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**Harbours**  
review

Security



**technology**

**0.5% sulphur cap**

**events 2017**

**cruise**

**cybersecurity**



# All over the world – from HaminaKotka

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## dear readers,

**a**nother year is coming to an end. As promised, we're presenting to you our second 2017 printed *Harbours Review*, with the best articles gathered over the second half of this year. Regrettably, we couldn't publish more of them in print, so dig for more on our website: [www.harboursreview.com](http://www.harboursreview.com).

And so – the topics! First of all you'll find out how many conferences we have covered this year. Our team travelled to Bulgaria, Estonia, the Netherlands, Sweden, Italy, Belgium (and earlier, Malta), to finally land in Sweden again, not to mention events taking place in Poland. And where will you meet us in 2018? So far we are 100% sure that you'll be reading this during Transport Week in Gdańsk, (6-8 March) and two times in Rotterdam – at ESPO (31 May-1 June) and TOC Europe (12-14 June).

We could not just let cybersecurity slide. Tuomas Kiiski writes: "Recently, anything with a prefix 'cyber-' has been over-popularized in media headlines and policymaking discussions. Nonetheless, the cyber domain – which initially sounded like science fiction – has become very, very real," and indeed – to learn more about how to keep your business safe from cyberattacks you must take a look at another article and an interview in this section.

As usual, a strong focus is put on technology and how it impacts ports and shipping. Here you can find a lot about next-gen reefers, learn how IT can get ports to work more efficiently and in a smarter way, and meet the world's first fully electric, autonomous, and zero-emission container ship. Interested? But there's more – Chris Mason reveals the plans of a company that came from the military to ports and Esben Pejstrup-Pedersen writes about the EfficienSea2 project. Finally, we hope you enjoy the technological and futuristic accent in an article by Sue Terpilowski and in two interviews (a must-read because the guys from Navis and ORBCOMM really know their job).

The 0.5% sulphur cap is a hot topic, too. In order to help you brace yourselves for it, we've included a lot of materials for all you waiting for 2020 (check the articles written by Bruce Abbott, Charles L. Daly, and Unni Einemo).

There is also something for those who want to read more about what is on the rise these days – namely, the cruise business. You will definitely find the article on *Ecoship* and the report covering cruise business in Europe in 2016 interesting.

We are also pleased to introduce to you our experts, people who shared their views on a variety of topics: the blue industry, ballast water management, key takeaways from the latest TOC Europe, and onshore power supply. But the next year is coming, a lot of topics to be covered, so stay tuned!

We wish you a pleasant reading,

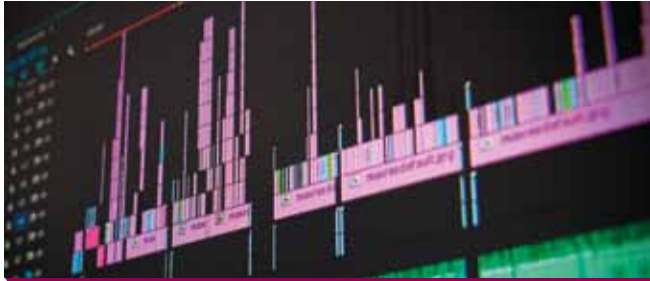
**maciej kniter and przemysław myszkowski**

## contents

## top news

### 03. Editorial

### 78. Partnership events



## tech impacts

### 38. Reefers in the digital age

– Smarter refrigeration

*Katsuhiro Tetsuya*

### 40. IT to keep ports working

– Interview with Peter Lundgren, Sales Director, JLT Mobile Computers

*Maciej Kniter*

### 42. Destination 2020

– The world's first autonomous and zero-emission container vessel

*Peter Due*

### 44. From the military to ports

– Interview with Chris Mason, Director of Sales, EMEA Region, Rajant Corporation

*Maciej Kniter*

### 46. E-connecting the maritime world

– Developing cloud-based e-Navigation and other next-gen e-Maritime services

*Esben Pejstrup-Pedersen*

### 48. opPORTunity

– Harboursing technology towards Ports 4.0

*Sue Terpilowski OBE*

### 50. The wave

– Interview with ORBCOMM's Michael Dempsey (VP Container and Port Solutions), Christian Allred (VP International), and Sue Rutherford (VP Marketing)

*Przemysław Myszka*

### 56. Technology boosting collaboration

– Interview with Guenter Schmidmeir, VP & General Manager EMEA, and Bruce Jacquemard, Chief Revenue Officer, Navis

*Maciej Kniter*

### Red-hot port matters

### 06. Phoenix lighting for Los Angeles

CMP to have a new cruise terminal

Gdynia to extend its port toward the sea

First Konecranes' portal harbour crane delivered to Spain

### 07. OT Logistics takes over Rijeka's reins

APM Terminals Zeebrugge to change hands

SENNEBOGEN cranes in Turkey

### 08. East Mediterranean sea-linked with the Arabian Gulf and Indian Subcontinent

CMA CGM chooses LNG for biggest ships

Ulstein to build a polar expedition vessel

### 09. Pacific Terminal officially opened

Meyer Werft delivers *World Dream*

Liebherr ships to Chile

### Market SMS

### 10. Top 10 UK ports

DCT Gdańsk

Norwegian ports

Spain's top 10 ports

### 11. Rail freight port exports in Russia

Hapag-Lloyd

## 0.5% SULPHUR cap

### 60. New sulphur limit

– Meeting the 2020 marine fuel market challenge

*Bruce Abbott*

### 62. State of play in the bunker market

– OW's bankruptcy still casting shadows as the market gears up for the 0.5% sulphur limit

*Unni Einemo*

### 64. Ready for another big change?

– How the 0.5% global sulphur cap will change the refining and bunker markets

*Charles L. Daly*

## events 2017

- 12. Going beyond the minimum**  
– Transport Week, 7-9 March, PL/Sopot  
*Ewelina Kroll*
- 15. Is there any money for my project?**  
– Regional Transport Investment Conference, 23-24 March, BG/Sofia  
*Maciej Kniter*
- 16. LNG Conference in Tallinn**  
– LNG Conference, 17-18 May, ES/Tallinn  
*Przemysław Myska*
- 18. The future of the port & terminal technology business**  
– TOC Europe, 27-29 June, NL/Amsterdam  
*Rachael White*
- 20. The Baltic delivers results**  
– Baltic Ports Conference 2017, 7-8 September, SE/Trelleborg  
*Przemysław Myska*
- 24. Eco-excellence**  
– The Grimaldi Group's XXI Euro-Med Convention, 29 September, IT/Santa Teresa di Gallura  
*Przemysław Myska*
- 28. Three quarters only**  
– ECG Conference 2017, 19-20 October, BE/Brussels  
*Przemysław Myska*
- 30. OPS on stage in Gothenburg**  
– Harbours Review Spotlight: Onshore Power Supply, 25-26 October, SE/Gothenburg  
*Andrzej Urbaś*

## cruise

- 68. A ship to change the world**  
– *Ecoship* – the most eco-friendly cruiser ever  
*Asuka Kobayashi*
- 70. Another peak**  
– The European cruise market in 2016  
*Catherine Couplan*



## cybersecurity

- 32. A matter of great urgency**  
– Building up port cybersecurity capacity  
*Tuomas Kiiski*
- 34. The threat is real**  
– Preparing for and dealing with cyberattacks  
*Bartosz Dąbrowski*
- 36. As complex as a port**  
– Interview with Dr. Indra Vonck, Senior Port Expert, Deloitte Port Service  
*Andrzej Urbaś*

## What do you think of...

- ...the Blue Industry?**  
**74.** Gunter Pauli  
Dorothy Winters  
**75.** Isabelle Ryckbost
- ...Ballast Water Management?**  
**75.** Monika Normant-Saremba  
Fotios Katsoulas
- ...TOC Europe 2017?**  
**76.** Suzanne Tiago  
Lisa Barbieri  
Matthew Wittemeier  
Wouter van den Bos
- ...Onshore Power Supply?**  
**77.** Grant Brown  
P A Ingman  
Roberto Bernacchi





# red-hot port matters

Photo: www.pexels.com

## Phoenix lighting for Los Angeles

The West Coast Terminal of the Port of Los Angeles chose the Milwaukee-based Phoenix Lighting to design and supply LED illumination for 10 ship-to-shore cranes. The terminal chose to upgrade the floodlighting system to Phoenix EcoMod® LED. In addition to better lighting, the EcoMod® floodlights provide 60% energy savings compared to the previous traditional system. Three of the 10 cranes are currently completed and are now said to be among the tallest in North America. Phoenix worked closely with ZPMC Services North America and terminal engineers to deliver 52 fixtures per crane, along with with customized optics and brackets. The mounting locations were at heights of 60, 54, and 16 meters, and the design was completed using two different optical arrangements.



Photo: Phoenix Lighting

## CMP to have a new cruise terminal

The Board of Copenhagen Malmö Port has given a green light to building a cruise facility in the Danish capital, to be located beyond the Oceankaj in Ydre Nordhavn. According to the plans, construction should be completed in 2020. The new terminal will be able to accommodate 5,000 passengers per call. "A new terminal, designed for more than 5,000 passengers, will enable us to receive more and bigger ships in future. With this development, we are making sure that Copenhagen retains and develops its position as the leading cruise destination in Northern Europe. We look forward to continuing to attract passengers to the attractive City of Copenhagen through close collaboration with various partners and actors in the city," said Barbara Scheel Agersnap, CEO, Copenhagen Malmö Port. Arnt Møller Pedersen, COO, Cruise & Ferries, Copenhagen Malmö Port, added, "This decision gives us the opportunity to create a modern, attractive terminal that can efficiently handle the large number of passengers wanting to visit Copenhagen in future."

## Gdynia to extend its port toward the sea

The port authority has presented an initial vision of an outer harbour to be located outside the port's current breakwaters. The new deep-water facility is planned as an extension of the Śląskie and Szwedzkie quays. The outer harbour is to comprise a container terminal, storage areas, and warehouses. Passenger ships are to be served there, too. "Our plans are slowly but steadily taking shape within the Port Gdynia 2030 programme. Since this will be an enormous project, we'll be searching for an external investment partner. I hope that the entire venture will be finalised in as little as 10 years' time. Building the outer harbour, setting up a new turning basin, and deepening the port's inner waters along with the fairway are the key elements which will shape our port in the near future. Because of the lack of available land, Gdynia has to reach toward the sea," Adam Meller, CEO of the Port of Gdynia, commented.

## First Konecranes' portal harbour crane delivered to Spain

The Finnish company has just handed over the first ever Gottwald Model 8 Portal Harbor Crane to European Bulk Handling Installation (EBHI) at the Port of Gijón, Spain. The Model 8 crane is a four-rope-grab variant, offering a maximum lifting capacity of 100 tonnes, with a 63-tonnes grab curve and an operating radius of up to 50 metres. The portal has a track gauge of 22 metres and a clearance height of 6.125 metres. The crane was ordered last October and will be mainly used for unloading iron ore and coal.

## OT Logistics takes over Rijeka's reins

As a result of an agreement with the Croatian pension funds Allianz ZB and ERSTE, OT Logistics has taken over operational and financial control over the Rijeka port. OT Logistics, Allianz ZB, and ERSTE hold, respectively, 32.56%, 15.15%, and 8.85% of the port's shares, which gives them the majority stake of 56.56%. Earlier this year, OT Logistics increased its share level by acquiring 11.75% of the Port of Rijeka's stocks. The agreement, detailing how the parties will run the port



Photo: OT Logistics

authority, has been signed for a period of seven years. "Thanks to increasing our own stock commitment in the Port of Rijeka Authority, as well as by partnering with other shareholders, we've gained tangible influence over the port's operations. Rijeka is a very important spot on the European transport map. We believe that it could become a gateway for the flow of goods between Europe, Africa, the Middle East, and the Arabian Peninsula," Zbigniew Nowik, OT Logistics' President of the Board, said. He then added: "Having 50% + 1 share is still on our company's agenda."

## APM Terminals Zeebrugge to change hands

COSCO Shipping Ports, a subsidiary of COSCO Shipping, has offered EUR 35 million for 74% of shares in the Zeebrugge container terminal. The deal is expected to close by the end of November. However, it is subject to adjustments and fulfillment of conditions precedent. As part of the transaction, APM Terminals has proposed to buy back 25% of the Shanghai International Port Group shares, and will then sell them together with APM



Photo: APM Terminals

Terminals' own 51% stake in Zeebrugge to COSCO Shipping Ports. This transaction is subject to customary regulatory approvals, estimated to take three to four months to complete. APM Terminals Zeebrugge was launched in 2006 and now offers 1.0 million TEU/year of capacity. COSCO became its minority shareholder in 2014, buying a 24% stake.

## SENNEBOGEN cranes in Turkey

At the end of October, Özüaydin Crane has put six SENNEBOGEN crawler cranes to work at a port construction site in Istanbul. The six crawler cranes include two models 5500 and one model 3300 of the E-series.



## East Mediterranean sea-linked with the Arabian Gulf and Indian Subcontinent

On July 2<sup>nd</sup>, CMA CGM, in co-operation with APL and COSCO, launched the INDIAMED box service, connecting Malta, Greece, Turkey, Egypt, Saudi Arabia, Djibouti, UAE, Pakistan, and India. The rotation will include the ports of Khor Fakkan, Karachi, Nhava Sheva, Mundra, Djibouti, Jeddah, Damietta, Piraeus, Malta, Aliaga, Mersin, and Port Said West.

## CMA CGM chooses LNG for biggest ships

CMA CGM has revealed the plan to equip nine of its 22,000 TEU ships with engines using liquefied natural gas (LNG). The new vessels, to be delivered in 2020, will emit 25% less CO<sub>2</sub>, 85% less nitrogen oxides, and 99% less sulphur and fine particles compared to vessels running on heavy fuel oil. "We have made the bold decision to equip our future 22,000 TEU vessels with a technology firmly focused on the protection of the environment. By choosing LNG, CMA CGM confirms its ambition to be a leading force in the industry in environmental protection by being a pioneer in innovative and eco-responsible technologies," Rodolphe Saadé, CEO, CMA CGM, said.

## Ulstein to build a polar expedition vessel

The polar expedition vessel ordered by Lindblad Expeditions Holdings at the Ulstein shipyard should be delivered in the first quarter of 2020, with an option for another two ships in the coming years. The ship will have 69 guest cabins and suites, and will include 12 cabins for solo travelers. Its features include X-BOW®, a distinctive bow that provides fuel efficiency and improves guest comfort in rough seas, and a very high ice class for access deep into polar regions. The vessel's expanded fuel and water tanks provide for extended operations in remote areas, while the zero-speed stabilizers will ensure stability underway, whether at zero speed when stopped for wildlife observation, or embarking/disembarking the ship. In addition, the design will allow access to the outside environment from anywhere on the ship, thanks to private balconies in 75% of the cabins, multiple observation decks, and new observation wings. What's more, expedition tools for exploration – such as kayaks, cross-country skis, a remotely operated vehicle (ROV), hydrophones, a video microscope, underwater video cameras, and a helicopter landing platform – will be available. "We are incredibly excited to be working with Ulstein and their brilliant team of engineers and designers on this state-of-the-art vessel as we continue the expansion of our fleet. It is the next step in the long-term growth of the company, and will be the most extraordinary global expedition ship in the world on a multitude of levels," Sven Lindblad, President and CEO, Lindblad Expeditions Holdings, said. "The launch of this ship will mark the 50<sup>th</sup> anniversary year of the first-ever purpose-built expedition ship, *Lindblad Explorer*, which was built by my father, Lars-Eric Lindblad, and will set another important milestone in the company's commitment to deliver expedition travel at its best," Lindblad added.



Photo: Ulstein



## Pacific Terminal officially opened

The Port of Southampton, operated by Associated British Ports (ABP), has opened a new vehicle export facility on November 2<sup>nd</sup>. Pacific Terminal will serve i.a. Jaguar Land Rover cars. “As the UK’s busiest vehicle handling port, the launch of the new export terminal will move Britain into fifth gear when it comes to world car exports. This will give a boost to leading British car manufacturers like Jaguar Land Rover by ensuring their cars are able to reach global marketplaces faster,” Greg Hands, Minister of State in the Department for International Trade, said. James Cooper CEO, ABP, added; “Southampton is the UK’s number one port for exports, handling exports worth some GBP 40 billion, and it is the UK’s number one for vehicle exports. The port is a critical part of the supply chain for the British automotive industry, providing essential access to global markets. The opening of this terminal will build on this critical role and support our customers’ drive to continue to grow their exports well into the future.”



Photo: Associated British Ports

## Meyer Werft delivers *World Dream*



Photo: Meyer Werft

Dream Cruises, a subsidiary of Genting Hong Kong, has taken delivery of its newest cruise ship, constructed at Meyer’s facility in Papenburg. The 151,300 GT *World Dream* is 335.35 metres long and 39.7 metres wide, offering space for up to 3,376 passengers in 1,686 cabins (including 1,272 outer cabins, the bulk of which have their own balconies). The ship has 20 decks, across which 35 restaurants and bars are available, together with a set of various entertainment facilities, such as theatres (approx. 1,000 seats), a climbing park, space for outdoor activities, and a range of virtual reality applications. Moreover, *World Dream* also carries a small deep-sea submarine, which can take up to four guests to

a depth of 200 metres, as well as a motorboat for excursions. The vessel will be based in the Port of Hong Kong from where she’ll head for two/five/seven night sailings to Vietnam and China. Artist Jacky Tsai has been responsible for the ship’s hull artwork, titled “A Tale of Two Dreams.” Tim Meyer, Managing Director of Meyer Werft, commented: “This is the 44<sup>th</sup> cruise ship we delivered. Our team did a great job. I am proud and thankful for their contribution.”

## Liebherr ships to Chile

Terminal Pacífico Sur Valparaíso has purchased a mobile harbour crane from the German company. The new mobile harbour crane has a maximum lifting capacity of 154 tonnes and a reach of 64 metres. The additional 9.6-metre tower extension ensures an operator eye level of more than 40 metres. The LHM 800 is able to serve vessels with up to 22 container rows across, depending on the terminal set up. The crane will be mainly used to handle temperature-controlled containers.



Photo: Liebherr

Photo: www.pexels.com

## TOP 10 UK PORTS:

82.17 mln tn handled in Q1 2017 (-0.3% yoy)

The biggest increase year-on-year of 5.5% was noted in Southampton, where almost 9 million tonnes of cargo was handled, compared to 8.52 million tonnes handled in Q1 last year.

### UK Top 10 ports' volumes [mln tn]

Port	Q1 2017	Yoy
Immingham and Grimsby	13.73	+1.5%
London	11.28	-0.1%
Southampton	8.99	+5.5%
Liverpool	8.14	+4.2%
Milford Haven	7.78	-13.3%
Forth	7.28	+3.3%
Felixstowe	6.83	+5.1%
Dover	6.81	+3.0%
Tees and Hartlepool	6.77	-6.5%
Belfast	4.56	+2.0%
<b>Total</b>	<b>82.17</b>	<b>-0.3%</b>

## NORWEGIAN PORTS:

43.3 mln tn handled in Q1 2017 (-5.1% yoy)

Liquids have the biggest share in the turnover results of all Norwegian ports, totaling 21.7 million tonnes (-11.7% year-on-year) within the reported period. Dry bulk handlings increased to 16.5 million tonnes (+5.9% yoy), while container tonnage decreased by 5.7% yoy – to 1.4 million tonnes.

### Top 10 Norwegian ports [thou. tn]

Port	Q1 2017	Yoy
Bergen	11,863.870	+16.0%
Narvik	5,198.097	+6.6%
Karmsund	3,004.417	-6.6%
Grenland Port Authority	2,952.163	+1.9%
Oslo	1,367.623	-10.9%
Trondheim	1,055.112	+8.2%
Kristiansand	423.109	-9.4%
Ålesund	375.417	-4.8%
Stavanger	280.319	-40.5%
Tromsø	178.429	+5.7%
<b>Total</b>	<b>26,698.556</b>	<b>+5.8%</b>

## DCT GDAŃSK:

1,138,702 TEU handled in I-IX 2017 (+16.3% yoy)

In September, the Gdańsk's facility noted its best-ever result, handling 159,945 twenty-foot boxes, up by 29.2% year-on-year.

### DCT Gdańsk's volumes

Month 2017	TEU	Yoy
January	111,129	+10.4%
February	109,595	+12.4%
March	104,095	-3.7%
<b>Q1 2017</b>	<b>324,819</b>	<b>+6.1%</b>
April	115,044	-0.3%
May	122,871	+7.7%
June	129,217	+23.2%
<b>Q2 2017</b>	<b>367,132</b>	<b>+9.8%</b>
July	145,275	+29.6%
August	141,531	+37.5%
September	159,945	+29.2%
<b>Q3 2017</b>	<b>446,751</b>	<b>+31.9%</b>
<b>Total</b>	<b>1,138,702</b>	<b>+16.3%</b>



## SPAIN'S TOP 10 PORTS:

175.73 mln tn handled in I-V 2017 (+4.2% yoy)

Barcelona saw the best results in the January-May period, up by 20.2% year-on-year to 23.80 million tonnes.

### Spain's Top 10 ports [mln tn]

Port	I-V 2017	Yoy
<b>Algeciras</b>	<b>41.63</b>	<b>-4.0%</b>
Valencia	30.38	+1.0%
Barcelona	23.80	+20.2%
Cartagena	13.65	+9.6%
Tarragona	13.35	+5.4%
Bilbao	13.18	+3.1%
Huelva	12.63	-2.4%
Las Palmas	10.55	+14.2%
Gijón	9.12	+9.9%
Castellón	7.44	+7.1%
<b>Total</b>	<b>175.73</b>	<b>+4.2%</b>

## RAIL FREIGHT PORT EXPORTS IN RUSSIA:

215.9 mln tn carried in I-IX 2017 (+5.9% yoy)

Out of the total number, exports handled by Russian Railways and destined for the country's North-West ports added up to 89.7 million tonnes in the reported period, up by 8.3% year-on-year. At the same time, rail-based port exports to Russia's seaports in the Far East amounted to 69.6 million tonnes (+2.1% yoy), and to southern ports – 56.3 million tonnes (+7.6% yoy).

## HAPAG-LLOYD:

4.22 mln TEU carried in H1 2017 (+14% yoy)

The figure includes almost 0.25 million TEU from the United Arab Shipping Company (UASC), with whom Hapag-Lloyd merged on May 24<sup>th</sup>, 2017. "The market in container shipping remains challenging, but we have managed to make very good progress in the first half of 2017. We improved profitability significantly and the integration of UASC will be largely completed in the third quarter. That will allow us to start capturing synergies very soon after the integration," commented Rolf Habben Jansen, CEO, Hapag-Lloyd.



Photo: Hapag-Lloyd



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## Going beyond the minimum

by Ewelina Kroll

**The 7<sup>th</sup> edition of the Transport Week conference, held once more at the University of Gdańsk from March 7<sup>th</sup> to 9<sup>th</sup>, was devoted to next-gen sustainable solutions for ports, terminals, and shipping companies in their strive to go beyond the minimum, be it concerning today's and upcoming environmental regulations, ensuring that corporate social responsibility isn't a hollow slogan, as well as working on securing long-term economic success.**

Nearly 200 participants from all over the Baltic Sea region and Europe gathered in Sopot to debate on the best ways the industry can face climate change, cut its negative impact on the environment and peoples' health, as well as maintain sustainable growth thanks to efficient green energy management. Isabelle Ryckbost, the European Sea Ports Organisation's (ESPO) Secretary General, pinpointed the need to develop comprehensive and eco-friendly maritime solutions in order for the sector to play its part in the transition towards a low-carbon economy. Stakeholder-wide cooperation will be instrumental in making tomorrow's agenda meaningful already today, as marked by Cameron Thorpe, Deepwater Container Terminal Gdańsk's (DCT) new CEO, who said during the panel debate, "Before the global financial crisis all we had to do was to compete, but after 2009 we all have to collaborate."

### Beyond the minimum

Day 1 of the conference started with an outlook on global shipping given by Christian Roeloffs, Head of Commercial and Business Development at the Boston Consulting Group. "Trends that will influence

container trade in the upcoming years, both negatively and positively, include the persisting overcapacity on the market, the state of Russia's economy and a potential growth rebound here, political uncertainties like the future shape of China-US relations, and the fragility of West Europe's economic recovery, aided to a certain degree by cautiously optimistic prospects noted in Central Europe," Christian summed up.

Taking up responsibility for the environment, society, and future growth requires going beyond what's already binding today, and what will be the norm in the near future through European and global regulations. In this regard, the Green InfraPort project – in partnership with the Baltic Ports Organization (BPO), the Motus Foundation, and SSPA Sweden – was presented during the first day as well. This pro-active initiative targets environmental management and port investments, focusing e.g. on planning and developing port reception facilities for sewage from passenger ships and scrubber residue, as well as on waste-free energy management in ports and terminals (i.e. smart lighting to avoid light pollution, and using LNG or hybrid engines in port equipment), along with advocating the need for setting up Europe-wide LNG bunkering infrastructure, basing on the extensive know-how gained throughout

the Baltic in this regard. The marine uptake of LNG was also the main leitmotif in a speech delivered by Wärtsilä's Leszek Buczkowski, who said that in light of the new more stringent eco-regulations, coupled with bunker costs being the most OPEX burdensome, having the proper vessel engine powered with the right fuel is and will remain the most crucial element in a shipping company's strategy of complying both with impending rules and fuel price volatility.

### Green and blue are the new black

The second day of the conference was an opportunity to learn more about different eco-solutions and innovations implemented across European ports. Borut Čok, the Port of Koper's Market Manager for Slovakia, Czechia and Poland, presented his port's eco-solutions, among others utilizing wood waste as bio-fuel for co-gen at a container washing station (saving the environment some 325 tonnes of CO<sub>2</sub> annually, while Koper's wallet EUR 84 thousand per year). Kris de Craene, Environmental Manager at the Port of Antwerp, spoke of his port's two decade-long history of eco-policies, virtually non-existing in the past, turned today into an attitude of anticipating the issues (monitoring, benchmarking, and setting goals being the basis of data-driven long-term masterplans). Kris also

told the audience of Antwerp's industry-nature cohabitation, where animals have taken a fancy to certain port areas not suitable for freight or passenger activities, and the port authority has taken steps to conserve such a state of affairs by designing these areas as nature protected space. This approach helps in cutting deals, too, as such soft values are appreciated by a growing number of companies considering establishing their businesses in ports. Mihkel Abe, Traffic Manager Muuga Harbour from the Port of Tallinn, told the audience a few words on the Smart Port 1 and 2 projects, aimed at streamlining with the use of i.a. modern IT solutions passenger and ferry freight flows to and from Tallinn's Old City Harbour. Next, Wim Stubbe, the Port Oostende's Business Development Manager, showcased what a small- or medium-sized harbour can do in order to preserve its port business by lending a helping hand to blue economy enterprises, such as the offshore windfarm industry, or the energy and chemical sector. Foresight, risk acceptance, and commercial-research cooperation were some of the key takeaways from Wim's presentation, giving a very compelling impression that the 21<sup>st</sup> century's ports can, and sometimes simply must go beyond traditional business models, acting now as clusters, incubators, and catalysts of next-gen ventures. Tommy Halén, the Port of Trelleborg's Managing Director, supplemented the environmental theme by underlining the importance of intermodal in Sweden, which helps to decongest roads by putting more weight on green electricity-run trains, providing at the same time intermediate storage in containers closer to the customer. To level-up intermodal operations in Trelleborg, Tommy added, the port has invested in so-called loco tractors, equipped both with rubber and steel wheels for flexibility interchanging between road and rail needs, hence decreasing the necessity of using shunting locomotives. Conor Feighan, Policy Advisor from the Federation of European Private Port Operators and Terminals (FEPORT), brought closer the issue of freight handling facilities' efforts in lowering their negative eco-impact. Terminals are responsible for roughly 10% of emissions in ports, counted on the basis of their equipment's movements, meaning that an increase in trade, i.e. more containers going over berths, will lead to worsening of terminals' environmental

performance. As such, terminal operators are investing in renewables and smart mobility systems; however, they also invest in social sustainability by providing proper training. The relation between ports and their nearby societies was one of the main discussion topics during the panel, too. All participants, supported by voices from the audience agreed that managing relations with port cities' citizens is a very important task, encompassing regular meetings, open port fairs, informing people of what's happening in the port (by e.g. carrying out on-site training programmes about the safety of LNG operations), as well as tackling challenges, such as lowering odour, noise, and light pollution (nevertheless, as Tommy Halén added in this regard, there will always be a certain group of people who will complain regardless of what a port does or does not do, and this needs to be taken into account as well).

### The digital future

The conference's last day was dedicated to the future of transport and logistics. Andrzej Szarkowski, Intermodal/Rail Manager at DHL Freight, spoke about the increasing role of e-commerce, which starts to transcend borders, putting in turn new requirements on multimodality, as different clients will choose different modes of transport (or a mix of them) for their e.g. China-originating shipments. In the view of DHL, rail-based e-commerce will be the next step here, following both the roll out of the New Silk Road, as well as owing to protracted problems of the ocean liner shipping business.

The importance of automation, robotics, and IT solutions was stressed by Sebastian Soltys, International Logistics Director at LPP, a company with multiple fashion brands in its portfolio, as well as by Sebastian Biskupski and Krzysztof Kulikowski from Flextronics. Modern soft- and hardware makes it possible to be faster (through e.g. automatizing warehouses and distribution centres), more agile (reverse logistics for putting up for sale returned products as soon as possible), and more flexible (changing products virtually on the assembly line). This part of the conference was also supplemented by our team, delivering a speech on the supply chain's future, with particular focus on 3D printing, automation and robotics, as well as what logistics will look like if everything goes wrong once the new wave of tribalism,







short-sighted politics, and wishful thinking washes away all common sense... How to stay on the safe side was the theme of the presentation made by TT Club's Andrew Huxley, who focused on all the perils with packing, storing, transporting, and declaring goods in cargo transport units, sometimes ridiculously funny, but in many cases having grave consequences, to name just the deadly fire on-board *MSC Flaminia*, or the powerful blast in the Chinese Port of Tianjin. There's not enough reminding the industry that goods, and particularly those dangerous, should be properly declared by honest cargo owners, stowed by highly skilled people, and then transported by reputable forwarders. Next, Tomasz Dowgilewicz, Managing Director at Marlo Poland, presented the Mix, Move, Match project tasked with cross-docking and load unit optimization. Boosted by cloud-based infrastructure (meaning low upfront investment) and unique identification on the spot, the project's solution has axed its partners' costs by one-third, halving their CO<sub>2</sub> footprint at the same time. The logistics part saw its conclusion with a presentation by Siemens' Benjamin Wickert, who presented the company's eHighway, a concept aimed at electrifying heavy duty road transports by connecting lorries to the grid with the use of pantographs. Provided with clean energy, the eHighway has the potential to make truck traffic a lot friendlier to the environment, sacrificing nothing of

this mode of transport's best features, such as flexibility.

#### Add the extras

This year's edition of Transport Week was accompanied by several additional meetings. The first day was marked by a seminar on Polish-Iranian business exchange, especially on tips for Pomeranian companies that are interested in the Persian market. The new opening that we see nowadays brings numerous chances for almost all kinds of sectors, including construction, cosmetics, food, medicine, and heavy industry to find partners in this part of the world; however, managing one's way through the cultural context may be the trickiest part to tackle, not transport and logistics themselves.

The second Harbours Review Spotlight seminar was themed with ballast water management (BWM), highlighting all the challenges associated with the implementation of the BWM Convention. Fotios Katsoulas, Shipping Data Manager at Affinity Research LLP, said, "Ballast water treatment consultants developed online applications to assist on the choice of a suitable system from among several options available. There are now databases containing all the systems on the market in their various configurations and suitable options, with several available fields, such as the flow rate, the power requirement, the working principles, and type-approvals."

The three-day event was also a chance to discuss the ways to cooperate as well as finance modern eco-friendly maritime and transport and logistics solutions. Participants had the opportunity to hear from the representatives of Horizon2020, the biggest

EU research and innovation programme, and the European Investment Bank, whereas the meeting held by the Interreg South Baltic Programme was devoted to various means of spurring blue (maritime) and green (environment) growth. Lastly, the organizers of Transport Week arranged study tours – to the Remontowa Shipyard, DCT Gdańsk, and KOGA, the last being a modern office building right in the transport and logistics heart of Gdańsk. ■

#### Transport Week 2017 Gala Dinner at the Olivia Business Centre's Sky Club, topped with the Baltic Trendsetters Club Award Ceremony

Day 2 of the conference ended with a mingling party at the Olivia Business Centre (OBC) – Transport Week 2017's business partner – the most modern office complex in northern Poland. The meeting took place in the Olivia Sky Club at the highest storey of the Olivia Tower, awing the participants with an impressive view of the 1,000 year-old yet at the same time top-notch modern Gdańsk.

During the Gala, our team honoured those who drive the Baltic Sea region's transport and logistics industry in the right way with the Baltic Trendsetters Club Certificates, which for 2016 achievements went to DCT Gdańsk, the CRIST shipyard, Scandlines, the Ports of Stockholm, Erik Thun AB and KG Jebsen Cement, and to YILPORT Holding Inc. (read more about Baltic transport 2016 highlights in *Baltic Transport Journal* 1/2017 on pgs. 43-49).

Hosting the World – scan the QR code to see OBC's video of Transport Week 2017's Gala Dinner



**transport  
week**







Photos: Regional Transport Investment Conference

Regional Transport Investment Conference,  
23-24 March, BG/Sofia

# Is there any money for my project?

by Maciej Kniter

**This event organised by the European Commission spread the latest know-how on financing all kinds of transport-related projects. It provided an opportunity to hear more about the different ways that enable to get in the stream of public money.**

The conference was opened by Violeta Bulc, EU Transport Commissioner, who focused on how transport investments increase welfare. Having said that the budget for the 2014-2020 period is EUR 26 billion, the Commissioner stressed that the needs are much higher, estimated at EUR 700 billion. This is why the European Commission invites private capital to participate in backing the key projects, the European Fund for Strategic Investments (EFSI) being one of the tools to encourage companies to take part, thanks to lowering the risk of investing.

## What's on the agenda?

According to Violeta Bulc, there are two priorities for EU transport – digitalisation and decarbonization, “We can encourage Member States to cooperate.” An example of this may be the concept of platooning, which is not under the EU legislation, but remains in the competence of states, and whenever they want to cooperate in this field, they sign a bilateral agreement.

Rail is among the sectors of biggest importance. As much as 97% of European rails is electrified; however, it's mostly underinvested, too and if this trend protracts, we won't see more freight hitting rails, because it is not as competitive as other transport modes.

Asked about the stream of Chinese money flowing into Europe as part of One Belt One Road initiative by Vassil Sotirov, Managing Board Member and



Chairman of the Union of Bulgarian Journalists, Violeta Bulc answered that the cooperation is good, especially that we want to set up common priorities. “If the money is to be invested in the EU, it must follow European standards,” she nevertheless added.

The first day of the event also touched upon financing clean transport in detail. The first out of three examples concerned Riga Transport Company, presented by Aivars Starkovs. The second one, titled National Fund to support clean and sustainable investments – the story of ECO SKLAD in Slovenia, was introduced by Katarina Kafadar, Eco Fund's Councilor. Last, but not least, programmes and instruments to finance cleaner transport, namely ELENA, the Cleaner Transport

Facility, and Green Shipping financing programmes, were demonstrated by Neil Valentine, Head of Strategic Roads Division at the European Investment Bank.

The main point on Friday's agenda was an info session on the EUR 1.0 billion so-called blending call under the Connecting Europe Facility. The participants could learn about key aspects and new features of the blending call, as well as get more into an application process, incl. required documents and evaluation process. Finally, the conference ended with a session on regulations, public-private interactions, and facilitating cross-border investment, such as the Rail Baltica project.



Photo: Port of Tallinn

# LNG Conference in Tallinn

by Przemysław Myszkowski

**The latest event organised by Actia Forum – with the help of the hosts from the Port of Tallinn and the shipping line Tallink – was devoted to global and regional developments across the Liquefied Natural Gas (LNG) market. The conference was held from May 17<sup>th</sup>-18<sup>th</sup> in the capital of Estonia as well as on-board the Baltic's newest cruise ferry, the gas-run *Megastar*.**

Moderated by Mark Bell, the General Manager for SGMF, and hosted at the Port of Tallinn headquarters in Muuga Harbour, conference Day 1 was all about the big picture – the worldwide LNG supply and demand, as well as infrastructural developments, concerning both upstream and export-import capacities of ports worldwide. Opening speeches focused on the latest events changing the LNG industry from being a fragmented and regional market to a more global one. Two issues were highlighted. First, the role of gas in the transition towards low-carbon economy. Second, LNG as a means of energy security.

## The Big LNG Picture

The Day 1 sessions kicked off with Eero Vanaale's (H Clarkson & Co. Ltd) presentation on LNG supply, demand, and pricing. Gas exports and imports alike are to experience a considerable boost in the foreseeable future, thanks to new players joining the LNG race. Chief among them, Australia has the potential to take the lead from Qatar in gas exports. Just as it is growing upstream, the LNG fleet is expanding to provide the necessary balance between supply and demand, which were noticeably detached from each other in the past. Gas carriers, too, are undergoing

transition of their own, following the evolutionary path from steam engines to diesel-electric to 2-stroke, all to lower their bunker consumption. According to Vanaale, the LNG spot market is not mature yet, but it is moving towards a shift from long-term contracts to tenders. Later in the day, Dr. Christoph Markel (Markel Energy) echoed Vanaale's thoughts by expressing what he thinks are the main market deterrents and catalysts for LNG to secure a firmer foothold in the Baltic Sea region. The former include the continued subsidies from the EU and the persistent high costs of small-scale LNG (though cost regression is tangible here, as the Baltic is a front-runner in such operations). The latter are the inclusion of LNG in the climate policy and the opportunity for creating a market hub. The Baltic Sea, Dr. Markel added, already has a proven LNG track record, be it regarding large- and small-scale terminals, on- and offshore bunkering, or replacing oil with gas.

The two presentations that followed, by Herkko Plit (Baltic Connector) and Monika Zsigri (European Commission DG Energy), touched upon the energy security aspect of LNG – in practice by opening the Finnish gas market (currently almost 100% dependent on Russian imports) through a pipe connection to Estonia and then further onto Western Europe via Poland. Next, Jan Kurel (Chart Ferox) divided his presentation into two parts. The first focused

on the differences between flat-bottom and vacuum LNG tanks, while the second was centred on various small-scale applications, be it trucks, trains, bunkering, fuelling stations, onshore terminals, etc. In this regard, Kurel showcased his company's products, know-how, and involvement in setting up a station in the Port of Klaipėda, an onshore extension of Klaipėdos nafta's Floating Storage Regasification Unit *Independence*, one of the two large-scale LNG terminals in the Baltic. Sten Aamer (Vopak E.O.S.) also discussed small-scale LNG, and in particular, the setting up of a 4,000 m<sup>3</sup> terminal in Muuga (during the third session, Wärtsilä's Timo Mahlanen spoke of a similar facility near the Finnish Port of Raahen). This session was closed by Andrius Sutnikas (Klaipėda Science and Technology Park, partner of the GoLNG project) who stressed the need for a public-private strategic approach towards developing and catering to the LNG market. Sutnikas underlined the utmost importance of education of both engineers and managers, so as to create new business models that encompass intellectual property, new technologies, and partnerships; in other words – entire value chains. The GoLNG is such an attempt to bring together business and competence centres in order for LNG to become a vital part of the so-called blue economy.

The last session of Day 1 started with Tommy Mattila (Skangas) speaking at



Photo: Tallink

length about LNG being a volume business. According to him, it's only a question of time when LNG becomes a major bunker for shipping, because of higher volumes standing for lower prices, as well as a competitive fuel for other appliances (such as for industrial purposes or in overland transports), and one of the pieces in the energy security puzzle, too. Mattila also highlighted his company's research into liquefied biogas, which can be handled with existing infra because it has the same chemical properties as LNG. Getting over the "Change Hill" was the topic of Stefaan Adriaens's (Gate terminal) presentation, too. He paid particular attention to how Port of Rotterdam's LNG portfolio is expanding with small-scale operations, on- and offshore alike. The same holds true for Klaipėda. To this effect, Lukas Geležauskas (Klaipėdos nafta) introduced the audience to Klaipėda's ambitions of becoming not only a regional LNG trading hub, but also a reference point for others regarding large- and small-scale operations, bunkering, advisory services, multi-party co-ops, marketing, etc. Before embarking on a study tour around the Muuga Harbour, Kirill Liats put forward the go-getting initiative of LNG Gorskaya to establish LNG bunkering stations virtually Baltic-wide, which would start large-scale in St. Petersburg, and then dot the region with transport & industrial small-scale in Lübeck, Möntu, Grenaa, Piteå, Pärnu, Liepāja, and possibly in Kotka.

### Cogs in the gas machine

The second part of the conference took place on-board Tallink LNG-powered cruise ferry *Megastar*, running between the ports of Tallinn and Helsinki. In contrast to the Day 1, it was about down-to-earth matters. As the conference set off from Terminal D early in the morning, Virgo Vinkel (Tallink) shed light on *Megastar*-related topics, such as the need to LNG-train the ship's crew, the differences between sailing on LNG and on Marine Gas Oil (e.g. increased time needed before an engine overhaul, 18 thousand hours vs. 13 thousand), as well as establishing LNG supply (currently by trucks from Finland's first import terminal in Pori, but also from Russia's Pskov). Next, Ralf Dankert-Paulsen (HEROSE) spent some time on the importance of safety valves for having such a ship like *Megastar* constructed in the first place. Kristoffer Lorentsson (MAN Cryo) gave a follow-up presentation to Jan Kurel's Day 1 talk, setting forth the differences between vacuum and polyurethane tanks, as well as between pressure vs. pump vapour feed, taking the audience on a real journey through the insides of LNG (Searoad's LNG ro-ros serving as examples). Afterwards, Jan Schubert (Nauticor, former Bomin Linde LNG) shared his thoughts on how to build a competitive LNG bunkering offer in relation to MGO, via e.g. floating your own purpose-built bunker vessels. When asked about future perspectives in this regard, he underlined that there's always space for improvement;

for instance, speeding the bunkering process. Piet van den Ouden (RINA Netherlands) talked about the 10-year long history of working out the International Code of Safety for Ships using Gases or other Low-flashpoint Fuels (IGF Code), and how it will now streamline LNG shipbuilding and infra development, which in turn can result in more orders for gas-run cruise ships (being part of a global market, thus putting tougher LNG bunkering requirements than those for fixed ferry services in the Baltic, for instance). Last but not least, Andrius Uldukis (DNV GL) listed the latest LNG ship order book, and provided some cautions, yet ultimately fairly positive outlook in this respect.

Day 2 was concisely summed up by taking note that the conference participants are on board a vessel that is the final outcome of numerous industries' products and services, and manned by a skilful crew. And as *Megastar* docked again in Tallinn, a final remark on the role of the Baltic Sea region in developing the uptake of LNG, in many areas nothing short of being a true pioneer, ended a very successful meeting. ■

Scan the QR code to access the LNG Conference's presentations  
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Photos: TOC Europe

# The future of the port & terminal technology business

by Rachael White



Rachael White is Content Director at TOC Events Worldwide, where she's been working since 1999. She has been involved in the maritime logistics world since 1987 as a researcher, writer, conference producer and trade association manager.

**The 41<sup>st</sup> TOC Europe show in Amsterdam this year gathered some 3,400 container shipping, port and bulk supply chain executives to discuss the latest industry trends, operational best practice and new technology. Alongside the exhibition, the TECH TOC seminars offered insight into the state-of-the-art in container terminal automation and digitalisation.**

**T**he seminar included the Leaders Debate, titled *The future of the port & terminal technology business*, which addressed challenges for automated container terminals of the future. Super smart problem solvers will be needed to troubleshoot complex systems issues and manage process exceptions at the automated, intelligent, near real-time container terminal to come – but currently there is precious little guidance or training out there for this new generation of port workers. This was one of the key takeaways from the Leaders Debate.

## The seminar's agenda

Moderated by World Cargo News' (WCN) Editorial Director Paul Avery, the speaker panel included Uno Bryfors, SVP at ABB Ports, Antti Kaunonen, Kalmar's President, Dr. Christian Koegl, CEO at Cranes for Siemens, Mika Mahlberg, EVP & Head of Business Area Port Solutions at Konecranes, and last but not least Dr. Yvo Saanen, Commercial Director at TBA. The audience for this session included executives from i.a. APM Terminals, Ashdod Port, Bolloré, Port Authority of the Cayman Islands, DB Port Szczecin, DCT Gdańsk, Dures Container Terminal, Eurogate Container Terminal Hamburg, Eurogate-Tanger,

HHLA, Mersin International Port (MIP), MSC Terminal Valencia, Nempont Container Terminal, Noatum Container Terminal Bilbao, PD Ports, Peel Ports, the Port of Koper, PSA Antwerp, Rempres, Rodaport, and TTI Seattle Terminal.

All panel members agreed, that digitalisation, artificial intelligence (AI), machine learning, and predictive analytics will change the face of container terminal operations in the coming years, alongside robotised and autonomous equipment. However, there are some major issues for the industry to address. Antti Kaunonen stated, "Compared to other industries we are 10-15 years' behind on digitalisation, and now it's all about turning from a hardware to a software company." Yvo Saanen added, "We can become a predictive industry," but, as for now, the industry has "a long history of collecting and poorly using data." Uno Bryfors said, "As an industry, we don't even know how much data we have in our systems today."

Panelists acknowledged that collecting data is one thing, but actively using them to drive digital transformation within the terminal and with supply chain members on the sea- and land-side is something entirely else. Explaining the decision Konecranes made 10 years ago to start putting

**“All panel members agreed, that digitalisation, artificial intelligence (AI), machine learning, and predictive analytics will change the face of container terminal operations in the coming years, alongside robotised and autonomous equipment.”**



**“**  
The panel members stated that the fast pace of technological development is not a barrier to standardization, as standards should be targeted at the data level rather than the equipment level, allowing different systems to speak the same language when they need to interface.

hardware and sensors on all of its container handling equipment, Mika Mahlberg pointed out that connected equipment provides a wealth of information for improvements to service, design, and manufacturing operations.

Systems integration inside terminals and with other parts of the transport chain remains a huge challenge, too, and standards are sorely needed. According to Uno Bryfors, “automation projects must be based on standards and proven experience. At present, however, this is far from the case, with each new scheme largely custom-built and very much proprietary. Not only is this slowing down industry learning with regard to better project delivery, it can also have a negative impact on ensuring that projects deliver the required performance.”

#### Workshop on automation

Jan Cuppens, Director of Global Engineering, DP World, commented at TECH TOC that terminal automation is simply not delivering according to specifications. Semi-automation delivers, but with far too many workarounds; remote quay crane operation is below expectations and full automation is far beneath. A similar message was delivered at TOC America last year by Anthony Otto, President of Long Beach Container Terminal, who told suppliers that they needed to do much better and deliver on what was promised.

In an editorial published ahead of TOC Europe, Antti Kaunonen identified the lack of commercial standards as a fundamental problem, noting: “In most industries, industrial automation has been standardised already many years ago. Nonetheless, in

terminal automation the industry standards are lacking even in the basic technical architectures. As equipment and solution providers, we should do everything we can to facilitate the development of basic standards for terminal automation, but instead we tend to be protective of our installed base and our own solutions. Thus, it must be a joint effort and the end users should be active in this development, too. I call for similar co-operation to our industry that has been accomplished in the airline industry to define their own requirements to suppliers.”

Panelists in the WCN debate, however, thought it unlikely that such broad industry cooperation is possible. Referring to the Terminal Operating System Equipment Control Interface Standard, launched at TOC Europe 2014 by the Port Equipment Manufacturers Association (PEMA), the panel members confirmed that these had not yet been actively adopted by the industry. “We as vendors cannot really drive the standardisation agenda. This needs to come from our customers,” asserted Antti Kaunonen. The panel members stated that the fast pace of technological development is not a barrier to standardization, as standards should be targeted at the data level rather than the equipment level, allowing different systems to speak the same language when they need to interface. That is the aim of the PEMA document, which proposes an open, standardised interface between terminal operating systems (TOS) and equipment control systems (ECS) for all types of container handling equipment.

The relationship between the TOS, ECS, and other sub-systems has been a perennial topic at TECH TOC for some years now,

particularly regarding where the intelligence and decision-making should lie. Not surprisingly, this came up again during the latest WCN debate. “Real time optimisation is coming more at the machine level,” said Uno Bryfors, while Christian Koegl stated, “decentralised machine management is the way forward, with self-optimising, intelligent sub-systems.” He argued that the TOS is concentrated on the container, not the equipment and said that the modern TOS are “getting like tankers” – big and cumbersome. Although not all on the panel agreed on this issue, there was general consensus that terminal IT needs to be viewed more holistically as an integrated “system of systems.”

A good portion of the debate was about the role of people in this new world of industrialised, automated container terminals. This included the need for a new breed of port operatives, focused on exception management and problem solving, with a process and systems orientation. Such people hardly exist today, commented Yvo Saanen, and there is little training and development out there to nurture them. Discussing future application of AI in automated terminal operations, Saanen added, “we have to be very careful on this related to safety issues.” Safe integration between robotised and autonomous systems and the human operator is a huge issue that requires much more attention as the industry continues down its path towards automation. ■



Photos: BPO/Joachim Wall



# The Baltic delivers results

by Przemysław Myszk

**This year's annual meeting of the Baltic Ports Organization was held in the Port of Trelleborg. The venue was chosen not by accident, as the Swedish seaport was meant to best reflect the conference's main theme: going future-green by being tech-savvy. While numerous topics were discussed in great detail, one theme came through virtually in all presentations, namely the question of what to do in order to become future-proof amidst the fast changing landscape of economics, politics, technological advancements, and the way these domains sometimes unexpectedly interact with each other.**

Times have indeed changed, observed Bo Petersson, Professor of Political Science and International Migration and Ethnic Relations at Malmö University, in his keynote speech. The idea of "Europe" is being heavily contested these days, with multiple challenges threatening to unpick the continent which went to great lengths after WW2 to make old adversaries into partners focused on jointly securing the wellbeing of many instead of only a few. New fronts of confrontation are now open following more or less recent events in Russia, Turkey, over the Atlantic, as well as within the European Union itself, Brexit being the most vivid one, along with counter-democracy movements in Hungary and Poland, as well as the protracted migrant crisis which itself points to other burning global issues. Today, Europe cannot be too self-contented, nor should it abandon its underlying values and virtues in the face of these threats. In this regard, Professor Petersson advised we pay attention to the canaries which signal problems in advance. Europe will have to be more vigilant in order not to play the second fiddle in the future.

## One set of rules

The maritime industry in general, and ports in particular, must be on the alert, underlined Brian Simpson, the European Coordinator for Motorways of the Sea programme. In his opinion, the voice of the sector isn't heard loudly enough in the EU. Seaports in co-op with shipping must push their views up the TEN-T agenda, as well as within the Member States. It's disheartening, Simpson noticed, that so little of the Cohesion Funds goes to the maritime industry. Some countries are doing this on purpose to shift money for other investments, particularly rail. Moreover, Europe-wide collaboration is needed. The Baltic region is renowned for its devotion to developing the blue economy and tackling related issues, like pollution, and Southern Europe should in this regard talk more to the North in order to make its own business cases based on the North's trial-and-error experiences, as well as hit the common goal of e.g. reducing harmful emissions.

Konstantinos Rigas, representing the European Commission's Unit Ports & Inland Navigation, agreed and highlighted the set-up of the European Ports Forum, of which BPO is a member, to break through the message to decision makers in Brussels that ports are key assets of the European economy and vital instruments

in the Union's eco-strives. In her speech, Isabelle Ryckbost, Secretary General of the European Sea Ports Organisation, echoed the views of Simpson and Rigas. The maritime business is up for a big fight with other transport modes for money from the second edition of the Connecting Europe Facility (CEF). Ryckbost went even farther than Simpson on sea shipping, stressing that there needs to be a global solution on the level of the International Maritime Organization (IMO) regarding decarbonising the industry. Anything less is burdened with the risk of ending up with tools that are nowhere near being useful for addressing the climate change. Supplementing this thought, Patrick Verhoeven, the newly appointed Managing Director Policy and Strategy of the International Association of Ports and Harbors (IAPH), presented the Association's latest initiative – the World Ports Sustainability Program.

Bogdan Oldakowski, BPO's Secretary General, brought up the Sulphur Emission Control Area as one of the most challenging issues the Northern Europe had to face not long ago. While the region tackled this issue more or less successfully in the end, new challenges are on the way, including the Nitrogen Emission Control Area or new rules on handling sewage





from passenger ships. It is true that a robust clean-tech sector for maritime applications benefited from all of this, but transporting goods with the use of ships has also become more costly because of the new legislation. The BPO, therefore, has always been on the standpoint that Europe needs a non-discriminatory level playing field. "One Europe, one set of rules," Oldakowski emphasised.

#### **Buck the trend**

Day 1 session II was opened by Professor Maciej Matczak from the Gdynia Maritime University. In his presentation, he put forward a synthetic round-up of the trends currently influencing the port and shipping markets, including decreasing world trade value; the more and more widespread implementation of robotics and automation, powered by digitisation; the liner container shipping sector going deeper into merger & acquisitions and alliance forming in the hope of balancing demand & supply; as well as re-industrialisation. There's also the "political factor", Professor Matczak added, setting the hearth on transport and logistics, as reflected in the slogan "Made in America supply chain".

The following panel discussion took up the baton on these remarks. Hannes Conzen, Managing Director at TT-Line, agreed that re-industrialisation has a potential to add volumes to European cargo flows, but he also pointed to the tug-of-war Europe has with Russia and that this conflict has put on freeze a lot of shipments. Nevertheless, the main message delivered by Conzen was the need for the entire industry – ports, shipping lines, stevedores, and trucking companies – to understand that moving lorries and trailers is their common business. In the light of this, he

continued, the involved parties should be smart about their investments by putting money into things which will be actually used and which will make freight flows as easy as possible. Policymakers, on their side, should focus more on supporting shifting these cargo streams from roads onto seaways, Conzen summed up. Michał Wykowski, Regional Director Baltic and Eastern Europe, Unifeeder, drew attention to the container market and the dominant trends here: consolidation, the introduction of mega ships, volatile freight markets, and digitisation. Bigger vessels and digitising transport and logistics are topping today's agenda also according to Valdo Kalm, the Port of Tallinn's CEO. Tougher competition, Kalm went on explaining, requires more flexibility and increased speed of operations. This can be achieved thanks to digitisation and automation; however, greater efficiency should not undercut sustainability and the care for the environment, since ports function as part of a greater society, Kalm stressed out. Kimmo Mäki, the Port of Helsinki's CEO, said that port investments have changed over the years. Nowadays, it's much more about executing specific, quite narrow projects. For instance, building a ferry terminal that it suited for a particular short-distance and high turnaround traffic in the hearth of a city. Also, Mäki added to Conzen's notions, partnerships through multi-party cross-border projects are instrumental if we seriously want to develop one's port, its services to other harbours, and the wider transport network that smoothly connects distant parts both within Europe, as well as between the continent and its closest and more faraway trading partners.

Session III kicked off with Dr. Indra Vonck, Senior Port Expert at Deloitte Port

services, presenting a vision of a future port. According to Vonck, three mega trends will shape how seaports will be transformed soon – increased complexity, pressure on revenues and costs, and energy transition. Technology will be critical in coping with these challenges. We will see the boldest ports blending 100% of their hardware with the software. This move will have, however, profound consequences for employment. Estimations speak of a 25% toll new technologies, especially automation, will take on the number of ports' workers. Then again, new posts will emerge, requiring new sets of skills. Future ports also won't act in isolation; data-led innovations will force them to co-op with each other in order to satisfy the society's greater than before demand for sustainability. Seaports will have to embrace the change toward alternative fuels, and in the long run figure out their role to play in an economy driven by renewables. Nevertheless, Dr. Vonck underlined, the maritime industry is sometimes too slow when it comes to grappling with tech-challenges. Cybersecurity, for instance, is one area where the sector is left far, far behind other businesses.

In the next speech, Henrik Roreger, the Port of Hamburg Authority, agreed with many of Dr. Vonck's remarks, adding that digitisation of ports also requires creating a digital culture in the workplace. It's not that technology will magically sort out all issues on its own. Port authorities must invest in training and encourage a mind shift, e.g. when it comes to data sharing. Ports must be adaptive



– this was the key takeaway from the presentation made by Emeritus Professor Han Ligteringen, representing the Ports and Waterways department of the Delft University of Technology. He talked about adaptive port planning, where assumptions underlying a given investment are regularly monitored in order to swiftly react if needed. By way of example, Professor Ligteringen showcased a few innovative solutions of flexible infrastructure, like converting sea areas into port lands with the use of prefabricated blocks consisting of containers and concrete.

The conference part of Day 1 was most probably best summarised by Henrik Widerståhl, Deputy Managing Director, the Ports of Stockholm. While presenting three projects that have already or will in the near future next-gen-transform the seaports in Stockholm, Nynäshamn, and Kappelskär, he said without blenching, “Do or die.”

After such a punchy ending, the event’s participants had an opportunity to relax during one of BPO’s famous networking dinners. The feast took place in the Viking stronghold Trelleborg, where real Vikings provided entertainment, including arm wrestling with the conference participants, swashbuckling, and epic songs and tales of big and small harbours.

Tommy Halén, the long serving CEO of the Port of Trelleborg, received an ovation and a special gift in gratitude for his accomplishments and friendship toward the maritime industry. Having retired, Tommy will nevertheless stay in the port market, offering his know-how as a consultant.

### Going through the changes

Addressing future adversities will require creativity, and Day 2 of the Baltic Ports Conference 2017 set off with a keynote speech on this topic, delivered by Mia Rolf, CEO, Ideon Science Park. First, the challenge needs to be defined by answering the questions of why? how? and what? Next, creativity – defined by some as intelligence having fun or connecting things anew – can be invigorated in several ways. Promoting a diverse workplace and creating a so-called customer journey map are some of the best ways of sparking it. Leadership is key, too, because creativity is in the people, and particularly in those with burning ideas that inspire and motivate others to help with bringing them to life. However, it’s not only about catching other people on fire – consistency over time is equally essential.

Afterwards, Session IV was inaugurated. Markku Mylly, Director of the European Maritime Safety Agency, talked in detail about the challenges the Agency is currently dealing with. He focused on drills concerning place of refugees; the availability of

alternative fuels in general, and LNG bunkering, which will soon become a global issue, in particular; as well as on the European Maritime Single Window (EMSW). While the EMSW has been introduced by EU Member States, Mylly acknowledged, the country versions aren’t interoperable Europe-wide, whereas some do not even talk to other systems within one state. A clear overhaul of the implementation and integration processes is thus needed.

In his purposely provocative presentation, Poul Woodall, Director, Environment & Sustainability, DFDS, took a long, hard look at various factors shaping the shipping industry. First of all, Woodall observed, regional and global regulations aren’t harmonised with each other. In his view, world priorities are primarily targeted toward reducing emissions of greenhouse gas (GHG), and only after that at dealing with SO<sub>x</sub> and NO<sub>x</sub> pollution. As a result, the Baltic Sea region is now mostly concerned with the Nitrogen Emission Control Area, and then with GHG and ballast water. These approaches may contradict each other. For instance, lowering the levels of shipping-related SO<sub>x</sub> emissions in North Europe led to ships’ higher CO<sub>2</sub> emissions. There are also “political showcases”, as Woodall called them, most notably LNG (still a fossil fuel) and cold ironing (which in certain cases may do more harm than actually benefit the environment and peoples’ health). Agreeing on a global agenda is vital if we’re





to make shipping emission-free. Woodall is sceptical about reaching a fast deal on everything, but at least some progress needs to be made. Nevertheless, there is a lot pushing and shoving these days – Russia vs. the rest of the world, Baltic vs. the world, ship-owners vs. ports, the EU vs. IMO.

Having mentioned global warming, or more broadly climate change, some ports are already negatively impacted by adverse weather events, Petra Sörman, Environmental and Sustainability Strategist, WSP, said. In addition to the most visible bearing nature has on ports – such as rising sea levels damaging facilities and goods, heatwaves leading to railway buckling, and high speed wind making navigating more difficult and less safe – climate change also affects other aspects of the port business. For example, insurers are starting to categorise floods as usual events, hence making it harder and/or more expensive to get compensation for them. In the end, extreme weather phenomena can ruin a port's reputation; after all, who would like to take the risk of entrusting one's goods in the likelihood of them being either flooded or blown away? In this sense, Sörman said, adaptation, through the means of stronger cranes, elevating the port's lands, investing in on-site renewables for energy supply in case the wider network blacks out, etc., simply means cutting costs as well as looking after your good name which has a value attached to it in the business world.

Next, a number of projects were presented, starting with GAZ-SYSTEM's plans to further develop the region's biggest LNG terminal located in Świnoujście. This facility will be upgraded with the addition of a third storage tank; a second bidirectional jetty where ships also could bunker; a combined heat and power unit; and a station for loading rail tankers. Afterwards, leaders on various Baltic projects had the opportunity to brief the audience on their initiatives. Carsten Beyer presented the Baltic Blue Growth, a project on the blue bio-economy encompassing technology, shipping, and tourism and maritime experiences. Andrius Sutnikas from GoLNG talked about the need for supplementing the Baltic LNG boom with additional products and services, as well as competencies. Professor Lauri Ojala put forward the HAZARD project aimed at mitigating emergencies in ports through increasing safety and preparedness. Ulf Siwe, in turn, brought closer the STM Validation project, which is about turning today's point-to-point maritime information sharing into an efficient network that synchronises shipping and unlocks new business and eco-friendly potentials like green steaming or just in time arrivals of ships. The round-up was finalised by Wiktor Szydarowski and his update on the works of the TENTacle Project aimed at assessing the level of understanding of the impact the implementation of the TEN-T

scheme will have on trade, business, governance, and other infrastructure-related investments.

### Bring the Baltic results

The conference ended with a panel discussion on exporting Baltic environmental standards. Ditte Folke Henriksen, Head of Section, Danish Maritime Authority, highlighted that the region is perceived in other parts of Europe as a role model not only in developing clean-tech, but also when it comes to cross-border and cross-sector cooperation, the former also involving non-EU partners. Asked whether it pays off to be green, Gert Nørgaard, Manager Strategy & Planning, Copenhagen Malmö Port, replied that while there are indeed costs associated with being a frontrunner, we also need to look at the bigger picture. Port operations, Nørgaard went on, have an impact on the environment and public health. For these reasons, these aspects need to be taken into consideration before deciding on an investment. Summing up the debate, Ulf Siwe contended that the Baltic is green because it simply delivers the results.

The Baltic Ports Conference 2018 is going to take place in Szczecin. See you all next year in the hometown of the duchies and dukes of Pomerania! ■





# Eco-excellence

by Przemysław Myszka

The 21<sup>st</sup> edition of the Euro-Med Convention, an annual conference and partner meeting organised by the Naples-based Grimaldi Group, took place this year in the town of Santa Teresa di Gallura on the island of Sardinia. The main event was split between two themes – the first focused on making maritime shipping sustainable in the long-term, while the other was devoted to the Italian economy and securing its structural growth in the fast-paced world full of changes.

After the welcome speeches, Emanuele Grimaldi, the Group's Managing Director, presented his understanding of what will be the future of the maritime industry. "Going green – he said – is already the matter of economic survival." In today's world, it's not only about social conscience, when one decides to pay more to adhere to the virtue of sustainability. Being environmentally-friendly, Grimaldi underlined, simply became part of the business, driven by new and more stringent regulations, but first and foremost by the tangible profits modern eco-technologies started to deliver.

"The trend is set, no matter how cheap the oil will be," Grimaldi said. So, decarbonisation and increasing public demand for environmentally friendly transportation will be the two most influential trends shaping the future of transport in general, and its maritime sector in particular. "An effective decision making in the maritime field passes through compounding the common good of people with the fair needs of the blue industries. It is for our stakeholders, for the next generations, for coastal populations. That's why this all started," Grimaldi commented.

Digitisation, in addition, will be a potent catalyst for making tomorrow a reality, what seemed to be a daydream yesterday. "The fallout of this most probably epic change is still largely unknown, but anyone can understand that maritime work, cargo handling and navigation techniques, maintenance and safety on-board will never be the same again," Grimaldi said in this regard.

## Bigger = better = greener

The company's answer to these challenges lies in its GG5G newbuilding scheme, part of its overall almost EUR 2.0 billion eco-excellence investment programme. The Danish Helsingør-headquartered naval architects from Knud E. Hansen have designed for the Group what will be the world's largest ro-ro ships once the first one comes online in 2020 (six units are already inked, with an option for four more). The new vessels will be 235 metres long and 34 metres wide, each offering 7,300 lane metres (for ca. 500 cargo units) of cargo capacity across five decks. Although these hybrid vessels will have nearly twice the carrying capacity as compared to the company's existing largest 4,000-lane metre Eurocargo-class ro-ros, they are to emit 50% less carbon dioxide per tonne-kilometre. Moreover, thanks to solar panels and lithium batteries (5.0 MWh in total, the biggest pack ever installed on board

a single ship, and the very first time ro-ros will utilise this technology), the GG5G newbuilds will be virtually emissions-free while docked. Additionally, fuel consumption at sea will be lowered thanks to air lubrication, LED lamps, electrical pumps, and waste heat recovery. The ro-ros will be equipped with scrubbers to comply with the more restrictive legislation on sulphur emissions, as well as to take advantage of the price spread between Heavy Fuel Oil and compliant bunkers, particularly post-2020 when the global 0.5% sulphur cap will enter into force.

Apart from these vessels, the company will invest in lengthening its current fleet. Here, four ro-paxes of Finnlines (*Finnsky*, *Finnsun*, *Finntide*, and *Finnwave*) will gain around 30% in cargo capacity (currently each offers 3,291 lane metres). Two cruise ferries of Grimaldi Lines (*Cruise Roma* and *Cruise Barcelona*), will also be jumboized (from 3,000 to 3,500 pax capacity), and will receive batteries to make them emissions-free during port stays. As it is in the case of the GG5Gs, making the vessels bigger, thus lowering their fuel consumption per carried cargo unit and/or passenger, is ultimately aimed at making the company's offer more competitive against competitors disposing of obsolete and seemingly less adaptive tonnage.

The Group already has rich experience in eco-performance to prove that

being green pays off. As a result of its earlier investments in newbuildings (incl. the world's largest con-ros of the Atlantic Container Line as well as Grimaldi Lines' Euro-Med car carriers), enhanced afterwards with more efficient rudders and covering their hulls silicon paint that provides less friction in the water, the Group saw its CO<sub>2</sub> emissions per tonne-km go down by as much as 40% between 2011 and 2016. In absolute numbers, this translated into avoiding the emission of 0.5 million tonnes of carbon dioxide annually. The greenhouse gases (GHG) aspect put aside, all of this points out to a more pocket-friendly full bill at the end of the day, a thing also appreciated by shippers who last year put 10% more shipments across the Group's network on 2015 volumes.

"When including the above newbuilding and lengthening projects, we can say that in the last four years Grimaldi committed to an expense of over EUR 1.5 billion for the building of 25 green units, and to an expense of about EUR 0.3 billion for about 150 green retrofit interventions on existing ships. All in all, nearly EUR 2.0 billion will be spent on actions aimed at reaching environmental excellence and at curbing polluting emissions. Institutions are slowly but steadily recognizing the role of Grimaldi in this green battle and recently the International Maritime Organization invited our company to join the Global

Industry Alliance, a club of the top 20 environmentally-friendly marine corporations, set up for pushing the marine technology R&D to the next level," Emanuele Grimaldi summed up the company's eco-efforts.

#### **Eco-rationality**

The following panel debate – moderated by Alfons Guinier, Former Secretary General of European Community Shipowners' Associations – centred on issues related to the environment, too. Several new challenges, which the maritime business will have to tackle, are clearly visible on the horizon. These include the aforementioned 0.5% sulphur cap that will encompass sea shipping worldwide; making Northern Europe, which already is a 0.1% Sulphur Emission Control Area, also a Nitrogen ECA; ensuring ship recycling is done in EU-approved facilities; facilitating the uptake of more eco-friendly alternative fuels; as well as implementing some sort of a worldwide monitoring system which would help reduce the industry's GHG footprint.

Emanuele Grimaldi and Mikael Makinen, President-Marine, Rolls-Royce, emphasised that when it comes to decarbonisation, the maritime industry is not the problem, quite the opposite – it is the solution, and one that is continually striving to improve its performance. While there won't be any revolution in the foreseeable future, the two agreed, even small steps

can deliver big results. For instance, Grimaldi said, a thing as simple as replacing propellers can lead to 10% savings in fuel consumption. Also, digitisation will increasingly come in handy by providing a wealth of data based on which virtually real-time fine-tuning to operations will be possible to make. Grimaldi and Makinen summed up this thread by saying that there will be no one-size-fits-all panacea. Instead, we'll see a mix of technologies for future smart ships, which will differ from each other, too, as at least many ro-ros and ro-paxes are built for specific routes, operational conditions, and markets.

The legal framework is crucial, too, added Peter Weiss, Head of EMEA Supply Chain Management & Global SCM Coordinator, Fiat Chrysler Automobiles. If there's no structure, companies are experimenting on their own (or as Grimaldi said later, "If there are no rules, everybody has its own set of them."). Next, Weiss went on, infrastructure is key as well, because it's no use having a perfect law on e.g. alternative fuels if there is no infra coupled with a supply chain that actually makes them available on the market. Nevertheless, law or no law, Grimaldi said, sometimes policymakers are







just gambling at the expense of the shipping industry. That was the case with the Sulphur ECA before it hit the clock in 2015, and it will most likely be the situation with the 0.5% limit. It's ultimately the transport segment that has to sort out things related to regulations impacting bunker prices and deal with the consequences of a potential modal backshift. "It's no good to gamble," Grimaldi stated. That's also what it means to be a frontrunner today – one that is ahead of the knowns and unknowns of the future economic-political landscape.

Ennio Cascetta, Managing Director, Rete Autostrade Mediterranee, drew the audience's attention to the need to see the bigger picture. Decarbonising the maritime business is just one of the elements in the grand game of making the transportation sector less polluting. The entire domain of transport and logistics, including mobility, must move toward sustainability in line with what people expressed in their support for a greener future, embedded i.a. in the so-called Paris Agreement. Indeed, the world is waiting and carefully watching what the maritime industry will do, added Patrick Verhoeven, Director Policy and Strategy, International Association of Ports and Harbors. He then also said that cooperation between stakeholders representing different transport modes, as well as ports who act as interfaces between them, is key. It would be unthinkable, Verhoeven underlined, to witness the eco-gains earned by the maritime players to be wasted down the supply chain and vice versa. "It's eco-rationality," said Grimaldi. He then pointed to the importance of unrolling the TEN-T network in an intermodal-friendly way, when investments in rail and port infrastructures are aligned with each other so that we can have the best of both worlds.

### Having the right setup

Session III – also carried out as a panel and led by Giorgio Mulè, Director of Panorama, an Italian media outlet – focused on cooperation as well. The topics put under discussion included, among other things, the new port authority system in Italy, where the powers and resources of single port entities were recently combined into authorities that govern multiple seaports. The main aim of this action was to foster a system that is more concerned with teamwork and joint projects rather than sometimes unnecessary competition.

This will be all the more important in the foreseeable future as maritime traffic is on the rise. This also will be vital if sea shipping is to continue making a logistics difference, particularly as transports in the South (e.g. between Italy and Spain), as well as with its partners in the North will be more and more interconnected. In addition, taking care of the human factor will play an essential role, too. One thing is the persistent truck driver shortage in Europe; the other, increasing the attractiveness of this profession. This is to be done by combining cabotage and intermodality, especially in Italy, on the north-south axes on both sides of the country's mainland. Such setup ensures that drivers can work in regions where they're based at, close to their homes and families, meaning that they don't have to undergo very taxing countrywide hauls.

### Against business

The conference part of the event closed with a press briefing during which Emanuele Grimaldi expressed his views on a number of issues. Asked about Brexit, he said that there's much speculation about it. On the one hand, it won't be an issue granted that the free movement of people, goods, services, and capital will stay in place. "Post-Brexit, the UK should be a good friend of Europe alike Norway," Grimaldi said. If the Leave Option goes hard, on the

other hand, companies will have to react accordingly. For instance, the vessels of the Atlantic Container Line, currently flying the UK flag, may have to move to another register.

On a more general note, Grimaldi is concerned with the still persisting nationalistic sentiments in Europe which act against businesses. As a case in point, he brought up the move done by the French government to nationalize the STX France shipyard in order to block its takeover by the Italian shipbuilding company Fincantieri; the yet another failed attempt to privatise the Polish ferry company Polferries, which Finnlines wanted to add to its portfolio; or the long-lasting ownership hurdles the Group has to face regarding its assets in the Greek ferry market.

Finally, Grimaldi shared his thoughts on the 0.5% cap. Drawing on the experiences gathered while preparing for the 0.1% Sulphur ECA, the Group is pretty much sure that refineries can produce compliant bunkers without adding a hefty premium on the price. However, there is still guesswork when it comes to the refining capacities to cater the market with sufficient supply. Therefore, the Group will continue placing its bets on the scrubber technology. However, Grimaldi noted, investing in this technology is a decision made on a case-by-case basis. What makes sense for newbuildings or fairly young units, does not need to be the optimal solution for others, particularly old and fuel consuming vessels, where the cost of a scrubber, its installation, operation, and maintenance would outweigh the value of the ship.

The XXI Euro-Med Convention concluded with an evening gala dinner, where, among many attractions, the Group handed out the Grimaldi Excellence Awards to its partners, suppliers, and clients, honouring all those who are the real backbone of the maritime freight transportation and without whom the strive for eco-excellence would be just empty words. ■





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# Three quarters only

by Przemysław Myszk

**Imagine a fairly big football stadium, one that's capable of seating tens of thousands of supporters. Now look at a glass of water in the middle of the pitch. How long would it take for this small cup to flood the entire facility if the amount of water was to increase exponentially each minute? About three-quarters of an hour. One moment before the end, the stadium is half full, the next it's an extravagant pond. That's one vivid way of demonstrating how the ongoing digital revolution is taking by the storm almost every "byte" of our lives, transport and logistics included.**

**T**his year's edition of the autumn conference of the Association of European Vehicle Logistics (ECG) took place on October 19<sup>th</sup>-20<sup>th</sup> in its hometown, Brussels. While the first day was exclusively devoted to networking and tasting what the Belgian cuisine has best to offer, the second day was a full-blown conference focused on understanding the diverse ways the digital world is interlacing with the real one – and how it is doing so at an increasingly rapid rate.

## **In good mood, but change is by and by**

The conference part was inaugurated by ECG's President, Wolfgang Göbel, who gave a snapshot of several issues. First, there's optimism in the market. Except for the UK (where the final shape of the Brexit deal continues to be a great unknown, a fact that causes much uncertainty), vehicle sales across Europe have been on satisfying levels throughout 2017. The Association is in fit shape, too. Its working groups are progressing with their specific tasks, heading toward a common goal, namely standardisation. ECG is also involved in a number of projects,

including on e-gate (making export & import flows go more smoothly), health and safety (of truckers and people working in compounds – in order to make these jobs more attractive in the light of worker shortages), and on handling and transporting electric vehicles (which will continue to penetrate the market following governments' decisions to phase out the sale of combustion engine cars). Moreover, ECG's highly acclaimed Academy is going to grow with two new courses – on competition law and on negotiations. Nevertheless, Göbel reminded everyone that while today's circumstances may seem to serve the industry well, this should be perceived as a good opportunity to invest for the future. Change is unavoidable because of all the tech-driven innovations ("Avalanche of progress," said Mike Sturgeon, Executive Director at ECG). This is why the Association not only encourages its members to put the effort in investigating the possible impacts of these, both positive and negative, but also is developing its own forecasting tool.

The following presentation was delivered by Christoph Stürmer, Global Lead Analyst at PwC Autofacts. Stürmer agreed that the market environment has been quite buoyant lately. But we're now also most probably over the cliff and in 2018-2020 the gravity will start to sink in.

Additionally, in 2021 new and more stringent regulations on emissions from new cars will enter into force. Meanwhile, more and more disgrace is brought upon diesel cars, following the infamous Dieselgate. Politically speaking, having such cars in one's portfolio, either as an owner or manufacturer, is becoming more and more a toxic asset. Stürmer pointed out that these things combined will force car producers to rejig their plans. He talked about the situation on the UK market, too, where uncertainty is killing capital investment (effectively cut in half recently). The future will most likely belong to digital mobility, he added. The research & development efforts are increasingly more centred around not only hybrid and electric cars, but also on making them autonomous, shared, and interconnected. This will ultimately lead to vehicles that are less polluting (incl. noise), as well as to a new kind of traffic where sharing cars will become the norm (though ownership may still be private in most cases).

"We cannot think about the future without digitisation," underlined Alina-Stefania Ujupan, Member of the Cabinet of Mariya Gabriel, European Commission for Digital Economy and Society, at the beginning of her speech. While there are clear gains to be made with the help of digitisation – just to mention more efficient

and environmentally-friendly long-haul freight transports due to truck platooning – there are serious issues that need to be resolved as well. These include cybersecurity, privacy, and data input and sharing in regards to connected vehicles, along with up-skilling jobs (of e.g. lorry drivers) to meet the requirements of the new economic model. The transport and logistics industry has the potential to lead the roll-out of the digital revolution, emphasised Ujupan. By engaging in multi-stakeholder co-ops with the IT and telecom majors, groundbreaking innovations, like the 5G network, can be introduced on a Europe-wide scale exactly through the transport and logistics channel. According to Ujupan, the European Commission will policy-support such actions through aiding research and providing the right legal framework (e.g. establishing cross-border corridors for testing new solutions), as well as creating space for the free and non-discriminatory flow of data.

Session 1 came to its conclusion with an out-of-the-box presentation made by Märtha Rehnberg, Co-founder and Partner at DareDisrupt. It was in fact Rehnberg who challenged the audience with the water-and-stadium example described in the lead. She then went on by showing how the exponential growth in computing power – a trend which hasn't been interrupted by any of the World Wars or lowering the Iron Curtain – has kept changing the world. One of the vital components of this revolution, she said, is the fact that a single technological development can disrupt scores of industries that initially may seem unrelated. Digital photography not only killed Kodak, figuratively speaking, but was the stepping stone for the Images function of Google, which, in turn, became a real data-mine the developers of Artificial Intelligence could draw from (and eventually the AI itself, self-learning and evolving thanks to big data).

#### **Down to earth**

"A journey is great to talk about, but you need to make the first step," said Peter Weiss, Head of EMEA Supply Chain Management, Fiat Chrysler Automotive (FCA). Still, a lot of data is manually handled, which is both suboptimal and prone to error-making. The initial aim is to take the data onto the Internet of Things level, a move that would greatly enhance data accuracy. Next, self-learning advice algorithms could be developed using this resource. The end aim, as FCA sees it,

is to have a fully integrated management of global supply chains with automated flows from production to delivery.

Pavel Haidai, President of Avtologistika, continued the supply chain theme. He pointed out a paradox. Rationalising supply chains – through the use of architecture, process, and price pressure tools – ultimately makes them more expensive, less reliable, and of worse quality. What we need instead of supply chains, he said, are supply nets. In other words, the future is in open logistics, when companies agree to combine their flows for the sake of greater efficiency. "Trust is essential," emphasized Haidai. People need to engage in "coopetition", a sustainable way of competing and cooperating simultaneously. Haidai believes that the future will belong to the shared economy and business coalitions, big data being the language they speak in.

Blockchain will be part of the future of transport and logistics, too, at least to a certain degree. This was the main takeaway from the speech made by Duncan Westland, Assistant Director – Global Blockchain, Ernst & Young. Though the technology itself isn't nothing special, how it works is revolutionary. In essence, blockchain makes transaction processing safe by forcing the involved parties to be absolutely trustworthy, so to speak. Therefore, blockchain can be used in the supply chain for total visibility. However, the technology isn't universal. To take advantage of it, the business setup must involve several parties cutting deals with each other; they have to value trust and transparency; and they want to ensure their records are tamper-proof, as well as secure the ownership and/or management of a finite resource (like fleets).

Other tangible benefits of modern tech-solutions were presented by Steven Quaak, Head of Strategy at Daimler Fleetboard, and Rabea Böhme, Senior Manager Business Development at RIO. Quaak began by saying that trucks spend around 65% of their time not driving, either because of traffic jams, dragging stops at borders, waiting for freight handling, due to red tape, etc. Daimler Fleetboard's answer to these hurdles is a sort of a meta-platform that rallies in one place all the web platforms that link those who have cargo for shipment with those that take care of transportation (just like the apps used for listing different options for hotel booking). In her presentation, Böhme highlighted that nowadays one

can buy a truck not only for the sole purpose of moving goods, but also for improving the logistics process. For instance, by augmenting the machinery with software, one can better manage the whole fleet, optimising the trucks' routing, decreasing their fuel consumption, or predicting when maintenance will be needed. Nevertheless, Böhme went on, big data needs to be handled smartly, so as to avoid info overload.

#### **The split**

The final session was very much devoted to political issues, particularly the Road Package. On the one hand, Eddy Liégeois, Head of Unit (Land Transport) at DG Move, presented the European Commission's ambitions with this legislative initiative, including addressing the climate change through making transport more sustainable, or avoiding fragmentation of the EU's internal market by simplifying and clarifying rules (e.g. on cabotage, worker rights, and fair competition). On the other hand, Mark Billet, Head of EU Goods Transport at the International Road Transport Union (IRU), challenged this proposal by i.a. questioning whether this simplification won't lead to new complexities. In the opinion of the IRU, for instance, the current law governing cabotage is fine. Moreover, Billet added, just putting in place even the best set of rules won't do the thing on its own. A clear commitment from all the Member States is key for efficient enforcement. Then again, one could read between the lines that the EU is split on the Road Package.

The conference closed with two speeches revolving around the topic of interoperability and multimodality. Lina Konstantinopoulou, Head of Transport & Logistics at ERTICO – ITS Europe, underlined that we need to make sure in advance that a given technology will be interoperable. Deploying proprietary systems that don't speak to each other leads to waste of efficiency and pulls us back from having a connected infrastructure across the whole of Europe. ERTICO is working on solving this info bottleneck. Its AEOLIX is to be an end-to-end supply chain data exchange solution. ■





Photos: Actia Forum

# OPS on stage in Gothenburg

by Andrzej Urbaś

**The meeting gathered a very healthy mix of port representatives, shipowners and technology suppliers, bringing together groups directly involved and highly interested in further development of Onshore Power Supply (OPS). Feasibility of OPS investments was the focal point of the discussion.**

The technology itself isn't necessarily a new topic in the maritime industry, but recently it has been garnering more attention from both port authorities and shipowners. This can be attributed to the constant growth of environmental consciousness in the maritime industry. OPS may facilitate port and shipowner compliance with some of the environmental regulations already in- or soon-to-come into force. Then again, just as the discussions held during the seminar showed, it is vital to not see it as a possible universal solution to all environmental maladies plaguing the industry.

## Proven experiences

The event proved popular among port authorities, with four European ports holding presentations and sharing their experiences with OPS technology. The seminar kicked-off with Edvard Molitor, Senior Manager for Environment at the Port of Gothenburg, examining OPS investments from a socioeconomic viewpoint.

By running an analysis based on the Swedish Transport Administration's data allowing to put monetary values on emissions, Port of Gothenburg was able to conduct a feasibility study for possible OPS implementation. The study showed that while it would make sense for OPS to be

installed in the ro-ro harbour, installation costs were much higher than external costs avoided in case of the energy and container ports. Pressure from the city was mentioned as one of the factors driving OPS implementation, especially in regard to NO<sub>x</sub> emissions. However, according to studies, only 5% of those emissions would be avoided if OPS were to be installed all around the port area.

Edvard stressed the need for cooperation between various ports and shipowners, a view shared by Heidi Neilson, Head of Environment at the Port of Oslo. The presentation included an analysis showing that a switch to OPS by only five of the top polluters among the shipping lines calling at the Port of Oslo would result in halving of the total emission numbers. Neilson stressed the need for the OPS modules to be compact, efficient and modular. Future expansion of the installations has to be kept in mind, as well as the possibility to share the energy with busses, trams, cranes etc. Efficiency is key, OPS energy cannot be used only for ships at berth.

## Free market – already interested?

Ports' role as developers, accelerators, and facilitators of OPS technology implementation has been explored in a presentation by Katrien Van Itterbeeck, representing the Port of Antwerp. "If the job can be done by private sector – let the job be done by private sector" – has been stated, before diving deeper into the

subject. This would allow for competition, in turn having a beneficial impact on the quality of services provided and the overall price level. Van Itterbeeck presented a set of questions helping to identify a port's role, whether as a developer or facilitator, including the potential for a positive business case, need for customization, opportunities for cooperation with interested parties, and OPS accessibility along the loop. The necessity for shipowners' willing commitment was a sentiment shared by Even Husby, Head of Environment at the Port of Bergen. A number of external pressure factors for implementation of environmentally friendly solutions was listed, some of them stemming from the Port of Bergen's unique geographical location. Bergen's planned action points include the lowering of costs linked to the grind rent and the energy tax. Incentive arrangements for ships and ports have also been mentioned, among them differentiated port dues, limitations of ships calling and passengers handled as well as the availability of LNG bunkering and OPS stations.

Environmental benefits of OPS implementation were examined by an expert in the field. Emre Aydin, Senior Consultant in Air Quality and Acoustics at WSP, took it upon himself to answer a very bold question. Is OPS the best possible solution for reduction of local air pollution and greenhouse gas emissions? While it is impossible to give a definite answer to this question, Aydin presented a very clear



and thorough assessment of OPS' impact. The overall benefits vary from port to port and from city to city. Certain aspects, such as the source of electricity provided or different methods of energy supply for ships at berth (especially fuel switching to LNG), need to be considered when deciding whether to invest in OPS technology.

#### **Environmental advantage**

A no less challenging question was the topic of Cecilia Andersson's presentation, Environmental Manager at Stena Line Group. Is the ferry industry a perfect target for OPS development? Like Emre Aydin, she came to the conclusion that it depends. With challenges such as poor electrical line infrastructure at ports as well as high electricity and investment costs, OPS implementation must be carefully considered. At the same time, the benefits are clear and they contribute a lot to a shipping line's or port's "green" image. A factor not to be underestimated in times of heightened environmental consciousness.

A strong line-up of speakers from the side of technology suppliers allowed for some concrete solutions to be presented as well. Ingemar Gustavsson, Business Unit Manager at Actemium, the conferences main sponsor and host, shared his company's mobile turnkey solution for high-voltage shore connection systems and low-voltage shore connection systems. A need for mobile OPS stations was

voiced by many of the port representatives speaking at the seminar. The next project involving Actemium's OPS container solution will take the company to Gothenburg.

Roberto Bernacchi, Shore-to-ship Power Manager at ABB, also sponsoring the event, presented OPS as a key element of a smart port's agenda. Their solution includes OPS in what they consider a smart grid – operating on a centralized and distributed power generation, with a multi-directional power flow operating on real-time data. Ports becoming smart would enable them to use the power more efficiently, with ships being only one of the recipients, along with electric vehicles and buses.

The trio of technology suppliers was rounded out by Henrik Jevrell, Local Sales Engineer at Cavotec. Henrik gave an overview of Cavotec's OPS portfolio while talking about the various challenges of shore connection to a dynamic ship. Between mooring lines, quay equipment, loading ramps and variables generated by the quay construction, finding the right solution can be a truly daunting process.

#### **Practice & forward**

After recharging their batteries and enjoying a brief networking evening, the seminar participants were ready for round two. Luckily, death by PowerPoint was successfully avoided. While day one presentations approached the topics at hand from a theoretical standpoint, day two

talks offered a hands-on approach – la change in pace welcomed by all. A study tour prepared by Actemium took the participants on a trip around the Port of Gothenburg, with stops at two OPS stations, located at the Germany and Denmark terminals. A showcase of Actemium's mobile OPS station, currently in use by Stena Line vessels, concluded the trip.

The event gathered around 50 delegates and was very well received, with the audience engaging in lively dialogue with the speakers. The next edition is being planned as you are reading this and the word on the street is that Norway will be the place to be for everyone involved in OPS technology in 2018. ■





## A matter of great urgency

by Tuomas Kiiski



This article is part of the HAZARD Project, co-funded by the EU within the Baltic Sea Region Interreg programme, which aims to mitigate the effects of major accidents and emergencies at key seaports in the Baltic Sea region through i.a. better preparedness, coordination, and communication, as well as by enhancing the handling of post-emergency situations. For more info please visit [blogit.utu.fi/hazard](http://blogit.utu.fi/hazard).

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Recently, anything with a prefix “cyber-” has been over-popularized in media headlines and policymaking discussions. Nonetheless, the cyber domain – which initially sounded like science fiction – has become very, very real thanks to the escalating use of digital applications and networks in daily life, and the growing capacity to store and process data. However, a number of new threats emerged alongside these development-unlocking tech advances, catching some of the port industry players off guard.

Like any emerging field, the cyber domain has its own terminology, which is still far from being systematized. Cyber threat, cyberattack, and cybersecurity are the three most commonly cited terms.

The first one is used to describe danger arising from cyberspace. Cyber threats are classified in growing order of severity as hactivism, cybercriminality, cyberespionage, cyberterrorism, and cyberwar. Each has individual elements relating to the actors, motives, and objectives involved. Depending on the parties concerned – hackers, cyber criminals, cyberterrorists, but also state agencies – their motives and objectives are diverse and often include excitement, fame, money, as well as influencing political agendas.

A cyberattack can be defined as a cyber threat that materialized. Methods of attack include phishing (an attempt to obtain sensitive information), malware (intrusive software, like computer viruses, worms, Trojan horses, etc.), and the so-called denial-of-service attack (where domains are shut off because their host servers cannot handle the sudden flood of access requests).

As a countermeasure, cybersecurity aims to maintain the desired state of access to and control of IT systems through diversified efforts. At a minimum, it calls for ensuring and maintaining password integrity and software updates. At a more sophisticated level, it requires adopting specific passive and/or reactive strategies for making the IT systems as resilient as possible to malicious acts.

### Why ports?

Arguably, two of the most renowned cyberattacks against ports occurred in Antwerp in 2011, and against A.P. Møller-Mærsk’s terminal operating arm, APM Terminals, in mid-2017. These cases illustrate opposite ends of the spectrum in terms of scale and consequences. What makes the Antwerp incident stand out was the fact that the multi-staged attack began already in 2011, when the port’s container management system was breached in an attempt to smuggle narcotics, but it took until 2013 before the case was finally resolved. The damages from that attack were limited to missing containers.

While the Port of Antwerp was an isolated target, Maersk was a part of a wider cyberattack aimed at numerous industry





players and governmental bodies in several countries. For APM, the attack temporarily halted some of its terminal operations, reportedly resulting in financial losses of up to USD 300 million. In addition to these two cases, a more detailed analysis shows that between 2010 and 2017, at least 10 other cyberattacks took place around the world that directly or indirectly involved the maritime sector.

Ports are particularly vulnerable to cyberattacks because of their multidimensional role and basic features. Globally, ports constitute key nodes of seaborne trade. From a national security perspective, they are part of the critical infrastructure that constitutes the backbone of society's functionality. Similarly, ports' operational features make them attractive targets in terms of the high level of automatization and reliance on data systems combined with massive throughput volumes, scope of operations, large number of operators, and high monetary values involved.

#### **Login: admin, password: admin**

Considering the recent growth of cybersecurity awareness in all spheres of public life, surprisingly little information is available on the current preparedness of ports against cyber threats. This is arguably attributable to three factors: the novelty of the topic, general secrecy policy related to security issues, and the discretionary nature of the subject. For example, the novelty of the topic is clear from the scant number of academic articles on it.

Yet there are signs that not only raise doubts over the capacity of ports to effectively counter cyberattacks, but also

suggest that a complete overhaul of the regulatory framework is needed. In 2011, a study by the European Union Agency for Network and Information Security (ENISA) concluded that there is poor to non-existent awareness of cybersecurity-related issues within the maritime sector. Six years later, the matters have scarcely improved. A survey conducted for the HAZARD project in 2017 highlighted the insufficient level of preparedness, as well as a lack of proper regulations in Baltic Sea ports regarding cybersecurity.

#### **Hindsight is 20/20**

Consistent with the maritime industry's traditionally reactive approach to adopting new regulations, the development of cybersecurity regulations has been sluggish. The pace only picked up following the mounting reports of cyberattacks, and the subsequent increased awareness of cybersecurity.

Over the past five years, policymakers and other stakeholders at various levels have become engaged in cyber issues by adopting cybersecurity strategies or guidelines. For example, the European Union introduced its cybersecurity strategy in 2013, and respectively United States Coast Guard did the same in 2015 for critical maritime infrastructure. In 2016, the International Maritime Organization (IMO) introduced interim guidelines on maritime cyber risk management. BIMCO, along with several other shipping industry associations, published cybersecurity guidelines to tackle the issue, too.

Notwithstanding these efforts, the global regulatory status on mandatory

port cybersecurity seems somewhat neglected. Cybersecurity is not included in any of the IMO Conventions related to port safety and security, such as the ones on International Ship and Port Facility Security (ISPS) or International Safety Management (ISM). However, some progress has been made: IMO's Resolution adopted in June 2017 will make cyber risk management on board ships mandatory as of January 1<sup>st</sup>, 2021.

#### **Don't be the one to blame**

When it comes to mitigating cyber threats in ports, there is definitely room for improvement. The current level of port preparedness seems inadequate, and the adoption of global mandatory regulations for port cybersecurity is still pending. The issue is both novel and of great urgency, as cyberattacks are becoming more common, with pervasive impacts on the society. The maritime sector in general, and ports in particular, is no exception, as demonstrated by the recent attack against APM Terminals (in this regard also read the articles *The threat hidden in the depths. Maritime cyber security in Baltic Transport Journal* 4/16, and *The threat is real. Preparing for and dealing with cyberattacks* on pgs. 34-35).

The scale of global shipping calls for a coordinated effort to ensure that adequate practices and regulations are adopted throughout the industry. ■



# The threat is real

by Bartosz Dąbrowski

**On June 27<sup>th</sup>, the Danish shipping giant Maersk was among the companies and organizations that were hit by a major cyberattack. While the primary target of the Petya ransomware seemed to be Ukrainian authorities and enterprises, the incident resulted in cargo delays, order processing problems, and limited access to internal systems for bystanders, including Maersk, TNT Express, and DHL. The main lesson to be drawn from this latest cyberattack is that no one can feel 100% safe anymore. Yet, not all is doom and gloom, as each of us can exercise in cyber resilience.**

**T**he recent hacking attempt affected Maersk mostly via its APM Terminals subsidiary, spelling serious problems for 76 sea container handlings facilities all around the world – from New York and New Jersey, via Barcelona and Rotterdam, to India's largest, the Jawaharlal Nehru Port. All terminals had to confront the crisis by finding alternative solutions, such as switching to external systems or even manual execution of orders. The restoration of business for APM was gradual, and only after reinstating IT systems was Maersk able to bring back container shipments to a normal state. While the whole disruption required a few weeks of intensive efforts to normalize the situation, the financial and operational impacts of the cyberattack are yet to be estimated.

In a statement, Maersk claimed that it was the first such incident in its history. That is exactly what most of the companies in the sector could have said in a similar situation. One can now wonder whether there haven't actually been other attacks like this, or if they've simply passed unnoticed. CyberKeel, a company specialising in cyber security, estimates that 44% of shipping lines has a low level of protection when it comes

to the digital part of their businesses, with some among the Top 20 using low quality passwords, like "x" or "12345", to guard their assets. Such doubts rise the question of how prepared companies and organizations are for another instance of a Petya attack, or an even more malicious one. And, more to the point, do they just lack the awareness of the threat in the first place?

## Systems at risk

The maritime industry is generally believed to be a bit behind in the inevitable process of digitalisation. However, computers today deal not only with abstract data, such as registry of deliveries, but are being connected more and more to physical objects in what is dubbed the Internet of Things (IoT). In the Maersk case, it was the terminals and delivery data that were affected, but we can easily imagine the dire consequences if autonomous vehicles and other heavy-duty machinery were the aim of a cyberattack.

While the IoT, with its aim to connect as many objects as possible, is still in its early stage of development throughout the logistics domain, the Electronic Chart Display and Information System (ECDIS) will become compulsory for all vessels by 2018. The ECDIS, freshly introduced in some organizations, may serve as an easy target for hackers aiming to load incorrect or outdated maps, to access

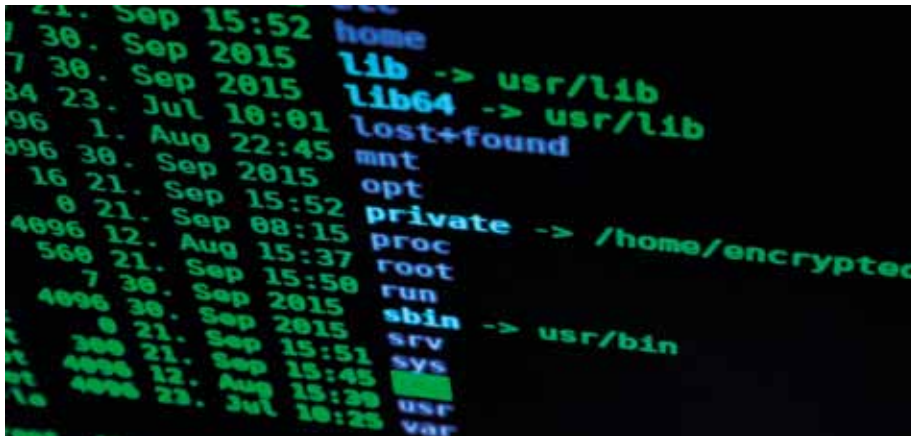
the underlying operating system, or to spread malware. Some ECDIS systems are known to run with administrative rights and no password protection.

The Automatic Identification System (AIS) is another example of a weak spot in the maritime cyber security defense line. The AIS supplements the marine radar, which continues to be the primary method of collision avoidance for water transport, but they do not guarantee proper security. AIS communications lack authentication or integrity checks, which can lead to abuse by people using even a simple radio frequency receiver.

This all points to a seemingly unavoidable side effect of introducing next-gen technologies, namely to the creation of new vulnerabilities. As with pretty much any other risk, the probability of the worst case scenario becoming a reality can be either minimised, or otherwise – we can just as well be handing the login and password to hackers on a silver platter.

## Time to think resilience

First of all, maritime companies must start taking the threat caused by hackers seriously, and doing this means introducing cyber resilience awareness and policies into their everyday routine. The after-effects of cyberattacks are proving to be even more severe than vehicle and workplace accidents, extreme weather events,



**“CyberKeel, a company specialising in cyber security, estimates that 44% of shipping lines has a low level of protection when it comes to the digital part of their businesses, with some among the Top 20 using low quality passwords, like “x” or “12345”, to guard their assets.**

or fraud in general. Learning about legal liability and assuring proper insurance are among the basic parts of cyber security preparations. However, they will not bring about the continuance of operations during a crisis, retrieve data afterwards, or ensure a sound level of safety that saves the day in the future. Insurance, sadly to say, also has nothing to do with restoring customers' faith in us.

The responsibility for implementing and up-keeping a cyberresilient environment lies primarily within management boards and top level executive teams. Such an environment should be more or less managed using the same tools as with any other business-threatening risks, adding experience and expertise gained from technology-based businesses and communities. Even though dangerous, crises such as the Petya malware attack may bring a lot of critical knowledge and case study material for maritime organizations to further build their resilience on. Moreover, this doesn't have to be a single party effort; resilience can be, and essentially should be, strengthened through the entire value chain. Imagine company A being keen on cybersecurity, but its indispensable partner B is carrying little to none about it. This ultimately poses a threat to both of them (A can deem B not being so indispensable after all), as well as to their clients. In the end, if a cyberattack occurs, it is of great importance to those affected to share the information about attacker's tools and practices, because it leads to better understanding of industry incident trends.

Nevertheless, relying mainly on experience and “instinct” in addressing cyber threats is far from being the only, as well as the best, solution a maritime company executive should implement as a

long-term strategy. This is because it's in fact really difficult to measure cybersecurity performance. Senior executives face a challenging task where traditional business performance metrics, like revenue or cost, do not serve the new purpose. For cybersecurity, there's no one-size-fits-all. The obtained cybersecurity approach should match the overall business strategy, and the probability of various threat types should be included in the general business risk assessment, as the protection of company's assets is more efficient when it is prioritized and differentiated according to their value. Protection objectives should be defined for all employees to minimize the aftermath of an attack, too.

### Train the tactics

However, many executives tend to concentrate mainly on the defensive part of cyber resilience. Although a highly qualified IT staff capable of detecting a threat and protecting their company's systems is by all means invaluable, there is no universal method for an unbeaten defence. Also, relying on IT people to sort out everything, so that other employees might as well forget about cyber resilience, is almost a certified way of getting into troubles. In fact, anyone may turn out to be responsible for a cyberattack, deliberately or out of sheer ignorance, as opening an infected attachment in an e-mail is enough to bring about serious problems. This means each and every employee should receive proper training to ensure that everyone is engaged in the company's cyber resilience day-to-day tactics. Everyone should be assigned a role in emergency plans, too, and be prepared to act when necessary. This particularly holds true for those on the front line, i.e. people managing strategic

assets or responsible for company's communication, who should be meticulously trained.

Whereas IT staff's expertise will be crucial in the phase of recognizing the attack and reacting quickly, people representing the company may turn out to be as much useful after an incident – be it handling both the media and internal communications, calming down business partners and clients, as well as analysing what went wrong to adjust properly for any future event. However, much can be done before anything really happens. It is in the power of a company's or an organization's board to decide whether to take training and testing to a higher level. Great benefits can come from real-life stress tests as well as from collaborating with ethical hackers. By, for example, using fake phishing e-mails aimed at internal training, employees can fully understand the risk. Then, testing company's systems with commissioned cyberattacks may not only bring new ideas to IT staff on how to better mount their defense, but also help in clogging any leaking holes.

### On guard

Once everybody involved directly or indirectly in a cybercrisis is updated about the recovery of the business as usual and action plans, the main task is to remain vigilant. It is never too late to draw conclusions from such crises, and share best practices with partners and peers. After all, the only ones benefitting from a non-cyberresilient industry are the offenders. ■





# As complex as a port

by Andrzej Urbaś

**Seaports are in themselves compound entities overseeing a number of diverse activities. New regulations and technological developments are adding new layers to this complexity, on the one hand creating new opportunities, but on the other imposing tougher obligations as well as forcing ports to grapple with emerging threats, like cyber threats. We are talking with Deloitte's Indra Vonck about how the new requirements on competitiveness, along with advancing digitalisation, are changing the port industry.**



**d**r. Indra Vonck, Senior Port Expert, Deloitte Port Service

## ■ How do seaports fit in the ongoing tech rollout?

Within the wider transport and logistics sector, companies have begun experimenting with a range of connectivity and data-enabled technologies. In aggregate, they form the so-called Internet of Things (IoT), which represents a convergence between the physical and digital worlds, ultimately using data as a source of value. These IoT technologies are being applied in diverse settings, from last mile transport optimization to warehouse and transport management systems. Seaports are playing catch-up with the large transport and logistics companies when it comes to developing insight-driven solutions and IoT applications. The current landscape offers some initial attempts at enhancing value propositions through technologies like automation, but overall these projects remain isolated.

The main challenge is not just to determine which technologies can support a port's overall digital strategy. Determining how to properly implement them is key, too. The diverse nature of a port – with a wide variety of companies and ecosystems, operating various kinds of equipment, and requiring different types of products and services

– creates a complicated environment with multiple stakeholders. In addition to the heterogeneity of data, a fear of transparency also remains a major issue. Ports typically comprise a cluster of competing companies which are often very hesitant to share information with a central authority that has the ability to aggregate and distribute this data amongst the stakeholders involved. In addition, the interaction with the surrounding environment, both ecological and social, adds an extra layer of complexity and opportunity to the development of a digital port.

## ■ Digitisation and the evolution of the port industry go hand-in-hand. Is it possible to support this process on a regulatory level, and if yes – how?

While providing novel opportunities, digital innovations are also transforming the whole port business landscape. They're opening the door to new competitors in key parts of the value chain (e.g. data or web platforms), and as such can disrupt the traditional power balance within ports. We're already witnessing players like Alibaba and Amazon investing in certain digital solutions for seaports. However, transport and logistics companies as

well as port authorities are often not equipped to deal with the fast-paced transformation of the environment that comes with digital innovation. There is a number of things regulators should focus on in order to improve the digital preparedness of seaports. For one, they should support the acceleration of developing common standards and interoperable solutions across the entire transport sector to avoid fragmentation. Next, they should make investing in digital products more attractive. They should also create incentives for port employees to upgrade digital skills. Least of all, they need to increase the awareness of the cost-avoiding benefits of adhering to high cybersecurity standards, something of utmost importance when one looks how easily a single cyberattack can wreak havoc across the maritime world, even if it's not aimed at it in the first place!

One cannot stress enough the importance of having a clear understanding of the needs and particularities of the port sector by major regulators, be it the International Maritime Organization, the European Commission, or

national governments. This complex multi-stakeholder environment requires a tailored approach where associations like the BPO or the European Sea Ports Organisation (ESPO) can play important roles as interpreters between the industry and regulatory side.

■ **How well is the port industry, especially in the Baltic Sea region, prepared for issues related to cybersecurity?**

Increased automation and the decrease of manual intervention creates a fertile ground for security breaches, as we have recently witnessed with the Petya ransomware attack, to which the APM Terminals have fallen victim. Port and ship cybersecurity has become of paramount importance, since the economic impact of such attacks on the shipping industry and port operations is huge. Companies active in the port industry are responsible not just for customer data, which is already extremely valuable, but also for physical goods, many of which can be regarded as strategic stockpiles, increasing the need for a robust security system.

Right now port security is limited to the global International Ship and Port Facility Security Code, which focusses mainly on physical threats. Port authority ecosystems must be aware that the digital threat is just as important, certainly if ports continue on their path towards further digitisation. Back in 2011, the European Network and Information Security Agency (ENISA) investigated the maritime industry's level of preparedness for a cybersecurity breach. They found that maritime cybersecurity awareness was low to non-existent, and that better information exchange and statistics on cybersecurity can help insurers improve security conditions. Sad to say this, but the cyberattacks which occurred in ports lately, like the drug-related attack on the Port of Antwerp and more recently the attack that hit APM Terminals together with other major players from across the transport and logistics sector, showed that little to no progress has been made in the meantime on this issue.

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Photo: Daikin Reefer

# Reefers in the digital age

by Katsuhiro Tetsuya, Director, Daikin Reefer



Headquartered in Japan, Daikin Transportation and Refrigeration Systems Division (Daikin Reefer) is a wholly-owned division of Daikin Industries Ltd, providing refrigeration equipment to the global container industry. Grounded in more than 90 years' experience, Daikin Reefer combines world-leading Japanese technology that delivers assured reliability, performance, and efficiency. For more information on Daikin, please visit [www.daikinreefer.com](http://www.daikinreefer.com) or follow @DaikinReefer.

**The continued growth of global populations and average salaries, combined with the increased demand for year-round imports, is facilitating the expansion of the reefer segment. According to Drewry, a global shipping consultancy, seaborne reefer cargo trade will reach a staggering 120 million tonnes by 2020, increasing by an average of 2.5% per annum.**

**a**dvances in reefer technology are attracting the attention of new customers lured by the promise of a cheaper and more environmentally-friendly shipping solution.

### Advances in new technologies

Technologies such as active controlled atmosphere (active CA) and precise temperature control are providing cost-effective trade opportunities for fruit growers, shipping lines, and food retailers. They are also increasing the choice and quality of goods available to consumers – regardless of regional seasons. Sea freight has even become a preferable shipping method of high-value items such as perishable fruit and vegetables as well as pharmaceuticals and cut flowers, which used to be moved predominantly by air freight.

For shippers, perishability and shelf life are critical. This is why CA and precise temperature control will continue to gain in popularity. What remains constant, however, is reliability – especially in economically challenging times. If there is something wrong with a reefer container, its cargo will almost certainly be damaged. The high risk of loss or damage, and of having their reputation tarnished by not being reliable, is therefore high.

For this reason, we will see continuous improvements made to the refrigerating

system in reefer containers to increase their reliability. As a case in point, the Internet of Things (IoT) and big data make it possible to track the position and temperature of reefer containers around the globe in real time. This increases traceability, optimises maintenance, and prevents breakdowns. Employing machine-to-machine (M2M) telematics and sensors to monitor the stuff in the Internet of Things, as well as leveraging big data, will become increasingly commonplace.

### Data of big importance

Big data is already an essential part of machinery analysis. With the right information (e.g. temperature or failure data), analysis can be conducted to predict potential reefer breakdown, and to efficiently carry out preventive or scheduled maintenance. The end result is a much more streamlined maintenance, breakdown, and repair process, which reduces equipment downtime and minimises mistakes due to human error. And, in today's challenging operating environment, increasing control over the management and operation of reefers remains crucial to shippers and shipping lines.

For shippers and shipping lines, real-time visibility tracking is the key benefit of M2M telematics and sensors. By fitting containers, equipment, and cargo with



automated locating and sensing technology, real-time visibility can be improved to achieve greater control over complex container supply chain operations. Knowing the location of each and every reefer at any given moment, as well as what condition the cargo is in, ensures a much more efficient use of equipment, since it facilitates making smart decisions. For example, if a shipping line knows that the shipment in transit remains in very good condition, then the container(s) could be temporarily stored without compromising cargo quality.

Moreover, IoT, M2M, and remote container management can save shipping lines significant amounts of time and money. Sensor technology can be utilised to determine whether something is wrong with the cargo, to locate precisely which container holds it, and to select the tools needed to fix it, therefore negating the need for manual troubleshooting.

### **Minimising human error**

According to Lasse Eriksson, Vice President of Digitisation at Cargotec, using smart devices in the cargo trade to monitor and control vessel fuel consumption, as well as to conduct requisite maintenance and repairs, and to manage and co-ordinate the fleet correctly, could save USD 350 thousand per vessel annually. In the container industry, the savings could amount to USD 17 billion, in total.

In today's market, M2M devices are comprised of various sensors that can be utilised to monitor an array of conditions, including temperature, humidity, and light. These devices allow users to remotely monitor and take the necessary corrective action. For example, sophisticated devices can easily regulate the temperature and internal climate of refrigerated containers. The potential for this is significant; ORBCOMM, for example, estimates that there are currently only 300,000 refrigerated containers fitted with M2M telematics, out of the global fleet of approximately 1.5 million units.

At present, if a reefer malfunctions, it sends out an alarm code, which has to be interpreted by a technician or chief engineer using a manual to effectively match the alarm code with the description and repair the problem to the best of their ability.

These new technologies have the potential to revolutionise the troubleshooting, repairs, and maintenance process by minimising the potential for human error, thereby reducing reefer failures, cargo claims, and ultimately food waste.

As part of our ongoing efforts to improve the reliability of our reefers, we at Daikin are continuously looking at cargo quality and how we can transport sensitive perishable products in better conditions for longer periods of time – all to extend their shelf life.

Daikin Reefer has developed the Daikin Intelligent Pre-trip Inspection (DIPTI) software to facilitate and streamline the current pre-trip inspection process. Reefers equipped with DIPTI are able to self-assess and effectively run diagnostics on how well the machinery is performing based on information gathered from the previous trip. Utilising this data, the reefer makes an informed decision on whether a Pre-Trip Inspection is needed. Whilst it is not needed in most cases, the ability for the machinery to determine this by itself is hugely beneficial to our customers, as it offers additional cost savings.

### **Adapting to the digital change**

Our plan is to take this a step further by utilising Artificial Intelligence (AI) to improve machinery performance. We envision a future in which a reefer that is not performing at optimal level, or is running on old software, can communicate with a newer reefer to compare performance, or to get the latest software.

Despite the various technological advances in the digital age, reliability remains pivotal to the Daikin Reefer promise. Cargo quality, combined with failure data analysis, allows technicians to

adequately prepare for maintenance if something goes wrong with our reefers, before a container reaches its destination. We continuously strive to provide a reliable service. This means empowering more people to make the right decisions at the right time and ensuring they are equipped with the exact information and proper parts to carry out any work needed. This safeguards cargo and minimises claims.

In November 2016, Daikin Industries Ltd. opened the Daikin Technology and Innovation Center (TIC) in Osaka. Based on the core principle of technology as a lifeline for manufacturers, TIC brings together companies, governments, universities, and other institutions with a shared interest in new technologies, as well as an appetite for potential future collaboration. True to the Daikin Group's philosophy, together we generate new value by anticipating the future needs of customers. Looking ahead, we believe that the most successful companies will be those that respond and react accordingly to external changes.

### **Future standards**

The drive towards digitalisation will continue and Daikin predicts that reefer containers will increasingly become visible, smart, and connected devices. Indeed, this will eventually become the industry standard. Fitting containers, equipment, and cargo with automated locating and sensing technology can improve real-time visibility to achieve greater control over complex container supply chain operations. Ultimately, however, people will remain central to upholding the highest levels of reliability, and it is their skills, married with technological advancements in reefer technology, that will drive the continued evolution of the market. ■



# IT to keep ports working

by Maciej Kniter



**P**eter Lundgren works at JLT Mobile Computers as Sales Director. In the past Peter held higher positions at IBM and Telia.

**IT companies are growing rapidly. Some, like JLT Mobile Computers, come from surprising backgrounds. Once a supplier of hardware control systems to the forest industry it is currently providing hardware and software for ports, and other industries operating in harsh environments. We are talking with Peter Lundgren about the company's recent projects and future plans, conquering new markets, automation as well as the TOC event itself.**

■ **What was your company's performance last year?**

It was a record year for us. Turnover increased by more than 50%, which is a very healthy growth (for detailed figures, please see our quarterly reports which are easily accessible on our website). To give you a couple of examples, we won a big project in the United States, where competition is much higher than in Europe; namely, a million-dollar deal with one of the largest transportation service providers in the world who deployed our JLT1214P vehicle computers in cross-dock forklifts at sites across the

United States. We also started an interesting project for ICTSI in Basra, where we have delivered 50 mobile computers. The temperatures here can soar to well above 50 °C in the driver cabins, yet the customer tells us that our rugged computers are running without any problems. That's the best proof that our products are of good quality! It's true that we have a nice and steady growth in ports, with a visible trend that customers are looking for equipment made in Europe. I can give a quick example – we talked to one customer who bought equipment from an Asian supplier two years ago; now they're closing down and the customer is left with almost new equipment without service, spare parts, and so on. In comparison, we at JLT Mobile Computers keep spare parts for our products for at least 5 years, often as long as 10 years or even more. And this is our commitment to our customers; we want to keep things working.

■ **Could you name some fields you want to expand? I mean both conquering new markets, and some new products you offer.**

In terms of regions, we are already present globally, from Europe and the



USA, to China and Iraq, so I don't see any big challenges in terms of geography. However, we see the biggest increase rather in your second point. I've been in this business for some years now, and my observation is that the companies, or more accurately, brands, are concentrating. I noticed at least four or five instances when a big company is either taken over by another, or it simply goes bankrupt. On the product side, one new trend that we see is customers asking for new functionalities to be added. In this case we serve them with our mechanics, electronics, software, we increase reliability, adapt our computers to the Internet of Things, etc.

■ **What's the role of the container business in all of it?**

Seaports are crucial for us, but we also begin to see a growing interest from the inland intermodal terminals. This is because our technology can be successfully applied inland as well. Traditionally, companies are focused on one sector, but we serve all – from dry indoor warehouse environments

to offshore. And the same happens in ports, more and more ports handle different types of cargo nowadays.

■ **How does automation influence your products?**

Automation is a process. It is not an overnight event. Some devices will work without constant control, but I'd like to say something different, it's not only the job of the supplier, it's both sides that participate in automation. The purchaser is often forgotten, but they must strictly specify their requirements. We've been in business for some 20 years, starting from supplying rugged computers to the forest industry. We used our technology later in mining, offshore, container business, and seaports in general. For me automation means the adoption to different requirements.

■ **How has the market changed over the past 10 years?**

We are involved in many different industries, and since the markets are developing differently that's a bit of a

tricky question. In agriculture, for example, the IT sector is developing really fast. We cooperate with a company in Belgium that inspects carrot seeds on farms. A camera does the image analysing, and the bad seeds are taken away, so only good ones are left. Solutions from ports and terminals can be applied even there!

■ **Considering what you have told us, what are your thoughts on this year's TOC?**

It's a great show to attend as the maritime business is developing very rapidly. This is the fourth time we decided to come and we don't regret doing this. We were very pleased to see our old friends here, and also to meet new prospects. TOC has always been focused on technology, that's quite natural, but this year there were a lot of automation and IT-related products. That's good; the ports are changing, and that is also contributing to changes in the other sectors. All of it is linked together!



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# Destination 2020

by **Peter Due**, Project Manager, Strategic Projects, Kongsberg Maritime

Once fully operational in 2020, *YARA Birkeland* will be the world's first fully electric, autonomous, and zero-emission container ship. However, her voyages are scheduled to start as early as the second half of 2018, when she'll begin carrying cargo from YARA's Porsgrunn production plant to Brevik and Larvik in Norway.

A joint development project between the agricultural solutions provider Yara and maritime technology developer Kongsberg, *YARA Birkeland* will be a 120 TEU open-top container vessel. Both companies believe that she'll be a true game changer, capable of rewriting the global shipping rulebook. Grand claims indeed, especially as her *raison d'être* is to replace a relatively short truck route with short sea shipping in Southern Norway. But from these relatively local ambitions, Kongsberg and Yara are creating a technology and operational blueprint for a safer, lower cost, and far more environmentally sound global shipping industry.

## The commitment

The project, which started in 2017, was born out of Yara's commitment to minimising the impact of its global operations on the environment. As a leading crop nutrition, nitrogen applications, and environmental solutions provider – with a total of 27 production plants in Europe, Americas, and Australia, and sales to approximately 160 countries – the company's stated aim is to deliver profitable and responsible solutions for agriculture and the environment.

Yara's fertilizers, as well as crop nutrition programmes and technologies,

increase yields, improve product quality, and reduce the environmental impact of agricultural practices. Its industrial and environmental solutions improve air quality by reducing emissions from manufacturing and transportation, and serve as key ingredients in the production of a wide range of goods. While Yara's product development and production is already at the forefront of environmental protection, the company believes that even more can be done. With this in mind, Yara has now turned its attention to its own logistics chain.

## The future of clean sea shipping

*YARA Birkeland* will be transporting fertilizer products from Yara's production plant in Porsgrunn, southeast Norway, to the country's sea container hubs in Brevik and Larvik. By road, the distance from the Porsgrunn production plant to the Port of Larvik is approximately 30 kilometres. By sea, navigating south through a beautiful part of the Frierfjord, the voyage is 58 kilometres (32 nautical miles). Currently, Yara dispatches around 100 twenty-foot containers of fertilizer products from its Porsgrunn plant by truck every day to these regional shipping hubs. From there, fertilizers are delivered to key agricultural markets in Asia and South-America.

Simply put, *YARA Birkeland* will reduce the number of trucks needed. Even though the journey by water is longer than by road, it will noticeably reduce NO<sub>x</sub> and CO<sub>2</sub> emissions, as well as improve road

safety by eliminating up to 40,000 truck trips across urban areas. The emission reduction comes from the fact that the ship will be all-electric. She will burn zero fossil fuels throughout her entire lifetime – its batteries will get all of their energy from clean Norwegian hydropower during loading and unloading, effectively getting rid of 700 tonnes of carbon dioxide emissions annually. The move towards all-electric

**Tab. 1. YARA Birkeland's key particulars<sup>1</sup>**

<b>LOA</b>	80 m
<b>Beam</b>	15 m
<b>Depth</b>	12 m
<b>Service/ max speed</b>	5 m/3 m
<b>Cargo capacity</b>	120 TEU
<b>Deadweight</b>	3,200 tn
<b>Propulsion</b>	Two azimuth pods, two tunnel thrusters
<b>Battery pack</b>	7.5-9.0 MWh
<b>Key sensors</b>	Camera (incl. infrared), radar, AIS, lidar
<b>Milestones</b>	<ul style="list-style-type: none"> <li>• 2017 – design finalised by Marin Teknikk; building contract awarded</li> <li>• H2 2018 – delivery from the shipyard; testing with captain and small crew, placed in a container-based bridge and crew unit</li> <li>• 2019 – remote control tests</li> <li>• 2020 – fully autonomous operation</li> </ul>

<sup>1</sup> Subject to change as the project develops



operation will also extend onto land. Loading and unloading will be done automatically, using electric cranes and other e-machinery. The ship will be equipped with an automatic mooring system, as well. In all, *YARA Birkeland* will be a living proof that a much cleaner maritime transport is achievable.

### She can do it all on her own

Autonomous operation will be another of *YARA Birkeland*'s ground-breaking features. The switch to unmanned service will be divided into several phases, giving Yara and Kongsberg time to test the advanced systems that enable operation without a person at the ship's helm. When she sets sail in 2018, *YARA Birkeland* will initially operate as a manned vessel. She will move to remote operation in 2019, and is expected to become fully autonomous in 2020. Due to her unique nature and state-of-the-art technology, the initial investment in the development and construction of *YARA Birkeland* will be higher than in the case of conventional ships of comparable

size; however, replacing truck transport with an unmanned, electric, and ballast free vessel will significantly reduce OPEX costs. It's also interesting to note that substantial savings will come from eliminating the need for "hotel" accommodation areas for the crew. This will help to reduce CAPEX at the design and build phase, but will also contribute to reduced OPEX, as there will be no energy consumption from crew facilities. The relatively small planned operational area makes *YARA Birkeland* an ideal platform to introduce full maritime autonomy. The vessel will sail within 12 nautical miles from the coast, between selected ports in Southern Norway. The whole area is wholly covered by the Norwegian Coastal Administrations' Vessel Traffic System (VTS) located in Brevik. In total, three centres with different operational profiles are planned to handle all the aspects of operating *YARA Birkeland*, including emergency and exception handling, condition and operation monitoring, decision support, surveillance of the ship and its surroundings, and all other safety

considerations. Alongside the VTS centre in Brevik, Yara will build a mission management/logistic centre in Porsgrunn, while Kongsberg Maritime will establish a shore control centre to monitor the ship's autonomous operation.

Kongsberg is providing all of the vessel's technology. Surprisingly, not all of it is specially developed for autonomy. This is because the solutions that allow ships to operate without a human being in the loop have already been available for a number of years. In fact, if we look back as far as the early Dynamic Positioning systems for offshore vessels, as well as other automation systems for merchant ships, the technology has been there for decades. What is new for *YARA Birkeland* in particular, and for the future unmanned vessel industry in general, is the way in which the control systems are integrated on-board and managed ashore. *YARA Birkeland* will be the platform that will shape future use of autonomous technology at sea.

Essentially, this shows that there are no longer any technical limitations to constructing large, unmanned, and automated ships. The key obstacles are now chiefly regulatory, and these issues are at the forefront of the *YARA Birkeland* project. So far, on the legislation and regulation side, there has been strong collaboration with Norway's various governing bodies and authorities, including the Norwegian Maritime Authority and Norwegian Coastal Administration. The project has also applied for support through ENOVA, an organisation established by the Norwegian government to invest in solutions that help build a greener Norway.

### Close, closer, almost there

By moving container transportation from land to sea, *YARA Birkeland* will make a major contribution towards fulfilling national and international environmental impact goals. On the strength of this promise, collaboration with the various governing bodies is proceeding well. With technology integration efforts well underway as well, the goal of making *YARA Birkeland* the world's first fully autonomous ship by 2020 seems very much within reach. ■

# From the military to ports

by Maciej Kniter



**C**hris Mason is Director of Sales for EMEA at Rajant Corporation. Previously Chris worked as Managing Director at Levels Business Consulting, held many positions at BT Global Services, for example Global Industry Practice Lead – Energy & Resources, and Senior Business Development Director – Global Mining, Oil & Gas, as well as was a Business Development Director at ICC Information. held higher positions at IBM and Telia.



**The metal containers alone are barriers and create interference for radio communications, which means that in such a dynamic environment, a network that can ensure that such physical barriers do not prevent operational connectivity and efficiency is essential.**

**TOC Europe is a harvest time for all port-oriented individuals keen on talks and discussions. Conversations spiced up by many technological topics could be heard at Rajant Corporation's stand, where we conducted an interview with Chris Mason. He told us a lot about the company profile, performance, and vision for the future business.**

## ■ What's in your company's current portfolio?

Rajant is a provider of private wireless networks powered by Kinetic Mesh®, BreadCrumb® nodes, and our patented InstaMesh® software. The technology we offer to the market is highly adaptable, and it leverages the power of real-time information to deliver on-demand critical business intelligence from the field. Such solutions are needed in environments where critical data is the lifeblood of industrial operations. They simply must be delivered from source to destination, in real-time, with low latency and high bandwidth, in dynamic, mobile environments where the lack of data on location and activity not only leads to reduced profits, but also potential loss of life. For instance, in port environments the Kinetic Mesh Network capability offers a mechanism to monitor, control, and optimise terminal operations to increase efficiency as well as maintain health and safety standards.

## ■ Could you sum up your company's performance in 2016?

Last year was a definite turning point for us, with a very positive trajectory

for a couple of reasons. First, we started realizing the benefits of our vertical market expansion strategy. Up and until a few years ago, Rajant's revenue and customer base came from two primary markets – military and mining. But now we are gaining significant traction and customers in ports, oil and gas, public safety, and transportation and logistics. Interestingly, these new industry sectors all have one thing in common: requirements for mission-critical network infrastructure that would secure and support mobility 24/7.

With the opening of our US Phoenix office in 2016, we have an entire team of security engineers dedicated to advancing our Information Assurance agenda across our technology platform. They are assisting us in developing the highest levels of cryptography in the areas for military warfare solutions, as well as for the automotive and connected car industry. As security challenges continue to keep network and communications managers up at night, we are thrilled to have such an advanced team with deep credentials working around the clock to ensure that our





Kinetic Mesh networks are secured. Another factor has been our ability to get our technology in front of more global customers as a result of a formal strategic partnership we entered with the Japanese company Mitsui in 2016. Together we share the vision of advancing network communications for industrial Internet of Things companies, something which is instrumental in expediting customer engagements and setting up technology demonstrations.

On a final note, our eco-system of channel partners has matured and evolved considerably. This maturation has opened new original equipment manufacturer partnerships and is attracting more qualified integrators partners who are best-positioned to leverage our technology to industrial enterprises like port terminals that demand it.

■ **Is there anything particular in Rajant's portfolio for this year?**

This year we added a new product to our solutions portfolio – the Slip-Stream. In order to better meet the growing demands of industrial applications, as well as autonomous unmanned aerial and ground vehicles, we developed a unique wired Bread-Crumb® that allows our customers to deploy a high throughput interface between their wired network and their existing Rajant Kinetic Mesh network. When properly designed into the network, customers can more than triple their throughput and are more capable of supporting additional video surveillance and automation functions demanding added capacity. We built

this product based on direct feedback from our customers. They now have a reliable and proven option for expanding network throughput rather than having to resort to a costly and unproven LTE alternative.

This year we have also enabled aerial broadband connectivity by introducing drones onto our Kinetic Mesh network. Now our customers can leverage unmanned aerial vehicles (UAVs) to accomplish tasks and applications more efficiently from the sky and at a substantial cost savings.. This is both an interest and a requirement that we are seeing in the ports and terminals today.

■ **What do you precisely do for ports?**

Ports are great environments to showcase the characteristics of a Kinetic Mesh® network. In common with most industrial processing applications, efficiency in processes provides the competitive edge in operational environments. Port locations include the co-ordinated and rule-driven movement and storage of containers – according to a complex, dynamic plan to serve the customers shipping and transferring containers. The metal containers alone are barriers and create interference for radio communications, which means that in such a dynamic environment, a network that can ensure that such physical barriers do not prevent operational connectivity and efficiency is essential.

Furthermore, container port environments are not radio-free environments. The ships that carry containers have their own radio networks, radar systems, and the flat open nature

of modern container terminals means that radio interference from neighbouring operations and municipalities adjoining the port is ever-present and needs accommodating into any reliable wireless system. Rajant's multi-radio and dynamic routing technology adapts to localised interference and ensures that low-latency and high-bandwidth is maintained.

■ **What is your vision for Rajant for the next decade?**

We believe 2017 is aligning with our 10-year vision. We have witnessed a pretty significant transition in terms of what our customers want from their networks, and those demands continue to grow in depth and complexity. Not only are industrial enterprise networks growing in size and function, they are also incorporating autonomous applications and robotics. Our 10-year vision is one that enables us to continue developing our industry leading InstaMesh so that it can bring additional intelligence and autonomous decision making to growth sectors such as Industry 4.0.

■ **Any comment on this year's TOC Europe?**

TOC Europe was a conference we are very keen to attend, given significant recent successes in securing port deployment contracts and the increasing number of enquiries from operators globally. The number of visitors to the stand and the interest shown in the technology is excellent. Not only did our booth staff have little time for breaks for food and drink, but after the second day of the event we had to have additional business cards printed – such was the level of visitors and interest in Rajant solutions. I can also say that it is one of the few trade shows

I have staffed, where in the first day we were asked to produce an outline design for a container port with associated rough order of magnitude pricing.



Photos: EfficienSea2

# E-connecting the maritime world

by Esben Pejstrup-Pedersen, *Communications Assistant, Danish Maritime Authority and EfficienSea2*

**The potential for digitalisation in the maritime domain is massive, but a fragmented sector, hardly any globally standardized solutions in place, and high regulative barriers threaten to cause more pain than gain for the shipping industry. The EfficienSea2 project, funded by the EU and led by the Danish Maritime Authority, involves 32 partners. Named a Baltic Flagship Project by the EU Strategy for the Baltic Sea Region, it is working towards changing this situation with the help of the e-Navigation concept.**

These days, ships are fitted with sophisticated equipment capable of almost everything, from monitoring exhaustion to analysing large quantities of data. Even some older vessels, and a great many maritime companies, are able to share vast amounts of data internally in refined ways. However, when sharing information between ships, ports, authorities, and maritime service providers, workflows are often paper-based, or come in incompatible standards. This results in a loss of both safety and efficiency.

Those involved in EfficienSea2 strongly believe that there's a way out of this dead-end, leading through the implementation of the concepts of e-Navigation and e-Maritime. "EfficienSea2 is essentially based on the idea that globally harmonized digital standards are needed if we are to reap the benefits of digitalisation in the maritime world. We want the different service providers to compete on solutions rather than on standards. In 2017, it makes no sense that computers aboard a ship and ashore speak two different digital languages," Mads Friis Sørensen, who was Senior Adviser at the Danish Maritime Administration and Project Leader for EfficienSea2, explained.

The project partners plan to provide a wide range of coherent e-Navigation solutions, but will also focus on providing solutions assisting with the many administrative burdens related to reporting to ports and authorities. "Too big a part of what the mariners do is administration," Sørensen said, and further added, "By that, I don't necessarily mean the authorities and ports are wrong to request a lot of information, but it should be done in a smarter way. We are building a framework that will enable smarter communications and less administrative burdens for the navigators, so they can focus on getting the ship safely from point A to Z."

## **A framework not in the clouds**

The EfficienSea2 project is focused on different parts of a greater whole, a communications framework known as the Maritime Connectivity Platform (MCP) being its centrepiece. In the main, the MCP is a cloud-based register for secure identities and trustworthy maritime services. It will be able to solve many of the issues surrounding authentication and trust, currently causing concern in the maritime domain. "One moment a mariner has to register in a National Single Window and the next you must provide information to a regional Vessel Traffic System. One port requires the mariner

to provide data in an Excel format, while another wants it done via an online formula. We want to combine all these different workflows by sharing information between partners connected in the MCP," Sørensen illustrated the issue. "All substantial maritime players will be able to register in the MCP, which safekeeps their identity and authorizes them to access a wide range of digital services. The services will be made available based on geographical position, ship type, permissions, and the specific need. At one point, the MCP could become the single access point for everyone who is serious about digitalising shipping," he added.

## **Global reach – Baltic touch**

In order to impact the entire maritime world, EfficienSea2 does not merely focus on providing a platform for finding trusted parties and services, and sharing data between them. It also emphasises the need for standardised data formats to cover the whole world.

To achieve this, the project uses the Baltic Sea as a test-bed, and develops a host of different services, making them available for mariners and the maritime industry. Most of these will be accessible on the web-based platform BalticWeb, which has been built to demonstrate the different e-Navigation solutions. BalticWeb is being developed as open source, and the



only thing one needs to access the map-based platform is an account in the MCP, which is being used to find and allow access to the different solutions available. In order to make the services globally accessible, EfficienSea2 works with international standardisation-bodies, such as IALA and the International Hydrographic Organisation, to ensure that the solutions are compatible with formats that will be approved for future use by relevant organisations. Moreover, as a part of their global approach, the team behind EfficienSea2 is closely cooperating with two other projects, the European Sea Traffic Management (STM) Validation and the Korean SMART Navigation, on the MCP. All three projects enlist services to the Cloud for testing that will help mariners and shipping companies better receive and share their data going forward (read more about the STM Validation project in *Baltic Transport Journal* 1/16's piece *A concept for future shipping*).

"Everything we do is a part of our ambition to connect the maritime world. We create solutions in open source for the Baltic Sea region, so developers based in the Pacific will be able to offer the same service, using the same standard, for their part of the world. At both places, the MCP will be able to provide the framework needed to share the data and expand coverage," Sørensen said.

### Wide range of practical benefits

The MCP is undoubtedly an ambitious endeavour, but EfficienSea2 keeps both feet on the ground while building the infrastructure needed to better connect the maritime world. A host of different research helps to deliver real world benefits independently of the MCP.

One such advance is the deployment and testing of the so-called Smart Buoys by the Maritime Office in Gdynia. These buoys will allow vessels and the port authorities to collect information

about weather, wave heights and water level, and then share that information with nearby users in a completely autonomous system. "EfficienSea2 is about much more than the MCP, and the Smart Buoys is a good example of how. They can bring great benefits to the navigators and improve safety at sea even without exploiting the MCP. At the same time, by exploiting the possibilities offered by the MCP, it will be easier for mariners to find the Smart Buoy Service and easier to receive and share the data they transmit," Sørensen underlined.

Active data-connection is another thing most digital solutions can benefit from, too. This need represents the final aspect of EfficienSea2; namely, the work being done on the so-called VHF Data Exchange System (VDES), which is being tested by Cobham SATCOM, Furuno, and the Polish National Institute of Telecommunications (all partners in the EfficienSea2 project). Sørensen said in this regard, "The MCP will include features that will allow it to function without a steady Internet connection, but everything we do is based on being connected. VDES is a chance to increase the bandwidth on the physical links in order to receive more data, and at a more attractive price."

The many different aspects of EfficienSea2 are expected to be finalised before April 2018, when the project ends. After that date, though, we firmly believe that all of the project's advances and solutions will continue to unroll, so that future shipping will have fair winds and following seas thanks to the cloud above it as well as buoys en route. ■

The EU-funded EfficienSea2 project – gathering 32 partners from 12 countries



– aims at creating and implementing innovative and smart solutions for efficient, safe, and sustainable traffic at sea through improved ship connectivity. EfficienSea2 is a demonstrator in the Arctic and Baltic Seas, and the first generation of a coherent e-Navigation solution. Through global collaboration, use of open source software, and an explicit aim for standardised solutions, the project wants to pave the way for a global roll-out of e-Navigation. For more info please visit [www.efficiensea2.org](http://www.efficiensea2.org)





Photos: www.pexels.com

# opPORTunity

by Sue Terpilowski OBE, *Managing Director, Image Line Communications*



**S**ue Terpilowski OBE is a frequent speaker and moderator at key industry events on ports and logistics issues. Sue is the MD of Image Line Communications, a dedicated PR, Marketing and Visual Events agency for the ports, maritime, logistics, and material handling sectors established for more than 29 years.

**Much is being written about how next-gen digital technologies are reconfiguring the logistics supply chain. But where exactly do ports fit into all of this? Do terms like “Port 4.0” or “Smart Port” carry any weight beyond sounding catchy? Following on from my presentation at the recent Mare Forum in Poland, I am even more of the opinion that this could be the coming of age for the port sector.**

**P**orts have been using digital advancements and automation to enhance their service performance levels for many years. In part, this has been driven by continued price pressure from carriers, the slowing down of growth, and high investment levels required to stay in the game (all of this especially holds true for ports reliant on container vessels for lower profit levels and a diminishing customer base). But ports have embraced technology and there are some excellent solutions in the market.

This has resulted in a commoditisation of service deliverables and driven them to offer a far higher level of service.

Then again, with profitability declining and fewer customers – who will not commit to contracts? And with ever increasing investment levels needed – where do ports go from here? Ports need to find a new way to differentiate themselves from each other. They have to offer a different type of value to the supply chain in order to gain a new customer base. Also, ports need to change their way of thinking about themselves, their operating and business models, and, even more importantly, move themselves up the value chain to be an indispensable must have, rather than, as commonly perceived now, as a cost and necessity that doesn't add anything to it. And they need to become a trade facilitator, an essential partner in the business supply chain.

## **All systems are go**

Until the 1960s, ports were seen as just loading and unloading places. Then between the 1960s and 1980s they became industrial ports. Until the last few years, they were a logistics port of necessity, part of the supply chain. Now into the 21<sup>st</sup> century, and with the ever increasing use of technology, ports are

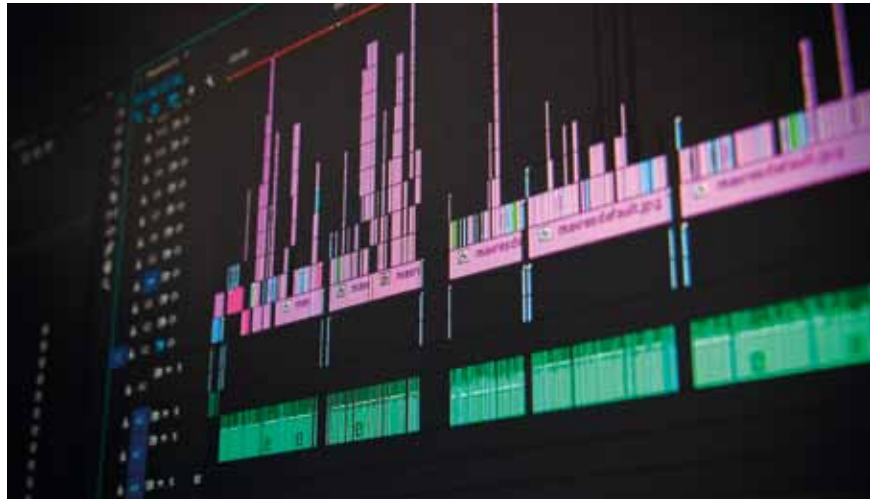


emerging as adopters of the latest digital innovations so as to become “Smart Ports” or “Ports 4.0”.

There are three eco-systems where port digitisation and automation have roles to fill: planning management, port management, and cargo/supply chain management. Today's digital port solutions are only focused on efficiency improvements like implementing better traffic management systems, improving the flow of goods throughout the port area, automating operations, reducing costs, or decreasing lead-time with the use of digital invoicing (customs). Covering two of the eco-systems planning and port management, the third is not really being taken full advantage of. Some ports are tinkering at the edges with container weighing services but very few are really embracing this opportunity. The future is in how ports embrace these three eco-systems and make them into one open sourced structure, supplying their vital data and unique analytics into a global supply chain system.

Naturally, there's also the Internet of Things (IoT), which I believe to be a genuine game changer offering really affordable tracking and data management for smart containers, low loaders, and similar port-wide machinery. The rollout of the IoT will finally bring about an almost seamless data trail all the way from origin to destination point.

So what else can ports add to make this even more desirable? The data that allows businesses to really plan their supply chain – when the goods will be unloaded, where they are in the port, and, just as importantly, when they realistically will leave the port – has been something of a black hole up to now. But when you add together (with the help of the IoT) shipping, logistics, and supply chain data you can gain real information to allow for smart planning and reduce the need to hold large inventories to cater for the unknown. Ships themselves will be communicating within the combined three-in-one eco-system, not only providing accurate location, but also showing whether they're running at optimum or sluggish levels, so that ports, in combination with weather forecasts, can plan for their arrivals almost down to a single second. This may help to bring some cargo back to the sea from air, provided that the shipment status and location can be verified all the time; that is, temperature can be monitored throughout the journey (from collection to delivery) and the goods



are not tampered with thanks to a certified proofing system. The big data adds another dimension to all of this by identifying bottlenecks and related issues (i.e. capacity needs, or traffic management tweaks), as well as by providing forecasting that is realistic enough for logisticians to be able to build supply chains around it. Last but not least, such superior real-time routing will result in less congestion and reduced carbon footprint, a foundation on which ports, often located either in close proximity to or in the very city centre, can build better relations with their societies and contribute to national and supranational environmental goals.

But the real transformation of supply chains is when this eco-system of data is then added to enterprise resource planning platforms – all those financial and insurance systems really assisting global trading. This is a similar revolution to the one Malcolm McLean enabled when he invented the container and allowed the affordability for goods to move efficiently around the world, essentially re-inventing the way the port and shipping sectors work.

### Talking to each other

So why isn't it happening now? Well, silo mentality is one obstacle and the real block is how and who is going to make any money from bringing together all this data, which to be honest today is mainly “dirty” unrefined records that need a lot of sifting to make them useful. This data has to become interchangeable so that it can be plugged into different eco-systems; some parts will have to be given freely, but when the need is for more sophisticated input this becomes the chargeable part. It will become an eco-system that will be

different for each consignment; TV broadcasters may not need a detailed analysis most of the time, but if a large advertising campaign is planned then making sure they are in stores will become the greatest need for really reliable and accurate data. Will customers pay the port and shipping lines to lift their boxes first as a service, giving them the optimum routing out? We'll see.

Times are indeed exciting and tech-opportunities are there to be seized, but changing minds and breaking out of the silo mindset is going to be the hardest part. The current three eco-systems in the port are hardly talking to each other. Bringing this into one-to-one environment is going to be challenging enough, but there are ports already starting to discover the potential. They are gearing themselves up to enter into the new era when ports come into play as vital nodes in the supply chain and gaining a new source of revenues from cargo owners, financial and insurance institutions, and facilitating the next generation of global trade.

But the one question I haven't really found the answer to is who is going to pay for this eco-system, or will it just have many parts blending together when needed from an open source platform similar in the way Wordpress is used for websites with some free plugs-ins and some paid for ones combining to form unique individual solutions diving in and out of the blockchain? But this is a technical “how?” question, because the essential “if?” has already been answered in the affirmative.. ■



Photo: www.pexels.com

# The wave

by Przemysław Myszka



**M**ichael Dempsey  
VP Container and Port Solutions



**C**hristian Allred  
VP International



**S**ue Rutherford  
VP Marketing

The world is going digital, and the so-called Internet of Things is one of the most powerful forces behind this transition, sweeping up almost everything – from daily utensils to global supply chains. We are talking with Michael Dempsey, Christian Allred, and Sue Rutherford of the US-based ORBCOMM about the changes that have already become a fact of life, as well as the opportunities and threats that emerge from this new wave of IT developments.

■ When talking of a “single” transport and logistics industry, are we really dealing with an environment of interconnected companies and assets? Or is this just a handy generic name for a fragmented industry that has not yet fully coalesced?

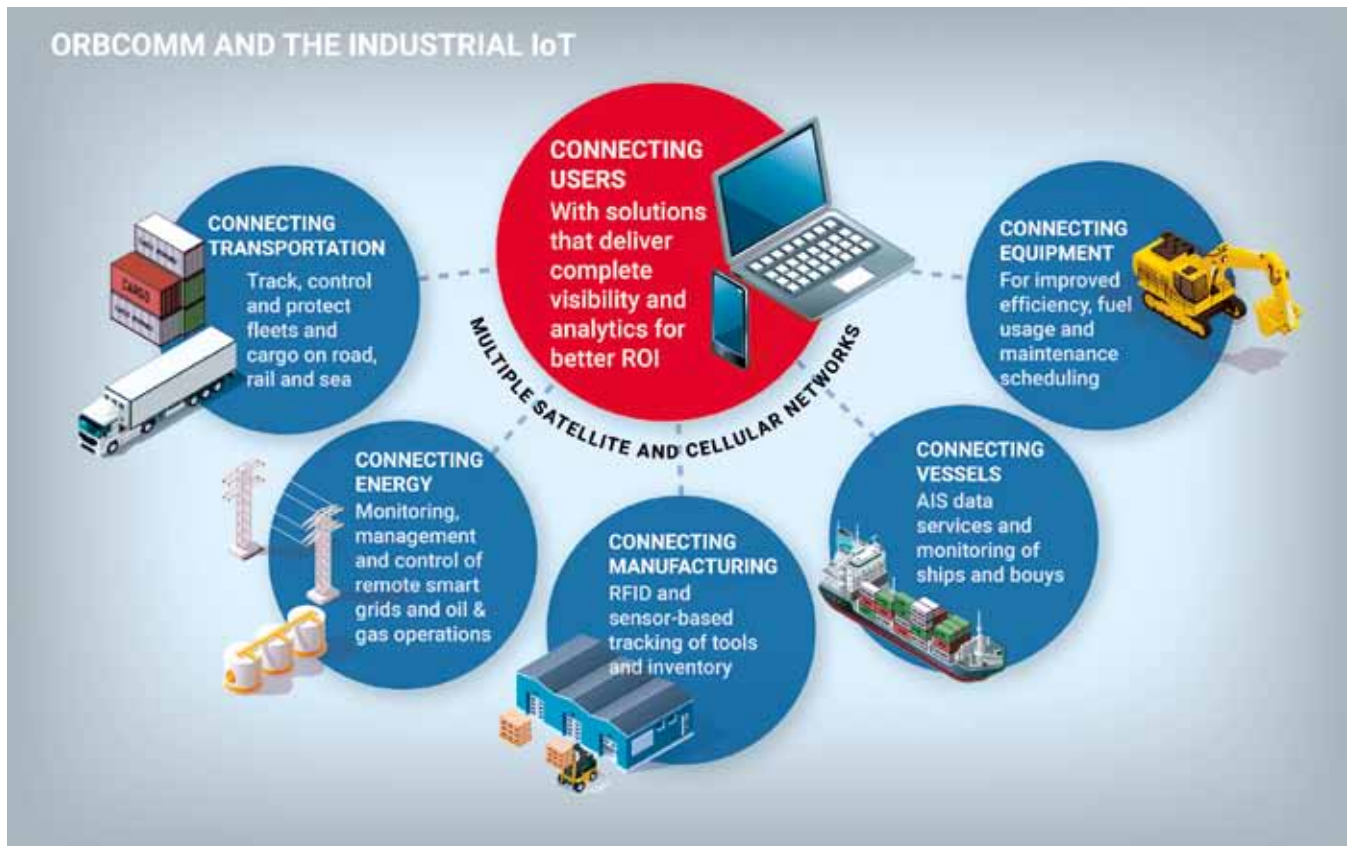
When you look at IT companies catering to the sector today, you can see a lot of them fitting only one piece of the puzzle, like providing GSM coverage, some electronic devices, or apps. We, on the other hand, deliver a multilevel stack, including sensor technology, devices, network management (of both GSM and satellite communication), as well as software. We’re most probably the only industrial Internet of Things (IoT) provider on the market who has its own constellation of satellites, over 40 of them today. Through our early asset work in this area, we’ve developed what we call low Earth orbit satellites. As it turned out back in 2002, the Automatic Identification System (AIS) for vessel tracking was an ideal match for this, so we’re currently the largest wholesaler of AIS data in the world. We have clients all over the globe,

also in the Baltic region – Gdynia’s Balticon, for instance. This IoT stack capability has led us to crosscutting the transport and logistics industry, so that when you have e.g. a container that backs to a warehouse and then is cross-loaded onto a trailer, we link up these connected assets that operate on closely affiliated but sometimes still separate markets.

■ How are innovations such as machine-to-machine communication, real-time connectivity, and the IoT re-shaping the shipping business, both off- and onshore, or – more broadly – the whole supply chain?

Let us answer through the eyes of our biggest customer, i.e. Maersk Line, who currently has over 300 thousand containers with our devices installed. We believe that Maersk had a pretty good idea what kind of benefits they’ll get from this deployment – for instance, better internal process efficiency. But during one meeting, their reefer manager said that, honestly speaking, they don’t even know how this technology will impact all of their processes in the end – if there will be an end to this

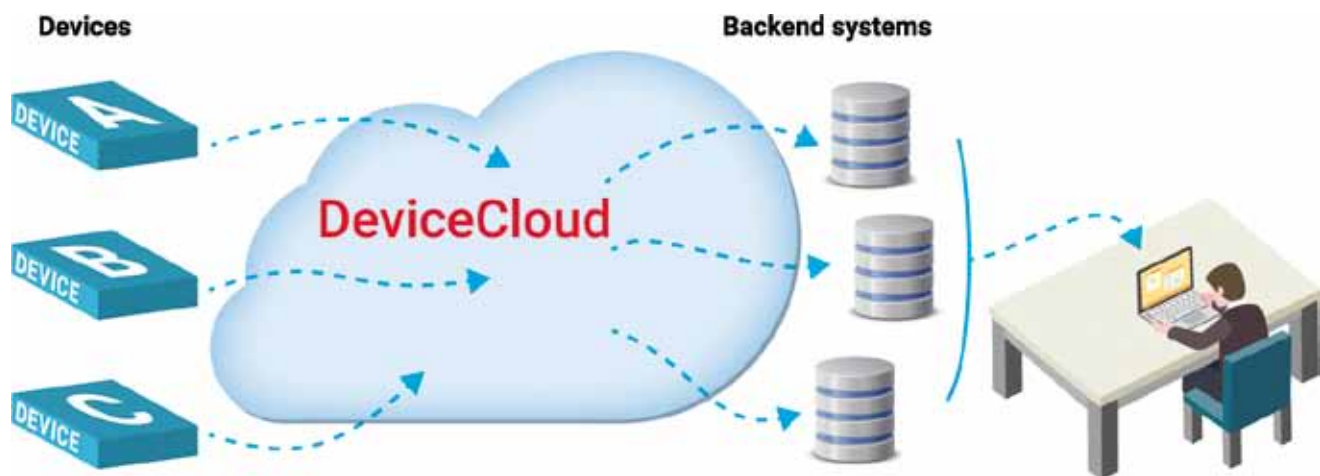




– simply because every day they're finding new ways of improving their operations thanks to the system. The unique situation we're dealing with nowadays in IT shipping is that everybody can indeed craft a game plan in advance, but, when the real shooting starts, they're surprised how many other possibilities pop up all over the place. Maersk had to initially dive big into setting the data flow free so that they could later start discovering the opportunities stemming from it – opportunities such as better asset visibility, which could in turn be used for improving container maintenance. Essentially, once deployed, the IoT proves to be a far larger thing than expected, helping companies not only with real-time asset management but also promising a qualitative breakthrough when it comes to adaptive predicting. When we think about big data, two things come forward. First, exception management. Maersk Line has a centre where, thanks to big data, they don't have to monitor each and every container, but can instead focus on the more demanding exceptions. Second, big data allows you

to work with things like machine-to-machine learning or predictive analysis for efficiency improvement. What Maersk did in this regard, in cooperation with the Technical University of Denmark, is that they've developed a pre-trip inspection (PTI) tool. Before a reefer box is delivered to a company for loading with temperature-sensitive goods – meaning high value but also higher risk cargo – it has to be tested. This process lasts several hours and costs a lot (in the US, around 300 USD per box), particularly when you have thousands of reefers. So, the starting question was: Can we save money through PTIs? Thanks to big data – i.e. historical records, a box's current state, etc. – they now know if a given container needs a PTI even before it arrives. Essentially, you've got this heavy chunk of intelligence giving out a simple "Yes" or "No" answer as to whether or not a container needs maintenance. The IoT is instrumental in leveraging flexibility, too. The Food Safety Modernization Act (FSMA) became effective on April 1<sup>st</sup>, mandating that anybody who "touches" a cold chain

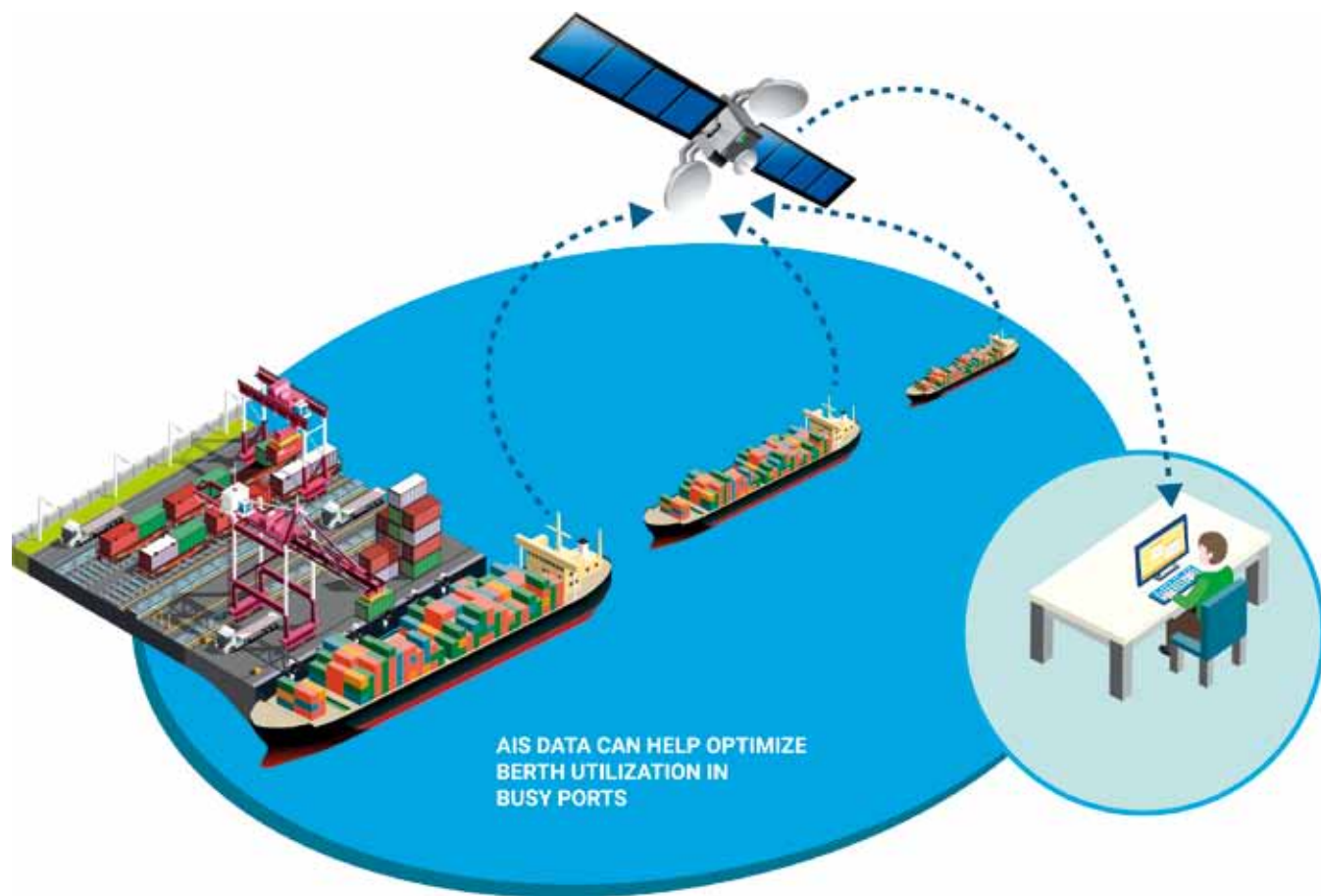
product that moves into the US must, if requested, provide a temperature record within 24 hours. Obviously, Maersk along with all of our reefer truck customers were FSMA-compliant from day one. Take another example: The market of moving pharmaceuticals between Puerto Rico and Florida, as well as other parts of the mainland, has become so competitive that unless you have a 24/7 end-to-end container visibility, nobody will do business with you. This is not to even mention being prepared for such logistic adversities as port congestion. In the past, the pharmaceutical guys were struggling with a black hole out in the sea regarding their cargo, a delicate and tense issue when you look at the value of goods they ship. Of course, it's not only about sea shipping. We're working on a project across the New Silk Road, too, where we have put both GSM and satellite devices onto reefers. This redundancy ensures us that, if a container

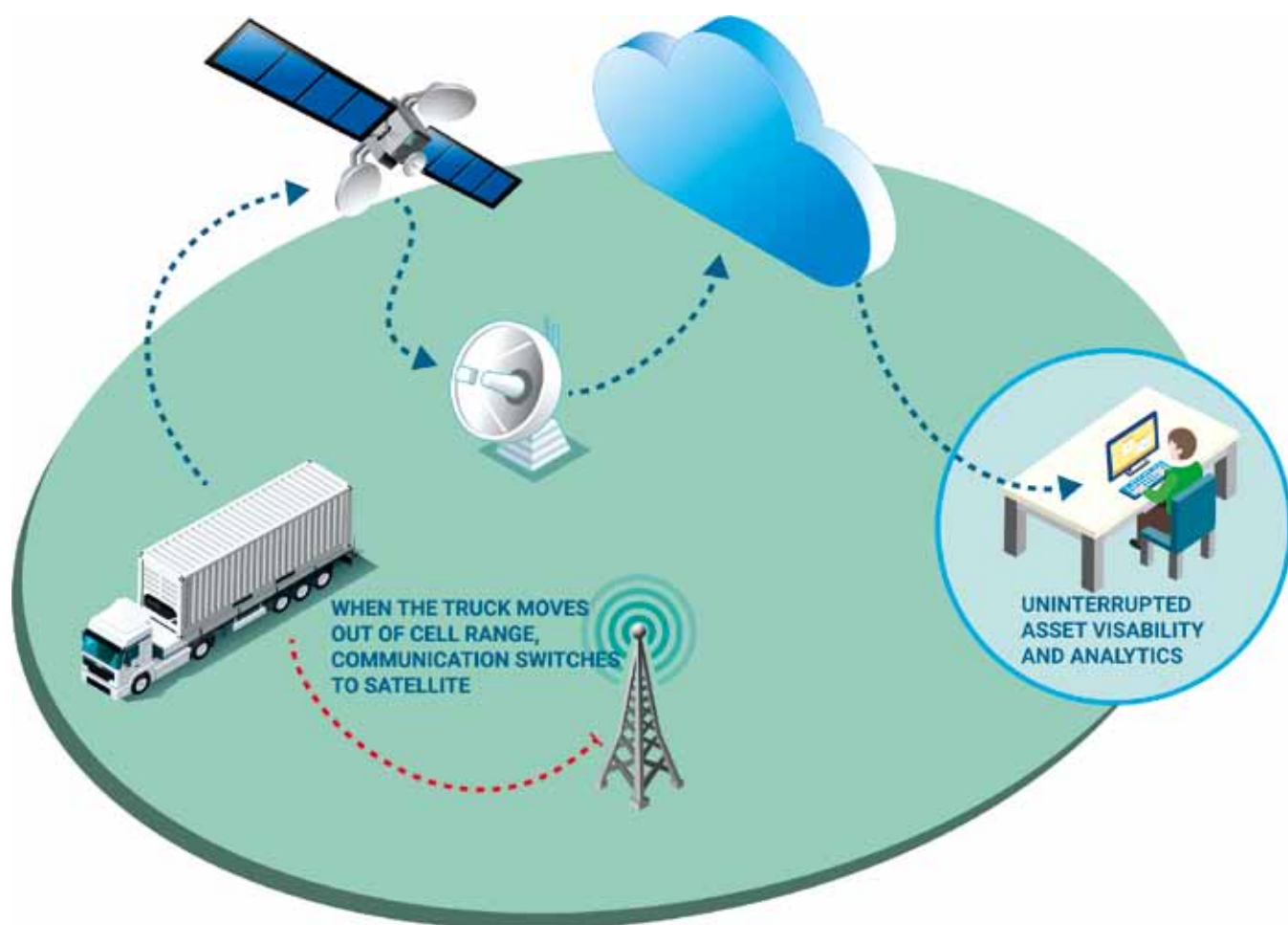


cannot “talk” GSM somewhere on its way through Kazakhstan, we simply switch to satellite. After all, if the Eurasian Land Bridge is to be a modern logistic solution, it needs a digital add-on. And, while the physical shipment is somewhere out there, probably in a remote destination, virtually it’s at your fingertips. It’s true that there’s a lot of

buzz surrounding the IoT nowadays. Some of the companies are claiming that they’ll keep the data to themselves, but we’ve decided to endorse the open standard. Our solution, the Device Cloud, enables us to quickly and easily integrate anybody’s devices and sensors, and then provide the data to subscribers via either our own or the client’s applications. Maersk has about 20 backend systems above our data

level that are subscribed to it. It’s ultimately the customer’s data since they’ve bought the device and the service. All in all, the role of an IoT provider, as we see it, goes beyond selling products or fixed services. It extends towards helping clients in finding unforeseen solutions, hidden in the vast amounts of data they’re gathering. This change also requires a labour shift. When others





speak of automation and IT developments threatening certain types of jobs, we point out to the new demand or those who can aid transitioning companies in making sense of the data they're now besieged with. The lavishness of data we're encountering these days is not as much a quantitative as qualitative enabler. Sure, you had automation and robotics in the past, but the connectivity the IoT already provides today moves the whole venture onto the next level.

■ **What are the most pressing challenges, e.g. cyber security, currently standing in the way of these developments?**

Certainly, the threat is out there, and the industry, as well as its product and service providers, will be susceptible to various types of cyber-attacks, now and in the future. We talked earlier about how the IoT and big data open new opportunities outside what has been originally

designed. Sadly, the same holds true for the risk part of the business. We're responding to this, for example, by making the data actionable. If there's a fire, or if sensors detect that somebody is tampering with a container, a fire brigade or the police are being notified. The same happens in the virtual world, where algorithms track whether you're being hacked or jammed. Our devices communicate at a very low level, with limited data sent through them, so it would be very hard to use them to hack other pieces of equipment. Nevertheless, there's precious value in vessel data, so it will be always tempting to sniff it out this way or another. Imagine knowing that a ship will come loaded heavily with coffee, the price of which is set on a daily basis, and that this single shipment will cause the local prices to go down significantly. This, in turn, can have a powerful impact on your business, especially such a volatile one as coffee trading.

The human factor is still the weakest link in the line of defense. We had a temperature-controlled banana box out in the open sea, and one of the vessel's crew went and changed the atmosphere inside the container, raising the level of oxygen in it. We immediately received an alert, sending it further so that a proper level could be restored remotely (or even automatically). In addition, the ship's captain received an e-mail with a warning that somebody is jeopardizing the shipment.

■ **You seem to be suggesting that the implementation of next-gen technologies isn't a question of "if" but of "when." However, is the industry driving this change? Or is the transition forced upon them, in an evolutionary, adapt or perish kind of way?**

We would call the change "regional", for want of a better word.



The intermodal business in the US used to be as ancient and backwards as possible, but now is one of the most modern. We supply this market with devices for automated cargo sensing. One company has approx. 90 thousands of them, scanning a container to identify whether it's laden or empty. If it's the latter, it automatically issues a pick-up alert. Turning over your assets as much as possible is key for making money in the US. Once one big market player has invested in such a solution, its main competitor follows suit instantly, so the change is industry driven. The same has happened in sea shipping between our two clients – Crowley and TOTE – active in the pharmaceutical trade. It may take longer if you're more global and find yourself in uneasy times. Think about liner shipping and all the alliance fuss they need to sort out first. Then again, certain more controllable areas, like the refrigerated trucking market both in the US and across Europe, have been very open and receptive to how software can boost hardware operations. The dry container market is lagging behind a bit, but they're catching up. We're still in the early days of this transformation, but we're witnessing that this change is more and more user-driven. Also, shippers and cargo owners are getting involved, having their production very much IT-enhanced, and asking in turn why the transport and logistics side cannot be adjusted properly. We see a clear push from them to have the whole supply chain IT-covered. This IT wave has its momentum, no doubt about it, and the awareness of the change happening literally in front of our eyes is getting through even to the average Joe. The whole case is an obvious thing if you work for such a company as ORBCOMM. But if your non-IT friends start talking to you about the IoT during a cocktail

party, then you know that something has changed profoundly.

■ **How does satellite AIS fit into this IoT-driven transformation?**

In the past, the question was: Where's my vessel? And everybody was happy when they more or less knew the answer. Now, it's a real heyday for AIS-tied applications. The Port of Rotterdam uses our AIS data for tax purposes in regards to vessels coming to and from its harbours. Traders are buying this data, too, to see where ships are, so they can assess the prices of commodities. Managing berth space, which is very valuable, is another example. And while vessels are perpetually late, once they've arrived, they want their place to dock. The case for AIS here is how to use it for predicting vessels' arrivals in order to best optimize berth utilization, which is critical when running a container terminal. Doing this in the past was unimaginable, but now one of our Baltic subscribers, BCT Gdynia, can queue container ships, advising them to speed up or slow down. AIS data comes in handy across various other fields of interests as well, be it dealing with piracy, ocean management, fisheries, etc. Also, nowadays AIS data does not work in isolation, because you can ask yourself other related questions, e.g. where's my container? Or, what should I do, knowing of factors A, B, and C (like port congestion, docker strikes, traffic jams, and so on and so forth), to get the box to its final destination safely and on time? The amount of AIS data we're wholesaling today, as well as the purposes it serves, has gone far beyond what we imagined in the first place.

■ **What's your long-term outlook concerning the shape the industrial IoT will take?**

The pace of technological development is so fast these days – particularly in communications, which we're so focused on – that "long-term" in our case means five years maximum. There are projects currently on the roll-out which have the potential to significantly reduce IoT costs. If worldwide GSM coverage

costs 8 USD a month today, you'll have it for 1 USD in the near future. We're talking about quantum changes, making it extremely hard to predict what will happen next year, let alone 2050. It's much more about constantly evaluating new technologies that are showing up all the time, asking ourselves if, and how, we can best use them.

We're seeing this in our everyday lives as well, tech gadgets like smartbands and the associated apps changing human behaviour. Again, the IT wave is changing the landscape. For some, using the original Nokia 3310 could be a nostalgic journey into the past, but after time the keypad would drive you mad. And, most importantly, the rest of the world wouldn't want to join you, or wait for you to come back. Technology is motivation. Something that would have been hard and labourous in the past now becomes easy and enjoyable. But technology requires decisions, too. Some admit that digitalisation may be good for Maersk, but don't see themselves benefiting from it. Others follow suit because they understand the rationale behind it, regardless of whether they're a global company like Maersk, or a more local one.

If we were to make a guess, within five years' time we'll see roughly 50% of the shipping industry using some form of IoT technology for some applications. Our first bet is on the reefer sector, promising a much higher return-on-investment than dry boxes. We'll most probably see some intermodal IT solutions exported from the US to Europe, too. One thing is certain, though: The IT wave will continue to plough through. In ORBCOMM, there are already the second and third generations working on this.

The Nasdaq-listed  ORBCOMM, headquartered in New Jersey's Rochelle Park, is a global leader and innovator in the industrial Internet of Things (IIoT), providing solutions that connect businesses to their assets to deliver increased visibility and operational efficiency. The company offers a broad set of asset monitoring and control solutions, including seamless satellite and cellular connectivity, unique hardware and powerful applications, all backed by end-to-end customer support, from installation to deployment to customer care. For more information please visit [www.orbcomm.com](http://www.orbcomm.com)

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# Technology boosting collaboration

by Maciej Kniter



**Guenter Schmidmeir**  
VP & General Manager EMEA,  
Navis



**Bruce Jacquemard**  
Chief Revenue Officer, Navis

**How can the latest technology serve business? At the first glance, the answer is simple, but it's better to ask the professionals who provide tools for that. We're talking with Guenter Schmidmeir and Bruce Jacquemard to ask about collaboration and Navis' recent activities, as well as make an update to our interview with Andy Barrons from Navis and Robert Inchausti from XVELA, published in *Baltic Transport Journal* 1/2017, and this year's first printed edition of *Harbours Review*.**

■ **First, could you explain the difference between Navis and XVELA?**

Navis is XVELA's parent company, though XVELA operates as an independent entity. XVELA is the name of both the company and the product. We decided to create a cloud-based collaboration platform that delivers transparency, efficiency, and profitability to a network of ocean carriers and terminal operators – and this is exactly what XVELA is all about. But, since XVELA is intended to work with many different terminal operating systems (TOS), it must be first and foremost neutral. The aim for our platform is to allow both terminals and carriers to see the full stowage picture, improve customer service and reliability, along with capturing substantial untapped savings across the entire ocean supply chain.

■ **And could you share any news of your recent activities?**

On the XVELA front, pilots have been conducted with leading carriers and terminal operators over the

past year, and have now evolved to the point where two of the top five carriers are moving forward to a Phase 1 implementation. Although I can't reveal who they are yet, what I can say is that we've had a positive response to the pilots and the progress we've made with the product since then. So there is demand for the initial value of XVELA; namely, collaboration around stowage. Our aim is to encourage terminals to engage as well. They can see what's happening with the cargo while it's being carried from one location to another. By integrating with the TOS, XVELA is able to provide visibility into multiple locations from a central view in real time.

■ **What about security in the so-called cloud?**

XVELA follows the Center for Internet Security (CIS) standards for cloud applications. We know what kind of security measures one has to implement around an application, and we are very closely aligned with the CIS standards and recommendations. We also leverage the



massive security investment and expertise of Amazon Web Services (AWS) and follow best practices to maintain high standards for the security of XVELA. Definitely, there is always a risk for companies of being affected if a big hacker attack takes place, like the one on June 27<sup>th</sup>. But implementing proper security controls, such as those recommended by the CIS, can really help minimize that risk. We at Navis also use our own measures in the applications for data security, and we're continuously ramping up our solutions to make them more reliable. Finally one important feature of the cloud – it is not a virtual private network (VPN), it uses a single point of entry, meaning you have more control.

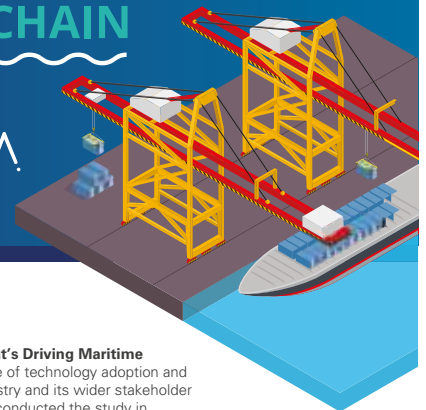
■ **Could you say a few words on the ocean supply chain survey you've conducted?**

We asked more than 200 companies about their business environment; namely, the shipping industry. Terminal operators, carriers, shippers, and many others were interviewed and 82% of them said that visibility is critical for shipping to get better outcome from operations. Furthermore, 99% of all respondents think that sharing information is important for business, but – get this – only 12% say that they're doing anything about this. So the finding is that there is a cry, an urgent need for this collaboration. And we have a solution, the XVELA collaboration platform. Yet, there are some hurdles to overcome – basically it's a mindset change to

make it happen. Organizations, especially in this industry, are resistant to

share data because they think it could give up some competitive

## COMPETITIVE GAIN IN THE OCEAN SUPPLY CHAIN



### REPORT SUMMARY

**"Competitive Gain in the Ocean Supply Chain: Innovation That's Driving Maritime Operational Transformation"** is a new study examining the state of technology adoption and collaboration taking place in today's global container shipping industry and its wider stakeholder ecosystem. The Business Performance Innovation (BPI) Network conducted the study in partnership with maritime industry technology leaders, Navis and XVELA.

Our study is based on a global survey of more than 200 executives and professionals from terminal operators, carriers, logistics providers, vessel owners, port authorities, shippers, consignees and other members of the global Ocean Supply Chain. The findings are also informed by in-depth interviews with a variety of industry executives.

OUR FINDINGS UNDERSCORE THE CRITICAL NEED TO IMPROVE **COLLABORATION** AND **EFFICIENCY** THROUGH **ADOPTION OF NEW TECHNOLOGIES**

### A FULLY-FUNCTIONING SUPPLY CHAIN REQUIRES VISIBILITY OF ACTIVITIES AND CONNECTIVITY BETWEEN STAKEHOLDERS, BUT...



**82%**

FEEL THE LEVEL OF **CONNECTEDNESS** AND **VISIBILITY** NEEDS TO BE IMPROVED



**12%**

FEEL THERE IS **VIRTUALLY NO VISIBILITY**

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advantage. They sometimes don't see the benefits coming from greater data sharing across multiple participants.

■ **So how can we transform the ocean supply chain through cloud collaboration?**

We're trying to integrate business across the ocean supply chain. As Andy and Robert said in the previous interview, Navis acquired INTERSCHALT, a company offering solutions for carriers. It was a natural step to acquire the market leader in stowage planning solutions and on-board loading computers. Our product, Navis MACS3, is used in over 65% of all container vessels. We can already see the synergy coming out of this – by integrating data from the MACS3 on-board computer in real time, XVELA can provide terminals with a quick evaluation of their load plan from a strength and stability perspective, so they have a much better idea of whether the plan will be accepted by the ship's first mate well in advance of the ship's arrival, potentially eliminating critical delays during load operations. This is a good example of a win-win situation.

■ **In our last interview, Andy and Robert talked about your plans for this year. Are any of them already in place?**

Based on the market demand, there will likely be continued investment in core planning and execution systems for terminals (Terminal Operating Systems) and growing demand to synchronize and optimize

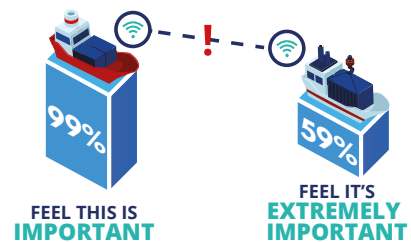
end-to-end planning processes across enterprises to improve vessel, berth and terminal planning and better match available capacity with demand flows. A greater acceptance of cloud enabled applications that integrate with core systems to improve ways of doing business will also be top of mind for executives. Automation will continue to be very important for improving operational performance with automated terminals handling larger volumes and increasing productivity. Projects will include partial automation in "brownfield" terminals as well as new automated

sites coming on stream. Based on our project pipeline, there will be continued investment in implementing and upgrading modern terminal operating systems that are automated equipment ready, along with cloud technologies that support data sharing and storage and multi-party applications that enable synchronized planning and support business analytics. There will be more work on identifying use cases for applying machine learning and in the financial and documentation supply chain more exploration of the potential of Blockchain.

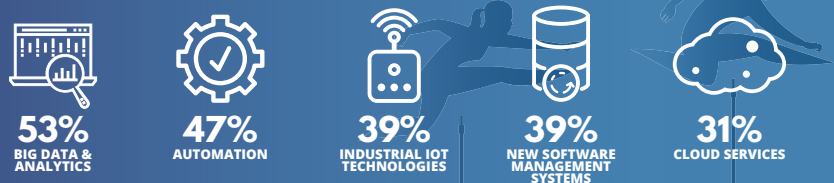
The findings of this report underscore the critical need for the shipping industry to improve collaboration and efficiency through the adoption of new technology-driven models and processes. Perhaps because it has been preoccupied and constrained by the economic challenges it faces—but also because many of its members are just plain resistant to change—the industry has been far too slow to enter the digital age.

While change may be slow, it is coming nevertheless. Across survey responses and qualitative interviews, there is a clear recognition that improved collaboration and better use of next-generation technologies to improve process efficiency and customer service need to be a priority—and already are for some.

**DESPITE HURDLES, STAKEHOLDERS AGREE THAT REAL-TIME ACCESS AND SHARING OF INFORMATION IS VITAL:**



**TO OVERCOME THESE HURDLES, KEY TECHNOLOGIES WILL DRIVE THE TRANSFORMATION**



**THEY BELIEVE THESE TECHNOLOGIES WILL MOST IMPROVE:**



“So there is demand for the initial value of XVELA; namely, collaboration around stowage. Our aim is to encourage terminals to engage as well. They can see what's happening with the cargo while it's being carried from one location to another.”

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## 0.5% SULPHUR CAP

Photos: Genoil

# New sulphur limit

by Bruce Abbott, COO, Genoil Inc

Three years on from the introduction of the 0.1% sulphur limit in fuel oil in Emission Control Areas and less than two years before the global 0.5% cap becomes mandatory, the flux in the marine fuel market shows no sign of abating. It might have been expected that shipowners would have come to terms with what needs to be done from a compliance perspective for the International Maritime Organization's (IMO) MARPOL Annex VI regulations.

However, the consensus is that as a whole, shipping is far from prepared for the impending regulation that will have seismic change on the industry, impacting the whole supply chain from charterers, shipowners and operators, to fuel suppliers.

Currently, Heavy Fuel Oil (HFO) comprises the majority of fuel supply for the shipping industry, so the impact this regulation will have on the industry and the future make-up of the marine fuel supply chain should not be underestimated. With the shipping industry accounting for 90% of global trade, the potential ramifications spread beyond its own sphere and into the wider global trade network.

### Possible scenarios

It remains unclear what compliance strategy shipowners will adopt to ensure that they are compliant with the new global sulphur limit. In basic terms, there are a number of perceived choices. Liquefied Natural Gas (LNG) – although there still needs to be significant investment in infrastructure, the development of bunkering standards and clarification on pricing, this is likely to be a medium to long-term solution, rather than an immediate one and is primarily for installation on new build vessels; scrubbers – so far these have had low a uptake due to the significant upfront capital investment required, the challenge of yard space for installations, and the negative impact of companies such as

Maersk publicly ruling them out as an option. Finally, distillates and distillate-based products, which is expected to be the most widespread compliance solution of choice in the short-term.

However, there are concerns over whether there will be enough distillate products to meet demand. By most estimates, the industry will have to replace almost 250 million metric tonnes (mt) of HFO with something that meets the new sulphur specification. There are also concerns in relation to the physical properties of hybrid distillate blends and their impact on engine performance.

A further complication is the uncertainty over future oil prices. OPEC's decision in November 2017 to extend the current oil production cut will maintain the current strong spread between HFO and Marine Gas Oil (MGO)/Ultra-Low Sulphur Diesel (ULSD). In the medium-term, leading up to 2020 and the 0.5% global sulphur cap, the spread between HFO and MGO/ULSD will widen, as increased demand surfaces for low sulphur fuels. CME futures shows that the Rotterdam spread in 2020 between HFO and MGO/ULSD is set to increase by USD 42.48 per mt, and the 2020 Singapore spread for HFO and MGO/ULSD at USD 69.00 per mt from present values. This will bring the spread up to USD 245.05 per mt in 2020, with crude prices estimated to hit USD 65-70 per barrel.

With all these questions, it seems that the majority of the shipping industry are



However, there are concerns over whether there will be enough distillate products to meet demand. By most estimates, the industry will have to replace almost 250 million metric tonnes of HFO with something that meets the new sulphur specification.

**“Genoil has developed a mini-GHU that can be built alongside existing refinery infrastructure in major bunkering hubs rather than incurring the costs to develop and build all new infrastructure.”**

adopting a wait and see approach without committing to capital investment now.

### Hydroconversion Upgrader

However, Genoil, as a clean technology engineering company, has developed a solution that will enable shipowners to capitalise on the price spread between high and low sulphur fuels. Its Hydroconversion Upgrader (GHU) converts heavy or sour crude oil into much more valuable, compliant low sulphur oil, for a low cost at the fraction of the cost of traditional refining processes and is ideally suited for the maritime market.

Genoil's innovation builds on existing and proven Fixed Bed Reactor technology, which accounts for approximately 85% of the world's reactors. However, the GHU takes it to new heights by super-saturating the carbon molecules with hydrogen, significantly increasing the desulphurisation, demetallisation and denitrogenisation conversion rates, and increasing operating efficiencies by 75%. In the context of the shipping industry's global sulphur cap, the GHU technology can take refinery residue and turn it into low sulphur fuel oil to meet the 2020 legislation.

Genoil has developed a mini-GHU that can be built alongside existing refinery infrastructure in major bunkering hubs rather than incurring the costs to develop and build all new infrastructure. The GHU unit costs between USD 30-80 million to install per one million tons per year of capacity. Based on Genoil's predicted crude prices, which have been reviewed by independent bodies, an initial investment of USD 30 million could achieve payback in less than three months. Indeed, at current levels, based on a spread between HFO and distillates of USD 179.78, and inclusive of Genoil's process fee, margins per metric tonne would be USD 123.78, equating to monthly profits of USD 11,701,789 based on a production capability of 94,537 mt per month.

The GHU would also take up significantly less space than a full refinery unit, measuring as little as 50m x 80m. The low cost and small footprint mean the GHU can easily be installed wherever adequate existing infrastructure exists, such as in major bunkering hubs worldwide.

Critically, the GHU enables Genoil to produce compliant fuel at a much lower cost than oil refiners, as well as alleviating the industry pressure on the industry's distillate supply challenges. This has benefits for all stakeholders within the marine fuel supply chain. For shipowners, it negates the requirement to invest capital in abatement technology or switching to LNG. For fuel payers, it facilitates access to cheaper, compliant products, reducing fuel bills and increasing profitability. For fuel suppliers, it ensures a continual supply of compliant fuel oil, which they can provide to customers at a reduced cost, but at a higher margin than traditional distillate or low sulphur products.

### Other beneficiaries

The advantages also spread to ports. In a highly competitive market, port authorities can increase their attractiveness by ensuring the continuous supply of MARPOL Annex VI-compliant, cost-effective fuel products, delivered through a state-of-the-art bunkering infrastructure.

Genoil has also signed a series of strategic partnerships with scientific, engineering, refining and financial organisations as well as physical bunker suppliers to fully exploit the potential of the GHU technology worldwide. These include a USD 700 million joint venture with the Chinese government refining operator, Hebei Zhongjie Petrochemical Group (HYT), marking the formal commercialisation of the company and its technology within a large-scale refinery. In April 2016, Genoil announced, in conjunction with consortium partner Beijing Petrochemical

Engineering Co Ltd (BPEC), the receipt of a USD 5 billion Letter of Intent for the funding of a 500,000 barrel per day desulfurization and upgrading project located in the Middle East. Beijing Petrochemical is a division of Yanchang Petroleum, sitting at position 380 on the Fortune 500 list. This is a project that will see, following the implementation of the GHU technology, a production capacity of 500,000 barrels per day of low sulfur crude oil.

In August 2017 Genoil signed a tri-partite science, research and technical cooperation agreement with two leading Russian institutions, the UFA Scientific Research Institute of Petroleum Refining and Petrochemistry, located in Bashkortostan, and the OJS "VNIIS" Institute, located in Tatarstan, to establish a world class partnership. The scope of the agreement is to research, develop and market cutting-edge technologies and patents both in the Americas and globally. The partnership will focus on the petrochemistry, petroleum refining and gas chemistry industries where, through joint co-operation and a wide base of expertise, the parties can add significant value to client proposals.

The deadline for the 2020 sulphur cap has been set and will not be pushed back. Genoil's GHU technology provides shipowners with a viable solution to secure compliant fuel with the same characteristics and compatibility with engines as existing HFO. It is a cost-effective and practical option and avoids the uncertainty of distillate fuel supply and costs, enabling shipowners and operators to plan for the future with confidence. ■



# State of play in the bunker market

by Unni Einemo, IMO Representative, and Media and Communications Manager, International Bunker Industry Association (IBIA)

**The bunker industry is going through a rough patch. Everyone has been spooked by the collapse of companies that were “too big to fail”, poor margins have undermined profitability for the past several years, and looming large on the horizon are uncertainties surrounding the transition to a global 0.5% sulphur limit in 2020. The latter may accelerate some of the changing dynamics we are already seeing.**

**I**n November 2014, the bunker market was shaken to its core when, out of the blue, OW Bunker of Denmark filed for bankruptcy. OW had been valued at USD 1.0 billion at an Initial Public Offering just seven months earlier, and was said to be the world’s biggest bunkering company by market share. It created a black hole of unpaid bunker bills which sucked in a raft of bunker suppliers and traders that had provided fuel on behalf of OW, and left end customers liable to multiple payment claims. Some of the bunkering companies with big exposures to OW also collapsed within months.

## **Disintermediation, low margins, and consolidation**

The fallout is still being felt today. It dealt a huge blow to counterparty confidence and unpaid creditors continue to fight court cases. If a bunkering company as big and well financed as OW could fall, the feeling now is that nobody is safe. The collapse of Hanjin Shipping in August 2016, another company that should have been “too big to fail”, added to this uncertainty. The fact that the banks of two such big companies were not prepared to help them stay afloat, despite the wider losses and damage to the market

caused by their demise, has had the additional effect of undermining confidence in financial markets to provide the required support to the shipping and bunkering sectors.

OW’s collapse led to greater scrutiny of the type of bunker sales involving multiple parties, and is said to have caused a trend that has been labelled “disintermediation,” namely the removal of intermediaries from the supply chain. The risks involved if there are multiple potential claimants in the transaction chain have been laid bare, and many owners are said to prefer to deal more directly with suppliers.

Much of the shipping industry has been struggling with exceptionally poor freight rates for years, so many are driving a hard bargain to keep operational cost down. Widespread use of slow steaming has caused overall bunker demand to stagnate and maybe even drop. Low oil prices since the end of 2014, meanwhile, mean that smaller bunkering companies, which would struggle to finance even a modest volume of trade in a high price environment, have been able to remain in the market. These factors have created intense competition between bunker traders and suppliers fighting for market share and contributed to putting suppliers’ profit margins under pressure.

At the same time, these poor market conditions are taking their toll and

there is a limit to how long companies can go on before throwing in the towel. Many believe it is inevitable that the strong, well-funded companies that have enough reserves to survive during the current lean times will become ever stronger and gradually absorb much of the market currently serviced by smaller players, especially if rising oil prices mean the trading volumes they can sustain with relatively limited credit facilities shrink. Even if oil prices remain low for the next several years, come 2020, the capital needed to maintain current business volumes is set to rise.

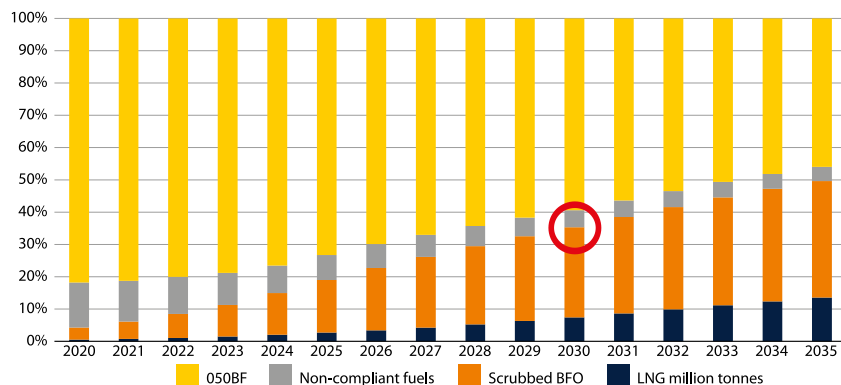
## **Shifting gears in 2020**

Exactly how much the cost of business will go up in 2020 as a result of the switch from fuels with up to 3.5% sulphur to no more than 0.5% sulphur is one of the big unknowns the bunker market is grappling with. Current predictions for the premium of marine fuel with max 0.5% sulphur compared to the High Sulphur Fuel Oil (HSFO) used today range from as little as USD 150 to as much as USD 400.

Whatever the premium is, the general consensus today is that most ships will comply with the global regulation in 2020 by using low sulphur oil-based fuel, as opposed to alternative fuels like Liquefied Natural Gas (LNG) or by using abatement technology such as scrubbers which cleans the sulphur out of the



**Fig. 1. LNG & EGCS: how significant will these options become? By 2030 LNG and scrubber BFO could account for 35% of demand**



Source: Robin Meech, Marine and Energy Consulting Ltd (MECL)

exhaust gas, meaning the ship can continue to use cheaper HSFO. One of the expected consequences, therefore, is a sharp rise in the cost of bunker stems, which in turn will increase the pressure on credit lines, the risk associated with each transaction, and the financial clout required to handle large bunker sales volumes. It will likely accelerate consolidation favouring companies with access to large credit facilities, e.g. companies that integrate commodity trading with physical bunker supply and trading. It may also lead to a rethink of how bunker transactions are financed.

The upcoming 0.5% sulphur limit will drive other changes too, as the supply and demand picture becomes more complex. Lessons have already been learned from Emission Control Areas (ECAs), in particular in Northern Europe, where the conventional wisdom which assumed the 0.1% sulphur limit that took effect in 2015 could only be met by Marine Gas Oil (MGO), LNG, or scrubbers has been disproven. Several oil companies developed alternative products meeting the 0.1% sulphur limit that are closer to fuel oil than distillates in nature, typically referred to as Ultra Low Sulphur Fuel Oil (ULSFO). Russia's Gazpromneft Marine Bunker, for example, says 17% of its overall fuel sales in the Baltic Sea in 2016 were ULSFO, compared to 23% MGO, and 60% HSFO.

We expect similar innovation to replace traditional distillates with lower cost products for the 0.5% sulphur limit; probably more new fuel formulations than we have already seen for the 0.1% sulphur limit. The individual components and nature of these products will vary. Some will need heating

during storage and handling, others won't; some will contain bio-diesel, others won't, etc. It will put increasing demands on both suppliers and ship operators due to the different storage and handling requirements, and avoiding co-mingling of fuels as compatibility between different products may be more challenging than we see today.

One of the big unknowns is to what extent ships will install scrubbers, which will determine how much demand there will be for HSFO bunkers. Predictions vary, but if we go by the official study the International Maritime Organization (IMO) used as a basis for the 2020 decision, it suggests scrubbed HSFO will account for 36 million tonnes, or about 11% of the global marine fuels market in 2020. HSFO bunkers, the dominant fuel today accounting for around 80% of global ship fuel consumption, would become a niche market, at least for a while until scrubber installations accelerate. Suppliers will need segregated storage and supply lines for HSFO and low sulphur fuels. Suppliers will therefore have to consider whether they can justify having the right supply infrastructure in place to make it worthwhile to offer HSFO. We may see this product disappear from ports where sales volumes are not guaranteed. Another possible result is that ships with scrubbers will need to enter into term contracts with specific suppliers to guarantee availability as there may not be much of a spot market.

#### Implementation of the sulphur cap

At its 70<sup>th</sup> session in October 2016, the IMO's Marine Environment Protection Committee (MEPC) agreed that the

global limit would be implemented in 2020. At the time, IBIA, which has consultative status at the IMO, highlighted that fuel users will likely wait as long as possible to comply with the new global limit due to the cost, but that changing the entire global supply infrastructure to provide low sulphur fuels is not as easy as flicking a switch.

Recognising concerns about the transition phase, MEPC has agreed to add a new work item to its agenda on what additional measures may be developed to promote consistent implementation of the 0.5% sulphur limit. In other words, now that we have the decision, how can we make sure this actually happens? Exactly what these measures will be remains to be seen, but it should help clarify what happens if, for example, there is a shortage of compliant fuels.

One of the biggest challenges is trying to ensure the 2020 global sulphur limit is effectively enforced. There are concerns that there will be a huge temptation to cheat, putting compliant operators at an economic disadvantage. Compliance with the 0.1% sulphur limit in ECAs appears to have been good in the European Union, which has put in place minimum requirements for checks and keeps records of compliance. But will this translate to high levels of compliance with the global cap, especially as the ability to effectively monitor and enforce compliance away from ports and coastal waters is limited? The jury is out on that question. ■



# Ready for another big change?

by **Charles L. Daly**, *Chairman, Channoil Consulting*



**T**he London-based Channoil Consulting Limited is an experienced team of oil and gas industry professionals with a wealth of first-class international commercial and technical expertise in mid and downstream oil and gas. The company's clients include oil and gas producers, refiners, marketing companies, consumers, traders, infrastructure owners, investors, governments, and development agencies. For more info please visit [www.channoil.com](http://www.channoil.com)

**After much deliberation and consultancy work, the International Maritime Organization has finally decided that the global cap on the sulphur level in ship fuel will be set at 0.5%. The new limit will come into force on January 1<sup>st</sup>, 2020, replacing the current 3.5%. Already, however, questions arise about the availability of compliant bunkers. This does not pertain only to refinery output, but also to how fuel traders, bunkering companies, and terminals worldwide will cope with the new norm.**

**I**n a parallel action, China decided to implement the 0.5% cap in 11 major ports, including Shenzhen and Shanghai, effective January 1<sup>st</sup>, 2017. It will be interesting to see if other countries in the Pacific Rim follow suit. As with previous conventions, such as the 0.1% Emission Control Areas established in 2015, the 2020 limit will only apply to signatory states. We have not yet seen the full list of these, but in the last round in the application of Annex VI Russia was a significant non-signatory. All in all, the implications of this global cap are very significant even prior to the new rules becoming reality, and will have a number of unintended consequences which will only emerge with time.

## **To refine or not to refine**

The refining industry will endeavour to meet the demand for 0.5% sulphur bunker fuel. This will probably be achieved by changing crude oil slate, rather than by investing in very expensive heavy fuel oil desulphurisation. History shows that, while premiums on new grades are initially high, they tend to reduce markedly within one to two years, as the industry adjusts to new relative values between grades and blending components. Refiners not

yet committed to capital investment in upgrading their solutions may be wise to adopt a wait-and-see approach to confirm the economics.

Some lessons can be drawn from the introduction of the ECAs. At the time, there was a lot of debate on how to satisfy the new demand. Nonetheless, the oil industry managed to cope – in part by using the distillate stream, in part by extracting a compliant fuel from residues via the vacuum distillation route. However, the price of this fuel was greater than the price of crude oil; meanwhile, High Sulphur Fuel Oil (HSFO) was traded at below crude oil price.

The key issue is that refiners will not invest in storage of components/finished grades and blending facilities for post-2020 bunker fuels. In effect, black oil terminals with modern blending facilities will be in considerable demand from 2019 on. The result of all this investment activity is the reduction of the availability of fuel oil, particularly in mature markets, such as Amsterdam-Rotterdam-Antwerp, the Middle East, and Singapore.

Another potential issue is the fact that the residuals exiting from these sophisticated refineries will be of whatever quality results. Some of these residual will not

be compatible with the middle distillates available in the market. Also, refiners will not make much effort to blend fuel oils, leaving it to traders or bunker blenders to meet the specifications demanded by ship owners. If the blends are made by unscrupulous blenders or traders, unwary engineers may end up with serious compatibility problems, even to the point of total engine failure. If these fuels start to appear on the market, however, it will become necessary to ensure that quality control is rigorous, and that pre-sampling and tank sealing takes place prior to delivery of the bunker parcel. Bunker suppliers are not going to like this.

### **Crude oil producers, bunker blenders and suppliers, and condensates**

One of the ways refiners can meet the demand for Ultra-Low Sulphur Fuel Oil (ULSFO) would be to change crude oil slates. Then again, as stated above, refiners' objective is always to increase refining margin, and unless the ULSFO commands a constant premium over crude oil, it is unlikely that they will make an effort to meet the demand for such bunkers. Changing the crude oil slate will also have implications for crude oil producers. With increasing demand for sweet crudes at the expense of sour grades, the sweet-sour differentials could widen substantially, giving the sweet producers a boost to income to the detriment of the sour producers. This will mean that demand for Algerian, Libyan, Nigerian, Indonesian, Malaysian, and Caspian blends will increase, while Middle East grades will suffer, except for condensate producers. It will also benefit the remaining North Sea grades and exporters of West Texas Intermediate.

However, if ULSFO is going to be attractive for refiners to produce, the differential between HSFO and ULSFO will need to widen by about 30% of the price of the crude oil (basic Brent). It could also mean that bunker blenders, who are currently supplied by refineries that run sour grades, may be affected as well. For instance, a port such as Fujairah may become disadvantaged when compared to Houston or Rotterdam. We see a major role for condensate refiners in this regard, too. As the role of liquid hydrocarbons transitions more and more towards road fuels and chemical feedstock, large condensate fields, such as the South Pars region of Iran and the adjacent fields belonging to Qatar, will be sought after once the bunker markets demand lower sulphur fuel.

### **Alternatives – LNG, methanol, and scrubbers**

Alternatives to low sulphur fuel are being sought; these include primarily Liquefied Natural Gas (LNG), methanol, and flue gas scrubbing technology. Some are experimenting with ships running on electricity, but, for the time being, this isn't a viable solution outside of short-distance fixed routes.

The proposals for LNG are well advanced, and a number of ports are gearing up to supply LNG bunkers. When it comes to versatility, the Baltic Sea region stands out by having in place not only tank trucks and onshore filling installations, but also a few purpose-built bunkering vessels. The use of LNG is particularly suited to point-to-point businesses, such as ferry routes and in-river transportation. We think this is a very fertile field for oil companies, as they have the technology and the investment capability. It will be a long haul, as it takes decades to change the world's shipping fleet (the last major energy transition, from coal to oil, took over 30 years). Nevertheless, should the price of crude oil rise out of line with LNG, it might be worthwhile for ship owners to retrofit their fleets. We do not see this happening soon, but work on ferries and coasters could be relatively easy to justify.

Methanol is in its infancy, and a lot of safety issues are involved that may not be easy to overcome. Yet, it is a liquid, is easy to produce from methane, and is sourced from the same fields as the LNG currently being mooted.

Finally, we come to flue gas scrubbing. On current price differentials between 3.5% and 0.5% fuels, the manufacturers of scrubbing units forecast a payback in just two years. This is fine, except – as stated above – there is no guarantee that the current differentials will stand the test of time. Crude oil differentials would encourage more production of ULSFO. We would thus see the HSFO-to-ULSFO differentials narrowing, as fuel oil demand remains solely the province of the bunker grades. The world's primary energy needs are likely to be met increasingly from renewable and/or nuclear sources, and the demand for fossil fuels will end up largely in road and aviation transport fuel, as well as in chemical feedstock. Most forecasters see this transition happening between 2030 and 2050.

The big question hanging over the scrubbing technology is what to do with the liquor that will have scrubbed out the pollutants? Since there is no coordinated view on this, waste products could end up in our seas in high concentrations. This

would surely be an issue of robbing Peter to pay Paul: take pollutants out of the atmosphere only to dump them in the sea. Until this issue is resolved, we see very little incentive for principled ship-owners to install scrubbers. Even though some 233 vessels have installed such systems thus far, these have been mainly lakers, cruise ships, and a number of ro-ros and ferries. This does not represent a major shift to scrubbing, all the more because we see very few large tankers in the scrubber fleet (though we have noticed owners, such as Maersk and others, installing scrubbers on their new LR2 and LR3 tankers). Available data shows that scrubbers cost around USD 2,000 per day to run – with additional USD 250 a tonne to remove the scrubbed liquid – and take up valuable cargo space.

### **Compliance outlook**

If we take a logical view as to how the marine industry will achieve compliance, we see three possible scenarios: middle distillate substitution, ULSFO supplies, and HSFO-cleaning scrubbers. Of course, there will be rogue owners who will cheat and not comply. This will be in the regions where enforcement of the specification could be lax or non-existent. We estimate non-compliance at around 10%.

Most forecasters believe that supplies will be available, and there should be no insurmountable problems for ship-owners. However, bunkering terminals may have to deal with more severe issues.

A lot of these facilities around the world are relatively small and have limited tankage. The usual pattern is to have tankage for HSFO, Marine Diesel Oil (MDO), and Marine Gas Oil (MGO), and in some cases cutter stock. The HSFO tankage is usually big enough to match the largest supply tanker that the terminal owner can accommodate, or the supply pattern demands. After 2020, this type of terminal is going to have to split its tankage between ULSFO and HSFO. This will require supplies to be received in smaller quantities, or the supplying tanker to be loaded with two grades. In either of these cases, it is likely that costs will be higher for this type of operation. If the bunker terminal owner is not able to pass





these costs onto shipowners, it is likely that they will suffer a reduction in the already thin margins in the bunker supply business.

In addition, the outlook for fuels and distillate prices is confused due to a number of “known unknowns”. Amongst others, these include the uptake rate of renewable fuels; the rate at which electric cars penetrate the market and how they impact power generation; the possible wider bearing of mass introduction of the Carbon Capture and Storage technology (CCS); the growth in coker investments; the rise in importance of LNG, Liquefied Petroleum Gas (LPG), Liquefied Bio Gas (LBG), and methanol as bunker fuels; the impact of incompatibility of new blended fuels; the potential for cheaper scrubber technology; other technological breakthroughs (ultra-high capacity batteries; lightweight materials for hull construction; additional propulsion machinery, like rotors or solar panels; etc.); as well as changing transport patterns due to profound shifts in manufacturing (e.g.

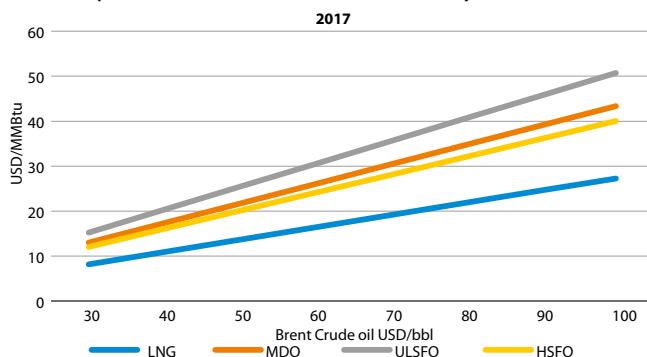
3D printing) and/or economy (new models of trade, commerce, and consumption – circular, sharing, immaterial, and the like).

Just as with the forecast growth of electric and hybrid cars, we already see outlooks being pushed upwards. The effect of one million electric cars is to reduce demand by one million barrels per day. Current forecasts are based on a 2035 horizon; however, we are conscious of the fact that car pools are rotated every seven years. If the fashion for electric cars catches on, then the e-car population could increase at a much higher and quicker rate. As we have seen with the German, French, and British governments, a major target is in the first instance to reduce the population of diesel cars. A big reduction in diesel engines will have an immediate effect on the price of middle distillate, and if the coker investments carry on, then it is possible to imagine a scenario where the differential between diesel and HSFO will narrow.

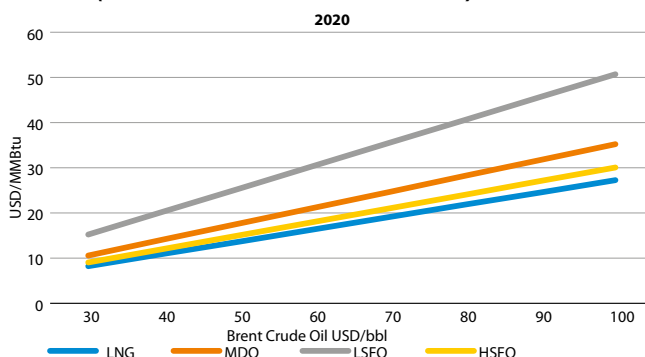
The use of diesel in marine engines is well proven and there are considerable savings to be made by a ship-owner using this fuel. The savings will come from the lack of the need to preheat the fuel oil,

filter cleanliness, and the pre-filter replacement cycle. We also believe there will be a positive, if small, gain from a reduced displacement from the density of diesel. However, we also believe that, from an energy intensity point of view, owners will come round to seeing that using diesel is not only simpler but also more economic. Figures 1 and 2 show the relative cost of energy in USD/million British thermal units that ship-owners should be aware of in making their decision for post-2020 fuel. It seems that, even if we assume that diesel will increase in price from 125% of the price of crude oil to 140% post-2020, it will still be the more cost-effective fuel. The charts indicate that, at present, HSFO is marginally cheaper than diesel in terms of energy cost, but much cheaper than ULSFO. By 2020, HSFO should no longer be an option, and the gap between diesel and ULSFO strongly favours diesel. We believe that the fears of shortage of ULSFO supply are somewhat exaggerated, and that, given a value, refiners will make the grade. However, it might be that, as diesel is shunned as car fuel, ship-owners might find it the best option. ■

**Fig. 1. Relative cost of energy between different bunkers in 2017 (USD/million British thermal units)**



**Fig. 2. Relative cost of energy between different bunkers in 2020 (USD/million British thermal units)**



Source for Figs. 1-2: Channoil Consulting



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# cruise

Photos: Peace Boat

## A ship to change the world

by Asuka Kobayashi

After over 30 years of organizing world educational and advocacy cruises on conventional passenger ship, Peace Boat, a Japanese non-governmental organization, is ready to take its commitment to the next level. By partnering with industry experts, it has embarked on a mission to create a vessel that will become a low-carbon cruising model for the industry, as well as serve as a flagship for sustainable climate action around the world. Meet *Ecoship*, the world's greenest cruise ship.

“Peace Boat has been sailing since 1983 on our educational and advocacy voyages for peace and sustainability. We have used chartered ships to date, and have become increasingly determined to close the gap between our message and the reality of operating a cruise ship,” Yoshioka Tatsuya, Founder and Director of Peace Boat, said. “We know that cruising is very visible to the public and it therefore has both great potential and great responsibility to make changes that will accelerate sustainable

innovation,” he added. From this vision, Peace Boat set out to create a vessel design and a set of specifications that would see the *Ecoship* not only act as a floating exhibition centre for the latest environmentally-friendly technologies, and stay ahead of any present and future regulations, but also offer a tangible transition model towards a low-carbon economy.

“While the cruise industry represents only a tiny fraction of world shipping, it must contribute to the agenda of solutions and also has the greatest potential to raise awareness and effect change,” Tatsuya pointed out, adding then, “The

cruise industry is growing so fast, particularly in East Asia, and the need to mitigate the environmental impact of such expansion is very important. Through its technical characteristics and in the programmes that it carries out, we hope that *Ecoship* will encourage a model for ‘green’ cruising and further innovations in the cruise industry.”

### Real life sci-fi

The *Ecoship*'s design process was in its own way a departure from traditional models of shipbuilding. In April 2014, Peace Boat gathered world experts on







naval architecture, marine engineering, renewable energy, energy efficiency, maritime law, biomimicry, and biophilia in Hamburg for a design charrette. The vessel's design was finalized after a three-year process. It was based on a systemic integrated design approach guided by a notion that elements of the whole work best when they are specifically designed to complement, rather than to compensate for each other.

The futureproof GT 60,000 vessel will carry up to 2,000 passengers in 750 cabins, and around 600 crew. The ship will operate educational voyages around the world, as well as host exhibitions on green technology in up to 80 ports per year, serving as a floating laboratory to contribute to ocean, climate, and green marine technology research. Key requirements in the *Ecoship* plans produced by the Spanish naval architects Oliver Design were to develop a high-performance vessel with the lowest possible energy needs, a ship that needs no generator utility when alongside and has better than standard air emissions and zero emissions into water.

The *Ecoship*'s design uses what is known as biophilic principles, i.e. concepts based on what actually works well in nature. For instance, the hull is based on a form of a humpback whale, while its anti-fouling coating mimics a fish's skin. Moreover, the aerodynamic upper hull has been designed to conserve fuel while sailing, and an air bubble hull lubrication system will be used to reduce the resistance between the hull and seawater. The vessel will also have 10 masts to harness wind energy, producing an average of 4% of the necessary

propulsion power, and up to 10% under optimal sailing conditions. The retractable wind turbines will deliver some 300 kW with wind speed of about 12 m/s. In favourable conditions, 30% of the in-port hotel services' energy needs could be supplied by wind power.

The ship will have 10 photovoltaic panel-covered sails, and a 6,000 m<sup>2</sup> top-deck solar farm which will generate more than 750 kW of power in low-wind conditions. It is intended that this system will supply 100% of the electricity needed to light passenger cabins and exterior public areas. Additionally, there will be radical waste heat recovery systems to recycle around 80% of the energy normally lost in the air and in the water, which can half the electricity load. The system will use smoke gas turbo generators, adsorption chiller plants, fresh water generators, domestic water heating, and Liquefied Natural Gas-cooled chiller water circuits for heating, ventilation, and air conditioning. A closed-loop system will purify and reuse water. The ship will also incorporate kinetic floors and a self-sustained garden that uses recycled garbage and wastewater. The *Ecoship* will have a hybrid engine which will use LNG as its main fuel, but will also be capable of running on bio-fuels, including methane. The podded vessel will have an optimised cruising speed of 17 knots.

Overall, our cruiser will emit 40% less CO<sub>2</sub> than conventional vessels, at the same time eliminating emissions of both NO<sub>x</sub> and SO<sub>x</sub>. However, the *Ecoship*'s arrangement has been designed with flexibility in mind, so other revolutionary tech solutions, such as fuel cells, may be adopted to make the ship even greener.

### Made in the Baltic

Last May, Peace Boat and Arctech Helsinki Shipyard signed a Letter of Intent regarding *Ecoship*'s construction. Once a final contract is signed, which is to happen soon, the ship can be delivered as early as in spring 2020. "*Ecoship* will combine Arctech's know-how in technically advanced and environmentally-friendly vessels with the well-established expertise of the Finnish shipbuilding network in designing and building of high-class cruise vessels and other special products," Esko Mustamäki, CEO, Arctech Helsinki Shipyard, stated. "We are very happy to work together with a Finnish shipyard, and look forward to exploring clean and sustainable technologies with partners throughout this region, which is known for its environmental leadership," added Yoshioka.

All things deftly counted, the goal is clear: *Ecoship* will be a showcase for what the industry can do. And who knows, maybe it will help us change the world – for the better. ■

Peace Boat is a Japan-based international non-governmental and non-profit organization that works to promote peace, human rights, equal and sustainable development, and respect for the environment. The organization seeks to create awareness and to encourage action in line with a positive social and political change in the world. At present, Peace Boat carries out its main activities through a chartered passenger ship that travels the world on peace voyages. For more info please visit [www.peaceboat.org/english](http://www.peaceboat.org/english)





# Another peak

by Catherine Couplan, Vice President Public Relations at Cruise Lines International Association (CLIA) Europe

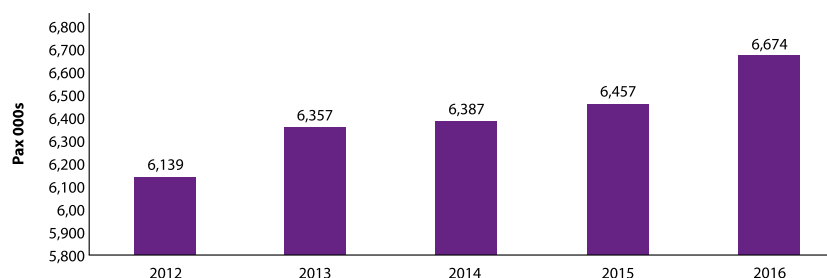
The past decade has witnessed a newly revived European holiday trend in cruising, characterized by a wealthier spectrum of destinations to visit, a wider choice in cruising activities, as well as more luxurious accommodation on-board bigger ships reaching European shores. As a result, the market grew by 50% over the past 10 years, and having increased by 3.4% year-on-year, it reached a new all-time high of nearly 6.7 million last year.

Looking at the past five years, the European cruise business has been rising year-after-year undisturbed (Fig. 1). The upward trend continues almost across all major markets of Europe (Tab. 1), Germany performing particularly strong and advancing by 11.3% yoy in 2016 to its new record of over 2.0 million travellers (who especially fancy Mediterranean cruises over any other destination). The ranks of British and Irish passengers increased last year, too, by 5.6% yoy to a total of almost 1.9 million. Spanish cruise guests, after a decline in 2014 resulting from a weaker economy, turned up again in larger numbers in 2016 (+4.2% yoy). Italy remains the third-largest cruise market of the Old Continent, with 751,000 passengers last year, followed by France which, with its tradition of being a major ship-builder launching famous vessels from Saint-Nazaire, contributed with 574,000 travellers to the annual cruise population at the same time.

As was the case in previous years, four-fifths of Europeans chose to cruise “domestically” in Europe, with 50% going to the Mediterranean (Tab. 2) and Atlantic islands, and 21% heading to northern Europe

and further eastwards towards the Baltic (read more about cruising across the Baltic Sea region in the article *Bigger is better (but not for all)* in *Baltic Transport Journal* 2/2017). However, the Caribbean and other over the Atlantic destinations continue to strongly appeal to cruisers (Tab. 3).

**Fig. 1. The European cruise market in 2012-2016**



Source for Fig. 1 and Tab. 1, 3, 4: IRN Research and the Cruise Lines International Association

**Tab. 1. The European cruise market in 2012-2016 – by country [thou. passengers]**

Country/region	2012	2013	2014	2015	2016	2016/2015 [%]
Germany	1,544	1,687	1,771	1,813	2,018	+11.3%
UK and Ireland	1,701	1,726	1,644	1,789	1,889	+5.6%
Italy	835	869	842	808	751	-7.1%
France	481	522	593	612	574	-6.2%
Spain	576	475	454	466	486	+4.2%
Scandinavia and Finland	324	289	305	231	226	-2.2%
Switzerland	131	152	143	138	138	+/-0%
Austria	108	126	122	113	115	+1.5%
Netherlands	110	114	109	105	101	-3.7%
Belgium and Luxembourg	59	72	77	68	72	+5.8%
Other	270	325	327	313	304	-2.9%
<b>Total</b>	<b>6,139</b>	<b>6,357</b>	<b>6,387</b>	<b>6,457</b>	<b>6,674</b>	<b>+3.4%</b>



### Eco ship capacity

Today, more cruise lines operate in Europe than ever before. Last year, 39 companies deployed 123 ships in European waters, visiting over 250 ports on the Mediterranean, Adriatic, North and Baltic Seas, the Atlantic shores, as well as the Norwegian fjords. Albeit a growing number of destinations becomes available, the Med. remains the prime cruise spot owing to its climate and cultural diversity, stretching all the way from the Strait of Gibraltar to Bosphorus (here, however, Turkey took a step back due to its uncertain political situation with cruise lines cancelling their Istanbul itineraries after terrorist

**Tab. 2. Top 10 cruise seaports in the Mediterranean in 2016**

No.	Country	Port	Cruise pax	Yoy
1	ES	Barcelona	2,683,594	+5.6%
2	IT	Civitavecchia	2,339,676	+3.0%
3	ES	Balearic Islands	1,957,429	-2.0%
4	IT	Venice	1,605,660	+1.5%
5	FR	Marseille	1,597,213	+10.1%
6	IT	Naples	1,306,151	+2.9%
7	GR	Piraeus	1,094,135	+11.6%
8	IT	Genoa	1,017,368	+19.9%
9	IT	Savona	910,244	-7.3%
10	ES	Tenerife	884,173	+5.25%
<b>Total</b>			<b>15,395,643</b>	<b>+3.6%</b>

Source: Cruise Activities in MedCruise ports (2017)





attacks in mid-2016). For Kyriakos Anastassiadis, CLIA Europe's Chairman, this is hardly a surprise. "Our growth prediction of cruising in Europe was confirmed in 2016 in spite of the socio-economic challenges we faced in several countries and some temporarily reduced regional deployment of capacity. Our industry is now more sophisticated and mature in Europe, which leads me to believe that the future is also looking up, particularly with the delivery of 26 new ships in 2017."

Newer, larger, and more environmentally-friendly vessels will soon set sail. The bulk of the newbuilds will be manufactured in Europe, as this piece of the shipbuilding industry is traditionally a major European stronghold niche successfully resisting competition coming from other corners of the world. Manufacturing and outfitting cruise ships requires far more sophisticated know-how than welding together e.g. container ships, and as such large shipyards in France, Italy, Germany, and Finland are catering to the market with a new generation of vessels, equipped with the latest tech (e.g. fuel cells in Turku), as well as customized to specific market conditions (like most recently the first cruise ship from Italy tailored to meet the Far East clients' fancy).

The challenge, in turn, for these new super ships is for port infrastructure to keep abreast. This will be especially a priority in Europe, as many of CLIA's cruise line members have invested more than a billion dollars in emission minimising technologies. In years 2017-2026, a total of 87 cruise ships are to use alternative-to-Heavy Fuel Oil bunkers powering their Tier III low-emission engines, whereas at least 13 of them will run on Liquefied Natural Gas (LNG). In such a way the industry is answering the rising demand for making its operations cleaner and less polluting.

### Something for everyone

Although cruising is Europe's fastest-growing form of spending holidays, it's still a young business representing a slim percentage among the available leisure travel options Europeans can pick from. This can, however, quickly change in favour of this market segment, as the industry

**Tab. 3. The European cruise market in 2012-2016 – by destination [thou. passengers]**

Destination	2012	2013	2014	2015	2016	2016/2015 [%]
Mediterranean and Atlantic Islands	3,456	3,574	3,433	3,443	3,363	-2.3%
Northern Europe	1,333	1,385	1,376	1,362	1,386	+1.8%
Caribbean and other	1,350	1,400	1,578	1,652	1,925	+16.5%



**Tab. 4. The European cruise market in 2016 – by cruise pax/population**

Country	Total pax [thou.]	Bed nights [thou.]	Avg. nights	Population [mln]	Pax/thou. population
UK and Ireland	1,889	18,471	9.8	69.8	27
Germany	2,018	18,042	8.9	80.7	25
Norway	99.0	507	5.1	5.3	19
Switzerland	138	1,238	9.0	8.4	16
Italy	751	5,649	7.5	59.8	13
Austria	115	958	8.3	8.7	13
Spain	486	3,558	7.3	46.0	11
France	574	4,450	7.8	64.7	9
Sweden	77	582	7.6	9.9	8
Denmark	36	294	8.2	5.7	6
Netherlands	101	966	9.6	17.0	6
Belgium	67	550	8.2	11.4	6
Other	323	2,229	6.9	355.7	1
<b>Total</b>	<b>6,674</b>	<b>57,494</b>	<b>8.6</b>	<b>743.1</b>	<b>9</b>



as a whole and many cruise line companies have invested in market intelligence and consumer or media campaigns. The cruise industry in Europe, as worldwide, enjoys the benefit of good citizenship as a major economic factor. The 2015 edition of our European Economic Contribution Report established that the cruise industry in

Europe contributed to 360,571 jobs, as well as put in EUR 41 billion in total contribution and over EUR 11 billion in employee compensation. Moreover, the numbers in terms of European employment and travel and industrial contributions continue to increase in tandem with annual European cruise passenger figures.

For many European customers, the attraction of cruising with an average eight to nine-night stay (Tab. 4) is to have to unpack only once, to be pampered, entertained, and afforded the finest of service, whilst being able to visit multiple historically interesting destinations (including, naturally, tasting the best in their culinary menus). In addition, with the huge choice of cruises, a wide range of customers is attracted on-board. One can opt for the best adventures from Greenland or Scandinavian fjords, Scottish wildlife, classic Nile, Adriatic Island hopping, photography in Mexico, archaeology in Turkey, cultural immersion in the Baltic, not to mention themed-trips, like Russian lost animals' world, the Coral Seas of the Seychelles, the Indian Ganges navigations, Arctic adventures, etc., be it in the fashion of modern or vintage cruising.

Once a prime choice for retirees, the industry now offers something to please various ages and social groups across 24 million people cruising worldwide annually. As such, there are offers for families, singles, couples, teenagers, babies-to-grandparents, LGBT, those travelling on a budget as well as deep pockets looking for a special treat. Geography and the calendar aren't obstacles either, because nowadays cruising is available virtually year-round, from the Arctic to Americas. What's also worth noting is the fact that today the majority of European cruise travellers are so-called repeat customers, meaning that they've enjoyed the experiences in the first place to such a degree that they want to make cruising part of their routine unwinding.

All in all, if the market keeps advancing at an +8.7% pace as it did in the 2012-2016 period, we'll have over 7.25 million cruise travellers in five years' time in need of being taken care of, both off- and onshore. The industry started preparing for this long ago. ■

The Brussels-based Cruise Lines International Association (CLIA) Europe is an independent, not for profit trade association that promotes the interests of cruise ship operators within Europe. As of today, CLIA Europe has a total of 32 cruise lines members. For more info, please visit [www.cliaeurope.eu](http://www.cliaeurope.eu)





# What do you think of...

Photo: www.pexels.com



## ...the blue industry?



### Gunter Pauli

*Economist and Author of The Blue Economy*

**“W**hen the island of El Hierro proposed to generate all its water and power with renewable sources of wind and hydro instead of petroleum at a cost of EUR 82 mln, the investment community and energy experts considered that this amount of capital for a population of only 10,500 inhabitants was not viable. Some even described it as a “white elephant.” Many formulating their opinions and critique lost sight of the fact that an annual cost of EUR 10 million for fuel represented a source of financing, offering a +10% return on the investment required. Whereas the conversion to renewables was viewed as impossible, the spending on petroleum was considered normal. The elimination of heavy fuel transport reduced the risk of spills, and cut carbon emissions to zero. The blue

economy offers a fresh look at the reality of development. The interface of land and sea will undergo a major transformation caused by climate change, rising sea levels and increased wave power, and we have to learn how to design our lives with the drastic shifts that will occur. The regeneration of mangroves along the coast of Surabaya in Indonesia offers welcome protection, while the channels in the new growth provide farming for shrimp which can now be harvested without the need for feed. The financing of mangroves is funded by the highly competitive pricing of high quality food. The land behind the mangroves is encroached by the sea, and there's a salt resistant rice that can be farmed. The blue economy works with what is available, generates value, innovates, and transforms. We have just started to see the grand portfolio before us. It is now up to the entrepreneurs and the policy makers to make this happen. With more than 200 projects implemented, and USD 5.0 billion invested, we know that this is a path that, if once walked, there is no turning back from.



### Dorothy Winters

*the Port of Amsterdam's Business Developer Offshore*

**“T**he ports of Amsterdam and IJmuiden have joined forces under the Amsterdam IJmuiden Offshore Port (AYOP), a public-private network organisation with over 70 specialists from government and the offshore industry. One of AYOP's aims is to develop the Amsterdam-IJmuiden into an area especially attractive for the offshore wind business, but we also cater to niches in the offshore oil & gas sector, such as drilling support, platforms' modifications & maintenance, and – particularly nowadays – decommissioning, and disassembly of redundant platforms. Experience is on our side – the first out of three wind farms in the Netherlands was installed from the Port of IJmuiden. AYOP is also a cable hub, catering to equipment, as well as logistics, and strategic storage for cable producers. Experienced as

we are in wind farm installation and maintenance, we have extended the number of berths for crew transfer vessels and boats. We have also done all turbine assembly activities for the near-shore wind farm Westermeerwind. AYOP is likewise very active within Decom@work, a group of companies working together to secure careful completion and decommissioning of parts in the life cycle, including logistics, re-use, and processing. We see the biggest future potential in rolling out of wind zones e.g. Hollandse Kust Zuid, and Hollandse Kust Noord, representing 2,100 MW of combined power. What's more, the Hollandse Kust West and the IJmuiden Ver will support energy transition in Dutch offshore wind with 7,000 MW. One of the initiatives taken by the Amsterdam-IJmuiden offshore region is research to support innovations in the offshore wind industry. The research covers three areas: Operations and maintenance (O&M), ship conversion, and logistics. It also offers a possibility of international knowledge-sharing between sectors in the area of process industry, materials, knowledge & expertise, manufacturing, sensor/sensing techniques, oil & gas supply, big data, etc. Furthermore, we are going to establish roundtables on each topic, so as to develop our ideas into collective industry innovation projects. Additionally, the Port of Amsterdam supports many other offshore activities, e.g. the development of the North Sea in a sustainable, responsible, and cost-effective way for renewable industry. Finally, I can say that we are devoted to the ROC Nova College initiative of launching the Wind Technician vocational technical education, which includes Falck training (offshore safety training), and Quercus (high voltage training).





## Isabelle Ryckbost

*ESPO's Secretary General*

**T**he blue industry concept is gaining particular importance these days, and many ports in Europe are responding positively to the ideas behind it. After all, since harbours are the connection nodes between land-based and the blue economics, it's no wonder that they are often the trigger facilitating blue industry activities both in the port area, as well as out in the sea. In order to face climate change and air pollution challenges, European seaports are trying to decarbonise their port operations in different ways. This can happen by encouraging stakeholders to embrace innovative technologies that help reduce harmful air emissions. I think that by attracting, facilitating the uptake, and even investing in alternative fuels, offshore energy and other renewables, ports can actively contribute to the energy transition in a bold move towards a low-carbon economy. European

ports are not only the nodes of transport, but also essential means of keeping the economy running or of securing the EU's energy security. The challenge for the blue industry will be to match different activities both in terms of space and priority. Therefore, port authorities can play an important role as matchmakers ensuring that the port-coastal waters cohabitation runs in the best possible way.

## ...ballast water management?



## Monika Normant-Saremba

*Institute of Oceanography, University of Gdańsk*

**W**hy does ballast water pose a danger to eco-systems? Human-mediated introductions of species in habitats outside their native range is a dynamic and non-stop process of global concern. Everyday organisms representing different taxonomic groups are massively transported to large distances in ballast tanks and in a ship's hull. What is worrying, the scale of this process has significantly increased over the last decades due to a rise in volume of world seaborne commercial traffic and trade. The origin of newcomers in European seas is highly concurrent with major shipping routes where we can find mostly species inhabiting the Atlantic coast of America, Indo-Pacific and Ponto-Caspian regions. Of course not all species are able to survive the journey and establish a self-sustaining population in a new environment – the

introduction of newcomers is more likely to be successful in environments that are similar to those of their origin; this means if the port of loading and port of discharge are ecologically comparable, the risk of a species introduction is relatively high. Growing in abundance and expanding its range, the population of non-native species may pose a threat to biodiversity (e.g. through competition, predation, hybridization, transition of diseases, alternation of habitats) and human health, as well as economy (e.g. through outbreaks of serious diseases, infrastructural damages, change of existing fishing patterns, damage to fishing gear, reduction in access to recreational resources). Only then does the non-native species become invasive non-native species. Unfortunately, due to the fact that invasiveness might be determined by different factors, all these unwanted impacts are usually unpredictable. Moreover, they are also almost always irreversible. Hence, it is important to take measures to reduce the number of new introductions. For the reason that eradication of new species is practically impossible in the marine environment and post factum management of invasive species is not easy and costly, the only reasonable alternative that should be prioritized seems to be prevention in the form of ballast water management procedures. Therefore, it is expected that the implementation of International Convention for the Control and Management of Ships Ballast Water and Sediments will significantly decrease problem of invaders in marine ecosystems.



## Fotios Katsoulas

*Head of Research at Affinity*

**T**he financial cost of installing one of the ballast water systems is rather significant, especially as asset prices are close to historical lows and earnings are under severe pressure across most commercial shipping sectors. The total amount of funds needed for ship-owners to install such system is estimated between USD 75-100 billion. The dilemma for owners of older ships, as scrapping the vessel just before their next special survey might look more attractive than carrying out the cost of installation, ranging from USD 500 thousand to USD 3 million, depending on the size of the vessel. Several ships have applied for extensions from the US Coast Guard (USCG) for meeting rules on discharging treated ballast, as it has signalled stricter enforcement on the issue and ship-owners face challenges installing USCG-approved BWT systems. But the availability of three systems creates a bigger

hurdle for ship-owners to get extensions for complying with US ballast water rules. The USCG considers extensions for each ship individually, rather than issuing blanket extensions covering multiple ships. This equals more detail on a BWT systems product's suitability for each individual ship in a fleet. For tankers, most vessels with surveys due after September 2017 are aged less than 15 years, but installations would mean even short-term supply reductions.

## ...toc europe 2017?



### Suzanne Tiago

*Portfolio Marketing Manager, TOC Events Worldwide*

**T**he recent TOC Europe event returned to Amsterdam – for the first time in 10 years. Visitor and delegate attendance at the event increased nearly 5% from the year before, and we had record numbers of exhibiting companies. The three-day exhibition was once again co-located with two free-to-attend technical seminar tracks as well as the high-level Container Supply Chain (CSC) Conference. Liner shipping, port connectivity, One Belt One Road and digitalization were some of the main subject areas covered at the CSC Conference. Delegates in attendance included carriers, third-party logistics providers, cargo owners and well as directory boards from ports and terminals. Speakers included representatives of Maersk Line, Stanley Black & Decker, Yilport and KTZ Express. The main focus of the two-track free seminar

programme was port efficiency, particularly in the fields of digitalization, automation, future terminals and also safety. The TECH TOC seminar fielded speakers including personnel from DP World, APM Terminals, Global Container Terminals and New Orleans Terminal; while speakers in the TOC Bulk seminar included Vale, Peel Ports and BASF. Within the trade exhibition, visitors met over 180 suppliers and saw the latest technology, including product launches, equipment displays, software demonstrations and simulations. TOC Europe positions itself as the Annual General Meeting for port and terminal professionals, providing knowledge and networking for both container terminal personnel and bulk logistics executives as well as their equipment and service providers.



### Lisa Barbieri

*VP Marketing, CM Labs*

**D**uring this year's edition of TOC Europe one could clearly sense global market players' increased interest in simulations. The adoption is largely driven by the need to use the actual equipment in the port to meet productivity requirements. With a documented reduction in time of 50% in real machine lessons when our simulators are used, combined with the ability to prepare operators for faults which cannot be reproduced on actual equipment, our products with a very high degree of realism are winning over even the skeptics. We also very recently announced that we're partnering with DP World on three continents as their simulation training solution provider. Attendees at TOC Europe got a hands-on look at the technology that market leaders are adopting to ensure safer training and more productive operations.



### Matthew Wittemeier

*Sales & Marketing Geschäftsbereich Logistik, INFORM*

**I**'m new to the logistics industry, coming from the aviation sector. Based on past experiences, I have to admit that I did not have high hopes for the TOC Europe exhibition nor the Tech TOC programme. How wrong was I! The exhibition and conference attracted a broad range of decision-makers and thought-leaders from across the terminals market together under one roof for three days of networking, business meetings, and highly engaging, and sometimes intense discussions. As a vendor, I was impressed by the quality of the leads we generated. As a new member of the logistics community, I was intrigued by its openness to welcome me. And, as a professional, I was amazed at the honesty and depth of discussions that were held both during formal sessions and in the ample networking opportunities. TOC Europe has set a standard for what I expect exhibitions and conferences to deliver.



### Wouter van den Bos

*Founder and CEO, SDC Verifier*

**F**or us, it is the second year to visit this exhibition-conference, which is an excellent spot for meeting everybody from the TOC Europe family in one place. And it was indeed a chance to meet our most important customers in the container and bulk handling industry – manufacturers, owners, and buyers of port and lifting equipment. We had good interest in both our FEA engineering consultancy and our software solution SDC Verifier. This year we experienced an especially optimistic atmosphere and we hope to increase our business accordingly. We are so happy to have been here that we're already booked for the next year. See you at TOC Europe in Rotterdam!

## ...ONSHORE POWER SUPPLY?



**Grant Brown**

*Vice President Marketing, PBES*

**M**ore recently, ports expressed some interest in the idea of using large scale energy storage to provide shore power to ships. The biggest advantage is the fact that a battery can supply large amounts of power at lower installed cost than modifying and building the infrastructure required to provide the same level of power using traditional transmission methods. The battery can be charged at night or during off-peak times and in certain locations the off-peak power is extremely inexpensive. The use of energy storage in an RTG crane can reduce fuel burn by up to 70% and achieve payback in under two years! These operational savings are very attractive and only get better if the government can offer some environmental breaks. A similar case could be made for OPS using energy storage as the backbone. In comparison to mobile generators or LNG-fired generators, there is

no additional carbon footprint. LNG in particular has been touted as a clean fuel, but due to methane slip (the escapement of unburned gas during production, handling, transportation and use), natural gas is actually far more polluting than previously thought. A completely clean power system will be an advantage in the future. With this in mind, PBES has developed an integrated solar and energy storage solution as a package that can provide 100% clean power to all types of applications. In northern climates this could be used with wind or hydro power. We are currently deploying systems to hurricane ravaged Barbuda and Puerto Rico to help rebuild their infrastructure, including a small port. The power they produce using the new system will cost roughly one-half of what it cost before the hurricane destroyed their infrastructure. It is a demonstration of how energy storage is helping to further move power generation away from fossil fuels and the associated cost and pollution. As mentioned above, Chinese ports are already implementing hybrid technology and have been doing so for at least four years. Rotterdam is also working on other forms of emissions reduction technology. Norway is leading the way with shore power in the form of power banks that supply battery power to all-electric ferries. There is a lot going on in the sector (more than I could possibly follow) and it seems to be a global trend.



**P A Ingman**

*Electrical Engineer, Silja Serenade*

**I** think I've got a clearer view now, especially on where the shipping industry can find a reason to choose shore power when staying at port (although that the ship-in-port emissions are just a very small part of the total amount). As we don't always know how electricity is produced, there might be even more harm coming from e.g. coal-fired power stations, than from the ships' own generators. But as the ports often are situated near or in the cities where the emissions and noise are a problem even without ships, it is understandable that they must reduce the total emissions by forcing the ships which stay more than two hours in harbor to invest in this kind of expensive equipment. From the vessel's "point of view" there is also one advantage during the cold ironing time – quiet and more friendly work of the engine room with better temperatures, which leads to savings the so-called running hours on

auxiliary engines and other equipment. The best (and only) solution any port/town I've heard of is a port in Norway where the price of the consumed electricity was so low that the investments to build the OPS possibility on the vessels was paying itself back in a reasonably short time! I'm sure that such solution would surely work out everywhere, where the same ships come often and stay for several hours, instead of doing the opposite by trying to cover own costs by overcharging for the same. Another point is the fact that the most of the ships stays only a short while in port and changing berth and port all the time and the OPS-equipment is quite unique for each vessel and do not normally suite many ships. When you look at the total emissions in a big harbour city, cargo transports on road is a bigger part of the cake. This probably means that a clean ship that e.g. uses LNG and will be able to reduce the total emissions only if other transport modes will do the same.



**Roberto Bernacchi**

*Shore-to-ship power & Smart Ports Global Product Manager Power Grids, ABB*

**F**or ABB, a leading shore-to-ship power technology provider, the Onshore Power Supply Seminar was the perfect opportunity to discuss the latest trends and developments to enhance port sustainability with ship-owners and port operators. It is well known and accepted that clean energy provision and elimination of diesel emissions (as well as noise) will improve the working condition, transit, and living environment in and around ports. Although an exponential increase in shore-to-ship power installations is currently happening in some regions, such as Norway and China, where local governments are facilitating the introduction of this breakthrough technology, the adoption of OPS in Europe is still selective. To facilitate a wide-scale implementation of the technology, a provider can play a fundamental role: starting from the project inception phase where an optimization of

capital expenditures and total cost of ownership can be performed looking at the specific needs of ports and shipowners, to the concrete realization of a stronger, smarter and greener port grid that allows the integration of e-mobility both on the blue side (electric or hybrid vessels) and on the land side (e-vehicles), as well as integration of renewable power sources such as wind farms or photovoltaic plants.



# partnership events

Photo: www.pexels.com



**Maritime Reconnaissance and Surveillance Technology**  
30-31 January 2018  
IT/Rome

*The conference will cover a wide-range of topics such as unmanned maritime system technology, intelligence gathering, automatic identification system, interoperability and system integration, as well as space-based surveillance.*



**Cyber-Security Seminar**  
9 February 2018  
UK/London

*Harbours Review Spotlight (HRS) is a series of premium seminars and workshops, focusing with pin-point accuracy on the most relevant topics from a variety of transport-related sectors. A limited number of participants ensures that your voice will be heard by our top-notch speakers and experts.*



**Border Security 2018**  
21-22 February 2018  
IT/Rome

*This year's event will bring together senior border security experts to discuss security management of borders at a time when mass illegal migration and cross-border terrorism have all nations at high alert. The event will tackle as well the use of new technologies.*



**International Conference RailRu 2018**  
28 February 2018  
RU/Moscow

*The event is focused on cargo railway transportation in Russia and rolling stock, and comprises round table discussions on the critical issues of the industry, like the global aspects of the balance of operational and economic efficiency, the issues of the freight cars market regulation and Russia's railway mainlines transit capacity overview.*



**2<sup>nd</sup> International Conference ShippingRu 2018**  
28 February 2018  
RU/Moscow

*The event is focusing on the in-depth consideration of topical issues relating to the current sea shipping market situation in Russia.*



**Transport Week 2018**  
6-8 March 2018  
PL/Gdańsk

*Transport Week 2018 is the next edition of our flagship transport & logistics conference. Widely recognized as the best possible start to your business year, it regularly gathers the crème de la crème of this highly dynamic industry. This year's edition of the Transport Week will be dedicated to the development of port infrastructure in Poland and Europe and the opportunities and challenges posed by the New Silk Road and China's One Belt One Road initiative.*



**Logistics CIO Forum EU**  
6-7 March 2018  
NL/Amsterdam

*The event will tackle in detail advancing technology, new market trends, changing business models, and increasing customer demands.*



**PVPC EXPO 2018**  
28-29 March 2018  
UAE/Abu Dhabi

*The exhibition welcomes all global purchasers, manufacturers and suppliers focusing on pumps, valves, pipes & compressors.*



**Arctic Shipping Forum**  
17-20 April 2018  
FI/Helsinki

*Taking place in April 2018, the Arctic Shipping Forum an event for the Arctic shipping sector, bringing shipowners, regulators, training specialists, environmentalists and maritime stakeholders together to discuss challenges facing the shipping industry in the Arctic Circle.*

We invite you to cooperate with us! If you wish to comment on any key port issue, share your feedback or have information for us, do not hesitate to contact us at: [editorial@baltic-press.com](mailto:editorial@baltic-press.com), +48 58 627 2320/ 2321.

# Shore Connection in a box



**Alan Arent**

*our representative in office  
in Gdansk, Poland*

After building the world's largest shore connection we are now moving on to a container solution for our customers.

We can set up the container for you at home and you can then connect it in any harbour in the world in about a week from delivery. And if your needs change, you just move your container.

With cold ironing the ship's auxiliary engine can be turned off at shore and thereby reducing both noise and emissions.

Actemium, part of VINCI Energies, has so far equipped seven harbours in Sweden and one in Norway. Will you be next in turn?

Contact me for more information at my office in Gdańsk at +48 515 710 450 or at [alan.arent@actemium.com](mailto:alan.arent@actemium.com)



**Less pollution**



**Less noise**



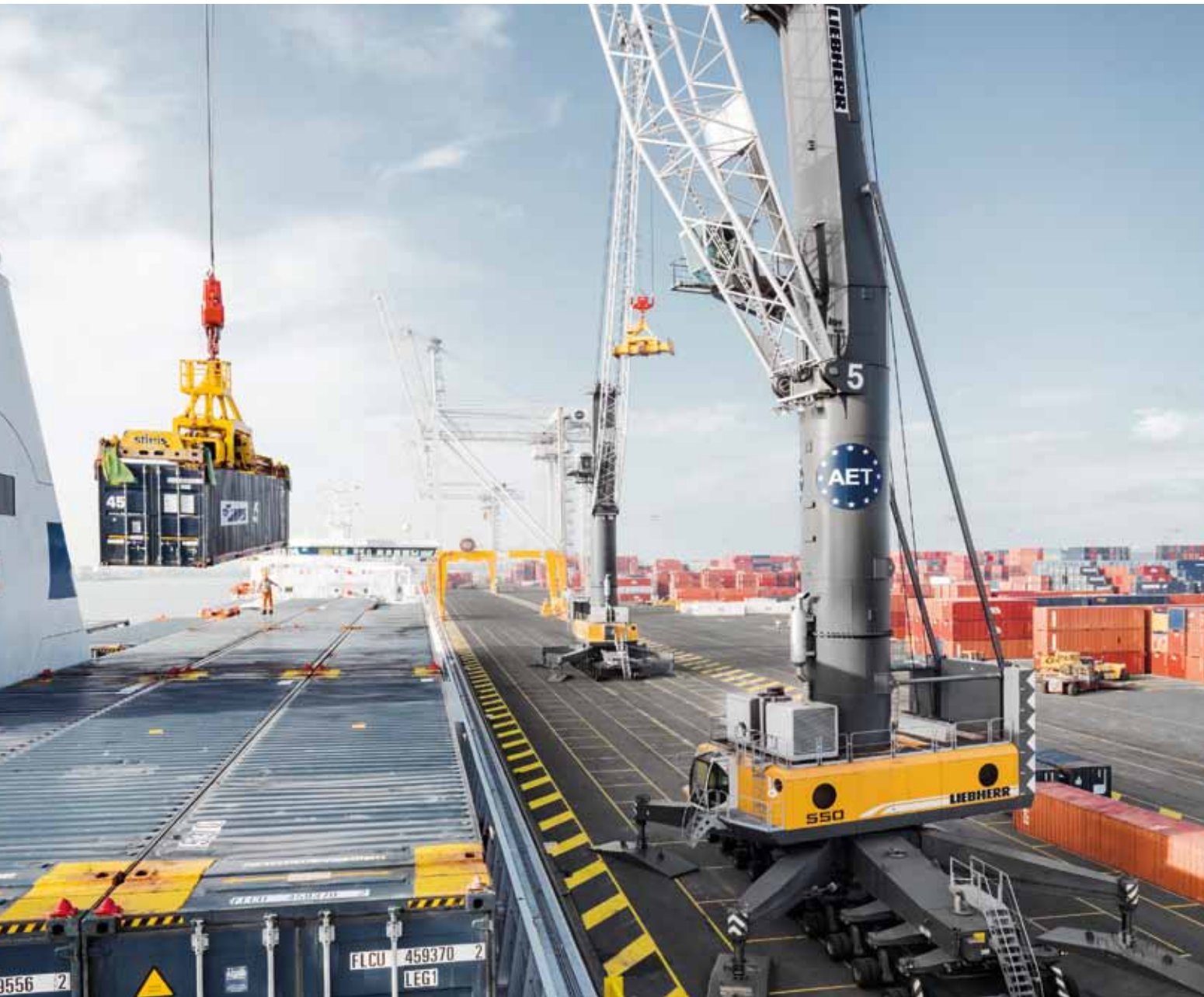
**Less energy**



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Experience the progress.



## **Mobile Harbour Crane**

- Fast, efficient and versatile material handling equipment
- X-shaped undercarriage guarantees the best weight distribution
- 360-degree mobility - outstanding in the MHC market
- Stepless hydrostatic power transmission for smooth and sensitive operation
- Flexibility makes it effective for all areas of application in the harbour

# **LIEBHERR**