Alarms with location, time, impact g-level, and direction of impact;***
- ***Impacts-over-time visualization of each asset;***
- ***Histogram the asset's impacts;***
- ***Real-time Reporting;***
- ***Detailed Impact Alarm Data;***
- ***Cloud Solution Software.***

CARGO SECURITY GOES HIGH TECH

"Our push to incorporate the IoT was simply the act of aligning our customers' connected expectations with our great measurement and monitoring tools. The transformation helps customers make better decisions with higher probabilities of success through their data and experience over time. At the end of the day, our mission is to give unbiased, virtual eyes to operations, maintenance, quality, logistics and supply chain managers around the globe," said Tony Fonk, CEO, SpotSee.

Tom Burke sees a similar mission, saying, "Ideally, the condition of a piece of equipment should be documented with PEIR at every point of interchange. The cost of just under $1 is an introductory price point. We believe that PEIR will be first utilized at trucking interchange points, but PEIR's value will be quickly realized by other industry participants and adopted."

Looking ahead, any Party to a cargo shipment whose trading partner employs PEIR at any point along the way (and does not protect themselves by doing the same), puts themselves at considerable risk. Similarly, the impact of that dropped box in Singapore can now be heard around the globe in Chicago by its owner, simply by employing the technologies provided by SpotSee. Like the commercial vessel emitting that now ubiquitous AIS signal on a 24/7/365 basis, those responsible for cargo damage now have nowhere to hide. But, only if shippers spend a little money in advance. These 'high-tech' solutions are just that simple.

A Familiar Name Tackles the Waterfront's Changing Challenges

Providing vehicles and equipment across the broad global spectrum of consumer automobiles to commercial trucks and on to the waterfront, Toyota has 'been there and done that.'

Edited by Joseph Keefe

Growth in the size of containerships is driving investment across the maritime, port infrastructure and supporting industry spectrum. That's because, until 2014, Maersk Line's Triple EEE was the largest containership in the world at 18,340 TEU, only to be surpassed two years later by CSCL Globe (19,100 TEU), with a 21,100 TEU ship coming soon and a 24,000 TEU ship on the drawing board. The logistics chain efficiency of running these mammoth ships is lost without matching port and terminal investment to move goods to and through shore side facilities.

Simultaneously, stricter environmental regulations demand that the machines powering the movement of goods run cleaner and more efficiently. To compete and survive in the era of tighter schedules and margins, better management of an efficient supply chain requires a thorough understanding of the machines that power the process. Material Handling equipment – including container handlers, reach stackers and forklifts – and services offerings, specifically focused on port operations, is just one way to reach the Promised Land. In fact, without a reliable source of modern, clean material handling vehicles, you can't get from here to there.

TMHU: a New Option for Stakeholders

The business of moving heavy cargo remains the domain of heavy duty, high capacity, reliable machinery that brings the physical muscle to the cargo handling and logistics chain, par-

ticularly in the demanding port environment. Ports have more than a few options when it comes to this aspect of their business. Toyota Material Handling USA (TMHU) is one such player – albeit a new one – in this space. That said; and when it comes to heavy equipment, engines and vehicles, the name Toyota also carries considerable weight.

According to the Port Performance Freight Statistic Program, an Annual Report to Congress, 2016, maritime ports are a major part of the United States' freight transportation system, collectively handling 75% of America's international trade by volume. As U.S.-NAFTA freight continues to grow, up some 6.5% this summer and riding a ninth consecutive month in which the year-over-year value in current dollars of U.S.-NAFTA freight increased from the same month of the previous year, even a crowded reachstacker market can use another player.

The snapshot is indicative of a bigger trend. Nationwide, growing containership volumes coupled with a flourishing economy, and further bolstered by the recent successful expansions of both the Suez and Panama Canals, has prompted the deepening of U.S. ports to handle a growing fleet of bigger containerships (20,000 TEU plus).

"Increased port traffic has created more opportunities for TMHU. For example, less than two years ago we didn't have a high capacity line to operate in the port environment," said Bob Lunt, High Capacity Sales Manager, TMHU. "This continued increase and opportunity drove our expansion along with the feedback from our customers that they would prefer to purchase from TMHU. Our volume continues to improve significantly year over year, but we are just getting started."

Why TMHU:

Port capacity varies widely, dependent not only to the physical constraints of the port, but a myriad of business and legislative constraints. Increasingly, port and terminal managers look to the fleet of cargo-moving equipment within their own house, as more efficient, cost-effective equipment provides not only a commercial benefit but another means to increase overall cargo handling capacity.

Demands have changed on many levels including an increased awareness of safety, increased traffic and cargo quantities. Overall, ports are better managing and tracking assets and related costs. Costs remain important, of course, a 'changing of the guard' on the waterfront has seen ports and logistics firms looking not only at the retail price, rather a long list of other factors as customers weigh CAPEX versus OPEX.

"Retail price, life cycle costs, versatility and safety all impact operations at the ports, and in most material handling applications," said Lunt. "Retail cost is certainly important when considering equipment procurement, but companies are now understanding that this is just one component of the real cost of ownership." These variables include lifecycle costs, the versatility of a particular piece of equipment, safety, and the newest but increasingly important differentiator – the footprint on the environment.

"Retail price, life cycle costs, versatility and safety all impact operations at the ports, and in most material handling applications," said Lunt. "Retail cost is certainly important when considering equipment procurement, but companies are now understanding that this is just one component of the real cost of ownership."

– Bob Lunt, High Capacity Sales Manager, TMHU

Still, in today's competitive landscape, most companies value most the idea of a single source provider for all their material handling needs. A company that can provide expertise in all environments from port to end user understands that there is value in partnering with a trusted supplier. And, that's where TMHU comes in. Providing vehicles and equipment across the broad global spectrum of consumer automobiles to commercial trucks and on to the waterfront, Toyota has 'been there and done that.'

The TMHU Product Offering

TMHU has a full line of high capacity products that include Straight Mast Trucks from 22K to 125K, ECH, LCH and reach stackers and RoRo units. The TMHU product line-up is a comprehensive family of products and systems, all designed to keep freight moving, efficiently and safely. Especially in the port truck line-up, this comprehensive understanding of both the supply chain and their own products is a major ben-

efit of choosing Toyota.

The implementation of products that cut fuel costs has also begun to define the port environment, as economic factors influence port managers in their material handling decisions. Lunt adds, "The continued electrification of traditionally internal combustion products during development is also a defining characteristic of the supply chain and of our product line."

The Promise of the Reach Stacker

Reach stackers are starting to gain greater acceptance in the U.S. market, where as in Europe they already dominate container handling. "Due to their flexibility; they are being adapted to a number of non-container handling applications, such as wind energy, steel-both coil and slab and oil and gas," said Lunt.

The Toyota family uses a module design philosophy and is well-suited to adapt to any number of applications. For instance, any standard container spreader can be updated to include an add-on WTP module, trailer handling leg module, or any number of slave attachments including hooks, spreader beams, slab handlers and coil handlers. Another added benefit to the reach stacker, especially in non-traditional roles, is having the ability to rotate the load, resulting in a more efficient use of space, as angled loads greatly reduce necessary aisle space.

TOYOTA
INDUSTRIAL EQUIPMENT

"Our reach stacker can stack up to 5 containers high with a reach depth of 3 rows which is the industry standard. Whether it is the optical distance sensors or automatic pendulum-floating twistlocks, our reach stacker gives the operator confidence when handling loads," said Bill Byrd, National Manager of Dealer Sales for TMHU.

While the TMHU reach stacker has room to grow in the Americas, Lunt also sees another key trend driving the unit's potential. "We see reach stackers supplanting a lot of the traditional straight-masted trucks in the future. The same modular approach we take with the reach stacker is applicable here, too, however. Straight-masted container handlers currently attain greater stack heights, with Toyota empty handlers going 8 high and Toyota loaded handlers going 6 high."

The Environment & Emission Reduction

Very quickly, the environment has become a key driver to all port operations. For example, the ports of Los Angeles and Long Beach, CA now seek to achieve, and where possible, accelerate to 100% zero-emissions cargo handling equipment by 2030. That's a lofty and pricey goal, especially when most of the low hanging 'environmental' fruit has already been picked. Separately, a recent industry study commissioned by the Pacific Merchant Shipping Association (PMSA) put the cost of achieving this lofty goal at about $16 billion locally. But what if ports and terminals could achieve some of those goals simply by investing in slightly more expensive container handling equipment? That's where Toyota Material Handling USA comes in. They provide cleaner equipment that's easier to maintain and longer lasting. It also produces a markedly reduced carbon footprint.

In fact 'green initiatives' are at the heart of the Toyota corporate culture, extending to, through and beyond the machines it manufactures. Looking through the lens of TMHU, there are clear initiatives to leverage the corporate philosophy through its product line.

"We use Cummins engines in our product line for many reasons including reliability, superior technology and industry acceptance over decades of service," said Lunt. "Cummins approach for Tier 4 is Diesel Oxidation Catalyst (DOC) and Selective Catalytic Reduction (SCR). There are multiple technology paths for emission reduction but SCR has been more widely accepted than Exhaust Gas Recirculation (EGR), specifically on higher horsepower engines."

While the TMHU line packs a powerful punch with its traditional internal combustion powered units, it also has plans on electrifying a large percentage of it traditional diesel powered THD product. According to Lunt, some of the traditional drawbacks to battery power, namely weight, turns out to be an advantage for this specific line of equipment.

"For larger THDs and port equipment we don't necessarily need a small physical footprint. Unlike the auto industry and their needs for electrification, counterbalanced material handling equipment requires additional weight and batteries that can actually serve to supplant existing counterweight," said Lunt. "In fact, many battery manufactures offering new technologies like the many variations of lithium (which are physically smaller and lighter than traditional lead acid batteries) have found that in order to gain traction in the forklift market that they must go back and weight up their battery boxes to make them more comparable to lead acid. These newer batteries have the advantage of increased run times, making them a viable alternative to IC power in certain applications/duty cycles."

With the advent of opportunity charging and rapid charging systems battery, technology can be a viable alternative to diesel in most applications. "Our intent is to ultimately provide a product platform that is 'power neutral' affording our customers the options of IC, traditional lead acid, lithium as well as fuel cells," Lunt said.

TMHU and the Intermodal Equation

The New Year finds the global waterfront, particularly where it intersects the domain of container shipping, in a rapidly changing environment. As volumes at many North American ports continue to set records, harbor dredging and dock upgrades continue as these gateways compete for the business of ever increasing sizes of boxships. At the same time, environmental and regulatory pressures demand a cleaner environmental signature from ports that handle more and more cargo.

A necessary part of both efforts will include new and improved material handling equipment. At the same time, corralling that last 5% of a port's environmental signature can't come at the expense of dwell time, efficiencies and other performance benchmarks. Ports can achieve both goals and the newest stakeholder in that equation – Toyota Material Handling USA (TMHU) – is also one of the most familiar names in business.

Bringing global reach to local markets, TMHU is now producing new and improved, versatile, high capacity and environmentally correct cargo handling equipment on the waterfront. It's about keeping freight moving, efficiently and safely – from the inland hinterlands, on the highways, and now, on the docks.

"A company that can provide expertise in all environments from port to end user understands that there is value in partnering with a trusted supplier. And, that's where TMHU comes in. Providing vehicles and equipment across the broad global spectrum of consumer automobiles to commercial trucks and on to the waterfront, Toyota has 'been there and done that."

Unlocking New LNG Transfer Possibilities

Credit: Trelleborg

Cryogenic hose technology is driving a rethink of LNG transfer in bunkering – and beyond.

By Vincent Lagarrigue

Many backers of LNG as a marine fuel, as well as wider industry stakeholders, have for a while now suggested that it will soon enjoy exponential growth as a future bunker fuel. There are several factors behind this; the increasing number of emissions control areas (ECAs) requiring bunker fuel of 0.1% Sulphur (SOx) to be burnt near coastal areas where the burning of dirtier heavy fuel oil (HFO) is forbidden. Most crucially, however, and undoubtedly the catalyst for such significant forecast growth, is the impending introduction of a 'global sulphur cap' in 2020 that will require all vessels to burn less than 0.5% sulphur marine fuel – spurring ship owners and operators around the world to look for compliant alternatives to marine gasoil (MGO) or marine diesel oil (MDO) distillates.

A recent report sheds light on just how dramatic this growth could be. Energias Market Research says the market for LNG bunkering will increase in value from US$825m in 2016 to nearly US$25bn by 2023 – that's a compound annual growth rate of more than 62%.

Nevertheless, and despite these headline figures, LNG will still only represent a fraction of global bunker fuel supplies. So, why is this? Speaking after the naming ceremony of Shell's dedicated LNG bunker vessel, the Cardissa, Shell LNG Fuel General Manager Lauran Wetemans said that the marine LNG sector had the potential to be 'disruptive' – just as the electric-powered car industry is disrupting existing sup-

ply infrastructure. However, he acknowledged that the 'buy-in' of owners is crucial if the use of LNG bunker fuel is to be stepped up from its current, relatively modest level.

Interestingly, Wetemans insists that the availability of LNG – an issue which is often cited as being a limiting factor – is not the challenge. Instead, he noted that LNG transference presents obstacles to be overcome, highlighting the need to be able to take that LNG in smaller quantities out of key hub terminals such as Rotterdam, Busan, Shanghai and Singapore.

The Real Challenge: Logistics

In addition to the growth of LNG as a bunker fuel, the global LNG market is evolving in such a way that necessitates the splitting of LNG into smaller parcels – both for use as a marine fuel, but also for power generation and terminal networks supplying communities who might be isolated from major hubs. Floating receiving and distribution terminals and coastal gas carriers are now an integral part of LNG activities and a crucial cog in the LNG supply chain. This is reflected in a diversifying LNG fleet. As the fleet passed 500 vessels earlier this year, its growth is accompanied by a broader range of vessel types. Today, the live LNG fleet includes around 26 FSRUs and 33 small-scale ships of 30,000m³ or smaller.

This shift requires us to rethink our approach to LNG transfer. While in some cases, it may be possible to replicate existing infrastructure, this may not always be feasible. Existing infrastructure at current hubs may not be suited to the range of vessel sizes represented in today's fleet. At the same time, the need for LNG to be transferred in a wider range of locations presents challenges, as transfer must occur in locations that may be too deep or shallow for traditional jetties to be used, or where harsh environments make conventional jetty-based transfer difficult.

This is where the latest LNG hose technology holds the key to unlocking a wider range of transfer possibilities. Because LNG needs to be transported at a temperature of -163 degrees Celsius, LNG transfer solutions require specialized composite cryogenic hosing to safely transfer LNG to regasification plants. As such, considerable research has gone into the development of cryogenic hoses. These hoses, when used in floating configurations, have the potential to unlock a wide range of transfer options.

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LNG Hose Technology 101

Composite LNG hoses typically consist of multiple, unbonded, polymeric film and woven fabric layers encapsulated between two stainless steel wire helices – one internal and one external. Essentially, the film layers provide a fluid-tight barrier to the conveyed product, with the mechanical strength of the hose coming from woven fabric layers. The outer protective hose draws on flexible rubber-bonded hose technology, which is known for its high resistance to fatigue and its ability to withstand harsh environmental conditions. Extra safety is provided by an integrated monitoring system that is able to detect even the slightest leak that may occur in the hose structure.

The system uses cutting-edge optical fiber technology that offers a fast, effective, and reliable control system, to monitor conditions during loading and offloading. This technology unlocks new options in both ship-to-ship and ship-to-shore transfer.

Ship-to-ship transfer

The rise of the new class of LNG bunker vessels such as the Cardissa and the Coralius underscores the need to examine how ship-to-ship transfers of LNG are conducted – a process which is already growing in importance thanks to the increase in carrier-to-FSRU transfer.

Two factors are critical in ensuring that ship-to-ship transfer is safe and efficient – proximity and time. The faster the transfer window, the lower the risk of an incident, and the further away the vessels are, the less likely a collision becomes.

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> *Two factors are critical in ensuring that ship-to-ship transfer is safe and efficient – proximity and time. The faster the transfer window, the lower the risk of an incident, and the further away the vessels are, the less likely a collision becomes. By using floating cryogenic hoses in tandem configuration, vessels can be moored as much as 300 to 500 meters away from each other.*

vessels can be moored as much as 300 to 500 meters away from each other. The increased separation distance mitigates the risk of collision and ensures the safety of the vessels and crew and, moreover, the heavy-duty hose design reduces risk of damage to the hose during handling.

Ship-to-shore transfer

The flexibility and high flow rates achievable by cryogenic technology also makes it an ideal solution for ship-to-shore transfer. It increases the economic feasibility of marine bunkering projects located away from existing infrastructure – particularly in areas where jetty-based transfer would be unfeasible thanks to harsh conditions or environmental concerns. The same goes for terminal or power generation projects.

Trelleborg's cryogenic hose-in-hose technology can negate the need for fixed onshore infrastructures; a concrete platform onshore combined with Cryoline hose transfer solutions offers an alternative that can be up to 80% more cost-effective for locations where fixed onshore infrastructure would be prohibitive.

Collaborations with partners such as Houlder, Wärtsilä, 7Seas and ConnectLNG demonstrate how ship-to-shore operations using cryogenic floating hoses can be further enhanced, and offer increased flexibility and a choice of transfer options. Floating transfer terminals or barges can be connected to the shore using Cryoline hoses, which can then easily connect with a vessel using a transfer system on a barge. These solutions can be built, outfitted and commissioned off-site in parallel with relatively light civil engineering activity. For instance, this could be a relatively infrastructure-light method of enhancing an existing LNG hub that needs to cater to a wider range of vessels – not just large LNG carriers.

The efficacy of this technology has recently been demonstrated with the first test of Connect LNG's universal transfer system, which was based on this model. The UTS transferred LNG from the 15,600m^3 Skangas-chartered small-scale LNG carrier Coral Energy to the onshore terminal at Herøya. Classed by DNV GL, the UTS took less than six months from design to hook-up. The system was installed in a day, and completed the transfer a day later.

As a self-contained mobile unit, a floating barge or transfer unit can be readily adapted for future and alternative deployment in the event of local changes or a desire to move location entirely, and individual components can be up or downscaled depending on requirements. A floating solution also allows for refuge to be sought in safe harbor during storms or hurricanes, deep maintenance to be undertaken at a shipyard, integration with a variety of LNGC mooring configurations, and the flexibility to support future, alternative applications. Moreover, the barge is also only used when transfer is underway, minimizing impact on the environment.

Evolving Solutions for a changing Market

The rapid evolution of the LNG fleet, both of vessels powered by and carrying LNG, reflect a market with huge growth potential, and rapidly changing dynamics. It is essential that, as LNG as a marine fuel grows, and the wider LNG market diversifies, that the solutions used to transfer it develop at the same pace – while simultaneously ensuring that efficiency, flexibility and safety are at their core. For this reason, cryogenic hose technology, and the multiple different transfer applications it enables, can ensure that transference is at least one obstacle that can be overcome.

The Author

Vincent Lagarrigue
is Director of Trelleborg Oil and Marine.

Maritime Training Practices Take a 'Right' Turn

MarTID – the Maritime Training Insights Database – a historic initiative to study global maritime training practices, and supported by a comprehensive survey, will close on 31 January.

The Maritime Training Insights Database (**MarTID**) is an initiative of *The World Maritime University*, *Marine Learning Systems* and *New Wave Media*. Intended as the ideal vehicle to collect data through a survey instrument, it will focus on the dominant training practices now being undertaken in the global maritime industry. In a world where mariners – despite being bombarded with the crushing weight of regulatory training and certification requirements – still seem to find trouble in way of collisions, allisions, oil spills and all manners of casualties, it is past time to stop and assess this important part of the global maritime industry. *MarTID* will lead the way forward.

MarTID: collaborative, confidential and non-commercial

MarTID's core principles include ethical integrity, objectivity and confidentiality. The ultimate goal is to promote the sharing of information that benefits the entire industry. MarTID will contain anonymized and secure data on industry training practices, foci, and outcomes. It will continually grow in depth and value as a resource through the administration of an annual maritime training practices survey. This database will provide invaluable data on current and emerging training trends and techniques, staffing models, training focus areas, training tools, training resource allocation, assessment practices and so on. It will be an incredible resource to allow each organization to benchmark their own practices.

The MarTID survey is focused on training done by maritime companies outside the context of shore-based education and training leading to STCW Certificates of Competencies. In other words, this is a survey seeking data on how maritime operators continue to train their seafarers, post-STCW certification. The results collected will be used to provide objective and comprehensive data on how the industry manages and conducts training for shipboard competencies.

The aim for this initiative is to provide insights that will aid in enhanced policy-setting, decision-making, benchmarking and optimization of training practices by industry and regulatory authorities at all levels, leading to the sustainable development of productivity and safety of vessel operations. It is anticipated that responding to the questionnaire should not take more than 30 minutes. *The survey will close on Friday, January 31, 2018.*

Why MarTID? Why now?

Vessel operators and maritime training centers are pouring significant resources into creating best practice and innovative training programs. Often intended to bridge the gap between standard certifications and what actually happens in the real world afloat, these unique efforts fall outside the realm of traditional 'licensing and credentialing.' That doesn't make them any less important.

In fact, in-house safety and competency training programs often go far beyond the typical STCW course. It is also true that in-house programs tend to be viewed as proprietary assets, intended not just to create a safer marine environment but also to achieve competitive advantage in the marketplace. As this siloed approach continues, it yields fruit, but also suffers from a lack of standardization and the absence of benchmarked 'victories.' That's where MarTID comes in.

Every year following the survey, a series of reports will be published broadly. These reports will provide both high-level and deep-dive information covering both broad trends as well as deep coverage of emerging issues and successes. The reports will grow to be a highly valuable and anticipated source of information each year – but only if there is broad industry buy-in from stakeholders like you.

Your Help Needed

This initiative, founded and run by the three partner organizations, requires community involvement to succeed. You will be hearing a lot about MarTID in the coming weeks and months. Now, your help is needed:

- *If you work at a vessel operator or maritime training facility, please make your senior training administrator aware of this important survey by sharing this article with them.*
- *If you are a senior training administrator of a vessel operator or training facility, we need you to complete a survey on behalf of your organization. Please send questions to info@MarTID.org or take the survey at www.martid.org/survey.*

The annual collection and analyses of training data will help the maritime community gain insights that can lead to enhanced policy-setting, decision-making, benchmarking and operational optimization by industry operators and regulatory authorities at all levels. It is hoped that the survey data and its analyses will become an important and authoritative source of knowledge for the global maritime community. Please take the MarTID Survey @ ***www.martid.org/survey***

World Maritime University: ***https://www.wmu.se/***
Marine Learning Systems: ***https://www.marinels.com/***
New Wave Media: ***https://www.marinelink.com***

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