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The Dutch Sales & service partner SMT Netherlands has recently delivered a SENNEBOGEN port material handler 875 E to ZHD Stevedores in Dordrecht for port material handling with clamshell grab. The SENNEBOGEN 875 E-Series impresses with ranges of up to 27m and a maximum load capacity of 7.5t. It offers high materials handling capacity, with proven low energy costs and operating costs that have even been further reduced, thanks to the Green Hybrid energy recovery system.

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SENNEBOGEN 875 E-Series working for ZHD Stevedores.

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featuring...

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Coal trade forecasts mostly positive

Despite political tensions overshadowing movements of some commodities, global import demand is still benefiting from positive impulses. Estimates suggest that world seaborne dry bulk trade could achieve further solid growth during 2018 as a whole and into next year.

On a cautionary note the International Monetary Fund commented in its mid-July update that the global expansion of economic activity is becoming less even and there are greater risks surrounding the outlook. A forecast of 3.9% growth in gross domestic product, slightly above last year's result, has been maintained. But the IMF suggested that some major economies' growth rates have peaked.

Coal

An updated overview published last month by the Australian government forecast only marginal (1%) growth in world coal trade in 2018. The estimated 1,392mt (million tonnes) total includes land movements but is mainly seaborne trade. Steam coal, the largest part, is expected to be stable at 1,058mt, while metallurgical coal (coking and other grades used in the steel industry) could be 5% higher at 334mt.

Expectations of increased coking coal trade partly reflect stronger steel production in raw materials importing countries. Prospects for higher import volumes by key Asian buyers are shown in table 1. In China, by contrast, coking coal imports could be lower. Widespread growth elsewhere could enable the global total to rise.

Iron ore

Steel production performances in the main iron ore importing countries during this year's first half emphasize continuing support for raw materials trade movements. Crude steel output was up by 1% in Japan to 53.0mt and by 2% in the EU to 87.3mt. South Korea's output was 4% higher at 36.1mt while India achieved a 5% increase to 52.8mt. In the biggest producing country, China, production rose by 6% to 451mt.

Iron ore trade derived much support from these achievements although China's ore imports in the first six months were 2% below those of the corresponding period last year, at 531mt. Nevertheless, several forecasters continue to expect this country's import demand to be stronger for the year as a whole. AGDIIS, for example estimates a 2% rise in the 2018 Chinese total to 1093mt.

Grain & soya

As the new 2018/19 crop year begins, there are no obvious signs of large additional import volumes which could provide a boost for world grain trade in the period ending June 2019. Based on the latest International Grains Council estimates, global trade in wheat plus corn and other coarse grains is likely to be essentially flat at 370mt, compared with 368mt in the preceding year.

Summer 2018 harvests in the main northern hemisphere importing countries are being monitored closely for signs of changing domestic production volumes, which could indicate imports variations. In recent weeks it has become clearer that Europe's grain production this summer will be down sharply, because of hot and dry weather. According to the IGC, output could decline by 5%. This reduction could potentially raise EU imports from the 23.6mt recorded in the past twelve months.

Minor bulks

Raw materials for the aluminium industry — bauxite, and the processed alumina — contribute large volumes to the minor bulks sector. Global seaborne bauxite/alumina trade is estimated to have reached around 130mt last year and seems set to expand robustly again in 2018. Positive influences seen recently include imports into China and some European countries.

Bulk carrier fleet

New bulk carrier capacity delivered into the world fleet during 2018 is still expected to be lower than seen last year, but not as low as earlier estimates indicated. A reduction of around one quarter in deadweight tonnes capacity added seems likely, as shown in table 2. But very subdued scrapping could result in sizeable fleet growth.

TABLE 1: KEY ASIAN SEABORNE COKING COAL IMPORTERS (MILLION TONNES)

	2013	2014	2015	2016	2017	2018*
Japan	77.0	74.1	70.6	74.0	71.9	73.0
South Korea	26.4	29.9	32.5	32.0	32.2	33.0
Taiwan	10.9	10.9	10.8	10.5	11.1	11.0
China	75.4	62.3	48.0	59.3	69.9	67.0
India	39.0	47.1	50.6	51.4	50.1	57.0
total of above	**228.7**	**224.3**	**212.5**	**227.2**	**235.2**	**241.0**

source: various & BSA 2018 estimates * *estimate*

TABLE 2: BULK CARRIER NEWBUILDING DELIVERIES (MILLION DEADWEIGHT TONNES)

	2013	2014	2015	2016	2017	2018*
Handysize (10-39,999dwt)	6.3	5.4	6.5	4.6	3.4	2.6
Handymax (40-64,999dwt)	14.7	11.4	15.9	13.2	10.8	5.3
Panamax (65-99,999dwt)	19.9	12.8	9.9	9.4	8.9	5.6
Capesize (100,000dwt and over)	22.0	18.7	16.9	20.0	15.3	14.5
Total	**62.9**	**48.3**	**49.2**	**47.2**	**38.4**	**28.0**
% change from previous year		–23.2	1.9	–4.1	–18.6	–27.1

source: Clarksons Research & BSA estimates for 2018 * *estimate*

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Dry bulk rates resilient despite US-China trade war

Despite an escalating global trade war, dry bulk shipping rates are recovering. However, commodity traders remain dubious that the Chinese economy will be negatively impacted or that there will be a significant reduction in stockpiles.

It is suggested that there are two reasons why business should continue as normal. Firstly, the Chinese economy is proving to be fairly resilient, and secondly, dry bulk trade between the US and China is relatively inconsequential in the bigger scheme of things.

According to the Bloomberg report, in 2017, the largest agribulk commerce between the US and China was soya, which amounted to 32.9 million tonnes. Compare this will overall global dry bulk trade, which is around 5.2 billion tonnes. Tariffs charged by the smallest agribulk carriers have therefore not been impacted at all by the dispute.

China has also invested heavily in domestic infrastructure projects to counterbalance any potential loss of trade with the US.

Barry Cross

Bettercoal launches revised Assurance System for responsible coal mining

On 23 July, Bettercoal launched its fully revised Assurance System which supports the delivery of the Bettercoal Standard. This is based on the Bettercoal Code which assesses the performance of coal mining companies and is designed to foster a globally responsible coal supply chain.

This new, robust and transparent process is the result of a comprehensive two-year review period led by Bettercoal Members and the multi-stakeholder Technical & Advisory Committee.

The new Assessment Process consists of five steps and includes an obligation to undergo a site assessment as well as regular reporting on continuous improvement.

This new system aims to reflect:

- a strong commitment made by coal producers from the outset, including clear deadlines;
- mandatory site assessment and reporting on continuous improvement;
- clear guidelines for Bettercoal Members' involvement in the process to avoid duplication of effort;
- clear claims for coal producers joining the Bettercoal Assessment Process and use in marketing materials; and
- New Policy of Association and clear guidelines for disassociation.

One of the most significant changes in the Assessment Process is the publication of summary results of the assessments which will be available on the Bettercoal website.

Bettercoal Executive Director Anne-Claire Howard said: "Bettercoal was founded over five years ago and it was important for the initiative to take on board the feedback received during those five years. Reviewing, modernizing and improving the rigour and quality of our Assessment Process was crucial to the credibility of our organization.

"Bettercoal and its Members recognize the role coal still plays in our economy through its multiple uses as a source of energy for electricity generation, steel and cement manufacturing and other processes. It was essential for buyers and producers of coal to have a credible, internationally recognized standard they could rely on to manage the risks in their supply chain.

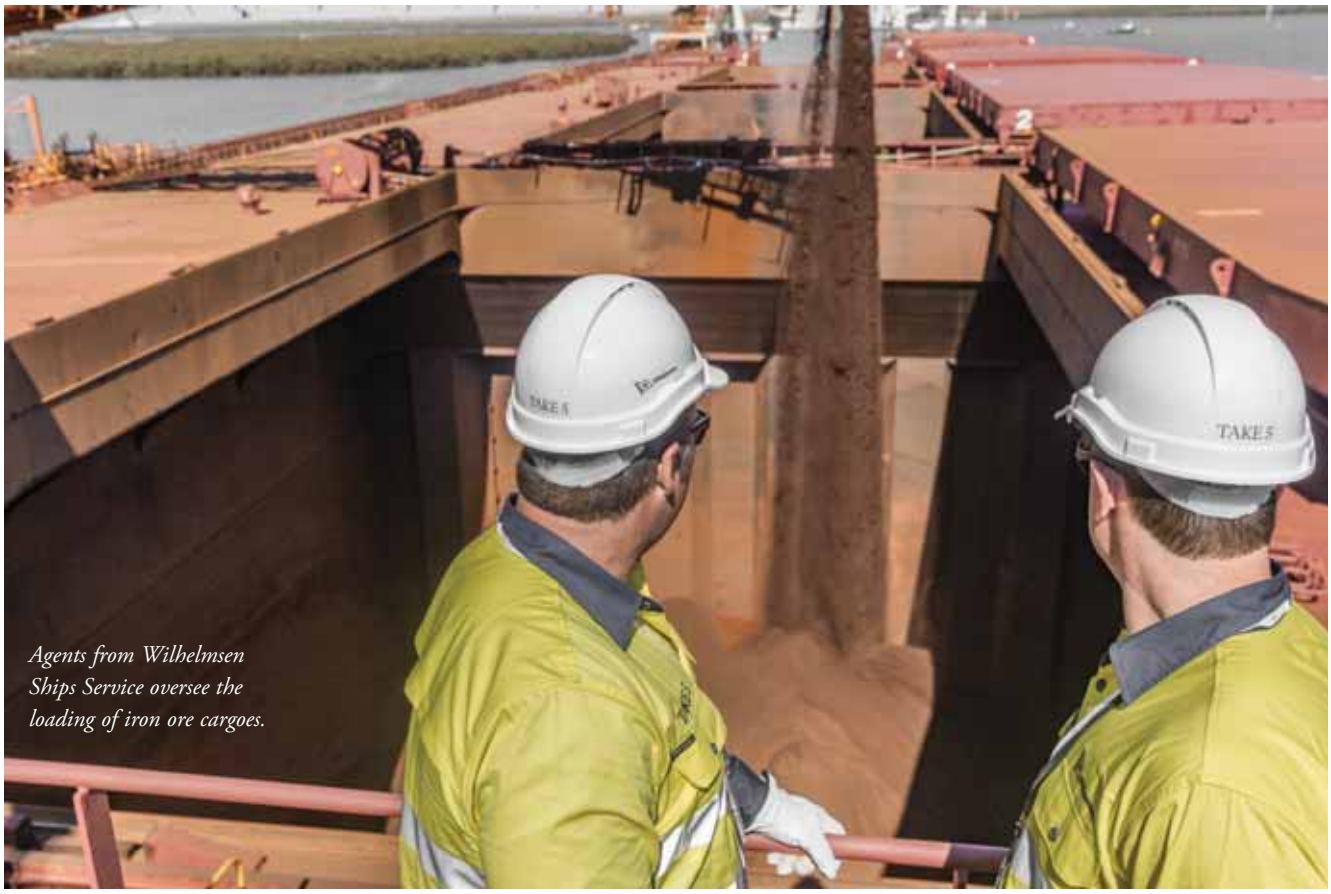
"We are proud to have worked with our multi-stakeholder advisory group to further enhance the credibility of our standard and ensure that we can contribute to a responsible global coal supply chain."

The new documents that support the revised Assurance System and that are available in English on the Bettercoal website are:

- Assessment Manual (versions in Russian and Spanish are soon to be published);
- Bettercoal Code (including a new Preface);
- Bettercoal Code Review Procedure;
- Claims & Logo Use Guide;
- Country Prioritisation 2018;
- Lead Assessor Application Form;
- Lead Assessor Allocation Procedures;
- Lead Assessor Approval Process & Criteria; and
- Policy of Association.

Bettercoal is a global standards initiative established in 2012 by major coal buyers striving to promote continuous improvement of sustainability performance in their coal supply chain.

China modernizes its approach to steel



Agents from Wilhelmsen Ships Service oversee the loading of iron ore cargoes.

Low-grade producers mull production cut to boost prices

True to its word, China continues to shed steel capacity that pollutes and uses old technology at a rate faster than expected, *writes Kunal Bose*. The country's industry ministry says the target to scrap 150mt (million tonnes) of capacity by 2000 is sought to be achieved this year itself. Slimming of steel capacity campaign has gained in momentum since president Xi Xinping himself wants pollution caused by steel and coal industries to be reined in for the world to take note.

Whatever China — accounting for some 49% of global steel capacity — does with its steel industry will have a significant bearing for the world trade in iron ore. Even while China is sitting on big reserves of iron ore, its dependence on imports is rising since the very poor quality of its mineral requires washing and beneficiation before it becomes usable.

China's ore imports last year were up 4.5% to a record 1.07bn tonnes when production of steel increased by 5.7% to an all-time high of 832mt. (Australia had a share of 62% of Chinese imports followed by Brazil's 16%.) But how could steel output rise in an environment of government commitment to carry out major supply side reforms? China has major dormant capacity, which came for use as rebar prices were up by 38% in the past year. The best that has happened for the environment and iron ore is China getting rid of 140mt of induction furnace capacity that uses scrap for making steel.

Use of induction furnace capacity was never honestly reported and the space that this section of steel industry has vacated is being taken up by integrated mills using blast furnace (BF) and basic oxygen furnace (BOF) route or DRI-electric arc furnace (EAF) route. Therefore, the continuing demand rise for iron ore in China.

Chief analyst for Baltic & International Maritime Council Peter Sand says:"Chinese imports of iron ore have been a reliable key driver in this decade of dry bulk shipping demand growth. Not only is China repeatedly importing larger volumes, it is also sourcing most of its imported ore from seaborne exporters with more than 98% of imports arriving via the sea."

India's steel secretary Aruna Sharma, who closely follows Chinese developments, says "the more recent times have seen that the world's largest producer is focused on migrating from commodity steel to value added products. Good prices for steel for nearly two years and the state push for better and better grades of metal will explain the Chinese industry's move up the value chain." Sharma is right, the deep capacity purge in excess of 50mt, effective ban on production of low quality steel, tight production restrictions during the winter

and above all a bullish market for steel saw the country's major steel producers' profit surging by as much 613.6% in 2017.

As it was destined to happen, insistence by Beijing that the steel industry's carbon footprint must be cut rapidly along with shift of focus to high value steel has resulted in Chinese mills using more and more ore with high iron (Fe) content. With a fall in demand, prices of inferior grades of ore met with an average price discount 37% in the March quarter against 16% in 2016, according to China's department of industry, innovation and science. The general consensus among market analysts is that the wide price differential between high and low grades of ore will remain in place. In fact, owners of low-grade iron ore mines are seriously considering the option of cutting production. This is in the hope that a reduction in supply may give a boost to prices.

"We've seen that one of the drivers for the spread between the higher grade and lower grade ores has been the high profitability of the Chinese steel mills... As that profitability comes under pressure, they will chase the lower-grade ore... The reality is that most of the producers, ourselves included, are not actually looking to grow supply of iron ore into China. The market is very well supplied... Nobody is looking at adding new supply into the market," says Fortescue Metals CEO Elizabeth Gaines. A kind of contrarian view to the general market analysis.

Earlier this year on 16 March, the Indian Supreme Court put a blanket ban on iron ore mining in Goa on the grounds that the local government was "unduly hasty" in renewing mine leases that was "not in the

India's steel secretary Aruna Sharma.

interest of mineral development" of the coastal state. That in one stroke took away 20mt of ore from the global supply kitty. The ore found in Goa has Fe content of 58% or less and almost the entire state's production was exported, mostly to China. There is no certainty as to when the state government will host auction of closed mines to grant leases to highest bidders. Moreover, once the auction-related formalities are over, the winners will have to secure as many as 13 different clearances plus approvals of village level conclaves before starting mining work.

In any case as the Chinese demand for low-grade ore has significantly ebbed, Goan miners, whenever they are back in action, will have a challenging task to sell their stuff in China or in any other market. In fact, much earlier to the court ban, New Delhi waived the 10% export duty on lump and fines ore, particularly to help Goan miners stay active in the world market. All this has now come to nought. India's share of the lower end of the Chinese ore market that is shrinking has been progressively usurped by other exporting countries, particularly Australia.

Sharma believes that China is no longer obsessed with volume of steel but is getting more and more focused on realizing greater value from what it makes. While Xi's passion for cleaning the environment will hopefully not let the shut capacity, including the polluting induction furnaces, back into production, China has all reasons to stay on course of structural reforms of the steel industry. In the current trade environment where the accusing finger is pointed at China for dumping steel in the world market and steelmakers finding better returns by making value added metal instead of chasing volume, it is rightly predicted that the country's steel production will remain broadly unchanged in the current year.

Going forward, Chinese production is likely to decline at an annual average rate of 0.5% to reach some 805mt by 2023. Since China will still have a 45% share of global production that year, the country will continue to remain the single most important factor in shaping the production pattern of the global iron ore industry and its investments in new projects.

Thanks largely to their recent investments in mines development in Australia's Pilbara region, both Rio Tinto and BHP Billiton are well geared to meet growing Chinese demand for high-grade lump and fines ore. According to a BHP official: "We believe our mines produce some of the best quality iron ore in Pilbara region. This

ensures we are well positioned as a low cost high-grade producer to meet the evolving demand scenario in China."

Moreover, the company developing the South Flank mine in Pilbara will further reinforce its position as producer of high grade ore. The official says:"As a high-grade deposit that produces both lump and fines at qualities equivalent to superior to the Platts reference grades, South Flank would support improved quality across our suite of products. Total lump proportion in our product profile would increase from 25% to approximately 35% and the average iron grade across our business would increase close to 1% from 61% to 62%."

The widened price differential in favour of high grade ore and changing texture of Chinese steel industry are proving music to the ears of Rio Tinto and Brazilian Vale. Improved demand for fe-rich ore helped Rio's Pilbara division to score earnings before interest, taxes, depreciation and amortization margins of 68% last year. Vale, Rio and BHP have all raised the efficiency bar to a level that leaves them with good margins at the benchmark 62% fines price at over $66 a tonne. All three have been able to contain production cost at $20 a tonne or below. China is producing less and less iron ore because of high production costs and the mineral with low fe content requires intensive beneficiation and washing, thereby boosting ore-making costs. It will be recalled that when ore prices, including freight and insurance, sank to a ten-year low of below $40 a tonne in December 2015, many small miners with high production costs and poor logistics backup were forced to shut up shop.

This only helped the industry's big four to increase their share of the ore seaborne market. At current prices, however, every section of the industry is in profit. In the meantime, the high levels of discount for low grade ore has remained the reason for some junior iron ore producers to include other minerals such as manganese and lithium in their portfolios and seek mergers/alliances with others similarly placed as themselves as part of survival strategy. One example is Atlas Iron and Mineral Resources, both of Australia, going for amalgamation of iron ore assets in the Pilbara region which should yield benefits of economies of scale and synergy. The combined entity with the benefit of lower production cost will be better placed to operate in a market where low-grade ore is sold at a heavy discount to superior varieties of ore.

The world market being such, it is imperative for India to extend the zero export duty relief granted earlier in February 2016 to lump and fines ore with fe up to 58% to help miners in Goa to ore with fe up to 62%, says HC Daga, former president of Federation of Indian Mineral Industries.

In the belief that resources such as iron ore should be preserved for future value addition locally, the government has in recent years used tariff barriers to discourage exports. As a result, India, which in 2009–19 was the world's third-largest exporter with overseas sales of 117mt, found exports last year down to 40mt. With production in Goa at a standstill, exports from India are to suffer a major setback in the coming days. This is sad for a country boasting of iron ore resources of 33.276bn tonnes. Australia and Brazil have found their resources position improving as they take out more and more iron ore from the earth.

There is a lesson for India in this. Put the focus and money in exploration. More and more resources will be identified. Discouraging exports is like putting the iron ore industry in chains.

Continued strong demand from China is keeping ore prices high: for how long?

There had been fears that the slowdown in the economy of China, the destination of more than half the almost 400mt (million tonnes) of iron ore Brazil has exported in each of the past few years, would cause a reduction in demand for Brazilian ore, and a sharp fall in its price, *writes Patrick Knight*. This has not occurred, and there are several reasons why.

The main one is that increased concern about pollution, especially severe in many cities in China, means mills are having to switch to using higher-quality ore than those mined locally, or imported from low-cost, low-quality nearby producers such as India. High-quality ore from Carajas, where a second mine opened in 2016, is now responsible for more than half the ore exported by the giant Vale company, the world's largest ore exporter. Carajas ore contains far less silicone than that from the mines in Minas Gerais state, exported via the Tubarao port complex.

Another reason for demand remaining buoyant, is that China is investing massively in large infrastructure projects in numerous countries in Africa, Asia and most recently, in Latin America, including Brazil. The investments aim to make it easier for more countries to import more Chinese goods, as several traditional markets, notably the US and Europe, have become saturated.

China also wants to ensure that the commodities they themselves need, including grains, notably soya beans and maize, as well as wood pulp, cotton, timber products and meat, can be imported easily and at low cost.

All these projects, notably railways, bridges and ports, will require large amounts of steel, so overall demand has not fallen, even though domestic demand in China itself may have done.

Being much further from customers in Asia, which as well as China, include Malaysia, the Philippines, South Korea and Taiwan, which together imported about 280mt of ore last year, than leading competitor Australia, logistics are a major challenge for Brazilian ore.

In the past few years, Vale has taken delivery of 36 of the first generation of the 400,000-tonne-capacity "Valemax' ore carriers, built either in China, or South Korea. Vale has now started taking delivery of a further 32 such ships. The second-generation vessels use considerably less fuel than the first ones did, as well as being less polluting.

New restrictions require that higher-grade fuel oil must be used in ships and this will push up costs. But the size of the new ships, much larger than the Capesize vessels previously used for the trade, means it now costs only about $8 to ship a tonne of Carajas ore to ports in China, or to one of the ports in nearby countries where Vale has facilities for blending Carajas ore, with that from Minas Gerais. This compares with the previous $18 per tonne. Last year, Brazilian ore was exported to 32 countries, 20 of which buy various blends of ores from the two sources.

It is now more than two years since the bursting of a dam containing slurry from the Samarco iron ore mine, owned jointly by Vale and BHP, at Mariano in Minas Gerais state. About 35 million cubic metres of toxic waste was released into the Rio Doce. Nineteen people lost their lives in the incident, and massive damage was caused to settlements on the river banks, as well as to vegetation, livestock and fish as the waste surged downstream to the sea. Numerous local communities instigated legal procedures calling for massive compensation from Samarco's owners. The ore from the mine travelled through a 600km pipeline to the Port of Uba, where much of it was converted into pellets.

Carajas iron ore mine.

Samarco was responsible for about 20% of all the pellets traded worldwide, while Vale made another 30% or so at its processing plants at Tubarao. The absence of Samarco pellets caused prices to rise, and customers are anxious for production to be resumed as soon as possible.

In June, agreement was reached between Samarco and the local community regarding what compensation will be paid. This opens the way for work aimed at re-starting the mine to commence. Until a permanent solution is found, waste from the Samarco mine will be pumped into old workings. There is sufficient ore at the Samarco mine to last for an estimated 45 years. It had been thought that BHP might sell its 50% share in Samarco to Vale, which would then become sole owner, but this now seems unlikely.

Samarco is not the only company in Brazil to be affected by equipment failure. In January this year, pipes on the 545km line which takes ore from the Anglo American's Minas-Rio project to the coast, burst at two points. Three hundred tonnes of slurry, comprised of 70% ore, 30% water escaped. Specialists have been examining the line, with the situation complicated by the fact that pipes were made in four countries, the United States, Japan, China and Argentina. Ultrasound equipment has been used to check welds for cracks and evidence of corrosion. The 1,600 tonnes of slurry in the line when the accident happened, have been removed and it is hoped that the line can re-start by October this year. A total of 17mt was produced at the Anglo mine in 2017, but is anticipated that only 7mt will be this year. Output from Anglo's mine is expected to

rise to 26.5 million tonnes by 2020.

The ore price averaged about $71 per tonne in 2017, and continues at about that level, rather than the $50–55 per tonne estimated for this year. Coupled with the fact that ore from Carajas can reach the port of Ponta da Madeira for a cost of only $35 per tonne, following the duplication of the 750km line railway which links the Carajas mine, to the coast, where new loading facilities have also been installed, allowed Vale to make a record profit last year.

Brazil's pig iron industry has gone into a major decline.

The large profit has allowed Vale to pay off half its $20 billion debt in the past two years, debt largely caused by the high cost of opening and equipping of the Carajas mine. Ore at the new mine is largely moved along conveyor belts, rather than carried in the very large trucks used in the first phase of the project, while the railway has been fully duplicated.

Company president Fabio Schwartsman, previously in charge of the Klabin pulp and paper company, and the first Vale CEO not to have worked for many years in the company, is anxious to ensure that the increasingly valuable Vale, is not the subject of a hostile takeover. Vale's previous owners, the Brazilian government, would strongly oppose this, however in need of hard cash it might be.

Schwartsman is also anxious for Vale to diversify away from its now almost total reliance on iron ore, together with a small, but significant contribution from nickel. Two decades ago, Vale was a leading player in all phases of the aluminium complex in Brazil; it had a share in several pulp mills and forestry projects, produced fertilizer and other commodities, as well as producing energy, and mining gold and copper.

Vale is now almost the sole supplier of the 30mt of ore sold to the companies which make up Brazil's steel industry, which has been experiencing difficult times in the past few years. In the first years of its 60-year history, Vale sold the great majority of its ore to countries in Europe, where the raw material was needed for the major rebuilding which followed the end of the Second World War. Once this phase was over, Vale turned its attention to Japan, as well as to the other 'Asian Tigers' which were growing extremely fast in the 1970s and 80s.

The growth of markets in Asia obliged Vale to give priority to its logistics, as its main competitors are the companies producing ore in Australia, which is far closer to countries in Asia. In more recent years, China has become the buyer of more than half all Brazil's ore. But there seems no likelihood of any new country emerging to take China's place as the leading customer for Brazilian ore.

New technology has revolutionized the steel industry. The arrival of electric furnaces, which rely mainly on scrap as a raw material, mean that demand for iron ore is static, even decreasing in many countries. China may soon join them, as more scrap becomes available there. Several revolutions lie ahead, not least the fact that as cars are increasingly fitted with electric engines, which incorporate far less steel than 'Otto' cycle ones do, raises questions about the future for steel, and consequently iron ore.

Pig iron, both for use by Brazil's own steel industry and for export, was until very recently, a major market for ore. But this industry too has gone into a major decline as steel making technology changes and Brazil's exports of pig iron have collapsed.

The Vale Sohar, *one of the 36 first-generation Valemax ore carriers. Vale has now started taking delivery of a further 32 such ships, with the second-generation vessels using considerably less fuel than the first ones did, as well as being less polluting.*

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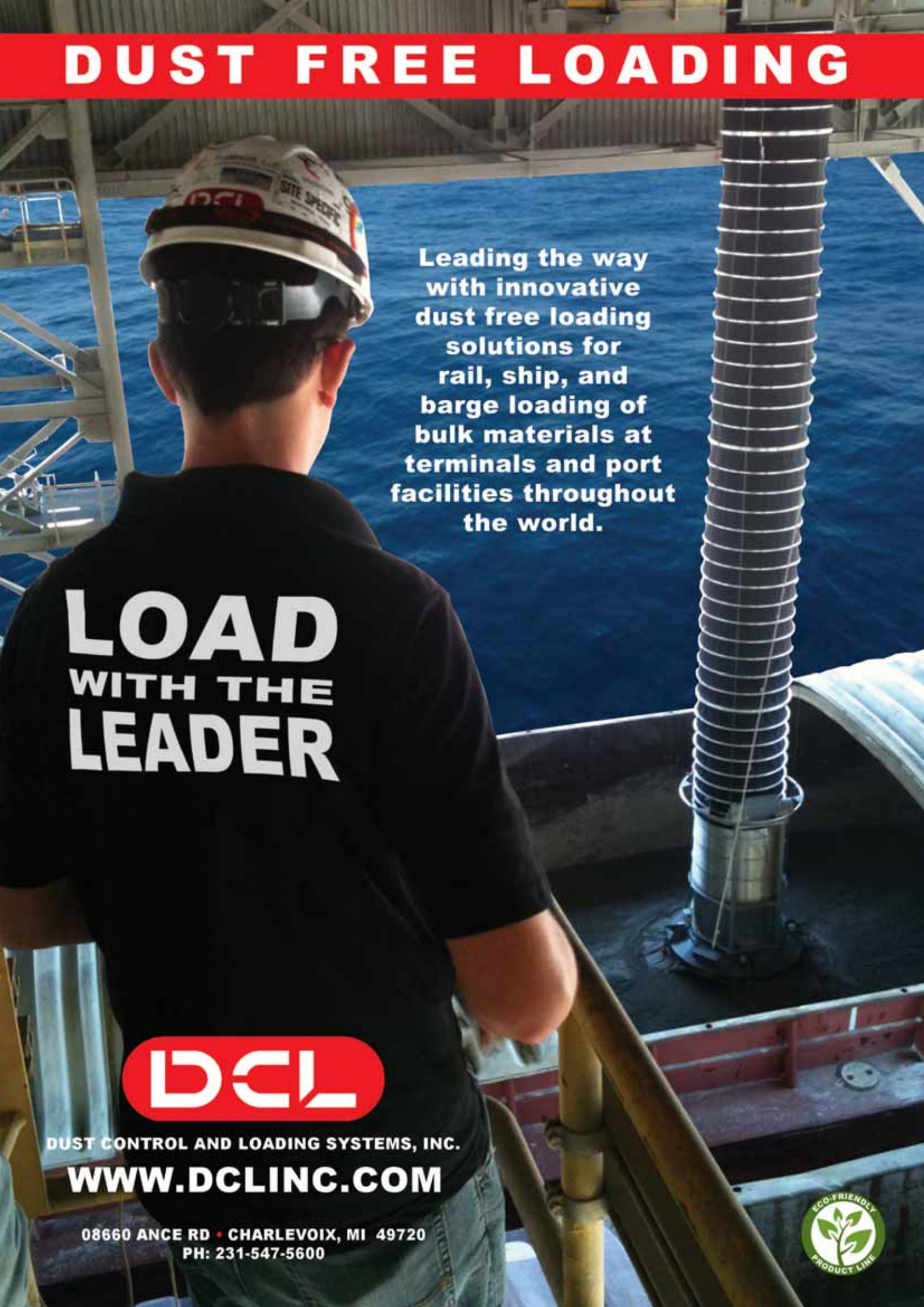
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Petroleum coke markets roiled by regulations and tariffs

Ben Ziesmer & Jesus Cabello, Jacobs Consultancy

The biggest – MARPOL VI Bunker rule – is yet to come

During the last year, environmental regulations in India and fears of a trade war with China have roiled the international petcoke market. However, these impacts will likely pale in comparison with those of the International Maritime Organization's MARPOL VI global 0.5% sulphur cap on bunker fuel.

Background

Petroleum coke (petcoke) is produced as a by-product in many — though not a majority — of oil refineries. Crude oil is first processed in an atmospheric distillation unit, followed by a vacuum distillation unit. The heavy residuum exiting the bottom of the vacuum tower (i.e., vacuum tower bottoms, or VTB) can be used to make asphalt, blended with some light products such as diesel to produce residual fuel oil (RFO), or used as coker feed (see Simplified Coking Refinery Flow Diagram on p15).

Traditionally, cokers are installed in oil refineries to convert VTB and other heavy residual oils into higher-value light transportation products (e.g., gasoline, jet fuel, diesel fuel). Until recently, a coker almost invariably increased refinery profitability because the yield of high-value transportation fuels is maximized and production of low-value RFO is minimized. While the coking process has been in use since the 1930s, petcoke production underwent its largest growth since 1990 because worldwide light transportation petroleum product demand has grown faster than RFO demand. Cokers have been, and continue to be, the preferred

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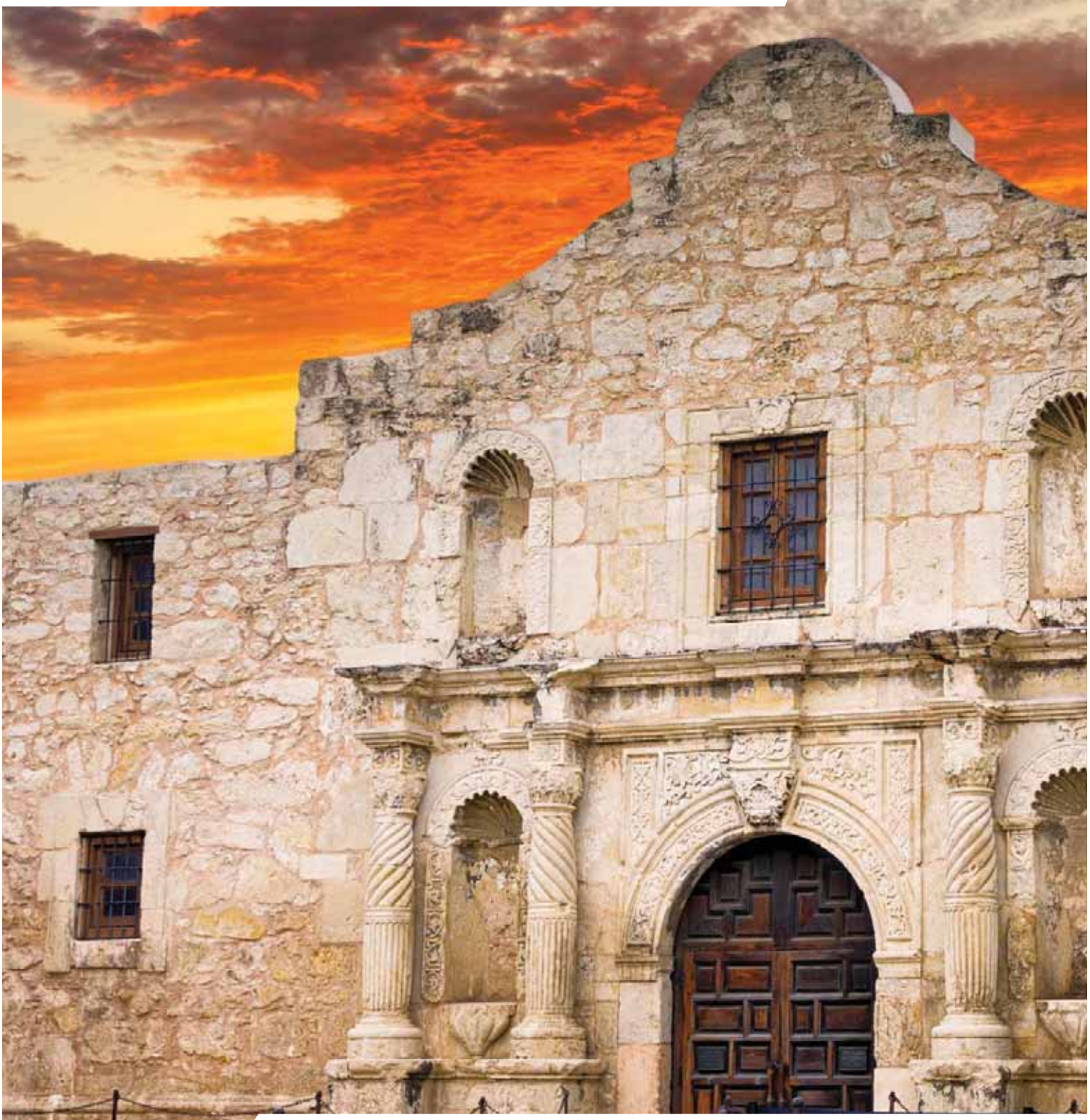

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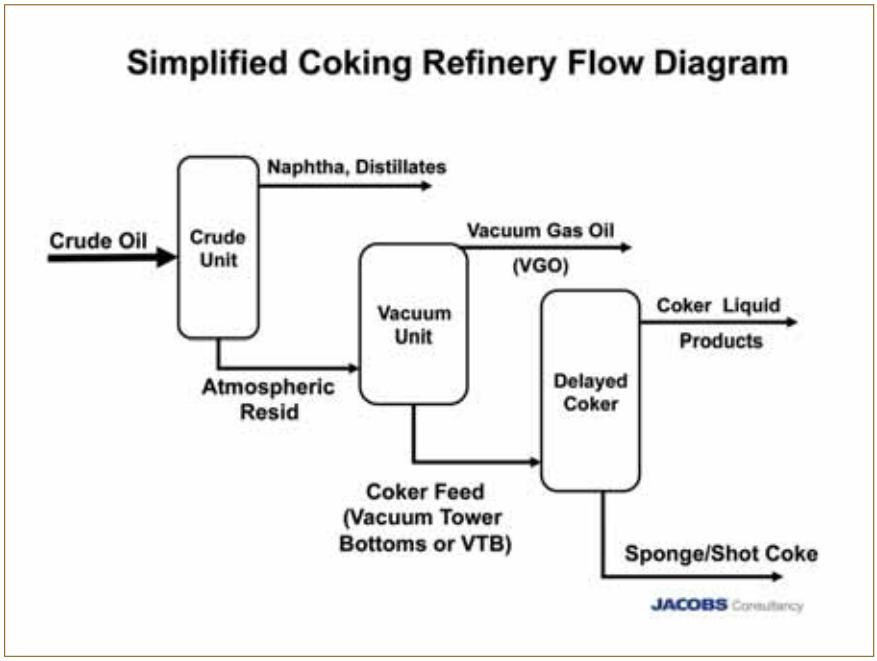
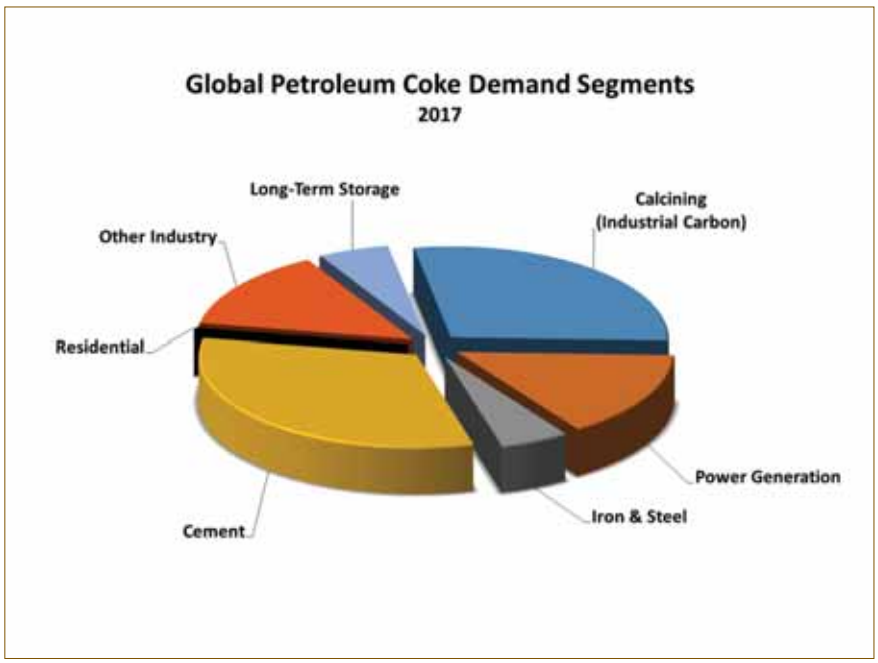
refining technology that allows the refining industry to reduce its production of RFO per barrel of crude oil processed, and bridge the gap between light product and RFO demand growth.

During the last two decades, two additional factors have driven the construction of cokers:

- Provide assured outlet for heavy crude oil: coking units allow a refinery to process lower-cost, heavy, sour crude oils. This was the driving force for the nine new or expanded cokers installed on the U.S. Gulf Coast from 1996–2004 when more heavy crude oil entered the market, and heavy crude oil producers signed long-term crude supply agreements to induce refiners to install additional coking capacity.
- Ultra-heavy crude oil production: cokers are used in upgraders that produce various grades of synthetic crude oil (SCO) from bitumen or ultra-heavy crude oils. This type of upgrader exists in Venezuela where ultra-heavy Orinoco Belt crude oil is upgraded and exported as lighter crude oils, and in Canada where upgraders are used to produce SCO from the bitumen derived from Alberta oil sands.





There are two general applications for petcoke: as a carbon source and as a heat source. The former requires better quality (e.g., low sulphur and metals) and commands higher prices. Green[1] petcoke is usually upgraded by calcination (a process which removes moisture and volatile matter and improves critical physical properties) when it is used as a carbon source. Petcoke that has been calcined is referred to as calcined petcoke (CPC). The largest market for CPC is in the production of anodes for aluminium smelting; other uses for CPC are in the production of carbon electrodes for electric arc furnaces, titanium dioxide (TiO_2) production, and as a recarburizer in the steel industry. Almost 30% of the petcoke produced is sold into these higher value-added markets for higher-quality petcoke; the remainder of the petcoke is sold into the fuel market, where it almost always competes with coal.

1. Technically, all petroleum coke that has not been calcined is green petroleum coke (GPC). However, within the petcoke industry, the term GPC is usually only used for petroleum coke that is being used as calciner feedstock.

India environmental regulations

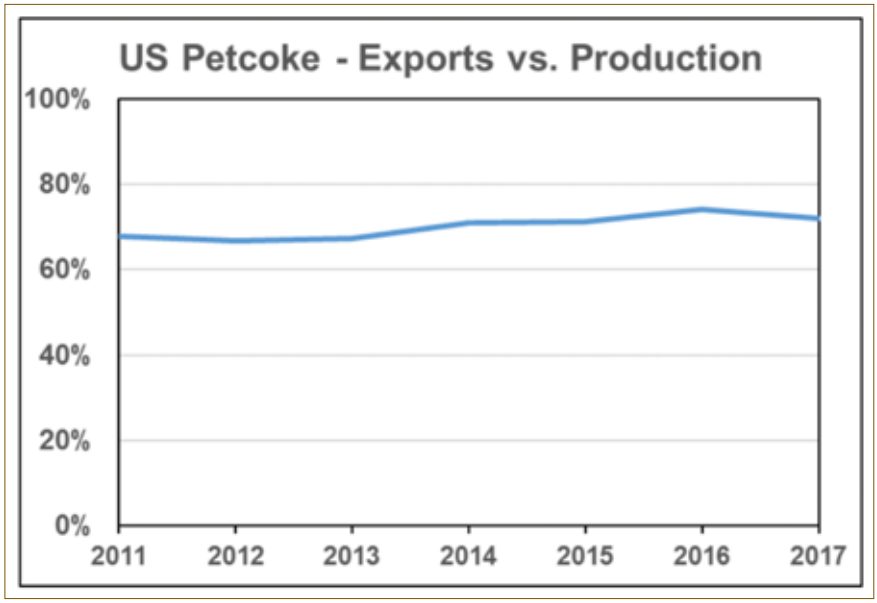
Petcoke exports from the U.S. Gulf Coast (USGC) and the Caribbean (primarily Colombia and Venezuela) provide approximately 65% of the seaborne fuel-grade petcoke trade. The sulphur content of fuel-grade petcoke in this market varies from 4.0–7+%. Some USGC refineries produce much lower sulphur petcoke, but this petcoke is used by U.S. calciners to produce calcined petroleum coke (CPC). Petcoke sulphur content is determined by the sulphur content of the crude oil being refined. Refiners primarily running Venezuela and US domestic crude oil tend to produce 4.0–5.0% sulphur petcoke, whereas refiners running Canadian, Mexican, or Middle Eastern crude oils tend to produce ≥6.0% sulphur petcoke. The clearing market for USGC/Caribbean petcoke used to be Europe, Middle East/North Africa (MENA), and Latin America; however, since 2009, the clearing market for ≥6.0% sulphur USGC petcoke has almost always been Asia (primarily China and/or India).

Recently, India has been the dominant Asian market for ≥6.0% sulphur USGC petcoke. Of the 9.0mt (million metric tonnes) of USGC petcoke exported to Asia in 2016, 80% was exported to India.

The issue of air pollution and air quality has been gaining importance in India as India becomes more industrialized and wealthier. Air pollution and premature deaths in the Delhi region gained greater public attention when the Centre for Science and Environment (CSE) issued a report[2] in December 2015 that stated air pollution is responsible for 10,000 to 30,000 deaths annually in Delhi and is the

fifth leading cause of death in India. India's capital city, Delhi, experienced severe air pollution in the fall of 2017, prompting action by the Supreme Court of India.

According to environmental activists and the CSE, petcoke use was one of the key factors driving air pollution in the National Capital Region (NCR)[3]. This triggered the Supreme Court of India on 24 October 2017 to ban the sale and use of petcoke and furnace oil (heavy fuel oil) in the NCR. Later, the Ministry of Environment, Forest and Climate Change (MoEF&CC) clarified that the court order applied only to those areas of Rajasthan, Haryana, and Uttar Pradesh that are within the NCR, not to the entire states. The use of petcoke and furnace oil has been banned in the city of Delhi since 1996. On 13 November 2017, the Supreme Court of India clarified that its ban on petcoke and furnace oil (heavy fuel oil) use and sale applied to all of the three states (Rajasthan, Haryana, and Uttar Pradesh) that surround Delhi, not just to those areas within the three states that are within the National Capital Region (NCR). This clarification more than tripled the amount of petcoke demand that was directly affected. The court also encouraged other Indian states to ban the use of petcoke. This ruling caused Indian petcoke buyers to retreat from the seaborne petcoke market.



Then, on 4 December, the Cabinet Minister who heads India's Petroleum and Natural Gas Ministry said that the central government is planning to curb the imports of petcoke.

These actions, along with the availability of high calorific value high-sulphur coal from the United States at economical prices, caused India's share of USGC petcoke exports to Asia to decrease to 55% in 2017.

The controversy regarding petcoke use in India has been fuelled by a number of

2. 'Body Burden 2015: State of India's Health'

3. Are within the states of Uttar Pradesh, Haryana, and Rajasthan that surround Delhi.

misconceptions that have been repeated in the public domain.

It is often stated or implied that US environmental regulations force US petcoke to be exported.

According to the *Indian Express*, a CSE research associate said, "In 2013–14, the U.S. imposed control of its use of petcoke but 60% of India's imports come from the US." In reality, there was no material change in U.S. environmental regulation of petcoke in 2013-14, and U.S. exports of petcoke as a percentage of production has been generally gradually increasing for years.

Probably the biggest factor behind the increase in the percentage of U.S.-produced petcoke being exported has been the shale gas production 'revolution'. The advent of natural gas production from shale formations (i.e. fracking) has significantly increased U.S. natural gas production and reduced the cost of natural gas to U.S. customers. Consequently, natural gas has taken market share from solid fuels (i.e., coal and petcoke).

It is important to note that a majority of U.S. petcoke has been exported for decades because refiners could achieve higher returns selling into the export market than by selling domestically. Key factors driving U.S. petcoke sales to export markets include:

- Most U.S. coking refineries are located on the coasts so they can economically access imported crude oil;
- Solid fuel demand in the U.S. tends to be located internally, near domestic coal reserves;
- Power generation is by far the biggest U.S. demand segment for coal, and coal-fired power plants are either located at mines or receive coal by barge or unit train;
- Historically, only one U.S. refinery had the capability to load unit trains; unit train rail rates have been, and remain, much lower than non-unit train rail rates;
- Transportation of solid fuels by vessel is much less expensive on a ton-mile basis than by unit train; and
- International steam (thermal) coal prices are higher — often significantly higher — than U.S. domestic steam coal prices.

Petroleum coke is often said to be a toxic waste of the oil refining process.

According to U.S. Environmental Protection Agency (U.S. EPA) regulations, something that has a positive value (i.e., can be sold) is not a waste product. Since petcoke is sold at positive values, sometimes at $100+/tonne it is not a waste product. Petcoke (except for needle coke, which is a premium priced purpose made product) is a by-product of refining crude oil at those oil refineries that are equipped with cokers.

The U.S. EPA defines toxic pollutant as a substance that is known, or suspected, to cause cancer or other serious health effects. Petcoke underwent extensive health and environmental testing as part of the U.S. EPA's High Production Volume (HPV) Testing Program. This testing determined that petcoke was neither a carcinogen nor toxic. The U.S. EPA does not classify petcoke as a toxic pollutant.

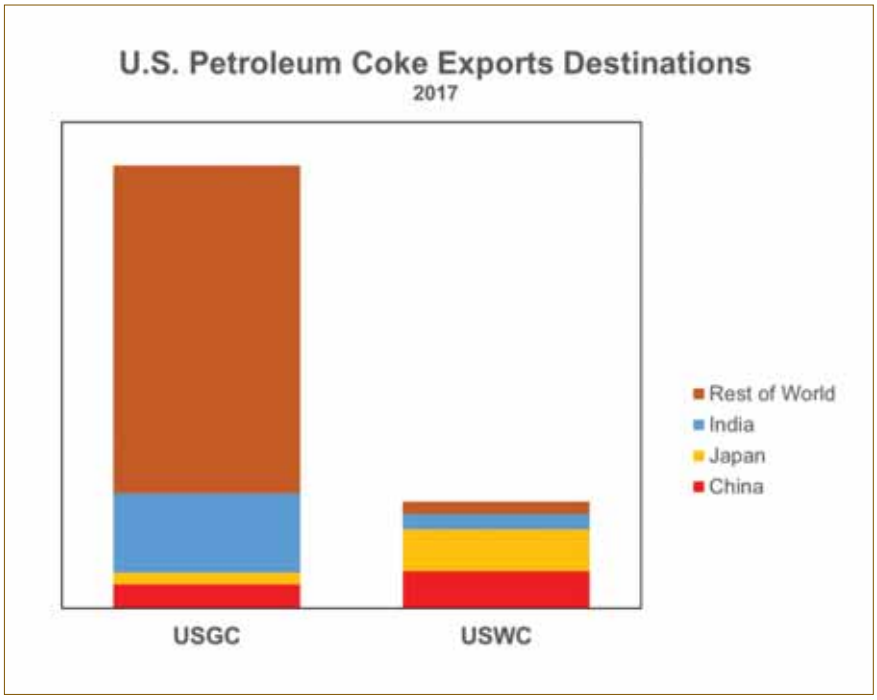
There is a failure to recognize that petcoke is not just used as fuel, but is also used in industrial processes.

As noted previously, approximately 30% of global petcoke production is calcined and used as an industrial carbon source. The largest use of petcoke as a carbon source is by aluminium smelters. A little over 0.5 tonne of petcoke is required to produce 1.0 tonne of primary aluminium, and currently there is no substitute for petcoke in the aluminium smelting process.

There is a failure to note that much of the sulphur in petcoke is often captured.

Cement kilns inherently capture ~90% of the sulphur in the fuel in the clinker[4]. Pollution control equipment can be very effective; for example, several electric generating units in the U.S. routinely capture 98% of sulphur in the petcoke they consume.

On 13 December, the Supreme Court accepted the recommendation of India's central government that petcoke could be used by cement and lime kilns and gasification plants because these industrial processes inherently capture high percentages of the sulphur in the petcoke. However, the issue of if petcoke imports would be banned remained unresolved. On 26 July 2018, the court accepted the recommendation of the central government that use of imported petcoke by the cement, lime, calcium carbide, and gasification industries be allowed. The court also accepted the central government's request of eight weeks' time to decide if petcoke imports for use by the aluminium and steel industries will be allowed. India imports significant quantities of generally higher-quality petcoke that is calcined to produce CPC to support India's aluminium smelting industry.



China Import Tariffs

On 8 August, China imposed 25% import tariffs on $US16 billion of US goods in retaliation for 25% import tariffs on US$16 billion of Chinese goods that U.S. President Trump authorized. Non-calcined (green) petcoke and CPC are on the list. China's tariffs are scheduled to become effective 23 August. Assuming the 25% tariffs go into effect, the tariffs will have a significant impact on U.S. petcoke trade, especially US West Coast (USWC) petcoke trade (see U.S. Petroleum Coke Exports Destinations Chart, above).

The tariff will probably end USGC petcoke exports to China and will reduce USWC exports to China. USGC exports to Japan will probably be supplanted by increased USWC exports. Additionally, some USWC petcoke will probably migrate to new destinations such as Europe, since Europe was the second-largest market for USWC petcoke before China became a major importer of U.S. petcoke.

MARPOL VI 0.5% Sulphur Bunker Fuel Regulation

In October 2016, the International Maritime Organization (IMO) set a deadline of 1 January 2020 for the global implementation of regulations that limit the sulphur content of bunker (marine) fuels outside of sulphur emission control areas (SECA). This regulation, which is part of MARPOL[5] Annex VI[6], will require ships to use marine fuel with ≤0.5% sulphur or install exhaust gas clean-up equipment (i.e., SO_X scrubbers). The dominant exhaust gas clean-up system technology utilizes seawater, which is alkaline, in a scrubber to capture sulphur oxides (SO_2 & SO_3) in the exhaust stream. The seawater, with the captured sulphates, is then returned to the sea.

The choices of lower-sulphur fuels range from utilizing low-sulphur marine fuel, which require very little or no vessel modifications, to using liquefied natural gas (LNG), which requires substantial ship modifications. The low-sulphur fuel options include low-sulphur residual fuel oil (LS RFO), low-sulphur marine gas oil (MGO), low-sulphur marine diesel oil (MDO), and blends of these fuels. The IMO estimates that there are 50,000+ vessels of 5,000dwt or larger that will be subject to this regulation.

The shipping industry consumes around 3.2–4.0 million barrels per day (180–230 million tonne/year) of high-sulphur residual fuel oil (HS RFO), and this market is important to many refineries. It will be a challenging task for the refining industry to

4. Clinker is cooled and combined with small percentages of gypsum in a grinding mill to produce cement.

5. MARPOL — International Convention for the Prevention of Pollution from Ships established in 1973, this code has been updated several times. Currently more than 180 countries are signatories.

6. MARPOL Annex VI — or colloquially MARPOL VI – Regulations for the Prevention of Air Pollution from Ships — was first enacted in 1997. Many people conflate MARPOL VI and the global 0.5% sulphur cap on bunker fuel even though MARPOL VI contains other regulations besides the global 0.5% S cap on bunker fuel.

replace this fuel with much lower sulphur fuel and find new outlets for HS RFO.

In the short to medium term, there is insufficient time for the shipping and refining industries to retrofit or install new equipment. For example, it typically takes five years for a refiner to install a new coker. Moreover, there was muted response by the shipping and refining industries to this new regulation until recently. It is our understanding from shipping sources that vessels representing ~5% of HS RFO bunker demand will be retrofitted with SO_X scrubbers by 2020.

Therefore, the dominant fuel solution for the 0.5% sulphur bunker rule compliance in the short to medium term is likely to be low-sulphur bunker fuel rather than ships installing exhaust gas scrubbing or converting to LNG. Consequently, MGO/MDO prices will be pressured higher. Refiners that currently produce HS RFO for the bunker market will have strong incentive to purchase lower sulphur crude oils so they can produce 0.5% sulphur compliant low sulphur bunker fuel. Conversely, refineries that have coking capacity will have increased incentive to process heavy, sour crude oil and maximize production of MGO/MDO. Thus, as 2020 approaches, we expect that petcoke production at existing cokers will increase and petcoke quality will decrease (e.g., higher sulphur content).

Longer term, it is expected that the shipping industry will move toward exhaust gas scrubbing or LNG and away from MGO/MDO. Since there are large economies of scale to SO_X scrubbing, the most likely evolution for the shipping industry will be some combination of SO_X scrubbing on newer, larger vessels, and the use of ≤0.5% sulphur marine fuel for the remainder of the vessels.

Shipping sources have indicated that, ultimately, vessels representing 0.8–1.0 million bbl/day of HS RFO demand will be equipped with SO_X scrubbers. Thus, the refining industry will make some investments to reduce its production of HS RFO. While it is possible to remove the sulphur from high-sulphur residuum (i.e. vacuum tower bottoms) directly, given the complex nature of these hydrocarbons, residuum desulphurization is a costly process, both in terms of capital and operating costs.

An alternative path for the displaced high-sulphur residuum is processing via delayed coking followed by distillate desulphurization. As was discussed earlier in this article, coking converts heavy residuum into light products (e.g., distillate fuel, similar to MGO, meeting the required sulphur limit of 0.5% maximum) and petcoke.

RFO typically contains 70% vacuum tower bottoms (residuum) and 30% diluent (e.g., kerosene), so currently approximately 2.2–2.8 million bbl/day (135–170 million tonne/year) of HS VTB (i.e., potential coker feedstock) is consumed by the maritime industry. While vessels equipped with SO_X scrubbers will consume 0.6–0.7 million bbl/day of HS VTB, the refining industry will be left with large quantities of HS VTBs with no obvious market. This year, we have seen increased interest by refiners in coking capacity additions with at least one project fully authorized to proceed and many others proceeding with engineering.

Conclusion

Seaborne petcoke trade flows have been impacted by environmental regulations in India and are about to be impacted by the impacts of China imposing 25% import tariffs on U.S. petcoke. However, the biggest impact on seaborne petroleum will occur beginning near the end of 2019 as the shipping and refining industries transition to complying with the IMO's global 0.5% sulphur cap on bunker fuel. In the near term, seaborne petcoke trade could increase by 15+% and longer term seaborne petcoke trade could increase by 40%. DCi

About the authors

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Jesus Cabello (Group Manager)
Jesus is a contributing editor to Jacobs Consultancy's *Pace Petroleum Coke Quarterly*©. He has more than 37 years of experience in petroleum product marketing, refinery planning, operations, and technical support. He has conducted a number of configuration studies for heavy oil upgraders, refining and petrochemical facilities, optimization and debottlenecking of existing facilities, technology screening studies, and due diligence for investors, and has strong experience developing operations best practices. Prior to joining Jacobs Consultancy, Jesus held a variety of technical and management positions a: PDVSA, CITGO, Shell, Lummus Technology, KBR, and Foster Wheeler.

Jacobs Consultancy Inc. has published the *Pace Petroleum Coke Quarterly*© since 1983. The report has been published monthly since 1984 and is considered the worldwide authoritative source for petroleum coke market information.

Thordon ThorPlas-Blue cuts operating costs while creating a safer working environment

The grease-free ThorPlas-Blue bearings Thordon supplied and installed to a Mississippi River line haul boat recently have helped reduce the vessel's operating costs while creating a safer working environment for the crew.

When this 180ft (54.9m) triple screw work boat recently docked for repairs, the ThorPlas-Blue bearings previously retrofitted to the vessel's tiller and jockey bars by precision field machining company Mactech On-Site showed no signs of wear, despite two years operating in the abrasive, low draught waters of the Mississippi River in the USA.

In response to the customer's request for grease and corrosion-free tiller linkage capable of withstanding greater vertical movement of tiller pins, Thordon's grease-free ThorPlas-Blue bearings were retrofitted to the triple screw towboat in 2016 with Mactech replacing the bronze bushings in the vessel's steering.

Thordon Bearings' Business Development Manager, USA, Jason Perry, stated: "It is typical of these Mississippi workhorses to drydock frequently to replace their greased sleeve type bushings. These types of bearings are unable to tolerate angular misalignments resulting from deflection or improper mounting, which can place considerable stresses on the steering system, causing high levels of vibration, corrosion and, in some cases, pollution."

"The nature of the work done by these vessels and the environments in which they operate also means that metal-on-metal bearings are more susceptible to damage and rapid rates of wear, which can increase operational costs."

At various times during the past two years' the vessel's steering gear was spot checked by pulling the tiller pins and measuring the internal diameter of the bushings. Based on measurements taken by Mactech and the customer, the bearings had experienced "no measurable wear."

"The commercial benefits of no longer having to replace metal-on-metal bearings every one or two years or purchase, store and apply lubricating greases are obvious, but the crew has also remarked that the tiller flat is a cleaner, safer working environment. The linkage system is completely grease-free, so there's no chance of slipping on greasy decks."

Based on the results and performance of the Thordon bearings on this vessel, the customer has now opted to retrofit ThorPlas-Blue to ten additional workboats.

Commenting on the retrofit process, Mactech Operations Manager Monty Glisson explained: "To create a completely grease-free steering system, a ThorPlas retrofit typically involves replacing hydraulic power units and cylinders, and carrying out quadrant modifications, as well as machining all quadrant and jockey bar bushings. Thordon and Mactech have the proper tools, experience, and processes to complete the job without removing all the steering components. We have a complete understanding of what the customer is trying to accomplish."

Prior to any retrofit project, Thordon and its partners will measure and record all as-found bushing data before creating a mock-up steering linkage. After this, new bushings are machined to size and clearance before fitting to quadrants and jockey bars. New wear plates are then manufactured for each pin joint and the steering system is reassembled with new pin retainers.

"The ease of machining allows the bushings to be finished quickly so that repairs and retrofits can be completed on time and without costly drydocking," said Glisson.

ThorPlas-Blue is a homogeneous, self-lubricating polymer bearing with a low dry coefficient of friction, high strength, and low creep.

About Thordon Bearings

A globally respected provider of seawater lubricated propeller shaft bearing systems, with over 35 years' experience in this technology, Thordon Bearings is renowned for supplying high performance, oil and grease-free bearing systems to the global marine, clean energy, pump and offshore markets. Thordon Bearings is the only manufacturer of propeller shaft bearings to guarantee its award-winning COMPAC system for a 15-year wear-life. Thordon systems and bearings are available worldwide through over 80 agents and distributors.

Mactech's bearing machining process.

The Thordon ThorPlas-Blue bearings in-situ *on the vessel.*

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Nautilus appoints new President and CEO

Nautilus International Holding Corp. has appointed Robert B. Owens to succeed James R. Callahan as president and CEO. Callahan will remain as chairman.

In his role as president and CEO, Owens will oversee all functions of the various enterprises of Nautilus, including Metro Ports, Metro Cruise Services, Metro Shore Services, Metro Events, Terminal Security Solutions and various other operating companies. All subsidiaries report to Owens, and he reports to the Nautilus board.

Nautilus President & CEO Robert Owens.

"I am thrilled to have Bob succeed me as president and CEO of Nautilus," Chairman Callahan said. "He brings an outstanding reputation as a highly skilled, personable executive of the highest integrity with a significant breadth of maritime experience spanning multiple decades, including critical skills in operational expertise, complex negotiations, financial acumen, strategic planning, business development, technology and automation platforms, and relationship building. Bob clearly possesses the experience, reputation and passion to lead the growth strategy at Nautilus."

Owens joins Nautilus after serving three successful decades in the maritime and intermodal sector for various companies, including Marine Terminals Corp., Ports America, Mi-Jack Products, TraPac and Total Terminals International. Owens' broad experience includes terminal operations, commercial and business development assignments including corporate acquisitions in the US and abroad. Additionally, he has implemented automated equipment and technology systems in multiple marine and intermodal facilities. Owens earned his Bachelor of Science in Economics degree from California State University, Long Beach, California.

"I am very excited to be joining a company with the history, success and integrity of Nautilus. I'm looking forward to building on the successful legacy and foundation that Jim and his teams have created through the years," said Owens.

About Nautilus International Holding Corp.

Nautilus International Holding Corp, headquartered in Long Beach, Calif., maintains oversight, business administration and management services of various subsidiary marine transportation companies concentrating in stevedoring, terminal operations, ground guest services to the passenger cruise industry, ship's agency, special events services, security and logistics.

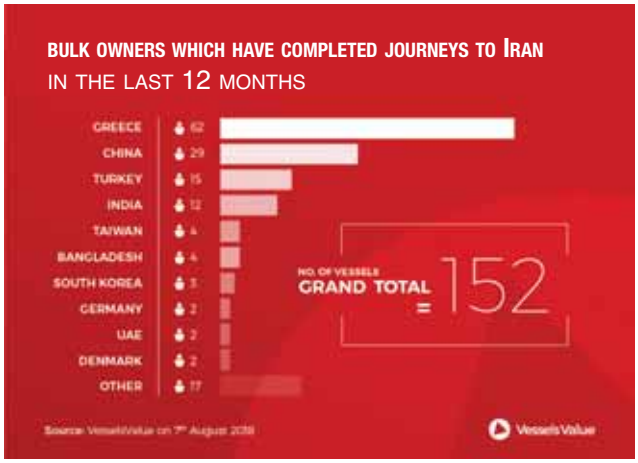
The companies of Nautilus International Holding Corp. excel in providing outstanding services to various market segments. These subsidiaries include Metro Ports, a contract stevedoring and marine terminal operator specializing in dry and wet bulk materials, breakbulk cargoes, forest products, wind energy, and a variety of other marine cargoes; Metro Cruise Services LLC and Metro Shore Services LLC, which jointly provide a full suite of services to the passenger cruise industry; Metro Events LLC, a company hosting corporate and special events; Terminal Security Solutions, which provides marine terminal security; and various other operating companies.

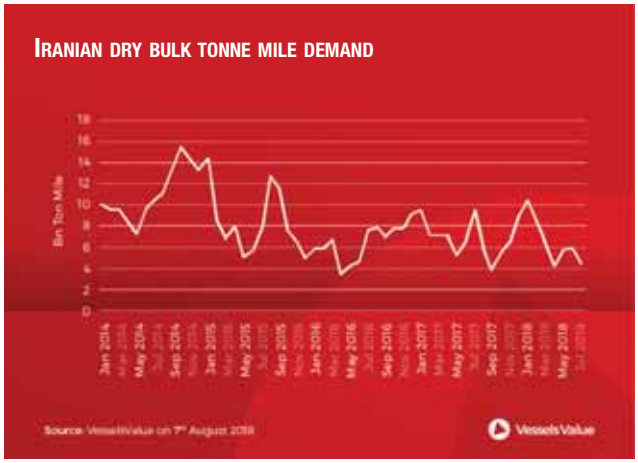
Shipping to/from Iran uncertain as US reinstates sanctions

The US has moved forward with reinstating sanctions following on from the US withdrawing from the 'Joint Comprehensive Plan of Action', also known as the Iran nuclear deal, according to information from market analyst VesselsValue. The sanctions are set to remain in place as until such time as Iran satisfies US demands, which include withdrawal of Iranian support from the Syrian and Yemenis conflicts, ending all uranium enrichment activities, acknowledging the true extent of its former nuclear programme and halting research and development on its missile programme. These demands are accompanied by more stringent threats that would target Iran's oil exports and impose sanctions on Iran's shipping, as well as other restrictions, and are set to come in to force on 5 November this year.

US allies in the EU who had previously voiced concerns about US withdrawal from the Iran nuclear deal have reiterated that the deal is crucial for security and have stepped forward with plans to insulate EU firms from US sanctions. EU's foreign policy chief Federica Mogherini has released a joint statement to this effect confirming that the EU are determined to protect European economic operators engaged in legitimate business with Iran, in accordance with EU law and with UN Security Council resolution 2231. This statement is, in turn, followed by European Union's updated Blocking Statute that enters into force on 7 August to protect EU companies doing legitimate business with Iran from the impact of US extra-territorial sanctions.

Iran's Dry Bulk Tonne-Mile demand is reflective of these contentious undercurrents. Trade volumes have been steadily declining from the beginning of this year up to President Trump's decision this May to withdraw from the Iran nuclear deal. Subsequent tussling between the US and EU allies and lack of a single voice for policy had a positive impact on Ton-Mile demand, but this growth has now retraced back to May's lower levels. It remains to be seen how the conflicting US and EU approaches to Iran will affect the market and its participants, fallout from the US–China trade war, including looming Chinese tariffs on US energy imports only add to this volatile dynamic.





GAC recognized in inaugural National Logistics and Transport Excellence Awards

GAC Sri Lanka is the only ship agent to be recognized in the first National Logistics and Transport Excellence Awards organized by the Chartered Institute of Logistics and Transport Sri Lanka (CILT). As one of nine companies to be bestowed a merit award, GAC Sri Lanka was recognized for its contribution to the country's transport and logistics industry.

"We are proud to be a major stakeholder in the transport and logistics industry of Sri Lanka, contributing to the economy and the growth of the industry with our full range of shipping and logistics services," says managing director Mahesh Kurukulasuriya.

"I would like to thank the entire GAC Sri Lanka team, as well as our partners, the McLarens Group, for the part they have played in this achievement," he adds.

GAC Sri Lanka handled more than 6,800 shipping, marine and logistics jobs in 2017. The pioneer of ship supply service off port limits at Galle and sole provider of ship-to-ship transfer services in Sri Lanka, GAC is a prominent ship agent in the country, with a market share of around 30%.

Work on one of Sri Lanka's biggest integrated distribution facilities is currently under way. The project by Spectra Logistics, a joint venture between GAC Logistics Sri Lanka and Hemas Transportation, will be fully equipped for container handling, multiple container repairing, container washing and container rigging.

About GAC Group

GAC is a global provider of integrated shipping, logistics and marine services. Emphasizing world-class performance, a long-term approach, innovation, ethics and a strong human touch, GAC delivers a flexible and value-adding portfolio to help customers achieve their strategic goals. Established since 1956, the privately owned group employs over 9,000 people in more than 300 offices worldwide.

Coldharbour opens Singapore office, plans expansion in Asia

UK-based Coldharbour Marine, a manufacturer of ballast water treatment systems (BWTS) based on unique inert gas technology, has opened a new office in Singapore and appointed Capt Mohit Batra, a master mariner with an MBA from Oxford University, to lead its planned expansion into the Asian market.

Batra, Managing Director of Coldharbour Asia Pte Ltd has extensive experience of the shipping sector gained over more than two decades. He has held several senior positions ashore including spells with classification society ABS and marine technology company Wärtsilä. He has also been involved in international business development, marketing and sales, implementing effective supply chain strategies and consulting on merger and acquisition activities.

Andrew Marshall, Coldharbour Marine's Chief Executive, commented on Batra's appointment and the new Singapore office. "Having a hub in Asia has always been a key part of our development strategy and I believe we have found just the right man to head our operation in this important market. Mohit has an unusual combination of seagoing and shore management experience and will bring these strong capabilities to our operations in Asia."

Batra explained the company's strategy: "We have timed the new Singapore set-up in advance of being awarded US Coast Guard type approval which we expect to receive in 2019. And it is next year that we expect the ballast water treatment installation market to take off strongly. This is particularly the case in our specific target markets which include large tankers, big bulk carriers and LNG vessels.

"We have identified a large number of ships in these sectors for which owners will need to plan system installations from 2019 onwards. Many of these retrofit projects will be undertaken in Chinese shipyards, whilst we will also be supplying treatment systems for new ships under construction at yards across Asia."

Batra, a highly respected figure in the marine industry, particularly in Asia, stressed the importance of Singapore as a location. "Apart from the obvious benefits of operating from this important maritime hub with its excellent international connections, we will be working closely with many ship operators and management companies which have chosen Singapore as their Asian base," he said. "We will also be establishing close links with the Chinese shipyards where many of the large vessels in our target market are likely to be retrofitted. From here, we will be ideally placed to coordinate and support ballast water system installations on both existing ships and newbuildings.

"I am very excited to have joined the Coldharbour team and look forward to developing the company's business across the Asian region," he said.

About Coldharbour Marine Ltd

Coldharbour Marine Limited is a UK-based design, engineering business with nearly four decades of inert gas and water treatment experience. The company has a long history in the inert gas generation sector and has in recent years developed Sea Guardian™ — a clean, green, compact "third generation" technology for use in LNG carriers and large tankers.

Sea Guardian™ inert gas generators incorporate a range of patented features that ensure stable, reliable, low maintenance operation and they are also integral to Coldharbour's award-winning GLD™ ballast water treatment system.

Key features of the GLD™ system are that treatment takes place in-tank and in-voyage and without the need for any form of in-line filtration. This approach ensures no disruption to terminal operations during ballasting and no risk of re-growth of marine organisms on long ballast voyages. With the GLD™ system, large vessels are now guaranteed to arrive at terminals ready to load or off-load ballast without the risk of delay caused by BWTS operational difficulties.

The system is fully type-approved by IMO, with testing undertaken by both the UK's Maritime and Coastguard Agency and Lloyd's Register. It also has US Coast Guard Alternate Management Systems acceptance and is currently undergoing the full US Coast Guard type approval process.

Yuzhny Commercial Sea Port handles 500mt of cargo in 40 years

In the period 1978–2018, Ukrainian state company Yuzhny Commercial Sea Port has welcomed about 24,000 vessels and handled 3.4 million railcars. The total cargo turnover is 502.8mt (million tonnes) since the first vessel was moored. This is the best result in the port industry of Ukraine.

"In the first half of 1978 the cargo turnover of the state company was 140,000 tonnes, while since the beginning of 2018 the company has handled 6.1mt of cargo. The company has much to be proud of: the state company now handles over 12mt of cargo every year.

"The port was built and developed to handle cargo for mining and metallurgical industry. Today, as well as 40 years ago, export ore, pig iron and metal make up the lion's share of the cargo turnover. Changes in the world markets contributed to the increase in demand for handling of thermal and coking coal for Ukrainian industry. In 2013, the company bought a new tugboat fleet with the total capacity of 6,000HP, as well as modern cranes and handling equipment.

"In 2015, due to the dredging at the berths, where the company operates, the first Capesize vessel was loaded up to a draught of 18.5m. Today, the state company handles Newcastlemax vessels on a regular basis. Moreover, our port is the only one that accommodates large-capacity vessels. It is to the merit of all the employees of the port, who built and developed the company. Our aim today is to attract new cargo owners and expand the range of cargoes in order to boost the cargo throughput, develop the infrastructure and capacities of the basic handling areas, increase profitability, efficiency of cargo operations, security level and create comfortable working conditions," said Anatoliy Yablunivskiy, acting director of Yuzhny Commercial Sea Port.

Yuzhny Commercial Sea Port is one of the biggest taxpayers in the Odessa region, and the largest local employer for Yuzhny town. The sum of 740 million UAN was transferred to different types of budget in 2017, 105.2 million UAN of which was aimed at Yuzhny town development. Payments to the town budget increased by 25.5% compared with 2016.

Thanks to the stevedoring company activities 12 blocks of flats, a secondary school, two nursery schools, a hostel, a health care centre, a modern sports and fitness centre, and other facilities were built for port workers.

New director joins major UK port

The Port of Tyne is welcoming a new non-executive director to its board.

With over 30 years of experience in shipping, maritime safety and engineering, Mike Comerford is a Chartered Engineer (C. Eng), a Member of the Royal Institution of Naval Architects (MRINA) and an Associate Fellow of the Nautical Institute (AFNI).

Comerford brings a wealth of expertise to the Port of Tyne having held previous senior roles within the Maritime and Coastguard Agency, Lloyd's Register and Bureau Veritas.

He said: "I am really pleased to be joining the Port of Tyne at an exciting time for the future of the maritime sector. I hope my years of experience in every aspect of maritime activity will be an asset to the board."

Comerford is also a non-executive director of David MacBrayne Limited; one of the largest ferry operating groups in Scotland transporting five million passengers annually and operating 25 harbours within the UK.

Mike Comerford.

Lucy Armstrong, Chair of the Port of Tyne, said: "I'm delighted to welcome Mike on board, his wide ranging experience will further strengthen the team."

- The Port of Tyne is one of the UK's major deep-sea ports — operating in bulk and conventional cargo, car terminals, cruise and ferry, logistics and commercial property.
- Overall the Port of Tyne adds some £690 million gross value added to the economy of North East England, supporting over 14,000 jobs directly and indirectly.

Offshore wind turbine project uses Port of Tyne

The deep-water heavy lift vessel *Aegir* has undertaken a number of highly complex heavy lifting operations at the Port of Tyne's Northumbrian Quay in North Shields, UK.

The 4,000-tonne heavy lift capacity vessel operated by Netherlands-based Heerema Marine Contractors (HMC) was in the river for around two weeks during which time a number of wind turbine jackets were transported down river from Smulders Projects UK, based in Wallsend.

The jackets which measure between 68–81 metres high and weigh 1,300 tonnes have been constructed by Belgian-owned Smulders UK as part of the European Offshore Wind Deployment Centre off Aberdeen in Scotland.

The complex marine operation started on 1 May, with the wind turbine jackets being towed from Wallsend on a barge to the deep-water berth at the Port of Tyne.

Aegir then came alongside the barge and lifted a jacket (one at a time) deploying its 125m-long, 96m-high main crane. After securing, *Aegir* sailed to Scotland with the jacket suspended from its crane, over the side of the vessel,

before returning to repeat the operation with the remaining jackets. During the lifting operations, the Port of Tyne enforced a slow speed passing limitation for other vessels — as the 211m-long and 46m-wide *Aegir* encroached into the river channel.

Steven Clapperton, Port of Tyne Harbour Master & Director of Health & Safety, Environment and Marine, said: "These are complex marine activities, using this substantial vessel of around 50,000 gross tonnes, which can be seen for miles around. The size of the ship, with its 4,000 tonnes revolving heavy lift crane, and the complexity of the operation make the Port of Tyne's Northumbrian Quay ideally placed to handle this work, due to its deep-water and close proximity to open sea."

Aegir returned from Scotland every three days to complete a total of five lifting operations at the Port of Tyne.

- The *Aegir* is 211m (689ft) long with a breadth of 46.2m (151ft) with two deck cranes, two ROV (remote operating underwater vehicles) capable of operating at depths of 3,500 metres and on-board accommodation for up to 305 people.
- The Port of Tyne is one of the UK's major deep-sea ports — operating in bulk and conventional cargo, car terminals, cruise and ferry, logistics and commercial property.
- Overall the Port of Tyne adds some £690 million gross value added to the economy of North East England, supporting over 14,000 jobs directly and indirectly.

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Execution of Taganrog Sea Commercial Port's development programme in H1 2018

In the first six months of 2018, Taganrog Sea Commercial Port (TagSCP, part of UCL Holding) in Russia invested US$2 million in the port infrastructure expansion programme, which represents a year-on-year 11% growth.

The majority of this amount was spent on the acquisition of a pair of rail-mounted slewing electrical double-jib cranes with a capacity of 32 tonnes. The AIST RPS-640 cranes can be outfitted with 10m³ grabs. The new equipment will enable the stevedoring company to boost performance and efficiency of dry bulk material handling at Berths No2 and No 3. TagSCP has also acquired a Hyundai HL760-9S wheel front loader with a 4m³ bucket for handling dry bulk materials.

Moreover, TagSCP has purchased a 5m³ bulk grain handling clamshell grab required for a Sennebogen material handler, a big bag spreader and a grip-type tilter for steel coils, which will contribute to better safety, efficiency and quality of handling operations. To reduce loss of pressure while handling oil products the company has acquired and installed an additional fuel oil heater.

The company also acquired an electrically driven NER pump station for operation with hydraulic tools used during installation/dismantling/repair operations.

To expand capacity of its storage facility, ensure efficiency of receiving and warehousing of dry bulk cargo, TagSCP has purchased 300 slabs for the storage yard's reinforced concrete fence.

Besides, investment programme of TagCSP includes a package of measures focused on improvement of safety and fire prevention. In the reporting period the terminal operator completed the replacement of high-voltage equipment, laying and connection of a high-voltage bridle cable between the port's substations and replacement of a gas metering unit.

About Taganrog Sea Commercial Port

Taganrog Sea Commercial Port JSC (TagSCP part of UCL Port, a stevedoring division of international transport group UCL Holding) is the largest stevedoring company operating at Berths No 1-5, 7 and 8 in Russia's southern Port of Taganrog.

Antwerp Port Authority goes for sustainable energy policy

The transition to a circular, low-carbon economy is one of the strategic priorities of Antwerp Port Authority. Sustainable energy is an important aspect of this, and in late July, the Port Authority was awarded ISO 50001 certification for the second time in a row. This internationally recognized standard recognizes the Port Authority's ongoing efforts in this area. A plan has now been drawn up for the next three years to concentrate on energy efficiency and to inspire other companies within the port platform to do the same.

The Port Authority was the first ever company of its kind to obtain ISO 50001 certification, in 2015. Now for the three-year cycle from 2015 to 2017 inclusive the Port Authority has again obtained an ISO 50001 certificate, which was officially presented by the certification body DNV GL to Greet Bernaers, the Port Authority's Infrastructure Manager.

Sustainable energy policy

The Port Authority has now drawn up an energy policy statement for the next three-year period (2018–2020). The ambition is to further improve the energy efficiency of the authority's own buildings and installations so as to reduce the in-house CO_2 emissions by 10% (compared with 2016). In addition, the CO_2 emissions of the authority's own fleet of boats will be reduced by around 5% per tugging operation between now and the end of 2020. Within the Port Authority an energy team has been set up to be responsible for implementing the energy management.

"This will be achieved with the help of various measures," explains Eddy Van Hove, the Port Authority's Technical Manager. "This will mean introducing more energy-efficient tugs and electric-powered vehicles and transport equipment, while making further use of renewable energy in buildings and in the lock complexes, drawn from solar panels and heat pumps. We will also organize ourselves more efficiently by clustering our buildings and activities, and we will further improve our behaviour with eco-driving and eco-sailing. All energy will be systematically monitored. These measures will enable us to systematically plan, implement and assess our energy-saving measures. The focus in all this will be on large consumers such as buildings and vehicles."

Günther Willems, Operations Manager Belgium DNV GL, declared: "Antwerp Port Authority has a system that gives a good view of the current performance, making it possible to take the necessary measures to reduce CO_2 emissions and achieve energy savings. Internal and external communication, along with the resources being allocated, demonstrate that the management is seriously committed to achieving the clearly formulated objectives and so to remain a leader in this sector."

Setting an example

"As a Port Authority we are conscious of our responsibility towards society, and we aim to set an example within the port platform," says Infrastructure Manager Greet Bernaers. "With a clearly formulated energy management plan that enjoys general support we want to inspire other companies to pursue energy efficiency in the same way. The fact that we have achieved ISO 50001 compliance twice in a row shows that we have been able to make energy efficiency an integral part of our business."

Port of Vancouver USA, partners dedicate $251 million West Vancouver Freight Access project

On 31 July this year, with the ring of an antique train bell, the Port of Vancouver USA and its partners dedicated a $251 million rail project that is bringing congestion relief and efficiency to port and regional businesses as well as rail users and communities across the Western US.

The West Vancouver Freight Access Project (WVFA) is a concerted, decade-long effort by the port to create jobs and generate economic benefit by investing in freight rail infrastructure. WVFA improves freight rail movement through the port and along the BNSF Railway and Union Pacific Railroad mainlines connecting the Pacific Northwest to major rail hubs in Chicago and Houston, and from Canada to Mexico.

Event speakers at the project dedication included US Rep. Jaime Herrera Beutler; Gov. Jay Inslee; David Hodges, Southwest Washington Director for US Sen. Patty Murray; Dena Horton, Southwest Washington Outreach Director for US Sen. Maria Cantwell; Port of Vancouver Commissioner Eric LaBrant; Port of Vancouver CEO Julianna Marler; United Grain Corp. COO Augusto Bassanini; International Longshore and Warehouse Union Local 4 President Cager Clabaugh; BNSF Railway Associate VP of Community Affairs Andrew Johnsen; HDR Senior VP Scott Goehri, and; Rotschy Inc. Project Manager Hans Schmeusser.

"The Port of Vancouver is one of our region's most critical gateways for commerce," said US Rep. Herrera Beutler. "I applaud the leadership and tenacity of those who have worked on the West Vancouver Freight Access project; its completion has been a long time coming. I'm honoured to have played a role in its success by helping secure important federal funding, and look forward to the jobs and expanded economic activity it will support."

"It is a thrill to celebrate the West Vancouver Freight Access Project and the jobs it will bring. This project shows that the Port of Vancouver USA and the region is open for business as WVFA improves freight mobility dramatically and opens Southwest Washington to more trade opportunities," Gov. Jay Inslee said. "Today is a great day of celebration for Vancouver and the entire state!"

"It's hard to overstate the importance of the West Vancouver Freight Access Project," said port CEO Julianna Marler. "Whether we're talking about how the project reduces rail congestion on the mainline and expands our capacity to 400,000 railcars per year, or how it supported thousands of family-wage jobs during design, engineering and construction — as well as jobs for the future — this has been a critical project with far-reaching benefits for our community, region and nation.

"We're very proud to celebrate WVFA's completion today with our staff and contractors and many of the partners who helped us make this project and its benefits a reality."

Funded through port dollars and federal and state grants, WVFA will help lower costs for US manufacturers and farmers, making them more competitive in global markets.

The project is also spurring private investment in and near the port. Port tenants and neighbours, including United Grain Corp., Great Western Malting and Farwest Steel, have already invested more than $200 million in private funds to upgrade facilities and equipment and take advantage of increased rail capacity.

The Port of Vancouver USA is one of the major ports on the Pacific Coast, and its competitive strengths include available land, versatile cargo handling capabilities, vast transportation networks, a skilled labour force and an exceptional level of service to its customers and community.

Fray Bentos to expand agribulk facilities

In Uruguay, the Ministry of Livestock, Agriculture and Fisheries has issued a tender for a concession to operate a dry bulk terminal at the Port of Fray Bentos. This covers the warehousing, conditioning and transport of bulk commodities as well as their derivatives, for example in the form of pellets.

The tender mandates that the concessionaire must ensure a reliable, quality service, at minimum cost to the end user for operations involving agribulk. In addition, the terminal must orientate operations towards foreign and not domestic trade, boosting Uruguay's exports as much as possible. Above all, it is expected to deal with deep sea traffic.

The above mentioned requirements will also lead to significant improvements being made in the port. There will be, for example, total storage capacity of 30,000 tonnes, while the concessionaire will have to implement facilities to accommodate total truckloads of up to 300 tonnes per hour. Furthermore, the existing port-road network will be upgraded to be able to handle the higher volumes of traffic.

The new terminal is expected to directly benefit the grain producing regions of the west of Uruguay.

Barry Cross

International Dry Bulk Terminals Group

Giving a voice to the operators of dry bulk terminals

Now in its 20th year, the International Dry Bulk Terminals Group (DBTG) is the only voice that speaks specifically for the operators of dry bulk terminals. DBTG is a not-for-profit organization that provides owners and operators of dry bulk terminals a forum to discuss issues that affect their sector and a platform from which they can be addressed.

In the 1990s when Ships of Shame were making headlines and some notable incidents involving dry bulk carriers, terminals were very often having fingers of blame pointed at them as the cause of the problem. Poor loading and dangerous cargoes were often cited as the cause of incidents when in truth, it was substandard and poorly operated ships that were most often at fault.

One man felt that this was not right and took it upon himself to contact some of the largest terminals of the time to see if there was an appetite to come together and collectively defend terminals from the unjustified criticisms that were filling the press. That man was Richard Peckham and after several days spent on the phone, he had the agreement of 30 terminal owners/operators, all handling a variety of commodities, to meet in Rotterdam to discuss the issues for what resulted in the first meeting of DBTG. Initially they called themselves the International Dry Bulk Terminal Contact Group and in 1999 the group was officially formed and became IDBTG, having dropped the 'Contact' aspect from the title.

The biggest issue for terminals at that time was zero representation at any level in the industry. This prevented terminals from publically representing or defending themselves and Peckham set out to rectify that. At the same time the Coal Export Terminal Operators Association (CETOA) had applied unsuccessfully for Consultative Status at the International Maritime Organization (IMO), unsuccessful because they only represented one aspect of dry bulk. However, Peckham had the vision to see that an application for Consultative Status to the IMO representing all dry bulk cargoes might be looked at more favourably. He was not wrong and 18 months later, in 2000, DBTG was granted Consultative Status as the International Bulk Terminals Association (IBTA). Since that time, IBTA has represented the owners and operators of its dry bulk terminal Members at the IMO with some notable achievements.

As an organization, there is a small team that runs the group. An Executive Committee, which comprises elected representatives of senior management drawn from the Membership, oversees the direction and the Executive Director ensures that direction is taken. They are all

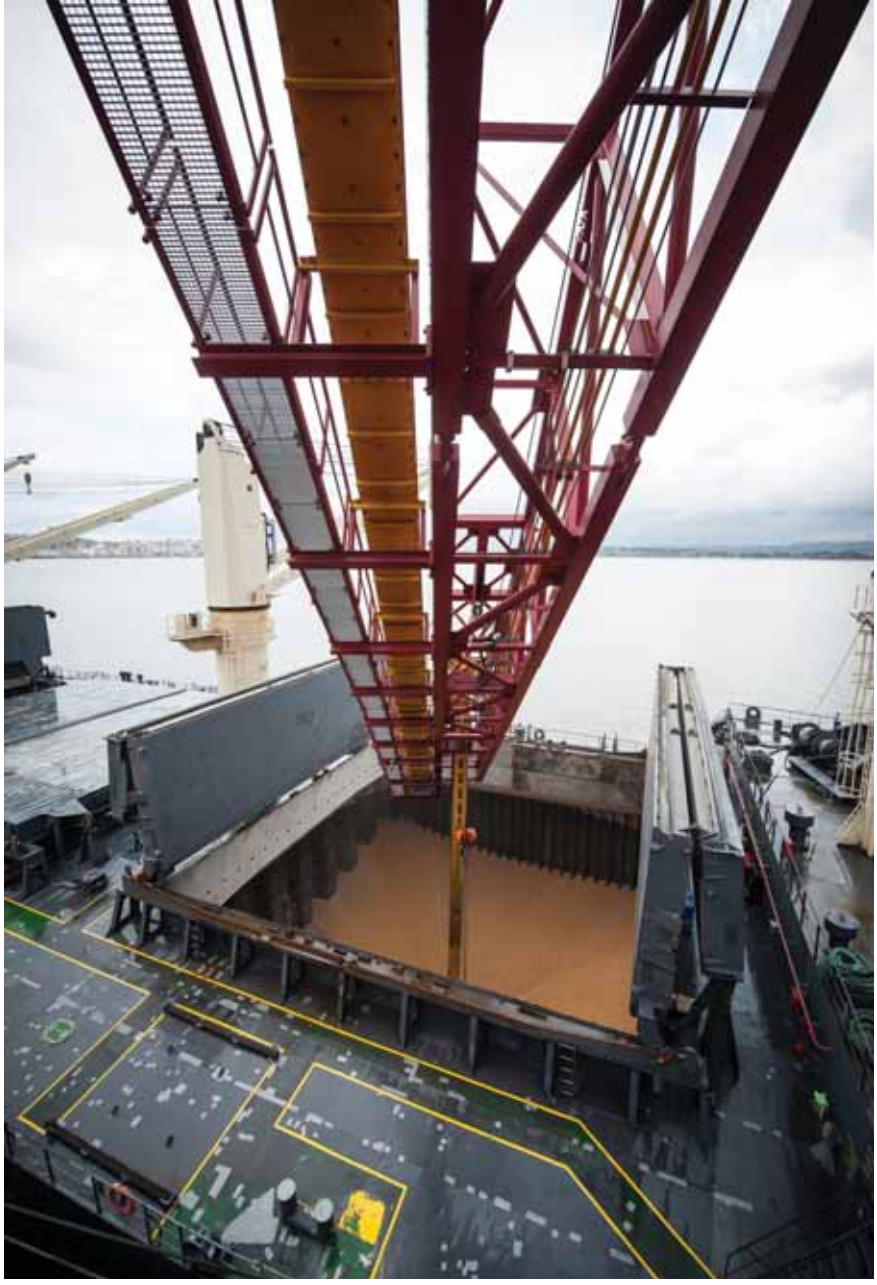
supported by the Secretariat which does all the hard work.

DBTG does not just rely on its members; it also co-operates with partner organizations and associate members. The partner organizations are the already mentioned CETOA, the North American Export Grain Association (NAEGA), the European Association of Professional Portside Storekeepers for Agribulk Commodities (UNISTOCK) and the International Iron Metallics Association (IIMA). Associate members are suppliers to the members — equipment manufacturers, technical specialists, engineers etc. Collectively there are centuries of experience to draw from.

One of the unique aspects of DBTG is this wealth of knowledge available through the membership, partner organizations and associates. DBTG members handle a variety of cargoes from coal and grains to aggregates and members are based in, or operate from, every continent in the world and handle some 35% of world seaborne dry bulk cargoes. All members contribute a variety of skills and knowledge when required to do so and are drafted in for their experience and knowledge to represent DBTG when required and available to do so.

As a non-governmental organization (NGO) at the IMO, one of DBTG's first milestones was the introduction and adoption of the Blu Code. This is effectively the industry handbook to which all self respecting operators work. More recently DBTG played a central role in the IMO tasked Global Bauxite Working Group (GBWG). The GBWG was set up in 2016 following the loss of the *Bulk Jupiter* off Vietnam in January 2015 and the research it conducted established that it is dynamic separation, not liquefaction, that causes some bauxite cargoes to become unstable. Dynamic separation is a process where moisture in some bauxite cargoes, those with a high percentage of fine material, is forced to the top of the cargo in each hold. This is primarily caused by the forces applied to the vessel, the motion of the ocean, which slumps the heap and compacts the fine particles in the cargo. This, in turn, creates a free surface water effect that renders the vessel unstable and liable to capsize with little or no warning. For this research, DBTG drafted an expert from its membership, Captain Kevin Cribbin, who not only has many years' experience at sea but has also spent many years handling bauxite.

From foundation, the DBTG philosophy has been to set industry standards and its



members have been doing that now for 20 years. When problems or issues are identified, they are discussed and analysed, and solutions are found. A unique aspect of such — and, at times, sensitive — discussions is the ability to do so in a non-competitive way. Members can and do sit down with their direct competitors and are able to have frank and open conversations for the greater good of their industry, leaving competition at the door as they enter.

For all this to be achieved, DBTG members, partners and associates gather twice a year. Meetings run over two days and cover a large spectrum of topics ranging from technical to operational, cargo and health and safety. Issues discussed can occur at any stage of the handling process too, from ship to shore and shore to ship and anywhere in-between. However, a staple of DBTG meetings is a tour of a local dry bulk terminal which facilitates the exchange of ideas and information. One meeting a year is located at a suitable location in Europe, the other is located somewhere similarly suitable outside Europe. This not only helps attract maximum attendance but also brings a different dynamic to every meeting. In April this year, Hamburg was a superb location for the first 2018 meeting where a variety of significant issues was discussed.

Meetings often set some of the agenda for future DBTG meetings. In Hamburg, Kevin Cribbin presented the findings of some research he has spent thousands of hours conducting into working with solid bulk cargoes. More specifically he looked at accidents and injuries incurred over the last 19 years resulting from working in enclosed spaces on board ship such as holds. The results of Cribbin's work are staggering and he has established that in the last 19 years, at least 106 people, either shore workers or ship's crew have lost their lives through either asphyxiation and/or carbon monoxide poisoning or through fire and/or explosion. The Executive Director of DBTG, Nic Ingle said "that such a large

The first meeting of 2018 took place in Hamburg, where all delegates enjoyed a terminal tour.

number of lives have been lost in this way, on average six every year, is shocking. Considering that over 80% of that number suffocated is simply not acceptable." He went on "In Hamburg we heard the tragic account of a 20-year-old terminal worker who died as a result of carbon monoxide poisoning earlier this year and we simply must do more to prevent such terrible loss of life. Setting industry standards is the DBTG philosophy and we are raising this matter at the IMO".

This research will feature on the agenda of the next DBTG meeting which will be in Baltimore USA in October (3–5). Also on the agenda is a Health and Safety panel debate, Spontaneous Combustion, US Inland Waterways, Grain Trade Policy, Commodity Testing and Grading, Port Expansion and Capital Investment. The terminal tour will be to the T Parker Host Sparrows Point facility.

The DBTG founder Richard Peckham was always open to new ideas and many years ago, Ken Jones from the Port of Liverpool suggested that a golf challenge ahead of DBTG meetings might offer some delegates a good way to meet and talk. Peckham, who could hit a ball but could not see where it went agreed and the DBTG golfing challenge cup, then sponsored by E-ON was inaugurated. Peckham sadly passed away nearly six years ago now but in the DBTG's 20th year, he will be remembered in Baltimore as the challenge cup will be played for again for the first time in several years.

From left: Executive Committee Chairman DBTG Han Ozturk; Secretary-General of the International Maritime Organization, Kitack Lim; and Executive Director of DBTG, Nic Ingle.

Executive Director Nic Ingle is keen to point out the not-for-profit principle of DBTG as he believes this is often overlooked or not truly understood. Not-for-profit means that DBTG is not driven by money, it is driven by a passion for what it does — represent its members who in co-operation, continually drive up industry standards. It also means that membership fees remain very realistic and affordable as only costs need to be covered — there are no shareholders or investors to satisfy. When DBTG says it is not-for-profit and represents its members at international level, that is true. Ingle says "Beware of those that make claims to our industry that are simply not true, they will make claims that are false, make statements based on the work of others and make promises they cannot keep, all they want is your money." DBTG continues to grow and exercises its voice when required be that at the international level in which it operates or to those who seek to undermine for profit.

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Inspecting the inspectors

cargo sampling and inspection remains crucial

Jay Venter

Alex Stewart Agriculture: Inspections accredited by ASCB To ISO 17020 Standards

Grain and oilseed inspection and analysis are core businesses of Alex Stewart Agriculture Ltd. Alex Stewart is a super-intendent and analyst member of the Grain and Feed Trade Association (GAFTA) and has also been accredited to ISO 17020 for inspections.

Alex Stewart works with many leading grain traders by providing trustworthy professional inspection and laboratory services globally. In addition, ASA can arrange fumigation services in most areas of the world to ensure that its customers' cargoes are treated as with the greatest care.

Upon nomination, Alex Stewart's mission is to protect customers' interests at loading and/or discharge ports worldwide.

ASA is also able to provide collateral management services such as supervision of long term storage of grain or control of transportation between storage facilities.

The head office of Alex Stewart Agriculture Ltd in the UK also provides consultancy services. Strategically and commercially located operations offices offer support and advice regarding ports and silos worldwide and will provide information concerning the latest industry standards in sampling and analysis.

Agricultural laboratories

Huson & Hardwick and A. Norman Tate Laboratories are GAFTA/FOSFA

Dry bulk commodities certified by Alex Stewart

Fertilizer

Alex Stewart Agriculture's highly experienced and knowledgeable inspection team has built a trusted reputation within the international fertilizer-trading arena. The fertilizer division offers first class inspection and analytical services for bulk, bagged and liquid fertilizer with the aim of protecting client's interests at production site, during transportation, or at store. ASA has fertilizer laboratories in the UK, Belgium, Ukraine, Russia, South Africa, China and India. Its offices in the UK, Belgium and the Ukraine are all members of the International Fertilizer Association.

Animal feed

The Alex Stewart Group provides a fully comprehensive package of inspection and analytical services. Its GAFTA/FOSFA-registered and approved laboratories strategically located around the world perform a full range of analysis for soya, oilseeds – sunflower and rape, and fish meal including infestation, foreign matter and admixture, hazardous contents, fuzarious grains, toxic contents (e.g. arsenic, mercury & lead) mycotoxins and pesticides.

Grain and wheat

Grain inspection and analysis is a core business of Alex Stewart Agriculture and is a superintendent and analyst member of the Grain And Feed Trade Association (GAFTA), working with many leading grain traders by providing monitoring, testing and consultancy services globally. In addition fumigation services can be offered as ASA works closely with fumigation companies to ensure that cargoes are loaded and stored in appropriate condition and quality is not affected during transportation. Grain inspection services also extend to provide collateral management services such as supervision of long-term storage of grain or control of transportation between storage facilities.

Quality inspection services

Warehouse inventory control and collateral management: ASA can provide a diverse range of services, from stock audits and control procedures, to security advice and commodity/store condition surveys.

- **pre-shipment inspection and analysis:** the Alex Stewart inspection team will check that the customer's product is within specification and fit for the intended use.
- **quality control:** checking that cargo conforms to contractual specifications, checking cargo for signs of contamination, odour, colour change, moisture levels, friability, protesting/

(Federation of Oils, Seeds and Fats Associations) registered analytical laboratories that specialize in the analysis of oilseed and edible oil, grain, barley, rye and wheat, animal feed, sugar and food products operate from Alex Stewart's head office in England.

They are able to perform a full range of commercial and shipping sample including protein, fat, fibre, ash, moisture analysis via classical wet chemistry and hi-tech instrumentation including NIR (near infrared), ICP (inductively coupled plasma) and HPLC (high performance liquid chromatography); also infestation, foreign matter and admixture, hazardous contents, fuzarious grains, nutritional values, toxic contents (eg. arsenic, mercury & lead) mycotoxins and pesticides.

rejecting inferior cargo on sight, granule sizing, radioactivity testing and laboratory analysis.

- **vessel hatch inspection:** service includes checking hatch condition ensuring that they are free from loose rust and paint flake, free from previous cargo, checking that hatches are tight fitting, checking hatch open and closing operation is functional and timely, inspecting hatch rubber condition, hatch hose water testing, checking that holds are water-tight.
- **vessel hold cleanliness:** detailed inspection ensures that holds are clean, dry, free of loose rust and paint flake, free from previous cargo, free from infestation and odour and, in every, respect fit to receive the designated cargo.
- **continuous supervision:** ASA guarantees continuous supervision of customers' cargo loading and/or discharge (24 hours), representative sampling/sealing as per contract.
- **quality control inspection:** packaging reporting when applicable.
- **weight verification:** gross, tare & net weighing.
- **weighbridge control:** test weight checking, scale calibration and certification check, recording truck movements across scale ensuring that all cargo is weighed.
- **bagging supervision and tallying:** full tally and checking for bag strength and durability (laboratory testing is available) and verifying markings.
- **continuous information updates:** ASA's busy administration centre is in contact with all of its inspectors operating in the field and provides its customers with up-to-date, hour-by-hour detail of all loading and discharging operations.
- **documentation:** Alex Stewart Agriculture uses state-of-the-art technology to supply standardized reports and certificates; certification and reporting can be tailored to suit customer requirements. Photographic reports by conventional and digital camera can also be supplied for evidence purposes.
- **damaged cargo assessment:** establishing possible source, cause, and severity.
- **loss prevention:** supervision of reconstitution of acceptable cargo.
- **container services:** supervision of stuffing and unstuffing, container sealing, container condition surveying (on/off hire, damage assessment).
- **transportation services:** whether the commodity is manufactured, stored, shipped, railed, trucked or containerized, ASA can assist customers in their trading activities.
- **consultancy:** ASA offers consultancy services to assist customers on methods concerning material handling, weighing, transportation, sampling and analysis. Local knowledge and years of experience are primary assets of its business.

Key agricultural GAFTA/FOSFA superintendent operations within Alex Stewart Agriculture

Argentina, Australia, Belgium, Brazil, Bulgaria, Chile, China, Egypt, Estonia, Germany, Italy, India, Indonesia, Kazakhstan, Latvia, Malaysia, Netherlands, Peru, Philippines, Romania, Russia, Spain, Thailand,

SGS opens Center of Agriculture testing in Emstek, Germany

On February 21, 2018, clients, staff and VIPs celebrated the official opening of SGS's new Center of Agriculture Testing

Agriculture Testing

Keeping up-to-date with changes in the legal environment, complying with European agricultural policy and staying on top of new strategies in the chemical and agricultural industries, all call for innovative test environments.

To answer these calls, SGS has established this new centre to enable it to meet customer requests, implement and combine different test methods. At the opening, the attedndees were joined by several guest speakers, including: Dr. Martin Hommes from the Julius Kühn-Institut; Dr. Günther Peters, Head of Approval and Product Safety Syngenta; and, Markus Becker, Managing Director, BACTIVA.

Speaking at the event, SGS's Christa Gerling, responsible for field trials and the brand-new Center of Agricultural Testing, highlighted the set-up and the resources: "We can offer a broad spectrum of services, whether field trials, tests in greenhouses and climatic chambers under controlled conditions, or a combination of all three. Thanks to our modern test environments, our experts can solve test issues and conduct diverse testing protocols."

Gerling and her team invited all guests to join them in a tour of the new facilities:

- more than 770m² of covered space hosting a laboratory with fume hood, drying chamber, autoclave and a state-of-the-art Research Track Sprayer for exact application of plant production products;
- 50m² of usable space in cool chambers (5 to 20°C, air circulation etc.);
- 96m² of usable space in two plant growth chambers with illuminated shelves (dimmable, 350µE/m²/s in 250mm distance possible), humidity control (range 45 to 95% relative humidity; humidity stability ±2.5% relative humidity), temperature control (range: +8 up to +30°C; temperature stability ±2K);
- 150m² of greenhouse with three heatable chambers, growth lamps for homogenous room illumination (type: DH light, ceramic vapor lamps at full spectra), energy screen with 55% shading effect, permanent recording of all climatically relevant data (humidity measurement in the chambers, indoor light measurement, weather station with external sensor for temperature, wind strength and direction, light intensity, etc.).

Services available in SGS' Center for Agriculture Testing

The centre is designed and prepared to be extended – the space in the cool and climate chambers, as well as the greenhouse, can be quickly multiplied.

Greater coverage from RC Inspection Group and CIGroup affiliation

Early in June 2018 RC Inspection Group announced that it has agreed to a full operational affiliation with CIGroup. This strategic partnership will create operational efficiencies and innovative inspection services, for both groups, differentiated by their joint ability to deliver ground-breaking services through their Global network and leveraging their respective international platforms.

Both companies are sharing and consolidating a wealth of experience and knowledge of sampling, inspection and analytical services in the fields of ores, concentrates, metals, minerals, solid fuels, solid biofuels, scrap, fertilizers and agricultural products.

By "being part of the RC Inspection Group network of companies", CIGroup complements and strengthens the global coverage of the RC Inspection Group, through their very strong inspection network in Africa and Sub Saharan Africa in particular.

The affiliation is part of a long-term growth strategy which will allow both groups to operate more efficiently internationally. It will also create a stronger foundation in current and new markets that the groups operate in, thereby ensuring that customers can still rely on the excellent personal relationships and services experienced to date.

All services provided by both groups will adhere to ISO 9001 quality standards, as well as committing to complying with the requirements of ISO/IEC 17020 and ISO/IEC 17025. This commitment will provide the most efficient services possible and a superior customer experience that will comply with the explicit requirements of each customer and for each specific nomination.

"As we gain energy from creating and executing business opportunities for our customers, we are working with our partners to optimize our network and to engage in other forms of co-operation. The foundation of this affiliation is a basis for continued future growth in both global coverage and the commodity range in which we can offer our combined services".

ASGCO® wins 'Export Leadership Award'

ASGCO® recognized with 'Export Leadership Award' by US Ambassador to Chile

U.S. Ambassador to Chile Carol Z. Perez, presented ASGCO®, Allentown, Pennsylvania, with the Export Leadership Award during the EXPOMIN 2018 trade event. The award was presented at a ceremony during the week of the exhibition, which took place from 23–27 April, in Santiago, Chile and recognizes ASGCO® for "exemplary leadership in exporting U.S.-made products and services to Chile."

The growth of the company, over the years, is due to recognized improvements in the productivity of its customers' operations. For many decades ASGCO® has exported a wide array of quality conveyor components for the mining industry into Chile, including; conveyor belt cleaners, tracking idlers, impact beds and conveyor guarding, all specifically designed for optimum conveyor performance.

ASGCO® has established a global network of distributors and representatives around the world. "We are honoured to receive this great award and are proud of all the great men and women of ASGCO® that helped make this possible," stated Aaron Gibbs, President of ASGCO®. He adds: "We look forward to continuing to deliver quality products to our customers in Chile and around the world."

About ASGCO®

ASGCO® "Complete Conveyor Solutions" founded in 1971 and headquartered in Allentown, PA is a major manufacturer, distributor and service provider of proprietary conveyor and screening equipment and accessories that improve the safety and performance of bulk material handling systems.

ASGCO® is a diversified and innovative company with three major divisions that serve specific targets of the material handling industry. The growth of the company, over the years, is due to recognized improvements in the efficiency, safety and productivity of its customers' operations. ASGCO® continues to strive to make the handling of bulk materials more efficient, safer, and more productive.

Eriez Magnetics Europe Ltd celebrates 50 years of manufacturing excellence

Major manufacturer Eriez Magnetics Europe Ltd marks its 50th anniversary this year. From humble beginnings has emerged a company who now has a strong customer base and can proudly boast numerous technological achievements and significant growth over half a century.

Eriez Europe was established when Bob Merwin, CEO of Eriez Manufacturing Co. in Erie, USA recognized the opportunity for a European manufacturing headquarters. In order to drive the company into the European market, Eriez North America collaborated with Sir Alfred Nicholas, founder and chairman of South Wales Switchgear Ltd. based in Wales, UK, to establish a European licensee.

Eriez Europe has thrived in technological innovations, productivity and expanded its manufacturing facilities, over the last 50 years. The company now employs over 120 staff and designs, develops and manufactures magnetic separation, metal detection, fluid filtration and vibratory equipment in a 53,000ft^2 manufacturing facility in its European Headquarters in Caerphilly, South Wales, UK. Eriez serves over 80 markets including mining, quarrying, recycling, ceramics, metalworking, food and mineral processing industries, and is certified with the BS5750 (ISO 9001:2015) quality standard accreditation.

Over the last 50 years, Eriez Europe has secured key strategic acquisitions that have expanded the company's product offering, including the purchase of: metal detection specialist Pulse Technology; manufacturer of sampling systems, Prisecter International; former competitor Boxmag Rapid; and fluid filtration and recycling equipment specialist, Centriforce Limited.

1968: Eriez Europe's first factory.

Eriez is a global company with 12 international facilities, offering a worldwide network of manufacturing sales and service and is the world's largest manufacturer of magnetic separation equipment.

John Curwen, Managing Director comments: "Eriez Europe has demonstrated remarkable growth since 1968 and we are immensely proud of what has been achieved. The root of our achievements stems from Eriez Europe's employees and their dedication to selling, designing and manufacturing high-quality equipment as well as our loyal customer base. The past 50 years has witnessed a commendable journey for Eriez Europe and we are confident our growth and success will prosper into the next chapter."

About Eriez Europe

Eriez Magnetics is recognized as world authority in separation technologies. The company's magnetic lift and separation, metal detection, materials feeding, screening, conveying and controlling equipment have application in the process, metalworking, packaging, plastics, rubber, recycling, mining, aggregate and textile industries.

Eriez manufactures and markets these products through 12 international facilities located on six continents. Eriez Europe Ltd. has its head office in Caerphilly, South Wales, UK.

Bedeschi supplies equipment to Chernomorsk Port in Ukraine

The marine trade Port of Chernomorsk, which is located on the north-western shore of the Black Sea and to the south-west of Odessa in Ukraine, will benefit from a new grain terminal in 2018. Kernel LLC, one of the largest Ukraine producers and exporters of sunflower oil and a supplier of agricultural products to the world market, plans to increase the capacity to store cargoes simultaneously.

Example of a Bedeschi slewing shiploader.

In view of this, major bulk handling equipment supplier Bedeschi has been awarded the contract to supply:

- two 2,200tph (tonnes per hour) slewing shiploaders to handle wheat, corn, barley, soy, flour etc.;
- two completely enclosed belt conveyors, with rubber belts, covering a distance of 28m; and
- two trippers to feed the shiploaders.

All of the shiploaders are equipped with a dust-control system, are provided with three different types of filters and have a telescopic chute that allows the equal distribution of the material, covering the whole surface of the vessel.

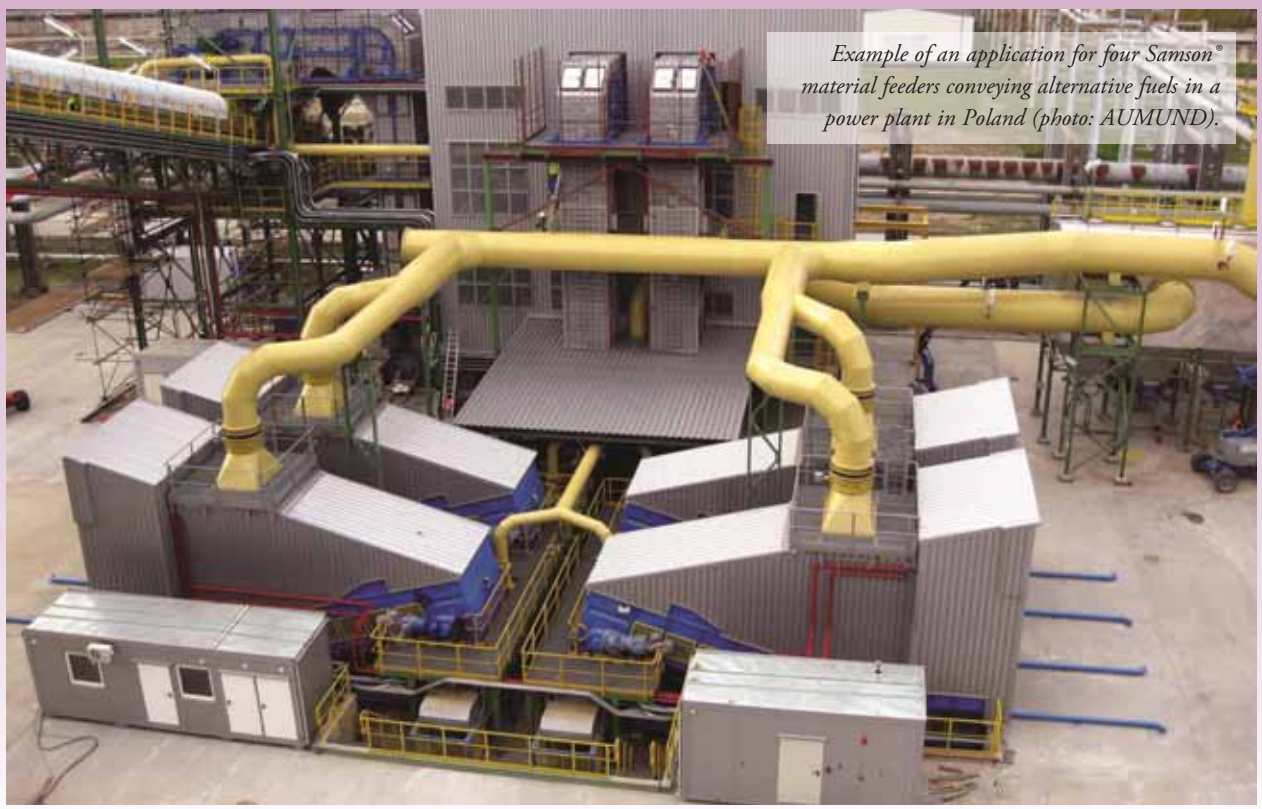
Samson® material feeder a clear winner against deep pit solution

A new biomass power plant to be built for ENCE Energía & Celulosa in Huelva, Spain by Spanish general contractor, SENER, will have two Samson® material feeders which have been ordered from AUMUND Fördertechnik GmbH. The new power plant will use many different alternative fuels. The decision by SENER/ENCE in favour of the Samson® machines was just as much a rejection of the originally planned deep pit solution. The two Samson® feeders will receive the various biomass materials, which can be delivered by several trucks at the same time, and convey them into the power plant, which is designed to produce 40MW using 100% biomass.

Compared to the originally planned deep pit solution, the Samson® machines demonstrate significant advantages on a number of levels. They are simply positioned at ground level and can receive bulk materials directly from dump trucks or sliding tippers. They convey moist, sticky bulk materials without bridging. Significantly less dust is produced due to extraction of material rather than reception of falling material from heights, and last but not least, robustness and reliability make the Samson® material feeder a durable all-rounder.

A particularly striking advantage compared to the deep pit solution for the biomass power plant in Huelva is the significantly smaller enclosure that is required, and consequently the much smaller volume of dust to be suppressed. Had the deep pit solution gone ahead, more extensive building modifications with higher investment costs would have been required.

The capital investment which had been set aside for civil works is no longer required. All in all, the effectiveness of a Samson® material feeder in environmental protection speaks for itself.



Example of an application for four Samson® material feeders conveying alternative fuels in a power plant in Poland (photo: AUMUND).

FLSmidth signs two large cement plant contracts in Central America

On 4 August this year, FLSmidth was been awarded two contracts: one for a greenfield cement plant valued at more than €100 million; the other for a brownfield cement plant also valued at more than €100 million.

Both contracts include design and engineering, equipment supply, automation systems, training as well as advisory services for installation and commissioning.

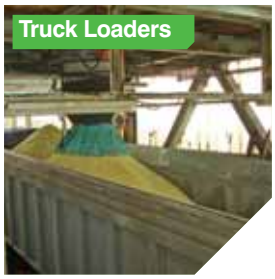
The projects are located in Central America, and the plants will each mainly supply cement to their local markets. The expected start-up is within 24 to 36 months and once operational, the cement plants will have a capacity of 2,000 and 3,500 tonnes per day, respectively.

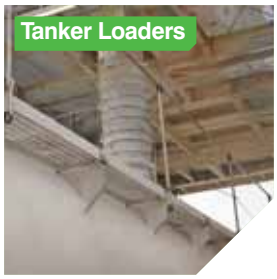
"These are the latest projects to underline FLSmidth's strength as a leading supplier of the most productive and energy-efficient equipment and technology and our position as a service provider to the cement industry and as a preferred supplier of complete production lines," said Jan Kjaersgaard, President, Cement. He continued: "We are extremely proud to have been chosen as supplier of these two cement plants. The relationship with the client has evolved over the past many years, leading to detailed negotiations this year, and we have now successfully concluded agreements on these state-of-the-art cement plants that is aligned with our customer's needs."

Combined, the contracts are worth more than €250 million. Among several other conditions, they are also subject to FLSmidth receiving the agreed down payment.

Cleveland Cascades Ltd

Global leader in bespoke dry bulk loading chutes





Cleveland Cascades are Specialists in the design and manufacture of bespoke dry bulk loading chutes.

Our bespoke solutions are designed to meet each customer's specific requirements from a tool kit of proven components, utilising the expertise of a team of specialist in house design engineers.

We lead the loading chute industry & set the standard for dust emissions and environmental pollution control in dry bulk handling.

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Contact Cleveland Cascades Ltd

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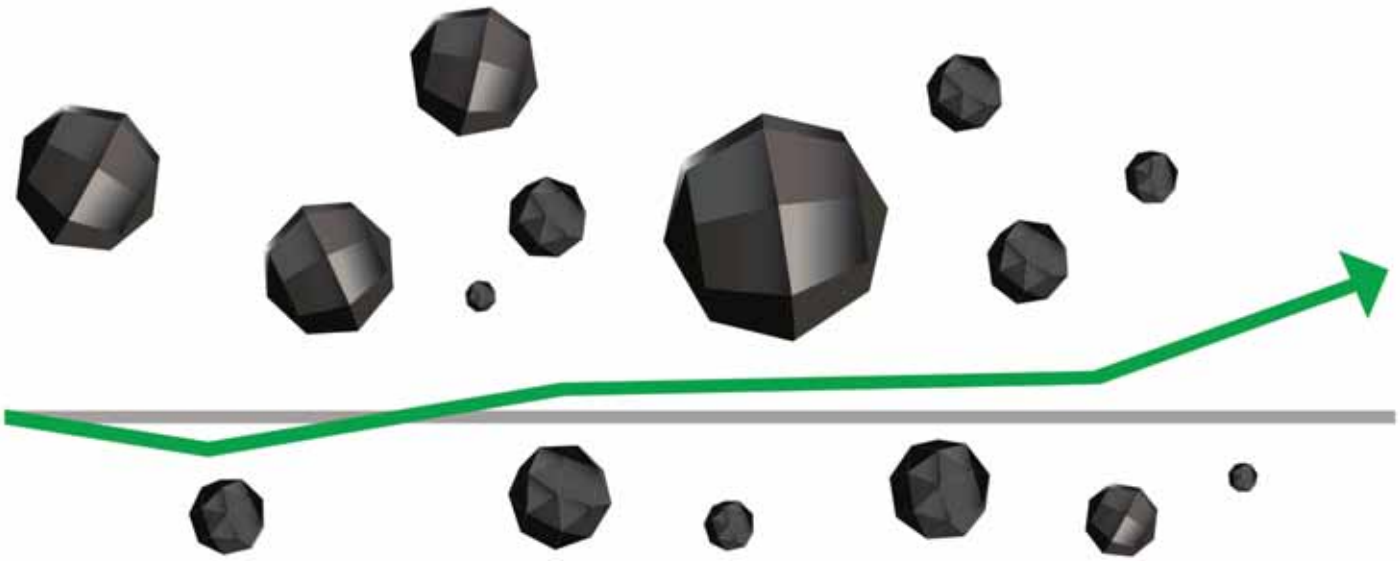

Coaltrans Conferences

www.coaltrans.com/wcln

Telestack secures record deal in the Middle East

Titan dual-feed all wheel travel 800-6 bulk reception feeder undergoing a full testing procedure prior to dismantling and dispatch to site in Oman.

Telestack, based in Omagh, Northern Ireland, has secured a £5 million contract to supply shiploading equipment to the Port of Salalah as part of an ongoing $15 billion infrastructure investment to cater for the export requirements of its local mining, quarrying and cement industries.

Telestack is currently fulfilling its largest ever single order with a 4-unit shiploading system ordered by the Port of Salalah in Oman. The port (in which APM Terminals holds a minority stake) is currently undergoing an expansion which will double the quay length, and increase dry bulk capacity to 20mt (million tonnes) annually. A '2030' initiative includes plans for $15 billion in infrastructure investment in the Salalah Free Trade Zone by 2028 to create a larger regional shipping and commerce centre for the region. In December 2015, the Port of Salalah opened a new deep-water General Cargo and Liquid Bulk Terminal, adding 20mt of dry cargo and 6mt of liquid bulk cargo annual handling capacity.

As part of this expansion, Port of Salalah has appointed Telestack in a £5 million deal to provide a unique shiploading system. The system, which weighs approximately 560 tonnes in total, is designed to handle the added capacity generated by the infrastructure investment to cater for the region's export requirements. Telestack began discussions in 2013 with the Port of Salalah technical and operational teams to design a unique shiploading system with a view to achieving optimum flexibility, simplicity of use, increased production rates and a lower cost per tonne.

Comprising of two shiploading systems, each suite comprises of a TB60 all wheel travel shiploader fed by a Titan dual-feed all wheel travel 800-6 bulk reception feeder. The equipment is designed to load limestone, gypsum and cement clinker at average rates up to 1,200tph (tonnes per hour) to Handymax, Panamax/Post Panamax vessels. These Telestack mobile shiploading systems will be operational in the Port of Salalah by Q3 2018.

In addition to the Port of Salalah contract, the local manufacturer has recently secured over £10 million of additional business for its shiploading systems, supplying customers in the Middle East, Russia, USA, South America, Africa and Europe.

3D model demonstrating the two shiploading systems from Telestack. Each suite comprises of a TB60 all wheel travel shiploader fed by a Titan dual-feed all wheel travel 800-6 bulk reception feeder. The equipment is designed to load limestone, gypsum and cement clinker at average rates up to 1,200tph to Handymax, Panamax/ Post Panamax vessels.

Commercial Director Malachy Gribben comments, "Endorsements such as the Port of Salalah contract are heartening as they help to validate our innovative engineering concepts. This is our largest single order ever and is the first system of its kind across the globe. Our experience and capability is vital when designing a system like this. Much of Telestack's success is driven by innovation, customization and a proven record of performance."

Telestack has taken the traditional 'truck-to-ship' concept and enhanced it by incorporating its impressive all wheel travel technology that offers superb mobility, flexibility and ease of use. Each TB60 shiploader will be fed by a custom designed dual feed Titan 800-6 bulk reception feeder. The mobile bulk reception feeder is a high-performance truck unloader with proven reliability over a range of global installations.

These Telestack mobile shiploading systems, which will operate in the Port of Salalah by Q3-2018, represent the new generation of mobile shiploading, offering all of the performance of traditional systems but with the added benefits of mobility, flexibility and ultimately a lower cost per tonne achieved by increased production rates, reduced cycle times and reduced labour costs. With an extensive 30 year history in the ports and terminals and aggregate and mining industries, Telestack is committed to continuing to lead the market through innovation and intelligent bespoke designs backed up with a strong infrastructure to support the customer from concept to the field. DCi

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thyssenkrupp to supply material handling systems for two power plants

thyssenkrupp has recently won a contract from Doosan Power Systems India (DPSI) to supply material handling plants for two thermal power projects in Uttar Pradesh, India. The order is worth a total of around US$115 million and includes engineering, delivery and installation of two complete coal handling systems, including associated structural and electrical works.

The plants will be part of the Obra C and Jawaharpur coal-fired power stations in Northern India, both to be operated by Uttar Pradesh Rajya Vidyut Utpadan Nigam Ltd. (UPRVUNL) and executed by DPSI. Once operational, they together will produce 2,640MW of power — enough to supply roughly 16 million Indian homes.

With the rapid social, economic and industrial development of the country, demand for electricity in India is increasing continuously. The state of Uttar Pradesh is India's largest province with a population of nearly 200 million.

The new thermal power plants will not only help electrify the surrounding area but also contribute to the central electricity grid and therefore help keep up with the ongoing pace of development in the country.

Malay Das, Managing Director and CEO of thyssenkrupp Industries India: "In India, thyssenkrupp has more than 40 years of experience in material handling technology and the execution of coal handling plants. We are very proud to put this experience to work with DPSI for the Jawaharpur and Obra C power projects. Our innovative and reliable technologies combined with a strong local setup that provides engineering excellence as well as commissioning expertise were key factors in winning this contract."

Integrated solution for efficient material handling

Effective material handling systems must be individually designed and fully integrated so as to achieve a smooth flow of material from one section of a plant to the next. To meet these requirements, thyssenkrupp will take care of the whole value chain from engineering to procurement and construction for the complete material handling system.

From coal unloading and conveying to crushing and storage all key equipment will be manufactured in the company's own facilities in Pune and Hyderabad.

The scope of supply includes numerous belt conveyors with an overall length of 17km, four twin wagon tipplers, screens and crushers as well as four combined bucketwheel stackers/reclaimers and one bucketwheel reclaimer.

Both systems with an overall coal handling capacity of 3,000tph (tonnes per hour) each will be fully operational by the first half of 2021.

Coal will be delivered to the site by rail either to a track hopper area or a railcar unloading station which will be equipped with two twin wagon tipplers each. A belt conveyor system with a capacity of 3,000tph and two meters belt width transports the coal to the crushing and screening complex equipped with a total of four ring granulators and four vibrating screens each. Two combined bucketwheel machines stack the processed coal to the stockpile. When needed the material is reclaimed and transported to the boiler plant on belt conveyors. The stockyard machines will be capable of handling 3,000tph both in stacking and reclaiming modes.

About thyssenkrupp Industrial Solutions

The Industrial Solutions business area at thyssenkrupp is a leading partner for the engineering, construction and service of industrial plants and systems. Based on more than 200 years of experience, the company supplies tailored, turnkey plants and components for customers in the chemical, fertilizer, cement, mining and steel industries.

As a system partner to the automotive, aerospace and naval sectors thyssenkrupp develops highly specialized solutions to meet the individual requirements of its customers. More than 21,000 employees at over 100 locations form a global network with a technology portfolio designed to offer maximum productivity and cost-efficiency. DCi

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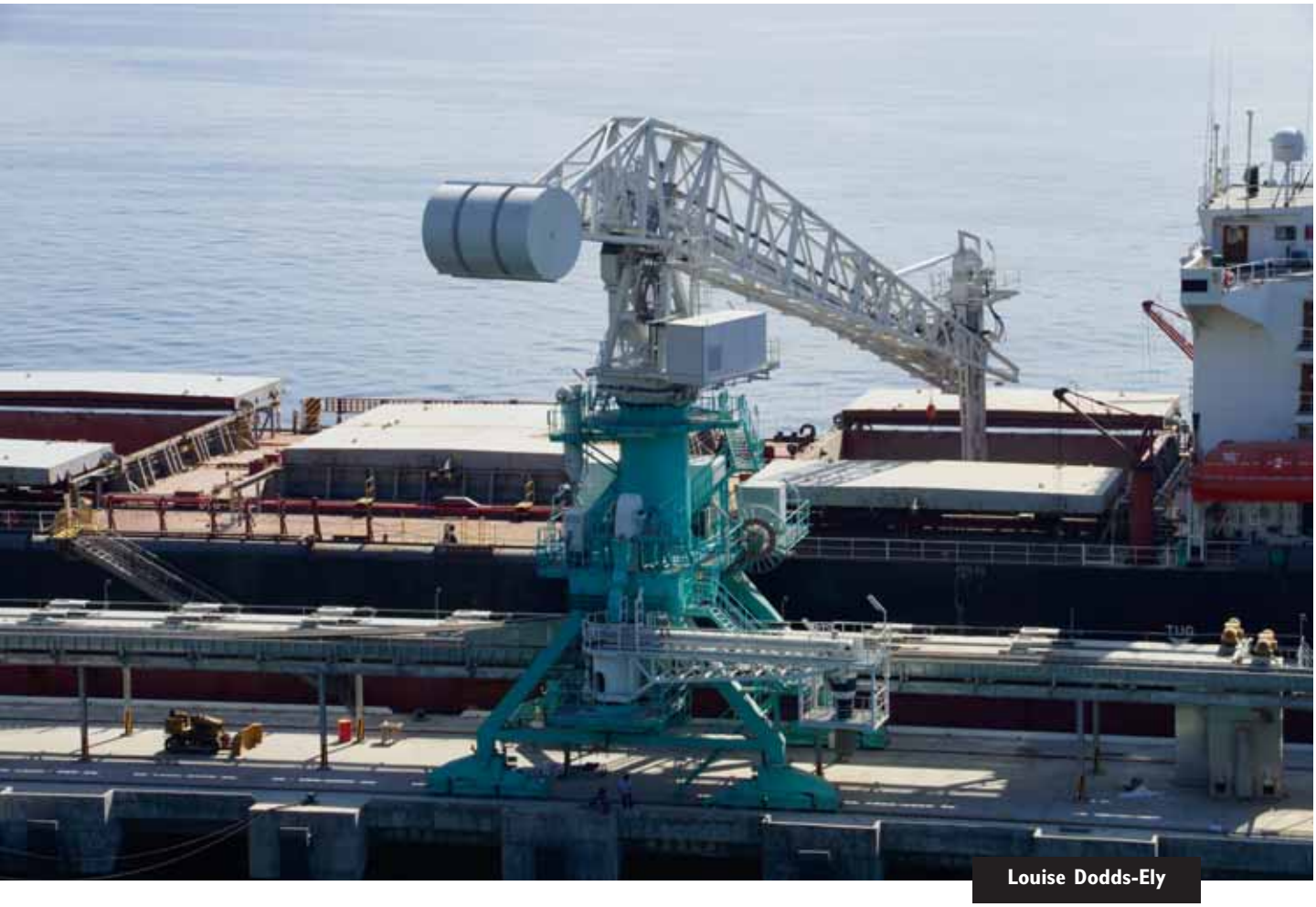
Emptying out ...

the low-down on the ship-unloader market



Louise Dodds-Ely

Over 150 years of experience behind Bühler ship-unloading technologies

Bühler has been active for over 150 years, processing and handling food products. Over that time, it has gained considerable experience in the continuous unloading of ships. It is more than 100 years since Bühler designed and installed its first mechanical unloader, and continuing product improvements have shaped the continuous ship unloaders (CSUs) such as the Portalink to their current form.

Key to the design and product improvements is the principle of always setting new industry standards to, for example, significantly reduce energy usage and product breakage, as well as overall lower operating costs. Moreover, a clear customer advantage is ensured by the increased efficiency due to ease of operation, supported by the auto sink-in function. Therefore, the Portalink mechanical unloader is often an ideal customer solution.

Through its long-term and intensive market experience, Bühler has developed a broad and extensive product portfolio — on which the Portalink product range is based — to meet the needs of its customers for fast, optimal, and efficient unloading of ships. For example, the Portalink mechanical unloader is very well suited for use with sea-going ships up to 125,000dwt, and offers an unloading capacity ranging from 300tph (tonnes per hour) to 1,500tph.

Bühler's continuous unloaders can handle all free-flowing food products, including mealy products like soya meal. The company's mechanical unloaders are especially well suited for handling cargoes with delicate product characteristics. In addition to the specific problems related to the handling and processing of grains, there is also the need to do so economically, which adds an extra dimension. Bühler's worldwide network of experts ensures that any problems the customer has are solved with the greatest care.

Portalink for San Miguel

San Miguel Corporation is one of the Philippines' most diversified conglomerates with activities in beverages, food, packaging, fuel and oil, power, mining and infrastructure. It has recently taken into operation a second mechanical ship-unloader from Bühler for its Golden Bay Grain Terminal at Mabini (Batangas Bay). This is the second ship-unloader that Bühler has supplied to San Miguel. The first mechanical unloader — a Portalino, for unloading Handymax vessels — has been in operation since 1994 in Mariveles (Manila Bay) with the specific purpose of unloading

malt for San Miguel's brewery.

Persuaded by the positive experience with the Portalino, San Miguel decided to invest in a new mechanical unloader, a Portalink. The low energy consumption, reduced wear requirements, and ease of operation — all of which combine to guarantee increased operating efficiency — convinced San Miguel to again choose Bühler for the new unloader. With Bühler having several installed Portalinks in the region, all performing to the full satisfaction of its customers, San Miguel was confident in its decision to purchase the new Portalink for its critical operations.

San Miguel has invested in its own grain terminal to increase efficiency in its supply chain, and to ensure sufficient supply to its factories. And now, with the new Portalink which is especially designed for Panamax vessels, San Miguel will be ready to handle a significantly higher volume of grains by its own.

A total success in time, concept and performance

For San Miguel, a critical requirement was the time until start-up and operation of the installation. Through its professional project management, Bühler was able to manufacture, install and run the Portalink in record time. Bühler has considered various assembly options — ranging from classic on-site installation up to full offsite assembly — thereby identifying the specific benefits regarding costs and assembly time. In close consultation with the project team of San Miguel, the optimal assembly set-up was selected where the Portalink is designed in five large sections which have been pre-assembled in the workshop. The individual sections were then shipped, and lifted by a heavy load vessel into place, reducing assembly time for the main structure to a mere three days.

The Portalink is capable of unloading at a constant rate of 600tph handling wheat. In addition, a loading boom with a spout of 250tph for barges up to 1,500dwt has been

AIready present in more than 60 countries, and growing







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installed. It can be directly fed by the Portalink from the marine vessels, or by a third conveyer belt from the silo. With this concept of combining an unloader and a loader, San Miguel has found a well-balanced system fulfilling the transshipment requirement, integrated in one installation.

The large and constant unloading capacity of the Portalink, combined with the proven advantages of the mechanical chain unloader — such as low energy consumption, reduced wear and tear, and ease of operation — significantly increase the overall efficiency of unloading operations. During the performance tests, the exceptional benefits of operating the Portalink system were proven when it unloaded a Panamax vessel at a peak rate of 670tph handling wheat, with an installed power of only 250kW.

As well as the San Miguel project, Bühler has also recently:

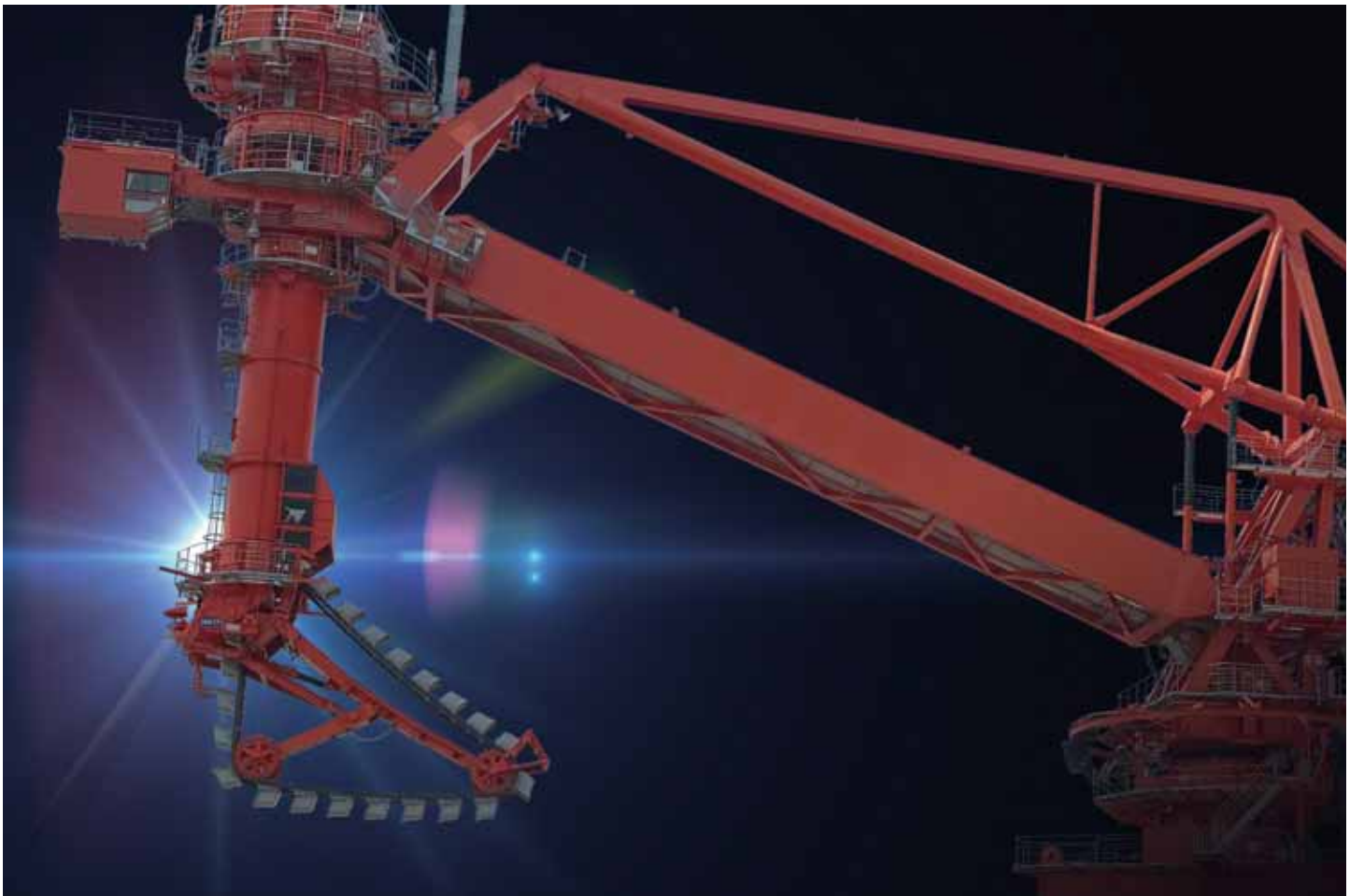
- installed and commissioned a Portalink 300 in Brazil;
- sold and manufacture a Portalink 600 for South East Asia; and
- sold a Portalink 600 to the Pacific Ocean region.

About Bühler

Every day, billions of people come into contact with Bühler technologies to cover their basic needs for food and mobility. The company strives for innovations for a better world, with a special focus on healthy, safe, and sustainable solutions. It contributes significantly to feeding the world's population, while setting the focus on food security and safety. Bühler's solutions and technologies enable efficient and clean mobility.

As a major technology group, Bühler invests up to 5% of its turnover every year in research and development. In 2017, around 11,000 employees in over 140 countries generated a turnover of CHF2.7 billion. As a globally active Swiss family-owned company, Bühler is particularly committed to sustainability.

Bühler wants its customers to be successful. It wants every human being to have access to healthy food. It wants to protect the climate with energy-efficient cars, buildings, and machinery.



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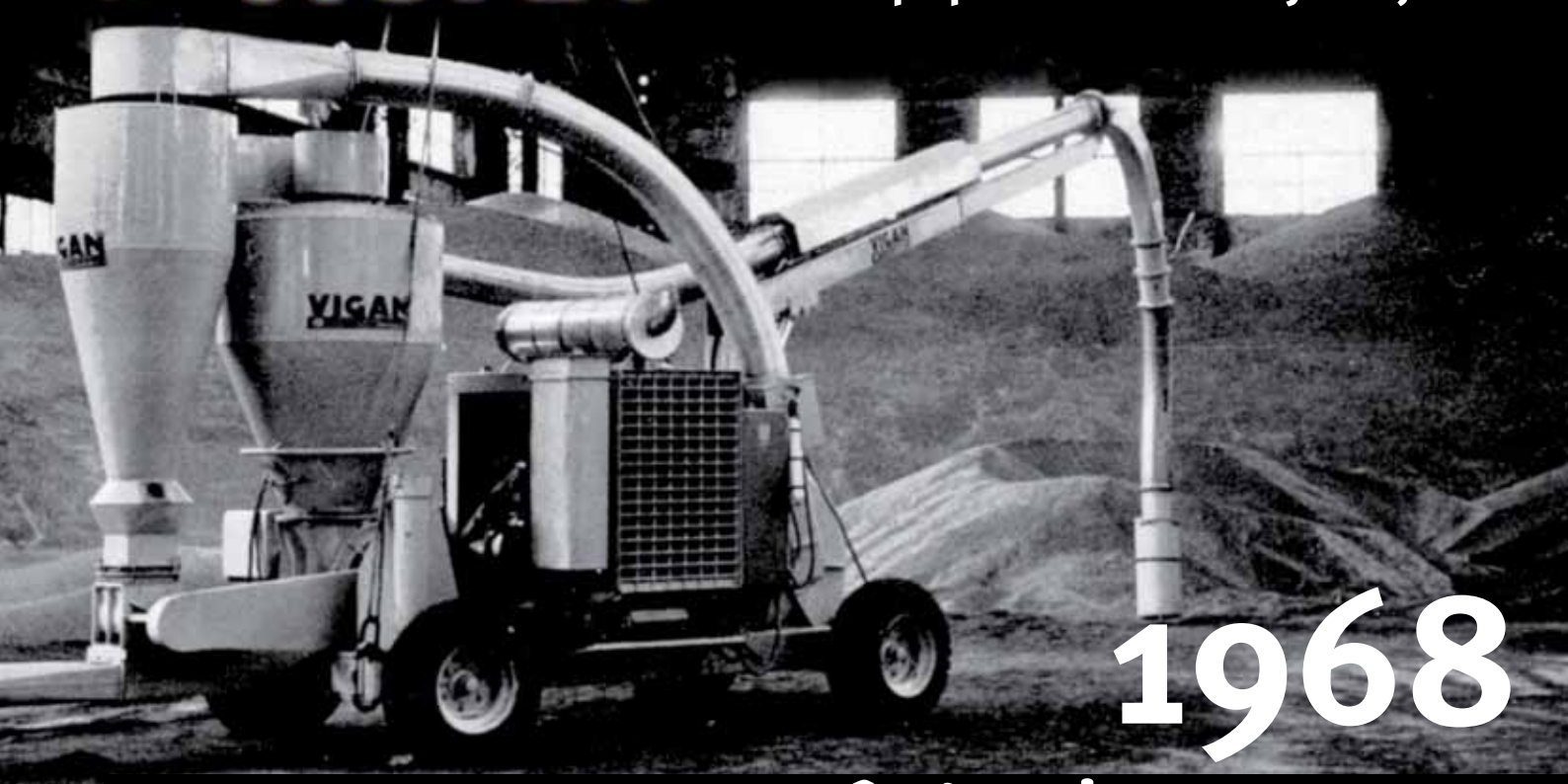

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Flexible, customized solutions and patented innovations strengthen Buttimer's DOCKSOLID range of unloading hoppers

The cargo handling market is arguably one of the most competitive industries in the world at the moment, and so the need to provide quality equipment coupled with supreme customer service is imperative to the survival of any mechanical engineering firm.

Buttimer Engineering is no different, but through decades of experience and innovation, the company has positioned itself at the forefront of the cargo handling industry both domestically and abroad. The success is attributed to the establishment of its DOCKSOLID brand, which has proven to be very popular in the unloading market.

The range of hoppers launched in 2014 is specifically designed for use in the ship unloading process. The DOCKSOLID range has been meticulously designed for use in situations where ease of use, robustness and value are the key considerations.

On top of providing outstanding quality, the significance of adhering to strict environmental laws cannot be understated. Buttimer is committed to making sure these hoppers are environmentally friendly and hazards — such as airborne dusts — are kept to a minimum. This is done through state-of-the-art dust prevention systems and environmental control techniques incorporated into every hopper design, meaning that DOCKSOLID not only guarantees the highest quality, but also environmental peace of mind.

Equipment

One of the key competencies of Buttimer and, in turn DOCKSOLID, is incredible versatility, offering a diverse range of ship-unloading hoppers. The standard hoppers come in a range of pre-set models which address the most common handling requirements, but Buttimer is flexible enough to handle custom requirements through the manufacturing of bespoke models at the customers' request.

Whilst the standard hopper can perform the vast majority of cargo handling duties, Buttimer offer options within DOCKSOLID in order to fully satisfy the needs of any and all potential clients. The Environmental hopper is fundamentally similar to the standard hopper, offering everything you would expect from the standard variation and more. However, the

Environmental hopper also includes state-of-the-art modernizations, such as a dust control flex-flap, dust extraction filters and a discharge chute to minimize the potential of noise and air pollution. Whilst these hoppers are renowned for their manoeuvrability, amongst other things, Buttimer also offers rail-mounted or static hoppers. The rail-mounted hoppers are of mounted onto new or existing tracks of any width, whilst the static hoppers can be permanently installed as part of a port terminal or industrial facility. This diverse range of products, catering to almost every eventuality is one of the key reason why Buttimer and DOCKSOLID have proven to be so successful in the ship-unloading market.

Commodities and clients

The DOCKSOLID range offers incredible diversity and versatility, with units ranging from simple open-ended hoppers up to fully aspirated self-drive dockside mobile loaders. Buttimer can also offer units that are rail-mounted or pneumatic tyre mounted, but arguably the most impressive aspect is not just what the company can offer but also in what it handles. Buttimer is capable of handling an extensive list of commodities, with very few products beyond its capabilities. Products handled include, but are not limited to;

- grains/cereals;
- coal;
- fertilizers;
- biomass;
- woodchips; and
- aggregates.

Apart from the ability to handle a large variety of commodities, the DOCKSOLID brand can be spotted in many different locations. One thing which Buttimer prides itself on is its willingness to move out of its comfort zone. Having started dealing predominantly in the Irish market, Buttimer has gone on to have clients and provide ship-unloading capabilities across the globe. Over the years clients have included some major players in the cargo handling sector, such as;

- Associated British Ports (ABP);
- Port of Gdynia;
- Port of Cork;
- Bunge Poland;
- Dublin Port;
- ArcelorMittal; and
- Port of Foynes.

Innovations and patents

Whilst everything that Buttimer offers as part of the DOCKSOLID range is of the highest standard, it is the patented innovations that makes these hoppers truly noteworthy.

- **DOCKSOLID suspension system**: wheel-mounted hoppers are fitted with a jacking and suspension system, designed in house, to give the mobile units exceptional load handling without putting undue stress on the hopper's structure, or the quay surface, during driving and unloading. The patented system equalizes the pressure across all four wheels while the hopper is in driving mode, allowing the units to easily handle uneven surfaces without putting strain on the upright columns or the hoppers structure
- **DOCKSOLID steering system:** DOCKSOLID hoppers possess a purpose designed steering system to give the mobile hoppers a high level of manoeuvrability, for quick and agile repositioning. The dual tie bar steering mechanism allows much greater wheel rotation than standard systems allowing for an agile turning radius with reduced power consumption. Dual tie-bar steering ensures that there is no misalignment of wheels during turning, preventing scrub on the tyres and premature failing of bearings. DOCKSOLID units therefore achieve significantly better manoeuvrability with less wear and tear than mobile equipment sig a simplistic or Ackermann steering mechanism.
- **loading pads:** a bespoke jacking system allows operators a simple and quick transition between driving and operating modes. While the hopper is in operating mode, the loading pads are lowered and the weight of the hopper and the product being handled is transferred from the wheels to the loading pads, allowing grater dispersal of weight over the quay surface.

Torquing sense about ship-unloaders

A ship at sea is earning its owners money; a ship in port is costing its owners money. Therefore, rapid loading and unloading are critical to the success of a shipping company and dockside technology continues to develop to provide ever more speed and efficiency.

Unloading dry bulk cargo from ships would be slow, laborious and potentially dangerous if it had to be done manually. But for many years the process has been automated and ship-unloaders are a well-developed technology that work continuously to reliably and efficiently transfer grains, minerals and other dry bulk materials from ship to shore.

Unloaders come in a number of different designs, each suited to different materials. The core technologies include bucket wheels, flighted vertical conveyors, augers, horizontal belt conveyors and pneumatic systems. The mechanical principles of each of these are self-explanatory, but it is essential that control and monitoring is maintained at all times to both ensure trouble-free operation and to calculate the weight of cargo being unloaded.

An emerging technology that is increasingly being integrated into unloaders is wireless, non-contact digital torque monitoring. This measures the work being done by the motors and drive shafts of the unloaders and the data is automatically and instantly converted into cargo weight figures.

Unloaders need to run at optimum speed to minimize ship turnaround times, while also controlling the rate of delivery of materials to the dockside facilities. Real-time data from the unloaders is collected by having sensors monitoring the critical variables — in this case the torque on the drive shafts, the speed of the motors and the drive power — and fed back to the control system.

However, torque data can be hard to collect, with traditional technologies introducing as many problems as they solve. Because the shaft is rotating, wires attached to it would wind up and snap, so a special way of monitoring it is required. The usual solution is to use slip rings, but these are expensive, difficult to set up and far too delicate in use for dockside applications.

Now, with over 20 years of research and development into digital non-contact torque monitoring, Sensor Technology UK Ltd is at the forefront of an important enabling technology. Mark Ingham, one of the company's managers says: "Our TorqSense transducer is based on the patented technology of measuring the resonant frequency change of surface acoustic waves [SAWs] generated by rotating shafts. It's a proven technology that has solved torque measuring challenges in a host of industries."

TorqSense torque sensors use two tiny SAW detectors made of ceramic piezoelectric material containing frequency resonating combs. These are glued onto the drive shaft at 90° to one another. As the torque in the rotating shaft increases one comb expands and the other contracts proportionally to the torque being applied. In effect, the combs act similarly to strain gauges, but measure changes in resonant frequency.

An adjacent pickup emits radio waves towards the SAWs, which are then reflected back. The change in frequency of the reflected waves identifies the current torque. This arrangement means there is no need to supply power to the SAWs, so the sensor is non-contact and wireless.

"TorqSense measurement together with the digital outputs it offers is often the only practical way to measure torque in an industrial environment. And once you are collecting torque data this way, you are well on the way to sophisticated real-time control of complex processes," says Ingham.

Born out of the need to solve a particular challenge in the automotive industry, TorqSense is now widely used throughout a range of industries including many liquid handling applications, in mixers, in the nuclear industry, for testing aerospace components and running drug trials. It is applicable to all sizes of torque measurement tasks, from dispensing active pharmaceutical ingredients, through stirring industrial quantities of cook-chilled curries, to modelling storm and flood water flows.

This innovative method of measuring torque is bringing distinct advantages to handling dry bulk products. A process that was once regarded as very difficult to monitor can now reap the same benefits as many other industrial processes, enabling operations to be optimized for the highest levels of productivity with the lowest cost.

Sensor Technology has also adapted the SAW technique for use with straight-line load monitoring, such as is required by cranes and hoists as they lift cargo to and from ships. This means that all cargo handling techniques used in any given situation can be monitored by the same system, which will lead to significant savings in management time and costs as two or more reports do not have to be integrated.

Ingham sums up: "The modern world requires rapid and efficient transportation of goods from continent to continent. As well as speed of handling, accurate records are also essential. TorqSense and its sister product LoadSense allow real time data to be collected, constantly updated and instantly converted into the critical information required for efficient logistics."

One Source

High capacity unloading

leading the way

DOCKSIDER™ pneumatic unloader – the most versatile and most advanced unloader in the world; designed to provide the performance you've come to expect from FLSmidth.

DOCKSIDER unloaders are custom designed to meet your specific terminal application. Exclusively developed for the ship and barge unloading industry, FLSmidth's state-of-the-art technology offers unequalled performance, reliability and durability.

Starting with a range of four basic sizes, FLSmidth can supply the right DOCKSIDER ship unloader for any terminal – whether you're unloading river barges or bulk vessels, and whether you're conveying to an adjacent belt conveyor or through a long pipeline.

Find out more at www.flsmidth.com

FLSmidth

Neuero offers range of unloaders to suit different bulk cargoes

The Combiport 600/1000 shiploader/unloader, recently commissioned by Neuero for Olimpex in Odessa.

Neuero Industrietechnik für Förderanlagen GmbH, based in Melle, Germany, offers turnkey solutions for bulk material handling. A major part of its portfolio relates to ship-unloaders.

All Neuero equipment is manufactured according to the 'Made in Germany' tradition, ensuring high quality, environmentally friendly and durable loading and unloading equipment for industrial plants, silo terminals, power plants, aluminium smelters, malting plants, feed mills, etc.

Below are details of some of the most popular models produced by Neuero. On all of these, ATEX directives are supported and explosion protected equipment is used. The use of the latest blower technology with additional equipment for sound absorption is supplied, also taking into account local regulations.

Another facet that is common to all of Neuero's pneumatic unloaders is the suction nozzle. This is characterized by an automatic electrical air bypass control which makes it possible to adapt the discharge power perfectly to the geometric conditions, the conveying product and the environmental conditions.

In addition, an automatic nozzle dipping device can be delivered. This controls the depth of immersion of the nozzle in response to the vacuum, thus ensuring a continuous operation with high average capacity. The auxiliary winch on the boom of the ship-unloader is very popular. With this winch, a small front-end loader (e.g. Bobcat) or larger excavators with up to 15 tonnes in weight can be lifted into the ship's hold to support the cleaning operation. The winch works at two speeds and is secured via load measuring axles.

COMBIPORT

Recently, Neuero has been very busy with its ship-unloaders, loaders and also with the Combiports. The Combiport is a combination of both equipment in one. Specially interesting when limited quay space and only one equipment can work at time.

The Combiport:

- is available stationary or on rails;
- has a loading capacity of up to 2,000tph (tonnes per hour) and an unloading capacity of 800tph, based on wheat with 0.75t/m³;
- has a payloader winch up to 15 tonnes;
- uses a power source via external power supply or diesel generators;
- unloads ship sizes from Europe II to Post-Panamax or Capesize;
- offers pneumatic conveying and loading onto on-site belt conveyors, trucks or rail cars;
- has low energy consumption;
- has simple operation with automatic mode;
- has low dust and noise emissions;
- considers all ATEX regulations; and
- offers easy access with low maintenance.

Neuero has just commissioned a Combiport 600/1000 in Odessa for Olimpex. This is the third item of equipment supplied to Olimpex in the last ten years. The equipment is designed to load vessels up to Panamax size at a rate of 1,000tph, with dust suppression and kick-in kick-out movement. The unloader will be used to unload 5,000dwt ships, but also Panamaxes. The equipment shares the power supply part and one function is parked in order to avoid collision.

The Combiport 600/1000 for Olimpex.

MULTIPORT

Neuero's most popular model is the Multiport M600, with a capacity of 600tph. There are several reasons for its popularity. It is available for most ships, especially Panamax and Cape. The 15-tonne auxiliary winch lifts the necessary front-end loaders for the clean up operation. The use of two blowers in series gives redundancy in the main drive system. Even if one blower is stopped, 50% of capacity still remains. The turbo blower unit is protected with vibrating and temperature sensors to protect against bearing failure for example.

The Multiport is suitable for the unloading of many kinds of bulk materials especially from the food sector but as well as for products from the power plant and aluminium industries. These systems are usually customized developments and adapt to the existing geometric conditions.

The Multiport:

- is available stationary, mobile on rubber wheels or on rails;
- has a discharge capacity of up to 800tph, based on wheat with 0.75t/m³;
- uses a power source via external power supply or diesel generators;
- is suitable for the unloading of ship sizes from Europe II to Post-Panamax or Capesize;
- offers pneumatic conveying and loading onto on-site belt conveyors, trucks or rail cars;
- has low energy consumption;
- has simple operation with automatic mode;
- has low dust and noise emissions;
- considers all ATEX regulations; and
- offers easy access with low maintenance.

FLEXIPORT

Another of Neuero's unloaders is the Flexiport, which is ideal for non-free-flowing materials. It has proven to be an ideal solution for corn gluten, meals and fish meal with less environmental contamination. The combination of suction and feeder is ideal for dusty materials also in smaller hatches.

Multiports in operation.

This is what our engineers say:

«Engineering such an integrated terminal handling system is extremely challenging as there are just so many factors one has to consider. Luckily we can rely on years and years of experience designing and building such systems around the world.»

INNOVATIVE MATERIAL HANDLING SOLUTIONS

Tenova **TAKRAF** is a key supplier of individual machines and integrated systems for the efficient handling of bulk material in mine stockyards, ports and/or terminals, power stations and metallurgical plants. Each project is approached from the end-user's point of view in order to design and deliver an optimal solution that exceeds requirements and expectations.
Complex material handling systems that extend from pit to port and include train or truck loading, train unloading via stockyard handling and blending to ship loading and unloading are developed on the back of extensive experience and know-how. **TAKRAF** stackers, reclaimers, combined stacker/reclaimers, scrapers, ship loaders and ship unloaders, to name but a few are adding value and efficiently moving material all over the world.

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The unloading operation is carried out with a pneumatic suction conveying system with a vertical and horizontal conveying pipe incorporated in a slewable and liftable boom. This allows the unloading of non-free flowing materials. The unloading suction line is equipped with a mechanical reclaim system at the inlet, feeding the material to the suction nozzle. This mechanical reclaim system consists of a electrical rotating feeder, which loosens the material and feeds it to the suction nozzle.

The Flexiport is ideal for non-free-flowing cargoes.

Flexiport unloaders have discharge capacities of up to 600tph, based on wheat. By kick movements of the rigid vertical boom, it can reach any place inside the hatch and even below ship covers.

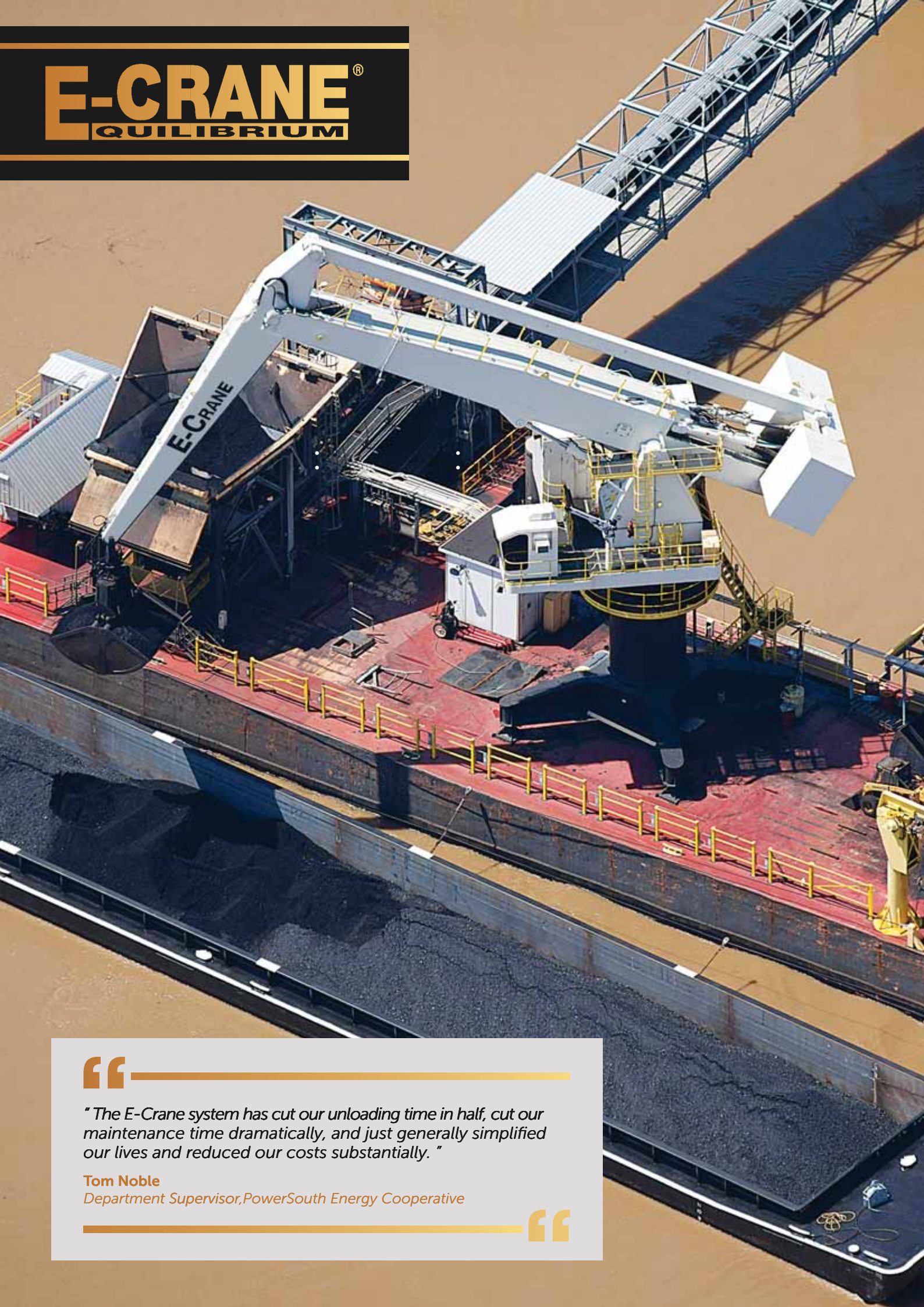
The use of the latest blower technology with additional equipment for sound absorption will be supplied taking into account also local regulations.

The Flexiport:

- is ideal for the unloading of non-free flowing bulk material like soy bean meal, corn gluten, fish meal, wood pellets, etc.;
- is available stationary, mobile on rubber wheels or on rails;
- has a special feeder for loosening the compacted bulk material;
- has a discharge capacity: up to 600tph based on wheat with 0.75t/m³;
- uses a power source via external power supply or diesel generators;
- is suitable for the unloading of ship sizes from Europe II to Panamax;
- loads onto on-site belt conveyors, trucks or rail cars;
- has low energy consumption;
- has simple operation with automatic mode;
- has low dust and noise emissions;
- considers all ATEX regulations; and
- offers easy access with low maintenance.

The Flexiport has a mechanical reclaim system consists of a electrical rotating feeder, which loosens the material and feeds it to the suction nozzle.

E-CRANE® QUILIBRIUM



" The E-Crane system has cut our unloading time in half, cut our maintenance time dramatically, and just generally simplified our lives and reduced our costs substantially. "

Tom Noble
Department Supervisor,PowerSouth Energy Cooperative

Dana's solutions for ship-unloaders and shiploaders: Brevini® helical and bevel helical gearboxes

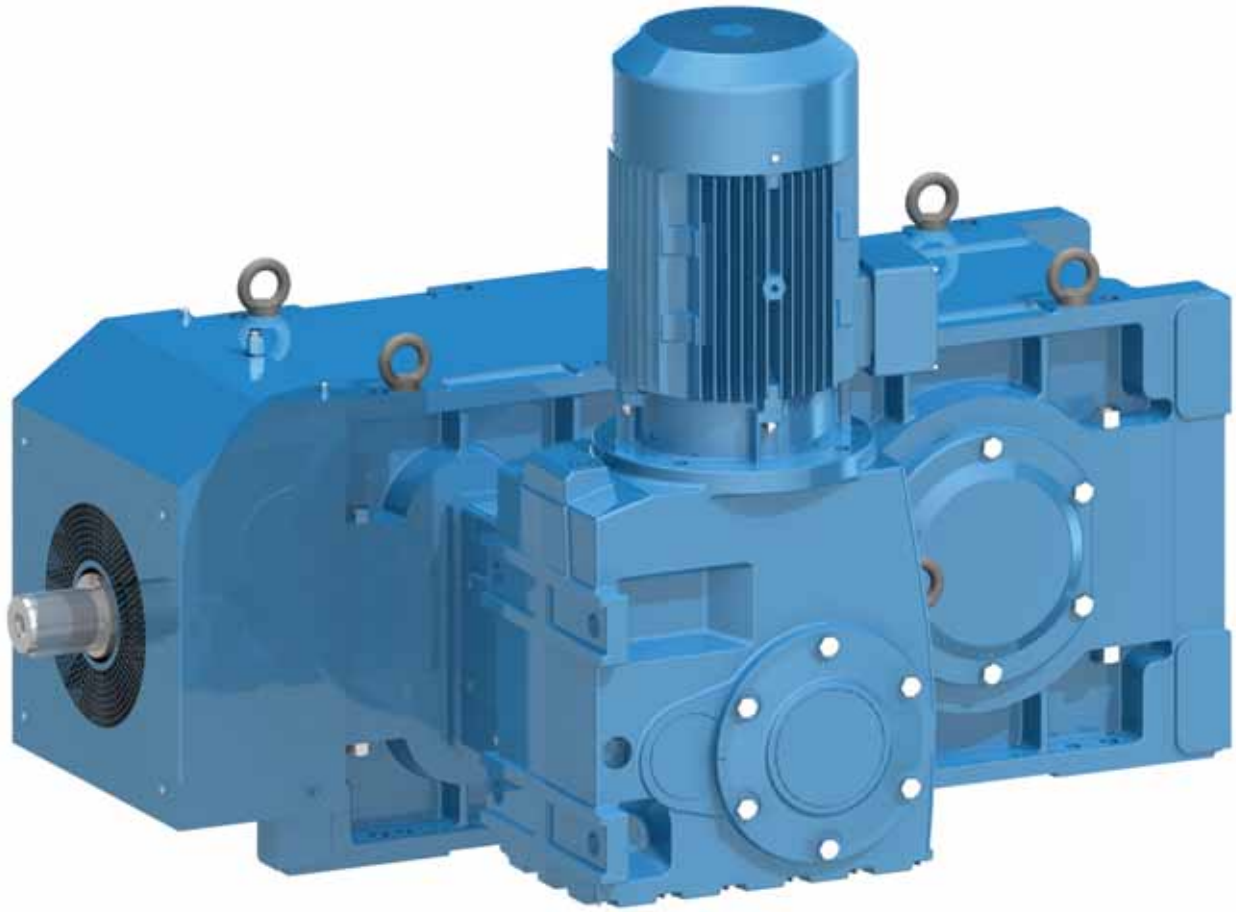
Founded in 1904, Dana Incorporated is world-renowned for its highly engineered solutions for improving the efficiency, performance, and sustainability of powered vehicles and machinery, *writes Gonzalo Salvatierra, Global Industrial Sectors Manager for Off-Highway Drive & Motion Technologies at Dana Incorporated*. With a range of solutions for the off-highway market, Dana also supports industrial and stationary equipment applications.

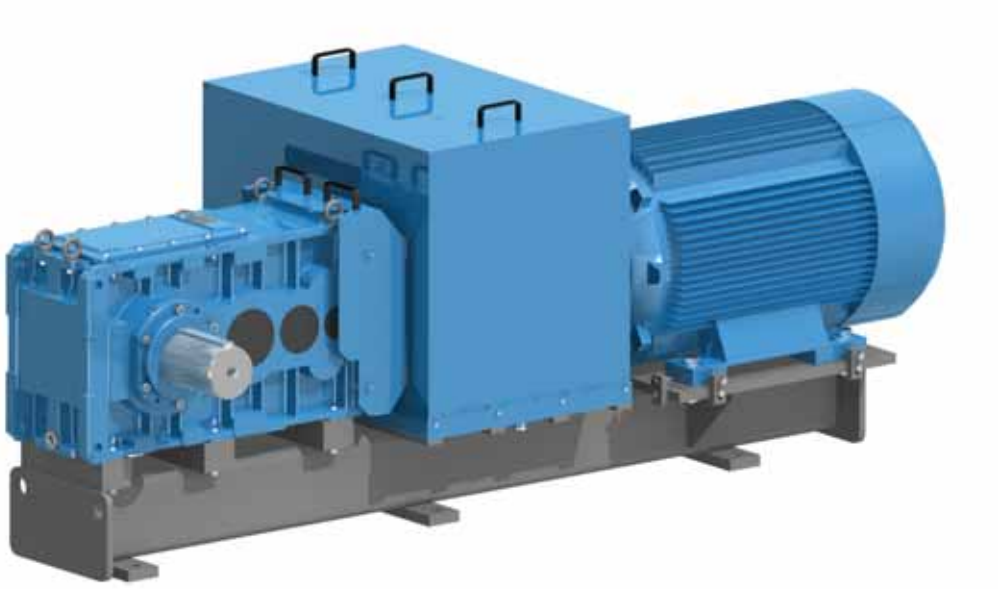
Employing more than 30,000 people in 33 countries, on six continents, Dana's employees work tirelessly to deliver long-term value to customers around the world. The company has earned its position as a trusted, top-tier supplier by collaborating with customers to develop, integrate, and support the innovations required to improve vehicle performance and efficiency.

A seamless complement to its existing offerings, Dana acquired the power-transmission and fluid power businesses of the former Brevini® Group S.p.A. in February 2017. This acquisition increases Dana content on off-highway and stationary industrial equipment, expands its range of product offerings with adjacent technologies, and gives Dana the unique ability to manage the power to both move equipment and perform its critical work functions.

For industrial markets, Dana's portfolio of advanced motion technologies has been engineered to support increased productivity and reliability, lower emissions, improve operator safety and comfort, and reduce total cost of ownership.

The engineers behind Dana's line of





Brevini products have many years of experience designing solutions for the marine sector including products for ship- unloaders and loaders. They understand that a single shiploader or ship-unloader typically features multiple separate drives to allow booms to move from front to back or up and down.

This design facilities filling the breadth of the cargo hold, and adapts to the ship's fluctuating draught while it is being loaded or unloaded. While unloading, even and complete filling of the cargo holds are facilitated by a special telescoping chute with a rotating, pivoting spoon.

Dana's line of products for shiploaders and ship-unloaders includes Brevini helical and bevel helical gearboxes, which are designed to handle solid, bulk material such as iron ore, coal, fertilizer, grain, and others — supporting 3,260 to 805,000Nm of torque. Produced with state-of-the-art design, material, and manufacturing technologies, they deliver maximum power and reliability within a cost-effective package.

With a range of POSIRED gearboxes, Brevini drives cover a spectrum of power transmission solutions for a wide variety of industrial applications in addition to marine — from environmental and recycling technologies to material handling and cranes, as well as the chemical, cement, and steel sectors.

This POSIRED series is based on a modular system, ensuring high efficiency, reliable operation, flexibility, and short delivery times. Many standard models and a great variety of customizable options guarantee optimal adaptation. Fans, cooling coils, external oil coolers, heating rods, torque supports, engine consoles, sub-constructions and operation monitoring systems are also available.

Tipping the balance with rotators from Container Rotation Systems

Australian company Container Rotation Systems (CRS) has given *Dry Cargo International* details of some recent contract awards for its innovative rotators.

CRS's rotators offer an efficient solution to the problem of unloading bulk from containers, a mode of transport that is gaining in popularity worldwide. CRS has recently delivered its first Eurospec to

Canadian stevedore and terminal manager QSL to empty its alumina cargoes.

The company has also just received two orders from Russia. The first of these orders is for two units of CRS's Rotainer Eurospec 38, a new upgraded model that will be fitted to a Kone STS crane. Loading can be done from all directions while the crane is travelling back and forth. This application will use Rotorcon open top containers set up for coal application, with a gross capacity of 38,500kg.

The second order is for PLP St. Petersburg, and will be for extra heavy duty models that will be used for a scrap metal application.

Pictured are some of CRS's Rotainer R.S. System models. This system went into Taiwan just over 12 months ago, and is used for copper concentrate blending and re-loading.

Svendborg Brakes supplies intelligent braking systems for maize transportation on vital Mississippi River network

The value and importance of the Mississippi River as a shipping network is hard to exaggerate. The river network extends throughout many of the central states and eventually deposits into the Gulf of Mexico, making it a key route for exported goods into central and southern America. With maize export being a key product for the USA's economy, it's vital that this transport network operates efficiently. Svendborg Brakes' SOBO iQ braking system delivers intelligent, reliable braking for some of the busiest barge-unloading conveyors on the river network.

Each year the US exports almost 10% of its total grain and grain by-product; contributing almost $80 billion to the country's economic output. Almost 90% of the feed grain that's produced by the country is maize, most of which is grown in Iowa, Illinois, Nebraska, Minnesota and Indiana. The majority of the maize that is exported from these states is shipped along the Mississippi waterway system to the Gulf of Mexico. Simply put, the transport of maize along the Mississippi River contributes tens of billions of dollars to the economic output of the USA every year — so the unloading systems are very important and must be as efficient and safe as possible.

The price of maize, and thus its competitiveness on the international market, is governed primarily by the ease and efficiency of its transport — the actual production values being relatively cheap compared to other commodities. Therefore, the reliability of the network of locks, dams and ports along the network is vital for this important industry. Many of these facilities are now 50 years old or more and investment is needed to fund repairs and refurbishments. Of particular

importance is the equipment used to unload the barges once they reach their destination. A single failure here can disrupt the schedule for hundreds of barges and can risk losing valuable crop to the river.

One such example is a large grain elevator facility located near to New Orleans, LA, run by a global leader in grain production, shipping and processing. Here, bucket elevators are used to quickly unload the barges. A gantry crane positions the bucket elevator, which is then lowered into the barge via a winch. Exposed to the hot, corrosive salt water conditions found near the Gulf of Mexico, the original braking equipment was approaching the end of its recommended service life. The facility's managers couldn't afford for the crane to fail, so approached Svendborg Brakes for a solution.

Svendborg Brakes, part of Altra Industrial Motion Corporation, specializes in engineered braking solutions, combining design ingenuity with manufacturing know-how to deliver efficient braking solutions for many of the world's toughest industrial applications. It designed and supplied the original brake system at the facility — which had performed reliably throughout the course of its operating life — so was the natural choice to design the replacement.

With a view to reducing project costs, Svendborg Brakes' engineers conducted a site visit to examine how the existing system could be repaired and upgraded, rather than installing a completely new system. The resulting upgrade allowed the utilization of the existing brake mounting pedestals to ensure that the system footprint would remain the same. In total, it was estimated that this solution would save $60,000 compared with the costs of completely replacing the system.

The new BSFA 635 mono-spring, hydraulically released, caliper disc brakes were coated with a corrosion-resistant finish designed to prolong life in marine and offshore environments. A custom V-seal ring was also installed between the adjusting screw and the yoke to prevent ingress of grain, moisture and other contaminants. Further, the existing control system was upgraded to a SOBO iQ controller to increase the maintainability of the electrical components.

The state-of-the-art, 'SOft Brake Option' (SOBO) braking controller provides a soft and predictable braking sequence which is ideal for conveyors and other applications where consistent stopping times or distances are desired. Capable of controlling up to four different hydraulic power units (HPUs) in different locations, the SOBO iQ manages braking torque based on the current speed and detected deceleration/acceleration of the application. This allows it to provide different braking profiles for different operational scenarios including stopping and holding, overspeed monitoring and rollback prevention.

By re-engineering the existing brake design, Svendborg Brakes' engineers were able to reduce the cost of repairs while also improving the performance and efficiency of the brake system. As a result of the control system upgrade, the operation of this critical piece of machinery was extended further, with greater reliability.

Recent surveys of the Mississippi waterway system reveal that as many as half of the inland marine transportation system structures are more than 50 years old. Beyond adverse weather conditions, the biggest threat to the maize export market in the USA would be disruption to the vital transportation network. This is why intelligent re-engineering projects like the one carried out at the grain elevator facility are so important — minimizing the cost of restoration projects while maximizing the performance capabilities of vital machinery.

Coal unloading remains a major market for Sumitomo's CSUs

Sumitomo Heavy Industries Material Handling System Co. Ltd was established in Japan in 1912, and is a renowned and respected industrial crane and bulk handling equipment manufacturer in Japan. In October 2015, Sumitomo acquired the material handling subsidiary of Mitsubishi Heavy Industries, Ltd. This integration further strengthened its position and enhanced its range of industrial cranes and services, and expanded its technical skills and know-how.

Sumitomo has supplied a wide range of cranes and bulk handling equipment for many years, and launched unique products into the bulk handling systems market. One of the primary products in the field of bulk handling is the bucket elevator type continuous ship unloader, or BE type CSU. With the integration with the subsidiary of Mitsubishi Heavy industries, Sumitomo has become the manufacturer with the largest supply record in the world for continuous unloaders, with more than 80 units delivered to date.

Its continuous unloaders have an excellent reputation with its customers, especially with their high unloading efficiencies, reliability and excellent after service. The salient feature of the Sumitomo BE type CSU is the BE swing-out for reaching under hold overhangs and the catenary mode for bottom clean-up, which greatly enhances the efficiency of handling. As a result, Sumitomo is playing a major part in the global coal handling market.

Since 1976 when it delivered the first BE type CSU, more than 80 Sumitomo CSUs have been delivered to its customers with capacities up to 3,500tph (tonnes per hour). Recent contracts include the delivery of 2,700tph CSUs for a Japanese electric power company in 2016 and a 3,500tph CSU for a Japanese steel company. Two CSUs which were in process of delivery to an electric power company in Taiwan became operational in 2017.

Coal market trends are changing daily, but it remains an important market and will be so in the future. Sumitomo now has more than six CSUs for electrical power companies in Japan on its order books. Sumitomo continues to contribute to the steel, port and electric power section with their most efficient and reliable CSUs. DCi

Kolberg-Pioneer equipment simplifies the handling process

Kolberg-Pioneer, Inc. (KPI) has been prominent as a manufacturer for the aggregate, mining, industrial, construction and recycling industries for over 90 years. As part of Astec Industries, KPI sets itself apart by designing, manufacturing and selling highly innovative, productive, reliable and safe equipment for the industries it serves, coupled with excellent customer service. KPI is pleased to offer a complete line of material handling equipment for the cargo handling industry, including portable and stationary conveyors, stackers, telescoping stackers, hopper feeders and complete engineered systems to fit any operation. It also offers crushing, screening and washing and classifying equipment.

KPI's mobile conveying equipment provides the flexibility to move material throughout the port. Mobile loading/unloading hopper/feed systems and conveyors deliver lower capital investment, shorter lead times, quick assembly, ease of relocation and efficiency within a small footprint.

The Kolberg-Pioneer SuperStacker® Telescoping Radial Stacker features an innovative design that provides producers up to 30% more stockpile capacity, compared with a conventional radial stacker. The SuperStacker® can be used to load and unload a variety of bulk materials, and is available in sizes from 130ft (40m) to 190ft (58m).

SuperStacker® conveyors utilize KPI's patented Wizard Touch® software which delivers revolutionary stockpile automation that is essential for an efficient operation and high-quality mix. The programme prevents material segregation and degradation by stockpiling windrows of material in incremental lifts using KPI's fully-programmable PLC controller. The system also includes an expanded selection of stockpile options and the ability to input multiple stockpile recipes for a more diverse operation.

With updated touchscreen controls, enhanced automation sensors, wireless remote option and the ability to input custom stockpile recipes, Kolberg-Pioneer's Wizard Touch® software offers producers extremely up-to-date technology and convenient operational

flexibility.

In addition, the new Kolberg-Pioneer track tugger can be used to provide on-site mobility for the SuperStacker® conveyors. Producers are able to hook the SuperStacker® to the tugger for easy tracking around the site. The tugger also has the ability to power two external conveyors, providing an added convenience for producers.

Kolberg-Pioneer also manufactures complete engineered loading and unloading systems. These durable systems can include a variety of material handling equipment including ship, barge and railcar loading and unloading systems, tripper systems, and a variety of radial and telescoping conveyors.

KPI builds its custom systems to match the needs of each operation, with extensive planning and engagement with the customer. Its systems come equipped with their own set of custom-created, HMI controls to provide the customer real-time information on belt scales, motors, trippers and more.

KPI also manufactures portable and stationary feed systems with heavy-duty construction designs and easy set up. These systems are compatible with the company's entire line of material feed products, allowing producers to run at peak performance and maximize the effectiveness of their operation by improving feed points. The feeding equipment, including portable feed systems, hopper feeders and tunnel feed systems, excels at efficiently feeding portable or stationary systems and easily fits into new or existing operations. DCi





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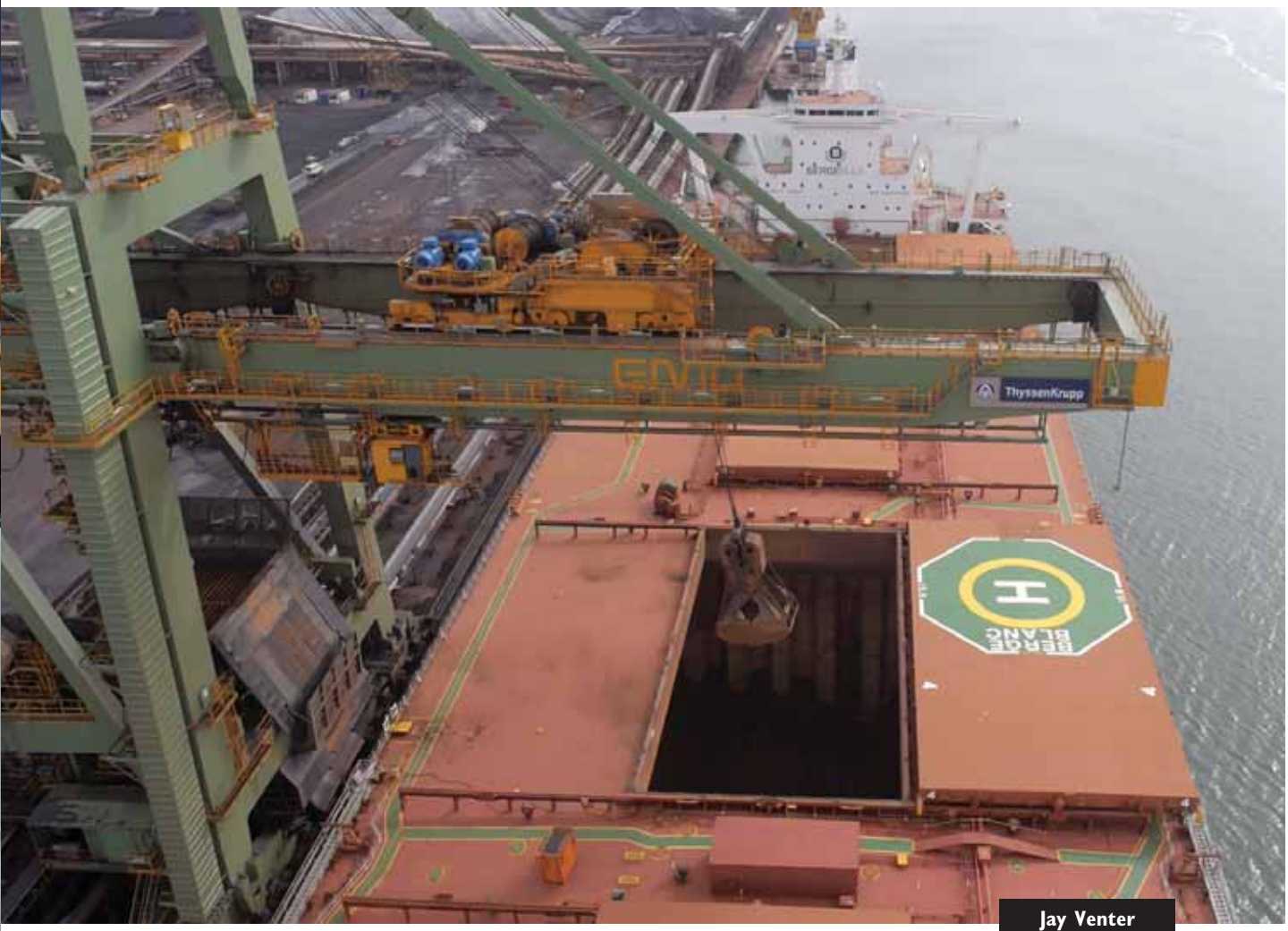
Cranes grab the spotlight

grabs, grapples and buckets under scrutiny



Jay Venter

Driverless grab ship-unloaders (GSU) for bulk carriers

The task

In an increasingly competitive environment, all manufacturers and operators of large gantry cranes have been tasked with providing a higher level of automation to provide additional value and reduce the cost of operation.

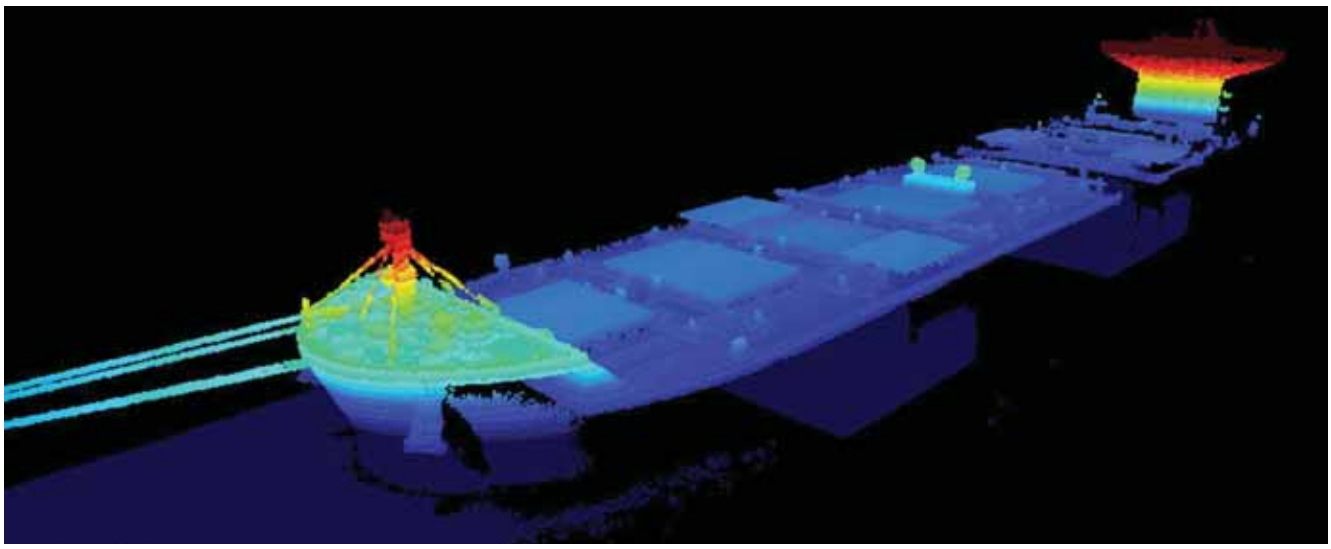
Current grab ship-unloaders have to be manned by an operator all the time and only basic teach-in procedures are available to support the operator. The first part of the unloading process has to be performed entirely manually and the collision protection is sometimes difficult, because the operator can see neither the unloading area nor the complete machine in all positions.

iSAM has developed and implemented two main technologies to improve production, safety and economy on grab ship-unloaders as well as shiploaders. This technology allows for the first time autonomous operation of equipment in ship-to-shore operations.

The solution

The task of operating a grab ship-unloader autonomously was a great challenge, if not a mission impossible. With a combination of the latest 3D LiDAR technology originating in self-driving cars, highly accurate RTK GPS systems for machine positioning and internally developed leading-edge control technology, iSAM has succeeded in solving the problem.

The solution consists of an advanced collision protection system, a sensor and an evaluation system which enables a control system to obtain complete information about its own position and of all other objects in the vicinity. For the first time, this allows for an enveloping protection of the machine structure against possible collisions. It also creates the foundation for remote and even fully autonomous operation by enabling the system to 'see' its environment and make its own, situation-specific decisions as an operator



would do.

iSAM serves both export and import terminals and has already delivered automation solutions for shiploaders and unloaders including:

- four autonomous grab ship-unloaders for up to Capesize class vessels (Hansaport, Port of Hamburg, Germany);
- three autonomous grab ship-unloaders for up to Valemax class vessels (EMO, Port of Rotterdam, Netherlands);
- one autonomous shiploader (EMO, Port of Rotterdam, Netherlands);
- one autonomous barge loader (Hansaport, Port of Hamburg, Germany); and
- numerous 3D modelling systems for machine envelope protection.

The systems are in use even during severe weather conditions such as fog, rain, snow in winter or bright sunlight and heat during summer time.

One of the key components of the systems for autonomous unloading is the intelligent grab tracking system based on the 3D real time laser scanner. The new high-tech scanner is fast enough to track the crane ropes and the grab itself in real time to measure sway, attitude and rotation of the grab. In most installations — with the exception of the largest cranes and special crane geometries — the same sensor can be used to track the grab, measure the hatch positions and generate the material profile inside the hatch.

In the control system, data from the grab tracking system ensures a continuous update of the energy and position model for the grab's moving path. This allows a precise 'landing' of the grab at any given point with a precision of about 0.5m in the cargo hold — whatever the weather conditions may be, at low tide and high tide.

The position of the unloader is permanently tracked by a RTK GPS. A high-precision 3D laser scanner delivers the exact position of the ship and its hatches as well as data about the material distribution in the cargo hold. The scanner is even able to reliably detect coal from a distance of up to 100m, under virtually any weather conditions.

Whereas the 3D scanner is the 'eyes' of the automation system, iSAM's leading-edge control technology connected with the PLC is the 'brain'. Finally, the best unloading strategy is automatically determined on the basis of the known material properties and the current sensor data of the machine environment. For example a "performance-oriented" strategy with a reduced cycle time is automatically chosen for materials that flow well, for instance pellets. For coal and ore which have poor flowing properties, the system selects a strategy to unload right from the start 'out of the corners'.

In contrast to a human operator, the control system is not only able to calculate the current position but also the kinetic energy of the grab at any point on the moving path. This guarantees that the grab does not collide with the hatch or the unloader structure during the whole cycle — not even in case of 'hard' stops, for instance when an emergency stop is pushed.

Highlights

- real autonomous operation, not a remote control;
- very uniform and steady unloading performance minimizing equipment idle times;
- driverless operation even under the hatch coaming, under virtually any weather conditions;
- real-time determination of the grab position;
- permanent update of data for the energy and position model for the grab's moving path;
- optional integration of safety system for persons on the quay;
- operation of all equipment from a central control station, i.e. minimum stress for the supervisory operator thanks to a maximum degree of automation (easily up to six cranes by one operator);
- possibility of manual intervention from the central control station by remote control;
- improved working conditions;
- lower wear and tear because mechanical performance limits are respected in automated mode; and
- fulfilment of operational guidelines and safety rules.

About iSAM

iSAM AG, Gesellschaft fuer angewandte Kybernetik, located in Muelheim an der Ruhr, Germany, develops and implements automation solutions that enable industry, commerce and service suppliers to increase their performance.

iSAM's team includes specialists from the engineering, computer science and physics sectors as well as business economics, focusing on increasing customer value.

The company's customers can be found all over the world and in almost every industry, such as mining, coal handling, transport and logistics, steel and metal manufacturing and processing, tube welding and pipeline construction, mechanical engineering and plant building, electronics and aerospace.

iSAM AG is well prepared for future challenges and iSAM experts are constantly developing, upgrading and adapting their technology to other applications and markets, finding unique solutions for each customer request.







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PLM Cranes are custom designed

PLM Cranes specializes in designing and manufacturing cranes for worldwide applications. All designs are fully committed to the customer and industry requirements.

PLM offshore bulk handling crane.

Products

Thanks to more than 50 years of operating, manufacturing and designing experience and a practical oriented mindset, PLM Cranes is able to create heavy duty cycle products that contain the best possible design, materials and components for the job.

All products are designed from scratch and are customized where required, to be able to deliver a top of the line crane for the corresponding application and duty cycles.

Ship cranes

PLM grab cranes are the most efficient way to handle large volumes of different materials for corresponding industries such as:

- dredging;
- bulk handling; and
- stevedoring.

All grab cranes are custom designed and are proven to have maximum unloading operating capacities and are rigid, duty cycle, low maintenance cranes.

PLM grab crane range:

- 2 to 50 tonnes lifting capacity (1,500 tonnes per hour) at all possible ranges; and
- higher lifting capacities on request.

PLM undercarriages;

- pedestal (box);
- gantry;
- rail;
- rubber tyres;
- crawler; and
- special undercarriages on request.

Marine cranes

PLM marine cranes are innovative cranes for all offshore industries. Worldwide PLM cranes is offering reliable and robust designs for marine applications. Innovative and rigid constructions provide a machine that is up for every task.

PLM grab crane.

All PLM cranes are custom built to provide the best possible crane for every customer worldwide.

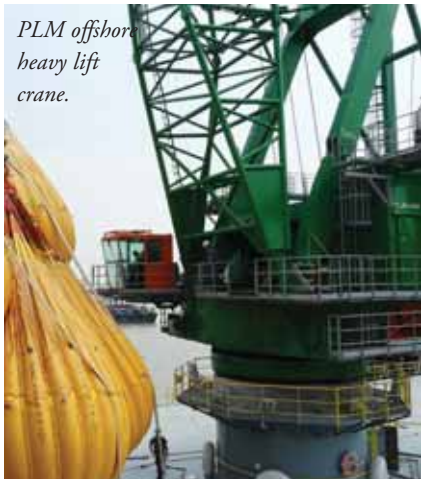
PLM marine crane range:

- 2 to 400 tonnes lifting capacity at all possible ranges; and
- higher lifting capacities on request

PLM undercarriages:

- pedestal (box);
- gantry;
- rail; and
- special undercarriages are available on request.

PLM also offers hoist cranes and drop ball cranes.



PLM offshore heavy lift crane.

Drives

PLM Cranes B.V. is specialized in all sorts of drives:

- diesel-hydraulic cranes
- electric-hydraulic cranes
- diesel-electric cranes
- fully electric cranes

Ropes

PLM Cranes B.V. is leading in custom made wire rope winches for cranes:

- two rope cranes; and
- four rope cranes.

MRS Greifer GmbH, various grab designs for wide range of material

German company MRS Greifer- und Maschinenbau Helmstadt GmbH was established 1977 out of the former crane manufacturer RIDINGER Mannheim. The entire expertise and the wealth of experience was absorbed into the new company.

For 50 years, MRS Greifer has been one of the biggest grab producers in the world. It manufactures all of its grabs in Helmstadt, which is why they are labelled as completely 'made in Germany'.

Currently, there are five owners and 80 employees working to satisfy customers all over the world.

Grabs

MRS Greifer produces all kinds of grabs with volumes up from 0.1 up to 30 cubic metres and up to 20 tonnes of weight, for the handling of bulk cargo. The grabs can be connected to a crane or an excavator.

Types

Dependent on the kind of drive, there are the following types of grabs:

Rope grab

Connection: crane with suspension and closing rope.

Drive: mechanically through the closing ropes.

Motor grab

Connection: crane with suspension rope.

Drive: electrohydraulic through electrical lead from the crane.

Hydraulic grab

Connection: excavator with frictional connection (e.g. quick-release attachment)

Drive: hydraulic drive through hydraulic supply from the crane.

Round log grab.

Design

In MRS Greifer's product portfolio there are grabs in different designs to ensure perfect handling of various types of material:

- clamshell grab;
- orange peel grab;
- dredging grab;
- round log grab; and
- others: special grabs for specific tasks.

After-sales

In addition to the production of new grabs, MRS Greifer offers an excellent after-sales service for its customers, either at the customer's site or in the company's works. One of the biggest advantages of the after-sales service is that well-trained MRS Greifer workers also repair grabs from other brands. This service is well known and appreciated by the company's customers.

Services

In addition to the products offered by MRS Greifer, the company also offers the following services:

- on-site-service;
- spare parts;
- repair;
- education/training; and
- transport.

Dredging grab.

MRS Greifer orange peel grab.

Investment in quality pays its way for port operators

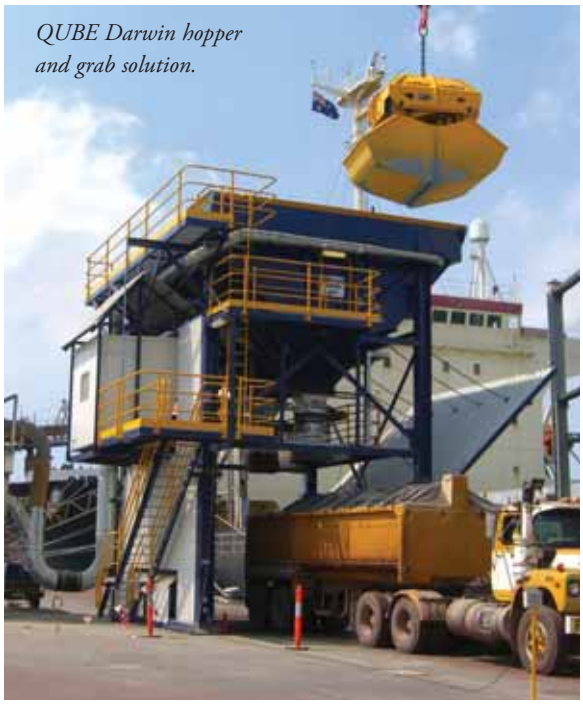
Page Macrae Engineering provides high capacity grab and hopper solutions for an integrated and seamless bulk handling system for its customers. The company's grabs and eco-hoppers are now known for their quality, reliability and performance.

"Including whole of life maintenance costs into the equation for purchasing port equipment like grabs has paid its way for many port operators around Australia and New Zealand," says Page Macrae Engineering's Product Development Manager, Bruce Ennis.

The company, established in Tauranga in 1955, started as marine and general mechanical engineers for local industry. The company's Port Equipment department began life servicing and maintaining equipment then evolved into research and development, design and manufacture of grabs, hoppers and other equipment used for port operations.

In 2006, customer P&O Automotive & General Stevedoring – POAGS (now known as QUBE), located in Brisbane, was one of Page Macrae Engineering's first Australian commissions. The supply brief was for four remote control grabs with rapid payback, minimal downtime and high productivity.

The customer reported productivity gains over 50%, fulfilling expectations for the grabs to meet cost recovery within 12 months of commissioning. Since then, the company has gone from strength to strength, supplying multiple grab and hopper solutions to ports and bulk cargo handlers throughout Australia, New Zealand and further afield.



QUBE Darwin hopper and grab solution.

"When you have large global identities pointing to the 'whole life cycle' costs central to the capital expenditure equation, we responded by continuing to fulfil that need by providing equipment that delivers high productivity, with minimal downtime and ongoing maintenance, thanks to good design and robust, high-quality construction." says Ennis, "While productivity remains critical, there is now greater scrutiny on the ability of the equipment to comply with specific environmental, health and safety criteria."

Since 2006 Page Macrae Engineering has supplied bulk grabs and dust-controlled

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hoppers to QUBE Logistics who are now the largest supplier of port stevedoring services in Australia, and, since 2010, has expanded their portfolio to be one of Australia's largest providers of logistics services also.

The decision to purchase a diesel-hydraulic grab and hopper solution stemmed from a problem in the East Arm facility in Darwin where it had been warned about the level of dust emissions from the discharge operations. Like many ports, it shares the harbour and waterway resource with recreational users and was facing interruption to its business if the problem wasn't solved.

Page Macrae Engineering DH-10-R1 diesel-hydraulic grab.

In order to submit a proposal to remedy the problem, Page Macrae Engineering conducted a survey of QUBE's operations. The end result was a proposal to supply a grab and hopper solution.

"The outcome was positive for all parties. The diesel hydraulic grabs delivered on productivity gains while the dust reduction technology of the grab and hopper combination contributed to a far cleaner, safer discharge operation for our customer," says Ennis.

Following this project, a commission for the Koniambo nickel mining project in New Caledonia, one of the world's largest nickel sources, made for a significant shift in grab development with the order resulting in another significant research and development investment to deliver to the client's strict specifications.

While environmentally sensitive design and operations were critical specifications, it required equipment that did not compromise on productivity. Efficient use of energy, protection of natural resources, waste minimization and biodiversity conservation were key mandates underpinning the project's establishment and operation.

Its remote coastal peninsula location, preservation of wetlands, waterways and marine environments were a key requirement for the mining company, which will extract nickel ore from around 380 million tonnes of saprolite resources over the mine's 50-year lifespan.

The diesel hydraulic grabs also ticked the boxes around low drift profile and were suited to the deep channel loading facility. Downtime and maintenance minimization were also critical parameters.

It is from these projects that the company developed its range of diesel-hydraulic and remote release grabs with a low drift profile, offering maximum productivity and capacity across a wide range of cargoes and facilities. The grabs incorporate technology which is now standard through the diesel-hydraulic range.

The grabs were built based on an innovative jaw design that minimizes dust and product loss. A unique overlapping blade seal design, capable of maintaining its integrity across a wide range of product densities, ensures a flexible grab with excellent sealing capabilities. This reduces dust emissions and valuable cargo losses onto the wharf and water.

The grab was subject to extensive noise suppression using acoustic sound reduction materials. The diesel engine's air cooling system means the operation is simpler than liquid cooled engines. Significant placement design ensures air-flow is not compromised by noise reduction material. The outcome is a grab which meets the 81dB threshold under load.

Spark suppression technology also ensures operation in hot, dry conditions minimizes fire risk, particularly when operating in confined ships' holds.

Fitting the grabs with a two-stage adjustable bucket opening makes them flexible enough to discharge into narrower hopper openings and provides better control over product drift in high wind situations. Bucket dust control flaps can be added to further suppress product loss.

Equipped with a diagnostics system, the technology provides operators with information on grab performance and fault diagnosis, allowing straightforward maintenance and repair.

Building the power plant into its own sliding sub-frame module ensures the engine can be easily removed for servicing, testing and maintenance. It also provides a low centre of gravity through the grab with the engine being located closer to the jaws, also helping to reduce noise emissions.

In 2010, the Diesel Hydraulic Bulk Grab won the Innovation Award for grabs in the Australian Bulk Handling Awards. In 2013 Page Macrae Engineering was awarded winner of the Bay of Plenty Exporter of the Year Awards, followed by the Heavy Engineering Research Association (HERA) Exporter of the Year Award in 2017 for its port equipment.

"We've proven that we can demonstrate genuine research, development, design and manufacture capability, backed up by technical support, service and parts for our equipment," says Ennis, "Page Macrae Engineering now focuses on whole chain and life cycle bulk handling solutions. Our equipment now includes both wire and chain, mechanical and diesel-hydraulic bulk grabs for ship unloading. Teamed with our Enviro-Max Hoppers, these are a proven solution for discharging cleanly and efficiently with technology ensuring productivity, environmental and health and safety requirements are being met."

Page Macrae Engineering's grab and hopper solutions are complemented by other port equipment including container and pulp spreaders, log lifters and skate tables.

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Negrini company, established in 1967, specializes in engineering and manufacturing a comprehensive range of grabs and buckets for rope machines and crawler mounted cranes; they are employed to do many jobs. Negrini buckets and grabs are very well-known for quality as well as for the very accurate and skilful engineering work; in fact Negrini supports their clients by analyzing the job to be done and, if needed, by adjusting the standard design of grabs and buckets to enhance their performance once in operation.

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nemaX: accelerated transshipment

The new nemaX® grab for iron ore, >10% higher productivity than comparable clamshell grabs, far stronger and the lower maintenance costs

The transshipment of dry bulk material is a crucial factor throughout the entire transshipment chain. Transshipment is the shipment of goods or dry bulk cargo to an intermediate destination, then to another destination. One possible reason for transshipment is to combine small shipments into one large shipment (consolidation) and/or to divide the large shipment at the other end (deconsolidation). High-performance transshipment usually takes place at onshore or off shore transport hubs. This white paper deals with high-performance off shore trans shipment situations and highlights the merits of the newly developed nemaX four-rope grab for transshipment situations at sea.

Trends and challenges

Apart from management issues on board, seaborne operations face the following challenges:

- **Operational:** How do I avoid congestion and demurrage costs of ingoing and outgoing vessels due to slippage in ETA & ETD, availability of the installation due to bad sea state and other meteorological conditions?
- **Technical:** How do I keep my installation going at open sea under severe conditions and without too much technical support?
- **Financial:** As the handling rates are under pressure due to overcapacity in the dry bulk market, how do I increase efficiency and lower costs per tonne of transshipment?

Equipment at transshippers

Many high-performance marine trans-shipment hubs are equipped with four rope (grab) slewing cranes. The reason for choosing four-rope cranes is significantly higher efficiency compared to, for instance, slow-moving, single line derrick cranes equipped with slow-operating remote controlled or electro/ hydraulic grabs.

In most cases, these four rope cranes are standardized to a high degree with specific speeds and accelerations, depending on the make and type. Within these constraints, the productivity of any transhipment crane depends entirely on the productivity of the grab.

Any grab, regardless of type or brand, will have a given deadweight and payload. The general idea is that the lower the grab's deadweight, the higher the payload and the higher the productivity. Right? Or is there more to it? The grab's opening and close time should also be considered.

Productivity = payload x cycles per hour

The number of cycles per hour is the result of the hoisting and slewing time of the crane plus the opening and closing time of the grab. Given the speed of the crane winches, the closing time depends on the grab's closing cable withdrawal length. As slewing cranes can only start to slew after the grab is fully closed and lifted out of the cargo, the opening and closing time of the grab is an important factor in the entire productivity. Especially at small slewing angles (which operators prefer to have in order to achieve the shortest possible cycle time), the speed of the grab has a dominant impact.

Zeroing in on nemaX

Through exhaustive computer simulations, Nemag has succeeded in developing a new generation of grabs for the handling of iron ore: the nemaX grab.

The nemaX has a 15% lower deadweight compared to similar clamshell grabs, as well as a 20% shorter cable closing length. The result is a higher payload, a significantly shorter cycle time and at least 10% higher productivity for the entire transshipper. In order to understand the consequences in daily practice, please have a look at the business case below, which refers to a well-known brand of maritime cranes. The table on page x compares a nemaX with a typical lightweight Clamshell grab that is often used for this type of crane. The result is clearly to the advantage of nemaX, which has up to 17% higher productivity due to a lower deadweight and a faster opening and closing time. The advantage will lead to even higher productivity increases in case of higher SWL cranes.

More advantages of the nemaX grab:

1. Increased productivity in the intermediate and clean-up phase

In addition to increased productivity in the free-digging phase due to lower weight and faster closing and opening times, the nemaX extends the free-digging rate past the intermediate phase and reduces the clean-up phase thanks to a 30% larger

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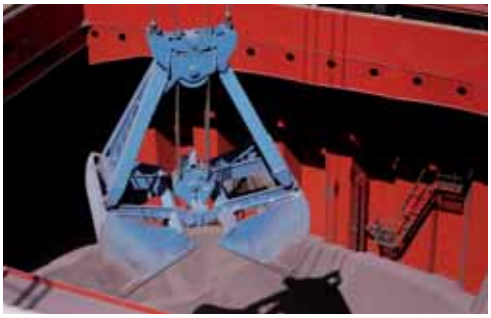

Are you looking for a new grab?

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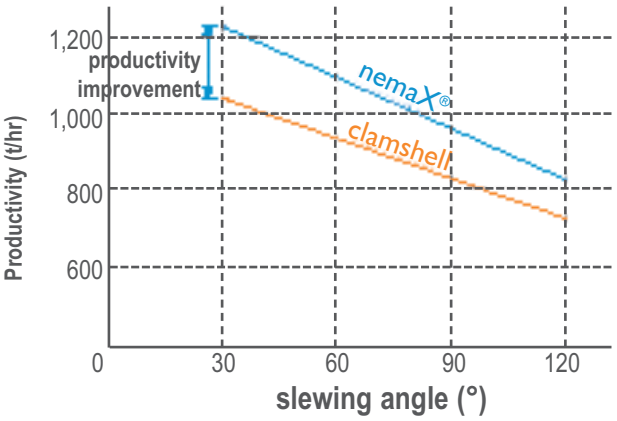
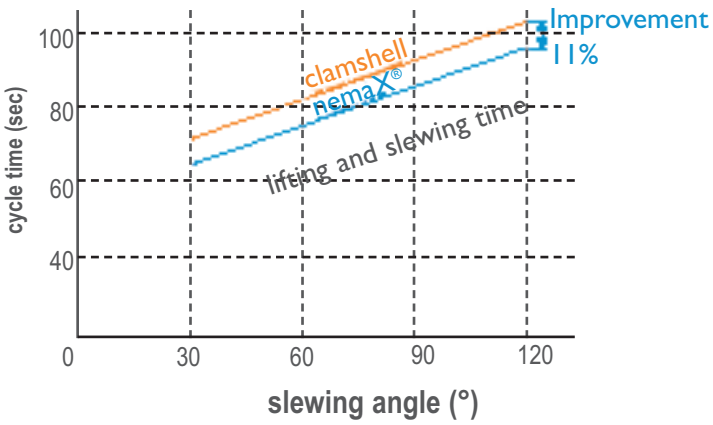
IMPROVEMENT WHEN USING THE NEMAX® GRAB

	Slewing crane 30t + clamshell grab	Slewing crane 30t + nemaX® Grab	Improvement
Grab weight (tonne)	9.3	8.1	
Payload per cycle (tonne)	20.7	21.9	+6%
Grab closing rope length (m)	10.76.2		
Lifting and slewing time @ 30° slew (sec)	47	47	
Opening and closing time of grab (sec)	24.4	17.4	
Total cycle time (sec)	71.4	64.4	+11%
Turnover/hour (tonne)	**1,044**	**1,224**	**+17%**





footprint and horizontal digging path. As a result, the nemaX helps save on expensive and time-consuming trimming equipment.

2. Improved dynamic behaviour at floating transshipment

A typical floating transshipment crane deals with a pendulum motion of the pontoon & crane. This is the result of:

1. **Crane sway due to shifting centres of gravity caused by changing weights (empty grab/full grab) combined with changing outreach of the crane**
2. **Sea state and swell**

Even a ballasted/stabilized pontoon will have significant relative movement, causing relative movement between the grab and the bulk during digging. This will lead to harmful peak loads in the crane and productivity losses. Experience with a 45-tonne SWL floating crane (Lemniscate type) in the Netherlands has shown that the extremely short closing length of nemaX makes the grab so fast that it can easily follow the pendulum of the floating crane. This significantly reduces load peaks on the crane. This has the following advantages:

- lower load impact on ropes
- lower load impact on opening/closing and hoist winches & gear box
- lower load impact on slewing ring bearing
- lower fatigue stress on the general structure of the crane
- significantly quieter operation for the crane driver

Due to the fast closing of the nemaX, unloading is less dependent on the dynamics of the floating crane and on the sea state.

3. Less maintenance

A nemaX requires less maintenance compared to a clamshell grab thanks to 70% fewer moving parts, the long lifespan of the closing cable and only one pivot point, compared with the six pivot points on a clamshell.

Conclusion

While the impact of some of these factors may vary, one thing is perfectly clear: nemaX can accelerate a company's unloading performance with its existing installation by at least 10% and lower the cost per tonne in bulk handled. It will also extend the lifespan and reliability of cranes and reduce maintenance costs.

NemaX is now available for handling all kinds of iron ores and minerals. NemaX will be available for handling coal and other light density materials by the end of 2018.

About Nemag

Nemag, a family business founded 94 years ago, is the preferred partner for the handling of dry bulk materials and enjoys a strong reputation worldwide. Nemag provides a wide range of grabs and various types of quick-release links and rope-pear sockets.

Whether it's handling coal and iron ore or loading and unloading wheat, scrap materials, minerals, biomass or other bulk goods, Nemag always offers an optimal and reliable solution. The aim is to reduce handling costs per tonne of dry bulk materials transferred for steel plants, power stations, OEMs and commercial terminal operators. Innovation, customer support and a highly intensive after-sales service are of paramount importance to both Nemag and its customers.

A global network of specialized representatives supported by Nemag specialists is ready to assist customers worldwide.

More white papers about the nemaX can be found on Nemag's website.

Clients can also compare their existing iron ore grab to the new nemaX grab to calculate their acceleration.

Plant expansion streamlines production and product delivery for Mack Manufacturing

Mack's expanded 10,800ft² prep shop is fully equipped to assemble, finish and ship its products worldwide.

Mack Manufacturing, an American manufacturer of heavy-duty hydraulic grapples, grabs and clamshell buckets, recently completed construction of a 10,800ft² expansion that has allowed new efficiencies throughout its production process.

The new facilities are housed in a standalone building adjacent to the main plant. Mack acquired additional property for its 11-acre site to accommodate the added space. Four years in planning and construction, the structure now houses all of Mack's assembly and finishing operations, up to final shipping.

According to Matt Davidson, Vice President of Sales & Marketing, the expansion is a major step forward for the company's production line. It houses a wide range of processes — assembling fabricated components, sandblasting, paint, crating and shipping. All those activities previously shared a 100ft by 45ft area in the main plant. Now, with almost three times as much space to work with, each operation has the dedicated space it requires, laid out specifically to allow for significant improvements to the workflow.

The improvements also include upgraded technologies such as a closed-loop recovery and purification system for its high pressure washing area, and a fully sealed steel-grit sandblasting stage that reduces the cost of consumable material and enhances its environmental controls.

In the main plant, the former prep shop is now home to Mack's hydraulic shop. Davidson says that the move led to a reorganization of its cylinder production, machining and fabrication areas that reduces handling and streamlines the overall manufacturing process.

Now in its fourth generation of operation, Mack's head office and manufacturing site now totals more than 60,000ft² dedicated to its 'quality first' engineering and production of clam shell buckets, grapples and grabs for all overhead and mobile material handling applications including: logging, aggregates, scrap, waste handling, dredging and ship unloading.

New Mack Mag-Grab features long-life durability with all-day lifting strength

At the recent ISRI conference and exhibition, held in April 2018 in Las Vegas, Nevada, Mack Manufacturing, supplier of premium grade industrial grapples and buckets, introduced a new mag-grab as the latest addition to its product line for the scrap-handling industry.

The combination four-tine grapple and lifting magnet are offered in 1-yard, 1.5-yard and 2-yard models. The 2-yard grab is fitted with a 44-inch lifting magnet, while the smaller models feature 40-inch magnets.

Mag-grabs typically are used to improve load retention when lifting fine material or to let operators 'sweep' the work area clear of ferrous debris during loading operations.

To develop the new product, Mack worked closely with the magnet manufacturer to optimize the attachment. Like all Mack products, the mag-grabs are 100% American engineered and manufactured.

According to Matt Davidson of Mack Manufacturing, there was a great deal of interest in this product at the show. "We feel that this combination will prove to be a very valuable addition to many of our customers and effectively increase their productivity in certain operating situations."

Matt Davidson (L) and Craig Mizell introduce the new Mack Mag-Grapple at the 2018 ISRI Show in Las Vegas.

Continuous rotation

Like other mag-grabs on the market, the new Mack models also allow continuous rotation of the orange-peel tines, providing extra flexibility and control for operators. The rotator on most grapples is located next to their attachment point. The Mack mag-grabs includes a brushless spindle below the attachment knuckle, so the tines can rotate independent of the attachment point. The tines can elevate above the magnet position, allowing the magnet to sweep right to ground level.

Long-life performance

Mack also highlights the reinforcement ribs forged into each of the orange-peel's tines, adding extra strength and rigidity to stand up against heavy loads. The grapple itself is all T1 structural steel with AR400 plate at high wear areas in the tines. Oversized bushings are used at hinge points for longer life and all shafting is heat-treated and stress-relieved 4140 material. Tines are fitted with premium replaceable points.

As with all Mack products, all hydraulic cylinders in the mag-grab are manufactured in Mack's own machine shop.

About Mack Manufacturing

Mack Manufacturing is a manufacturer of industrial material handling attachments, specializing in heavy-duty hydraulic grapples and buckets for overhead cranes and mobile equipment. Established in 1942, Mack continues to operate as a family-owned business committed to the development of highly-skilled welders, fabricators and support staff. Mack's head office facility in Theodore, Alabama, is fully equipped to complete every step of attachment manufacturing and remanufacturing tasks under one roof, from engineering to precision machining to final finish.

CJSC SMM's level luffing crane AIST has successfully completed all performance testing at Stevedoring company Malijport LLC in Russia

On 29 March, 3 April and 6 April this year, LLC Stevedoring company 'Malij port' CJSC 'SMM' conducted grab mode performance tests on the 'AIST' series electric level luffing crane with articulated double jib. The actual performance results of the crane were 595.1 tonnes of cargo per hour on average.

During the tests, the crane, equipped with double-jaw grab for bulk cargo of 10m^3, carried out loading of three ships. The crane managed 57 cycles in one hour (positioning, closing, lifting, boom reach changing, turning, lowering, reset). The crane handled from 10 to 10.6 tonnes of cargo in one cycle.

The crane maximum load capacity in grab mode is: 18 tonnes; in hook mode, 32 tonnes; and in hook mode at increased load capacity, 40 tonnes. Maximum boom reach is 36 metres; hook mode maximum height, 26 metres; grab, 25 metres; distance from ground level, 15 metres. The crane is able to operate in temperatures ranging from –40° up to +40° Celsius.

In addition to the new crane, three more AIST-series cranes are being operated in Stevedoring company Malij port LLC , each of which can significantly increase the level of handling of bulk cargo.

Also, in the previous year, PJSC Murmansk Commercial Seaport carried out a series of tests on the level luffing crane 'VITYAZ', No. 2004028, according to the 'warehouse to vessel' approved regulations. The crane has carried out the loading of coal on the vessel from a cordon dock warehouse. The calculation of production cycles was conducted during a controlled period (one hour of work) and also one cycle of time was recorded.

During the tests carried-out, the average actual productivity of VITYAZ level luffing crane surpassed expectations and the predictions of experts, achieving a rate of 968.3tph (tonnes per hour), and a quantity of cycles of 60.6.

These indicators exceed the crane's stated technical specification by 27% or 120t and 17% or 143t respectively.

CJSC SMMs AIST and VITYAZ series level luffing cranes have been working at PJSC Murmansk Commercial Seaport since 2005. The company's heavy load-lifting equipment has proven its reliability and high performance in 13 years of operation. A total of 19 cranes have already been supplied to the port and two more are at the production stage.

About CJSC SMM

CJSC SMM is a Russian company specializing in the design, production, installation and service of heavy load-lifting equipment for ports, transport terminals, shipyards and industrial enterprises. Its head office is located in St. Petersburg.

About Stevedoring company Malij port LLC

Stevedoring company Malij port LLC is one of the most dynamically developing enterprises in the far east. The port of the company is located in the east of Peter the Great Bay, in the ice-free Bay of Wrangel. Coal handling is the company's main business.

About Murmansk Commercial Seaport

Murmansk Commercial Seaport is the main northern gate of Russia and the largest stevedoring company in the Arctic basin. The seaport is located on the east coast of the Nikolskiy Bay of the Barents Sea and is the world's largest port located behind a polar circle.

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Great Lakes/St. Lawrence Seaway System

Louise Dodds-Ely

Hands-on management keeps the system ticking over nicely

The Great Lakes St. Lawrence Seaway System is a deep draught waterway extending 3,700 km (2,340 miles) from the Atlantic Ocean to the head of the Great Lakes, in the heart of North America. The St. Lawrence Seaway portion of the System extends from Montreal to mid-Lake Erie. Ranked as one of the outstanding engineering feats of the twentieth century, the St. Lawrence Seaway includes 13 Canadian and two US locks.

The Great Lakes and St. Lawrence River have been major North American trade arteries since long before the US or Canada achieved nationhood. Today, this integrated navigation system serves miners, farmers, factory workers and commercial interests from the western prairies to the eastern seaboard.

Virtually every commodity imaginable moves on the Great Lakes Seaway System. Annual commerce on the System exceeds 200 million net tonnes (180 million metric tonnes), and there is still ample room for growth. Some commodities are dominant:

- iron ore for the steel industry;
- coal for power generation and steel production;
- limestone for construction and steel industries;
- grain for overseas markets;
- general cargo, such as iron and steel products and heavy machinery; and
- cement, salt and stone aggregates for agriculture and industry.

The primary carrier vessels fall into three main groups: the resident Great Lakes bulk carriers or 'lakers'; ocean ships or 'salties'; and tug-propelled barges. US and Canadian lakers move cargo among Great Lakes ports, with both nations' laws reserving domestic commerce to their own flag carriers. Salties flying the flags of other nations connect the Lakes with all parts of the world.

Opened to navigation in 1959, the St. Lawrence Seaway part of the system has moved more than 2.5 billion metric tonnes of cargo in 50 years, with an estimated value of more than $375 billion. Almost 25% of this cargo travels to and from overseas ports, especially Europe, South America, the Middle East, and Africa. From Great Lakes/Seaway ports, a multi-modal transportation network fans out across the continent. More than 40 provincial and interstate highways and nearly 30 rail lines link the 15 major ports of the system and 50 regional ports with consumers, products and industries all over North America.

The Great Lakes/St. Lawrence Seaway was built as a binational partnership between the US and Canada, and continues to operate as such.

Administration of the system is shared by two entities, the Saint Lawrence Seaway Development Corp. in the US, a federal agency within the US Department of Transportation, and The St. Lawrence Seaway Management Corporation in Canada, a not-for-profit corporation (ownership of the Canadian portion of the Seaway remains with the Canadian federal government.)

The two Seaway entities coordinate operational activities particularly with respect to rules and regulations, overall day-to-day operations, traffic management, navigation aids, safety, environmental programs, operating dates, and trade development programs. The unique bi-national nature of the System requires 24-hour, year-round coordination between the two Seaway entities.

SEAWAY MONTHLY TRAFFIC RESULTS
June 2018

Traffic (in thousands of tonnes)	SLSMC - Combined Traffic			
	Year to Date		Change from 2017	
	2017	2018	Tonnes	%
Total Cargo	12 371	12 113	-258	-2.08%
All Grain	2 911	3 131	220	7.55%
Iron Ore	2 877	2 353	-525	-18.23%
Coal	634	923	289	45.58%
Dry Bulk	3 397	2 848	-550	-16.18%
Liquid Bulk	1 404	1 800	396	28.20%
General Cargo	1 135	1 055	-80	-7.05%

Vessel Transits	2017	2018	Transits	%
Total Transits	1 322	1 361	39	2.95%

The St. Lawrence Seaway Management Corporation

US Saint Lawrence Seaway Development Corporation (SLSDC)

The Saint Lawrence Seaway Development Corporation is a wholly owned government corporation created by statute 13 May 1954, to construct, operate and maintain that part of the St. Lawrence Seaway between the Port of Montreal and Lake Erie, within the territorial limits of the United States. Trade development functions aim to enhance Great Lakes/St. Lawrence Seaway System utilization without respect to territorial or geographic limits.

The mission of the Corporation is to serve the US intermodal and international transportation system by improving the operation and maintenance of a safe, reliable, environmentally responsible deep-draught waterway, in co-operation with its Canadian counterpart. The SLSDC also encourages the development of trade through the Great Lakes Seaway System, which contributes to the comprehensive economic and environmental development of the entire Great Lakes region.

The SLSDC headquarters staff offices are located in Washington, D.C. Operations are located at the two US Seaway locks (Eisenhower and Snell) in Massena, N.Y.

Canadian St. Lawrence Seaway Management Corporation (SLSMC)

The St. Lawrence Seaway Management Corporation is a not-for-profit corporation responsible for the safe and

efficient movement of marine traffic through the Canadian Seaway facilities, which consists of 13 of the 15 locks between Montreal and Lake Erie. The Corporation plays a pivotal role in ensuring that the waterway remains a safe and well-managed system, which it shares with its American counterpart, the Saint Lawrence Seaway Development Corporation.

The Corporation's mandate promotes efficiency and responsiveness to the needs of shipping interests, ports, marine agencies, and provincial and state jurisdictions.

Today, cargo moving through the combined Great Lakes/Seaway System supports over 227,000 jobs in Canada and the US. While these numbers are impressive, the St. Lawrence Seaway can contribute even more to the North American economy. The existing Seaway locks and channels have the capacity to handle double the present shipping volume, and reach 80mt (million tonnes) of cargo annually.

Having a reliable and dependable system is key to a sustainable future. This can happen only with rigorous maintenance schedules and careful investigation of any breakdowns. The SLSMC prides itself on the excellence of its personnel. Their high standards in maintaining structures make it possible to provide a consistent and safe vessel transit, with minimal delays.

One of the SLSMC's initiatives to make the most of this available capacity is its programme to convert the Seaway's high-lift locks to Hands Free Mooring (HFM) and Remote Operation. This programme began in 2013.

The Canadian Seaway has now been completely fitted, in time for the opening of the 2018 season on 29 March this year. The entire System is expected to be fitted in 2019, when the US Seaway completes work on its locks. At this time, the system will be fully operational. Using vacuum mooring pads to secure a ship in a lock eliminates the need, in most cases, for Seaway personnel to manually tie up ships using lines.

The locks will also be operated from the SLSMC's newly modernized, state-of-the-art operations centres in the Montreal/Lake Ontario and Niagara sections of the Seaway. These changes mark the greatest change to operations since the Seaway's inception in 1959, and will enable ship transits to be safely and efficiently processed for decades to come.

The SLSMC is also continuing to recondition and upgrade the Seaway's locks and structures which, for the Welland Canal, date back to 1932. From 2016-2017, the SLSMC invested $68m in asset renewal, and this proactive approach to maintenance is key to continuing the Seaway's stellar record of system availability.

The 2018 navigation season opened on 29 March this year, explains Bruce Hodgson, Director, Market Development of the SLSMC. He reveals that cargo levels — year to date — are in line with cargoes at this time last year. Business has been stable, he says, though an increase in tonnage is expected by the end of the year, with an anticipated 40.1mt. Canadian grain is above last year and US grain has been above last year. Liquid bulk is also above last year's levels.

In terms of national and international co-operation, Hodgson is also pleased to note that the Hwy H_2O initiative is continuing apace. It continues to move ahead with marketing initiatives such as US grain movements. The SLSMC is also working closely with its European agent, who works closely with European buyers.

Safety remains a priority within the SLSMC, both for its customers and for members of the public. Safety measures have again proven successful in the past year, with no major incidents. The SLSMC is rightly proud of its safety record, which is at a world-class standard.

60 YEARS ON — AND STRONGER THAN EVER

The SLSMC and the SLSDC are delighted to have reached the impressive milestone of the 60th navigation season of north America's vital waterway.

Port of Bécancour: government-owned entity offers stable and efficient service

The Port of Bécancour is strategically located on the South Shore of the St Lawrence River, halfway between Montréal and Quebec, with nearly a quarter of the entire North-American population concentrated within a radius of 1,000km (625mi). Whether it be by road, sea, rail or air, companies can ship and receive goods from anywhere in the world.

The Port of Bécancour (Société du parc industriel et portuaire de Bécancour — SPIPB), which can trace its origins back to the 1960s, handles approximately 1.9mt (million tonnes) of cargo each year, with dry bulk representing about 84% of that volume.

The port has almost 7,000 hectares of land without any elevation, and has an impressive cargo capacity.

In terms of marine transportation, the Port of Bécancour operates year-round in fresh water, and can handle vessels that require a water depth of up to 10.67m (35ft).

The road network at Bécancour is impressive, and facilitates inland transportation of bulk cargoes. The SPIPB builds and maintains its own network of roads that specifically meet heavy carrier standards. In addition, Highway 30, which crosses the Park, connects with Highways 20 and 40 via the Highway 55 segment, thereby linking Montreal and Quebec.

These multi-lane highways provide access to the entire North-American network of highways.

The 39195 railroad is served by the Canadian National Railway (CN). This network allows shipments to be sent anywhere on the continent, from coast to coast. It is also connected to the Kansas City Southern of Mexico which makes it possible to reach Mexico.

Facilities at the port include:

- five berths with lengths varying from 150 to 292m (492–958ft);
- ro/ro ramp;
- liquid bulk terminal;
- railway line;
- storage area;
- gatehouse; and
- truck weighing system.

Services include:

- tugs;
- marine traffic services;
- maintenance;
- environmental service;
- clean-up; and
- customs.

Industrial infrastructures offer impressive advantages

Electricity

Located at the crossroads of three electrical power transmission networks, the SPIPB is recognized as one of the most reliable sites of hydroelectric power in Quebec. Furthermore, the Park is fed by three different hydroelectric sources: Churchill Falls and James Bay — two of the world's largest power stations — and the network of power stations along the St. Maurice River. The following voltages are available in the Park: 230W, 120RV, 25kV and 600V.

Natural gas

The SPIPB is served by two 400kPa high-pressure lines, and an underground distribution network that supplies its industrial users.

Potable water

Filtered and treated water is supplied by the water treatment plant of Bécancour City that is equipped with tanks which offer a total storage capacity of 15,910m^3. In order to meet demand during peak periods and to increase fire protection, the SPIPB has built an additional 4,545m^3 storage tank connected to the municipal water system.

Industrial water

The SPIPB operates a screened raw water distribution network. Industrial water. which is taken from the St Lawrence River, is analysed regularly and usually meets industrial requirements for cooling and various processes.

Sewage and industrial wastewater

Domestic wastewater is evacuated through underground pipes. Once treated, the water is released into the St. Lawrence River. Rainwater is also released via a network of ditches into the St Lawrence. In conformity with the regulations of the Quebec government, industrial wastewater must be treated before evacuation to eliminate all risk of pollution.

Bearing capacity

The bearing capacity is as high as 100 tonnes per square metre in many areas.

A strong industrial community

Leading-edge companies share a common economic environment. The close co-operation between many of them is a key factor in maintaining their collective economic vitality

A large pool of qualified workers

A regional educational network enables specialized workforce training adapted to the needs of current and future industry.

An environment that enhances the quality of life

The SPIPB harmoniously integrates its activities with the surrounding communities, always promoting the environmental aspect at the forefront. Furthermore, Bécancour and Trois-Rivières offer all the services employees need (schools, health services, recreation, etc.) but is safer and more affordable (lower cost of living) than the larger urban centres.

photo: Jean-François Paquin.

The credibility and stability of a government-owned company

An entrepreneurial approach and an excellent reputation as an official representative of the Government of Quebec provide an effective combination for conducting successful business affairs.

Duluth Seaway Port Authority names new Executive Director

A woman will be at the helm of the Duluth Seaway Port Authority (DSPA) for the first time in the organization's 60-plus year history. The DSPA board held a special meeting on 13 August and unanimously appointed Deb DeLuca as executive director, effective 16 August. DeLuca has served as the Port Authority's government and environmental affairs director since 2014.

"A key ingredient of a successful organization is effective leadership," said Port Authority Board President Ray Klosowski. "We are fortunate to have had a history of strong leaders at the Duluth Seaway Port Authority. We are adding another chapter to that legacy in naming Deb DeLuca as our new executive director. Staff and board members appreciate her thoroughness, her leadership style and her profound commitment not only to the mission of this organization but also to the well-being of our entire port community."

The search committee reviewed dozens of applications and interviewed a series of highly qualified candidates from across the United States in multiple rounds of a rigorous selection process, explained Tony Sertich, DSPA commissioner and search committee chair.

"One candidate rose above the rest," Sertich said. "Not only does Deb DeLuca possess the management expertise we were seeking, but she also is heavily invested in this community. She is a person who values collaboration and takes into account the opinions of all stakeholders. Those connections will undoubtedly help inform strategic planning and decision-making here at the Port Authority going forward."

DeLuca brings decades of public and private sector experience to the job. She has spent the last four years tracking regulatory issues and legislation for DSPA, the Port of Duluth-Superior and the Great Lakes-Seaway system. In that role, she represented the port's interests to policymakers at local, state and federal levels of government and to environmental, economic development and community development organizations. DeLuca currently chairs the Harbor Technical Advisory Committee (HTAC) for the Duluth-Superior Metropolitan Interstate Council, serves on the Executive Committee of the Duluth Area Chamber of Commerce and represents the Port Authority on the Mayor's Economic Development Coalition. Earlier this year, she was one of just 36 civilians selected to participate in the Joint Civilian Orientation Conference, a public liaison program of the US Department of Defense.


Deb DeLuca

In directing brownfield assessment and cleanup efforts to support the Port Authority's industrial development program, DeLuca has been responsible for procuring a portfolio of grant funds matched to Port Authority needs. Most recently, she spearheaded a comprehensive study through the Initiative for a Competitive Inner City (ICIC) to analyse and benchmark Duluth's industrial economy, focusing on its potential to drive diversified economic growth across the community. A final report and key findings will be presented to the community this autumn.

DeLuca thanked board members for placing their confidence in her to lead the organization. "I am honoured by this appointment and accept the position with great enthusiasm," DeLuca said. "It has been a privilege to work for the Duluth Seaway Port Authority during what have been four of the most growth-driven years in its history. Being selected as its executive director only deepens my commitment to this organization, to the Twin Ports community and to the Great Lakes-Seaway system that this port so honourably serves."

A noted expert on redevelopment projects and environmental policy, DeLuca was a founding board member of Minnesota Brownfields. As owner and principal of DeLuca Strategies for 14 years prior to joining the Port Authority, she provided consulting services to public, private and nonprofit sector clients in the arenas of grant writing, implementation of funding strategies, project management, government relations and public outreach. She began her career at the Minnesota Department of Agriculture after which she worked with the MPCA, becoming supervisor of its Voluntary Investigation and Cleanup Program in 1996. A graduate of UW-Madison, DeLuca earned a Bachelor of Science degree in molecular biology and a master's in land resources (environmental chemistry and policy) from the UW Institute for Environmental Studies. She is an outdoors enthusiast and former U.S. national cycling team member. DeLuca and her husband, Eric Dott, have lived in Duluth since 2006 and have two college-aged children.

In accepting the position, DeLuca becomes the eighth executive director in Duluth Seaway Port Authority history, following in the footsteps of former directors: Robert T. Smith (1957–67), David W. Oberlin (1967–69), C. Thomas Burke (1969–77), Paul Pella (1977–79), Davis Helberg (1979–2003), Adolph N. Ojard (2003–13) and Vanta E. Coda II (2013–18). Since Coda's departure in February, CFO Kevin Beardsley has served as interim executive director.

The Duluth Seaway Port Authority (DSPA) is an independent, public agency created by the state legislature in 1955 to expand and improve facilities at the Port of Duluth-Superior in anticipation of the opening of the St. Lawrence Seaway in 1959. Two years later, with $10 million in public funding, the Port Authority created the 120-acre Clure Public Marine Terminal, the port's only general cargo facility. The Port Authority's mission is to foster domestic and international trade, facilitate regional industrial development and advocate for maritime interests.

DSPA also owns and manages multiple properties, including the Clure Terminal, a 26-acre expansion, Erie Pier and Duluth Airpark. The Port of Duluth-Superior is the largest tonnage port on the Great Lakes and continues to rank among the top 25 ports in the US, handling an average of 35 million short tons of cargo and hosting nearly 900 vessel visits each year.

Algoma Central Corporation: regional bulk behemoth

The Algoma Innovator *(and below) is a 650ft* River-class *forward mounted boom self-unloader.*

Algoma Central Corporation owns and operates the largest fleet of dry and liquid bulk carriers operating on the Great Lakes–St. Lawrence Seaway, including self-unloading dry bulk carriers, gearless dry bulk carriers and product tankers. Algoma also owns ocean self-unloading dry-bulk vessels operating in international markets. Algoma has expanded into global short sea markets through its 50% interests in NovaAlgoma Cement Carriers and NovaAlgoma Short Sea Carriers.

Bulk fleet

Algoma's Vision is to grow its position as the carrier of choice for bulk commodities in the Great Lakes–St. Lawrence Seaway to become a leader in short sea shipping globally.

The corporation's Canadian flag dry bulk fleet is the largest and most diversified dry-bulk cargo fleet operating on the Great Lakes.

Algoma offers shippers within the Great Lakes, St. Lawrence River and Canadian East coast regions the largest, and most versatile fleet of dry bulk carriers available today. The Algoma domestic dry-bulk fleet comprises standard gearless dry bulk carriers and various conveyor-style long boom self-unloaders.

Algoma has embarked upon a major fleet renewal programme, which has seen many older vessels replaced by modern, state-of-the-art and environmentally sustainable carriers of the future. Algoma resets the bar for both operating and environmental performance with the innovative design of the *Equinox Class* of vessel. Algoma's Equinox Class vessels bring technological advancement in fuel efficiency, reducing its environment footprint and its forward-thinking design has made Algoma a frontrunner in the marine industry.

Self-unloaders

Algoma's self-unloader fleet includes traditional hopper-hold vessels that have full Seaway-size dimensions, as well as those that have a length of 650ft, and a bow-boom configuration. The 650ft vessel class adds flexibility for shippers with operations to ports having vessel length restrictions.

Algoma Innovator

- 650ft *River-class* forward mounted boom self-unloader.
- The front end configuration and size give the vessel the capacity to reach smaller ports.
- The *Algoma Innovator*, like all *Equinox Class* vessels, is equipped with an exhaust gas scrubber. The scrubber allows the vessel to clean the exhaust gas released in order to discharge a minimum amount of SO_x into the environment and reduce particulate matters. The company completed certification of the first scrubber on the *Algoma Equinox* in 2014.

The Argonaut *in Toronto.*

- The engine, as in all *Equinox* vessels, is fully electronic which allows for specific fuel consumption, reducing the amount used resulting in reduced emissions.
- Also fitted with an Intelligent Combustion Control System to monitor and tune performance automatically and continuously.

Gearless bulk carriers

Algoma Central Corporation provides dry bulk shipping services to shippers who do not require self-unloading technology. For more than 50 years Seaway-size gearless bulk carriers have cost-effectively transported Canadian and U.S. grain harvests eastward through the St. Lawrence Seaway system, and iron ore shipments back to the Great Lakes.

Global short sea shipping

Algoma Central leverages its experience in short sea shipping beyond the Great Lakes to the global marketplace through strategic partnerships.

The Global Short Sea Shipping segment comprises two joint ventures with Nova Marine Carriers SA (Nova), both with 50% interest. These ventures are a reflection of a strategic intent to enter the global short sea shipping sector, focusing on niche markets featuring specialized equipment or services and lacking an existing dominant player.

In January, 2016, Nova and Algoma created NovaAlgoma Cement Carriers, or NACC. The fleet, which is now the second-largest in the world, comprises pneumatic cement carriers that utilize a compressor and pump system to load and unload cement powder via a large diameter hose and is now the second largest in the world. This operation is very clean, with essentially no discharge to the atmosphere.

Cement shipping is a regionalized market with generally smaller vessels servicing large global manufacturers that support infrastructure investment.

In April, 2017, a second joint venture, NovaAlgoma Short Sea Carriers, or NASC, was created with Nova. The fleet comprises owned ships, chartered vessels, and vessels under third party management contracts. The size and configuration of short sea mini bulkers allow cargo to be moved efficiently between coastal and inland ports; these mini bulkers have capacities up to 15,000dwt. The NASC fleet supports the agricultural, cement, construction, energy and steel industries worldwide.

NACC 'Argonaut' & NACC 'Quebec'

Pneumatic cement carriers

Algoma currently has two pneumatic cement carriers operating on the Great Lakes–St. Lawrence Seaway: the NACC *Argonaut* and the NACC *Quebec*. There are 12 total cement carriers sailing on the Great Lakes.

- Both the *Argonaut* and the *Quebec* are part of the NACC joint venture with Nova Marine Carriers of Lugano, Switzerland. NACC fleet currently consists of 20 owned vessels that sail globally.
- The cement vessels are modern, pneumatic and are equipped with a closed system which is specifically designed to reduce the vessels' environmental impact by reducing cement dust.
- Both the *Argonaut* and the *Quebec* can load cargo directly into cement tanker trucks and have the capability to have a bagging plant added.

Vessels not in the system/possibility of a longer shipping season

The system has unused capacity that beckons the shipping industry to consider Intermodal opportunities for moving merchandise traffic off congested roads

Fednav joins network of whale watchers

Fednav Limited has become the first international shipowner to join the whale watching members of the Marine Mammal Observation Network (MMON).

Fednav is the world's largest operator of ice-class dry-bulk carriers and a renowned Canadian oceangoing dry bulk shipowning and chartering group. It operates a modern and efficient fleet of approximately 100 vessels, the majority of which it owns. The crews of two of the company's domestic vessels sailing within the Arctic will participate in the whale watching data collection project.

Training of these crews has started, with biologist and Green Marine programme manager Véronique Nolet having already been aboard the *Arctic* at the start of this month to train the captain and team in observing and identifying marine mammals. She will soon train the team aboard the *Umiak I*. Already, these Arctic mariners have sent their first whale-watching data from the St. Lawrence Gulf and Estuary; north of Hopedale in Labrador; and, south of Resolution Island in the Arctic.

"Protecting the environment is a cornerstone of Fednav's philosophy and a fundamental business value," says Fednav's Director of Governmental Affairs and Sustainable Development Marc Gagnon. "Therefore, it made sense to participate in this observation project that will make it possible to learn more about the movement of whales, with this knowledge definitively contributing to their conservation."

The project engaging the maritime industry in the collection of marine mammal data was initiated by MOMM in 2015 with Groupe Desgagnés and Canada Steamship Lines, a division of the CSL Group. Green Marine then joined the project funded by the Government of Canada's Species at Risk Habitat Stewardship Program to facilitate the networking with shipowners and to develop the appropriate training tools.

In just a few years, more than 1,800 data observations have been gathered by the network's member vessels. The collected data is available to the public through the St. Lawrence Global Observatory's (l'Observatoire global du Saint-Laurent) website.

"The addition of these two Fednav vessels is particularly interesting given that the territory sailed by both of them extends into the Arctic, permitting us to further consolidate the territory encompassed by the project since the majority of participating vessels now mainly cover the St. Lawrence Gulf and Estuary," says MOMM's Executive Director Esther Blier.

"Fednav makes numerous trips within this Arctic-bound navigation corridor and these many journeys will permit us to collect accurate and calibrated data throughout the season about the presence of marine mammals and their behaviour," adds Nolet.

The addition of Fednav's two vessels brings the fleet of vessels with trained whale watching crews to more than 50, in addition to the observations made from shorelines, the Matane, Godbout, Baie-Comeau, Rivière-du-Loup, and Tadoussac ferries, and an evolving collaboration with marine pilots. Five commercial shipowners are now taking part in the project — Desgagnés, CSL, Oceanex, Algoma, and Fednav — demonstrating the maritime industry's commitment to the environment and conservation.

Marine Mammal Observation Network – MMON

The Marine Mammal Observation Network (MMON) is a non-profit organization based in Rivière-du-Loup, Quebec, that has been working since 1998 for the conservation and sustainable development of the St. Lawrence River and its wildlife. Using an integrated management approach, MMON collaborates with diverse maritime industry stakeholders in a concerted effort to conserve marine ecosystems.

Fednav Limited

Fednav is a privately owned shipping company with a workforce of 290 employees: 170 at its Montreal headquarters and approximately 100 in commercial offices in Antwerp, Charlotte, Hamburg, Rio de Janeiro, St. John's (Newfoundland and Labrador), Singapore, and Tokyo.

Green Marine

Founded in 2007, Green Marine is a North American environmental certification programme that stems from a voluntary maritime industry initiative to surpass regulations. This inclusive, rigorous and transparent initiative focuses on environmental priorities through its 12 distinct performance indicators.

To date, more than 120 shipowners, ports, terminals, and shipyards from coast to coast in Canada and the United States are participating in the programme. The Green Marine program's unique character is derived from the support it receives from environmental, scientific and governmental organizations. These approximately 60 supporters contribute to shaping and revising the programme.

and onto inland waters that reliably serve bulk markets today. But government policy changes are needed to address the obstacles, both regulatory and economic.

Addressable markets: a) import and export containers connecting to container ships in Montreal or Halifax; b) transborder freight now moving via rail or truck between Canada and the US; c) domestic freight between Canadian points, or between US points. Both Canada and the US have cabotage regimes in place.

- **Existing port network:** Lift-On/Lift-Off equipment and Roll-On/Roll-off ramps can be installed, but initially vessels will have to be geared or having self-unloading capability for trailers. Eventually, Seaway-capable cellular containerships can be brought into service, as well as Ro/Ro carriers.
- **Modal competition:** Until a market develops to support frequent weekly carrier sailings, water transport of consumer merchandise and manufacturing components cannot be attracted. The distance between major commercial centres of Montreal and Toronto is enough for rail economics to prevail over trucks for international container traffic. North American freight is currently organized around available truck availability, but rail competes at longer distances such as Toronto and Montreal to Detroit.
- **Location of freight distribution centres:** Logistics handling of consumer merchandise has evolved around major highways and rail terminals. Generally ports, especially those considered secondary, have land for development. As land costs continue rising around city centres, ports have an opportunity to benefit from logistics park developers looking for more cost effective supply chains.
- **Seasonality:** Supply chain planners would need to use alternate transport when the Seaway system is closed. Since alternative modes are performing well at present there is no incentive to make a commitment to marine transport. Shortening the current closure from three months to two will not bridge this supply chain gap and there is no policy supporting co-operation with rail or motor freight carriers. There is a thought that spreading the system's maintenance outages across the year would be more acceptable to shippers not wanting to switch between modes for the long winter shutdown.
- **Economics:** Cabotage law, freight handling, navigation protocols, seasonal switching to more costly modes, first/last-mile inland movements, and other system costs burden marine transport with outdated and uncompetitive circumstances. These conditions pre-dated the emergence of world-wide container transport as a fundamental and generally more efficient logistics solution for commerce. But the fundamental changes needed face entrenched and politically active interest groups concerned about spillover impact to their existing markets.
- **Policy:** Canada has a leading role to play in shaping policy that promotes marine transport as a viable alternative to land modes. No dedicated services exist so there is no threat to Canadian operators, and revisions can be targeted to avoid unintended disruptions to other trades. US laws and regulations limit the full realization of Intermodal traffic on the System. But the vision of Highway H2O as a competitive transport corridor for much of the existing inter-city shipments can be achieved with dedicated and creative government focus.

Port of Montréal: major gateway for bulk and breakbulk

The Port of Montréal is administered by the Montréal Port Authority, an autonomous federal agency created under the terms of the Canada Marine Act. It does everything in its power to make the Port of Montréal as competitive as possible, and from this perspective provides first-rate facilities to sea and land carriers, to terminal operators and to shippers.

The Port Authority builds and maintains infrastructures that it leases to private stevedoring companies. These companies, as well as shipping lines, are represented by the Maritime Employers Association, which employs the longshoremen at the port.

The MPA directly operates a passenger terminal and its own railway network, which includes more than 100 kilometres (60 miles) of track and provides transcontinental railways with direct access to almost every berth.

The Port of Montréal has five container terminals six liquid bulk terminals, three dry bulk terminals, five non-containerized cargo terminals, one grain terminal, one grain containerization facility, and one cruise terminal.

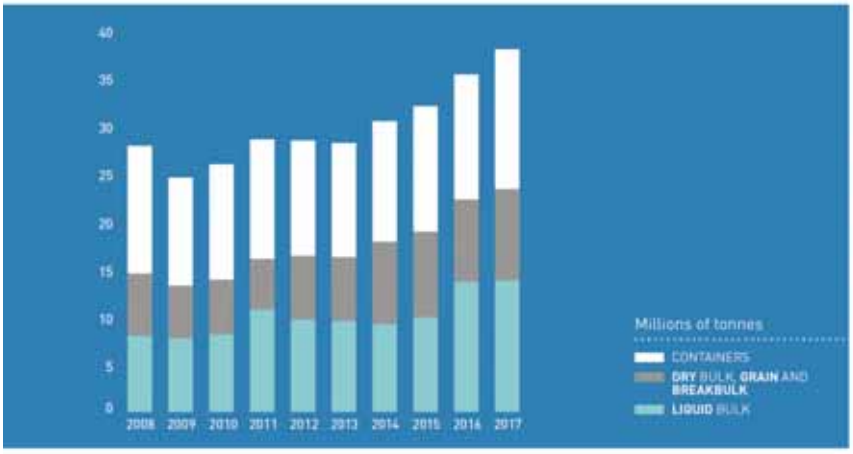
Montréal is the port for Quebec and Ontario; 98% of Quebec importers and exporters, and 93% of Ontario shippers, use the port.

The port is the second-largest container port in Canada, though bulk remains a vital part of the port's business.

The Port of Montréal is a diversified hub handling all types of cargo: dry bulk, liquid bulk, containerized, breakbulk and oversized cargo. The Port of Montréal, located 1,600km inland from the Atlantic coast and at the centre of a fully integrated rail, road and pipeline network, is an essential link in the supply chain of the major consumer markets in Eastern Canada. the US Midwest and Northeast.

The Port of Montréal is a leading gateway for the handling of bulk, breakbulk and oversized cargo, and is of vital importance to industries that rely on a supply of raw materials. Representing 64%

Evolution of volumes at the Port of Montréal over the past ten years (mt)



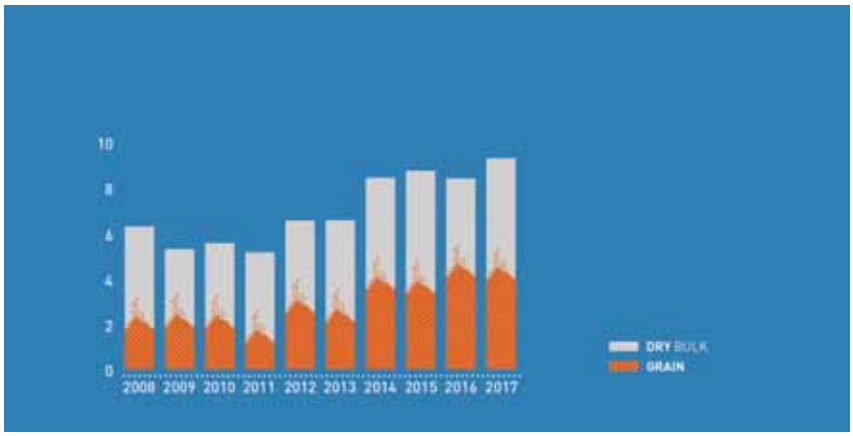
of the total tonnage handled at the port in 2017, this sector underlines the port's know-how and expertise as an international trading partner.

Bulk facilities at the port's three bulk and three breakbulk terminals include 100km of railway track alongside the berths and on the terminals. Up to 2,500 trucks pass through the port daily, as do 60 to 80 trains weekly. There is the capacity to handle unit trains. Over 2,000 ships call at the port each year.

In 2017, the Port of Montréal handled 9.3mt (million tonnes) of bulk and 223,000 tonnes of breakbulk.

As a major dry bulk centre, the Port of Montréal is a vital gateway for raw materials. Iron ore, and various other minerals, de-icing salt, gypsum, gravel, raw sugar and virtually all other bulk commodities are handled at the port's 15 berths dedicated to dry bulk in Montréal and Contrecoeur. Rail access to the CN and CP networks gives the port a competitive advantage, facilitating shipment of merchandise between the North American hinterland and international markets. Logistec began operating in Montréal and Contrecoeur in the 1990s and provides stevedoring and terminal handling services to various bulk customers at three terminals. With its numerous conveyors, railcar and truck discharge pits, dust suppression systems, and a complete fleet of payloaders with 5m³ and 12m³ backhoes, Logistec offers a high quality dry bulk handling service.

Bulk volumes at the Port of Montréal over the past ten years (mt)



Logistec has an experienced team of operations specialists who can safely handle all types of breakbulk and general cargo, including out-of-gauge pieces. It has two of the largest cranes in North America, providing the largest lifting capacity on the St. Lawrence River at the Port of Montréal. It has numerous conveyors, railcar and truck discharge pits, dust-suppression systems and a complete fleet of payloaders with 5m³ and 12m³ backhoes.

For grain customers, Viterra Inc handled over 4.5mt at its terminal in the past year; its high vessel-loading capacity makes the Port of Montréal's grain elevator one of the fastest and most efficient on the St. Lawrence River. Viterra's year-round operations and capacity to handle unit trains keep its facility connected to international markets throughout the year.

Grain specialist CanEst is a grain-handling facility dedicated to the containerization. storage, cleaning, sifting and packaging of agricultural products. Strategically located in the port, close to container terminals, this state-of-the-art

Logistec stevedores handling project cargoes at the Port of Montréal.

Logistec's strength lies in top-quality employees

Logistec is a highly respected terminal operator that is active in the Great Lakes area, as well as across North America. It operates in more than 37 ports and over 61 terminals.

With over 2,400 people, Logistec has the expertise to manage all types of cargo. Logistec's terminal operations and specialized cargo handling services include bulk, breakbulk, project cargo and containers, as well as intermodal facilities and RORO operations.

Logistec plays an important role in the global supply chains. It helps economies grow and communities thrive. It is an important job — one that requires resourceful, proud, and passionate people who work closely with our partners and customers. Logistec's employees are people who strive to continuously push boundaries and seek new solutions. Through pro-active thought, Logistec aims to create the most efficient, safe and sustainable logistic chains. In this way, it is also strengthening the competitiveness of Canada and the United States.

Empire Stevedoring has provided loading and unloading services since 1931.

installation facilitates the logistics and shipping of grain. Rail connections, served by CN and CP, enable all Canadian producers to trade with the world.

CanEst's facility offers:

- 91 independent concrete silos;
- total capacity storage of 68,000 tonnes;
- rail capacity: 110 railcars
- unloading capacity: six trucks/hour (210tph [tonnes per hour]); three railcars/hour (270tph); and
- loading capacity: eight containers/hour.

The strategic location of Montréal, at the centre of major highway and rail networks, provides access to all the major North American industrial centres.

Empire Stevedoring has a long history at Bickerdike Terminal and has provided loading and unloading services since 1931. This terminal can accommodate many types of vessels: bulk carriers, container ships and vessels carrying oversized cargo. The three warehouses located at the more than 300,000m^2 terminal and the on-dock rail network make this terminal more than qualified for any breakbulk shipment.

Transloading, warehousing and trucking services in Montréal are offered by the following logistics providers: Groupe Robert; MTL Link; Simard Transport; Trac-World; and XTL.

Shipping companies include: Algoma Central Corporation; Canfornav; CSL; Groupe Desgagnés; Fednav; McKeil Marine; and Transport Nanuk.

The MPA gives ten reasons to select the Port of Montréal:

- **strategic location:** closest international container port to Eastern Canada and the US. Midwest major distribution centres and consumer markets;
- **distance:** shortest direct route between Europe and the Mediterranean to North America's industrial heartland;
- **connected:** connected to all continents and to over 140 countries through direct services to transshipment ports in Europe, the Mediterranean and the Caribbean;
- **load centreing:** one-stop port, with no intermediate calls. Balanced trade, through full vessel discharge and load, favours cost-effectiveness;
- **reliable:** dedicated weekly services from leading global carriers;
- **fluidity:** consistently low dwell times and congestion-free operations allow seamless transit through the gateway;
- **market within reach:** fast access to 110 million consumers, 40 million within one rail or trucking day — an additional 70 million within two rail days;
- **intermodal platform:** connected to a national network of highways and on-dock rail, links to both Canadian National [CN] and Canadian Pacific [CP] provide daily services to major inland markets across Canada, the US Midwest and Northeast;
- **smart port:** numerous innovative initiatives [GHG reduction. truck fluidity programme, e-navigation, rail management system, data sharing with stakeholders] better position the Port of Montréal in the new technological era of logistics.
- **expansion projects:** continued investment in infrastructures to increase capacity and support future growth.

Infrastructure developments

Among the projects under way and planned, the MPA has set aside $10m for the development of bulk terminals, the addition of a storage area, the construction or renovation of sheds and the modernization of facilities. This will all serve to increase the port's competitiveness and improve its service offering.

A further $30m is being invested in upgrading the port's defences and to upgrade docks in the dry bulk and liquid bulk sectors, to maintain a competitive edge.

US-flag vessels represented by the Lake Carriers' Association

Lake Carriers' Association (LCA) represents US-flag vessel operators on the Great Lakes. The Association's 13 member companies operate 45 US-flag self-propelled vessels and tug/barge units ('lakers') ranging in length from 494 to 1,013.5 feet. These vessels can carry more than 90mt (million tonnes) of cargo in a year. Iron ore, limestone and coal are the primary commodities carried by LCA members. Other cargoes include cement, sand and grain. The vast majority of cargos carried by US-flag lakers move between US ports, in what is commonly referred to as the Jones Act trades.

In promoting the common interests of its members and their customers, LCA places special importance on legislative and regulatory matters. To facilitate a broad-based understanding of US-flag shipping on the Great Lakes and its role in the nation's economy, LCA compiles statistical information on the volume of cargo movement, both in US-flag lakers and from major Great Lakes ports in the United States and Canada.

America can take pride in the US-flag Great Lakes fleet. No other maritime nation has assembled such a modern, productive fleet of self-unloading vessels. The thirteen 1,000-footers flying the US flag on the Lakes are longer than most of the grandest ocean liners. So technologically advanced are these vessels that they can discharge 75,000 tonnes of iron ore in 12 hours without any assistance from shoreside personnel or equipment. The industry's carbon footprint is the smallest of any of the major transportation modes.

1,000-footer transiting Poe Lock. (photo: Carmen Paris, U.S. Army Corps of Engineers, Detroit District).

Lake Carriers' Association 2018 State of the Lakes Report

"The Great Lakes are one of America's most important waterways," *explains Jim Weakley, President, Lake Carriers Association in the annual State of the Lakes Report.* "Each year they handle more than 150mt of cargo. US-flag vessels (lakers) typically carry over 80mt each year. Primary among those cargoes are iron ore for steel production, limestone and cement for construction, and coal for power generation.

"Lake Carriers' Association (LCA) has represented US-flag vessel operators since 1880 and is one of the oldest trade associations in the country. Today LCA has 13 members who collectively operate 45 vessels exclusively on the Great Lakes.

"LCA is working hard to keep the Lakes a vital part of America's transportation system. Currently there are four major initiatives: federal, uniform regulations governing vessel discharges, including ballast water; a second Poe-sized lock at Sault Ste. Marie, Michigan; construction of a second heavy icebreaker for Great Lakes service; and system-wide dredging.

"Federal, uniform regulation of vessel discharges is important because currently both the US Coast Guard (USCG), the US Environmental Protection Agency and 25 states have their own requirements. Sixteen states have ballast water specific requirements.

"Therefore, compliance is difficult, if not impossible. That's why LCA supports the Vessel Incidental Discharge Act (VIDA). The bill sets a uniform, federal standard that is the highest achievable given the current state of technology. As technology advances, so will the discharge standard.

"The locks at Sault Ste. Marie, Michigan, connect Lake Superior to the lower four Great Lakes and St. Lawrence Seaway. Only two locks at the "Soo" are viable, and only one, the Poe, is capable of handling the largest and most efficient vessels. As a result, more than 90% of all cargo LCA members move through the locks transit the Poe.

"Congress has long acknowledged the need for a second Poe-sized lock, and President Trump has publicly supported the project. Much is at stake. The US Department of Homeland Security has forecast a six-month closure of the Poe Lock would quickly bring steel production and heavy manufacturing to a virtual standstill and leave nearly 11 million Americans unemployed. Unfortunately, a flawed study of the project's benefit/cost ratio (BCR) held it back.

"All that changed in June 2018 when the US Army Corps of Engineers issued its

Built in 1949, the SYKES *illustrates the benefits of operating in freshwater. Since being christened nearly 70 years ago, the vessel was converted to a self-unloader in 1975 and underwent a major engine overhaul this past winter (photo: Rebeca Barclay).*

New Soo Lock Economic Validation Study that determined the project has a BCR of 2.42, well above the level required for inclusion in an Administration budget. James C. Dalton, the Corp's Director of Civil Works, stressed that 'The strategic importance of the Soo Locks cannot be overstated.' Another Corps official noted that 'We [the Corps] recognize domestic steel production is almost entirely reliant' on the viability of the Soo Locks.

"With this hurdle cleared, LCA will focus its efforts on having a substantial portion of the $922 million project estimate included in the Administration's next budget. Construction is expected to take seven years to complete.

"Shortly after our entry in World War II Congress funded construction of a heavy icebreaker to keep cargo moving on the Great Lakes when ice formed .That vessel, the *MACKINAW*, served the nation well from 1944 until its retirement in 2006. Since then, its replacement has proudly carried the same name, *MACKINAW*.

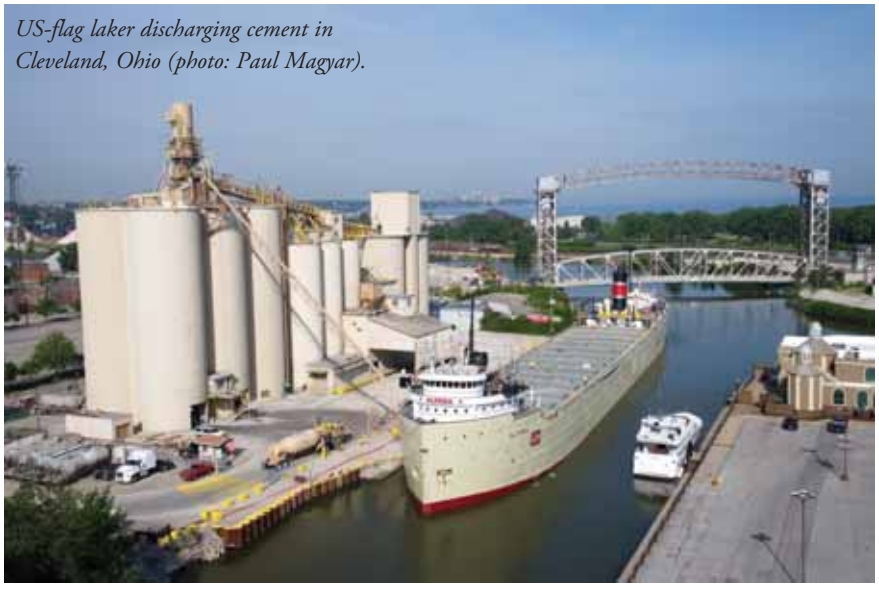
Icebreaking is one of the USCG's most important missions on the Lakes, and to that end, the service supports the *MACKINAW* with six 140-foot-long icebreaking tugs and two, 225-foot-long buoy tenders with some icebreaking capabilities. Unfortunately, despite the crews' best efforts, these forces were no match for the winter the winter of 2017/2018 and three of the last five winters. At one point this winter, five of the icebreaking assets were out of service at the same time! The delays in December and January were so significant that LCA members saw 1.8mt of cargo either delayed or outright cancelled.

"The USCG has begun the process of modernizing the 140s (they were built in the late 1970s and early 1980s), and this is an important step forward. However, another heavy, *MACKINAW*-class icebreaker is needed. Initial funding to design the vessel has been appropriated. Now LCA's resources are focused on funding construction.

"Steady increases in funding for dredging have reduced the backlog of sediment that needs to be dredged from ports and waterways from 18 million cubic yards to 13.5 million. However, the backlog must continue to be reduced. The vessels operated by LCA members lose anywhere from 50 to 270 tonnes of cargo for each inch of reduced draught. Congress must continue to adequately fund dredging the Lakes. Even when the backlog has been cleared, the natural rate of siltation will require that three million cubic yards of sediment be dredged each year.

"These issues are formidable, but LCA's members are committed to impacting these desired outcomes. Each year they invest upwards of $60 million to maintain and modernize their vessels in Great Lakes shipyards. Recent years have seen a number of vessels repowered or reconfigured to further reduce the industry's already small carbon footprint.

"Everything points to a sustainable future for US-flag shipping on the Great Lakes." DCi



US-flag laker discharging cement in Cleveland, Ohio (photo: Paul Magyar).

Bulk goes back East

North America's East Coast

Port Canaveral: cargo gateway into Florida and beyond

Port Canaveral's deep water container and multi-purpose cargo berths make it an economical and convenient ocean gateway for cargo into Florida and beyond. The port has the experience, equipment and facilities to handle a variety of cargoes including bulk, containers, breakbulk, roll on/roll off (Ro/Ro), and project. Its facilities include: ten deep water berths; to handle all types of cargo.

Port Canaveral is located directly on the main shipping lanes along the East Coast of Florida which is ideally suited for short sea shipping. Port Canaveral's Harbor is just one hour from sea buoy to dock providing easy transit and no air restrictions for carriers while allowing for highly efficient routing and reduced vessel costs.

Port Canaveral is an ideal gateway to Central Florida, the 10th largest market in the United States, with an uncongested nonstop highway connection allowing cargo to reach the high demand consumer markets, such as the Greater Orlando area, as well as the Southeastern United States.

Nearly four million tonnes of dry and liquid bulk cargo are handled annually at Port Canaveral, including petroleum, aggregates, cement, salt, sand, and slag. Facilities feature a 2,800 foot aggregate conveyer system with a discharge rate of 2,200 tonnes per hour. Special storage facilities are available for cement, slag and petroleum.

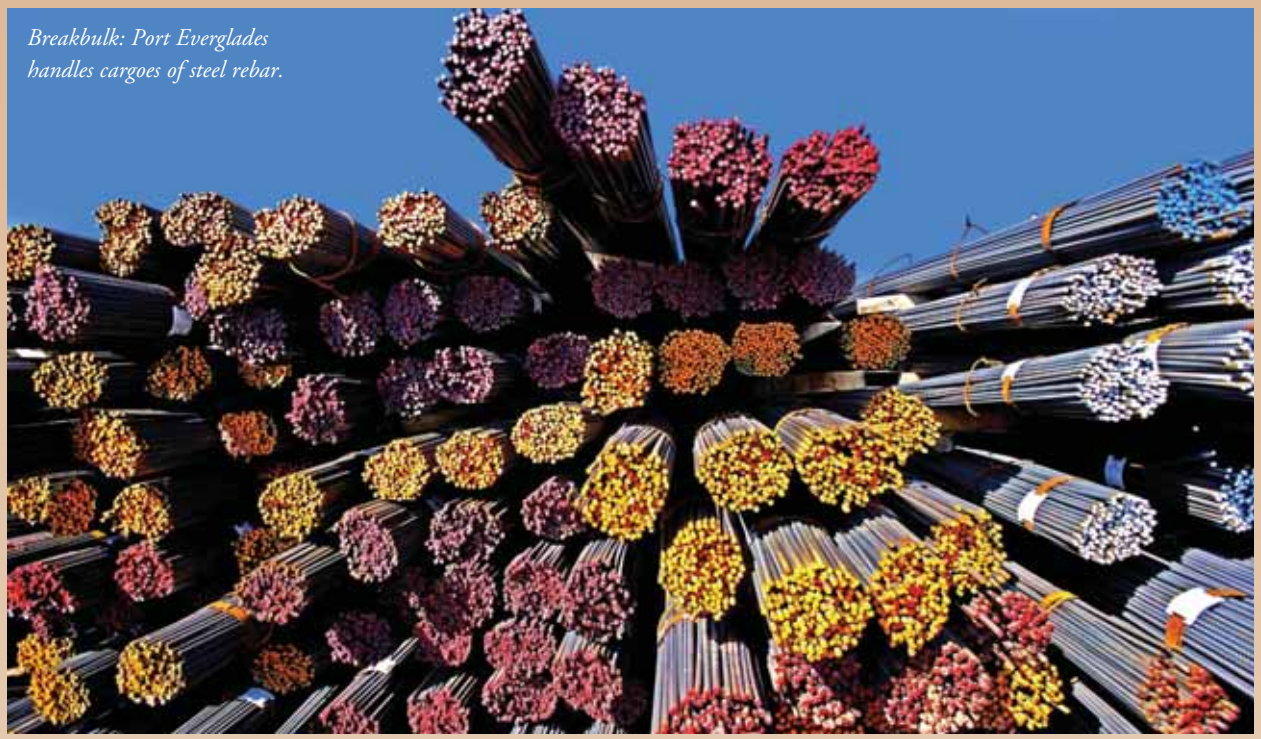
Port Canaveral offers highly competent and experienced union and non-union stevedores, modern handling equipment including a 40 metric tonne mobile harbour crane, and more than 370,000ft^2 of enclosed, dry and secure dockside warehouses to load, unload and store a variety of breakbulk cargo.

Port Canaveral's North and South piers offer secure, well-lighted open-air storage, most less than 100 feet from dock to point of rest.

Each cargo receives the attention of experts who customize their approach to handling the varied goods, which historically include steel, boats, frozen juice concentrate, lumber, wood pulp, newsprint, perishables, automobiles, heavy equipment and project cargoes.

With unique local aerospace programmes, a diverse manufacturing community and a growing regional population, project cargoes through the port include everything from specialized industrial machinery to aerospace components to massive defence-related items. Two shore cranes, in addition to the 40 metric-tonne-capacity mobile harbour crane are available for project cargo. The port's expert team handles large to small, high-value specialized items including power plant transformers, space vehicles and payloads, floating docks, yachts, generators, communication buoys and wind turbines.

Port Everglades appoints security manager



Breakbulk: Port Everglades handles cargoes of steel rebar.

Port Everglades promotes Jenkins to Port Security Manager

Port Everglades recently announced the appointment Robert "Rob" Jenkins to the position of Port Security Manager, a promotion from Security Compliance Manager.

Jenkins joined the port staff in 2013. Prior to Port Everglades, he was a Senior Marine Terminals Operations Representative for the Port of New York/New Jersey. He also served as the Facility Security Officer for the New Jersey Marine Terminals and managed a 24-hour operations control centre.

"Security and safety are top priorities at Port Everglades," said Steven Cernak, Chief Executive and Port Director. "We are excited to see Rob move into the role of Security Manager. We think Rob has the right mixture of maritime experience and leadership skills to fill such a vital position."

In his new position, Jenkins will be responsible for overseeing security and fire rescue operations and management for the port, as well as facilitating related contracts, grants and funding. Additionally, he will interface with federal, state and local regulatory agencies that operate in Port Everglades.

About Port Everglades

As one of Florida's leading economic powerhouses, Broward County's Port Everglades is the gateway for international trade and cruise vacations. Consistently ranked among the top three busiest cruise ports in the world, Port Everglades is also one of the nation's leading container ports and South Florida's main seaport for receiving petroleum products including gasoline, jet fuel and alternative fuels.

The port also handles bulk and breakbulk cargoes. Port Everglades continues to keep pace with Florida's construction and population demands by moving shipments that include:

- imported and exported cement;
- lumber;
- steel rebar; and
- other construction materials

These commodities are demand driven, meaning higher volumes moving through the port are a result of increased building in the area.

Bulk cargo mainly consists of:

- cement;
- aggregates;
- tallow; and
- gypsum.

Breakbulk products are mainly steel, lumber and wood.

The Port Everglades Department is a self-supporting Enterprise Fund of Broward County, Florida government with operating revenues of more than $162 million in Fiscal Year 2017 (October 1, 2016 through September 30, 2017). It does not rely on local tax dollars for operations. The total value of economic activity related to Port Everglades is more than $30 billion. More than 230,000 Florida jobs are impacted by the Port, including 13,000 people who work for companies that provide direct services to Port Everglades.

STATISTICS

Total bulk & breakbulk

FY2017	FY2016	FY2015	FY2014	FY2013	FY2012
1,582,500	1,765,540	1,564,952	1,566,952	1,076,660	1,094,003

Georgia Ports Authority expects larger cargo exchanges, increased resin production

Terminals in Savannah, Brunswick are vital gateways for wide array of goods

At the Georgia Ports Authority, deepwater terminals in Savannah and Brunswick ensure the continuous flow of goods. These vital gateways move everything from retail shipments and refrigerated cargo, to cars, machinery and breakbulk cargo.

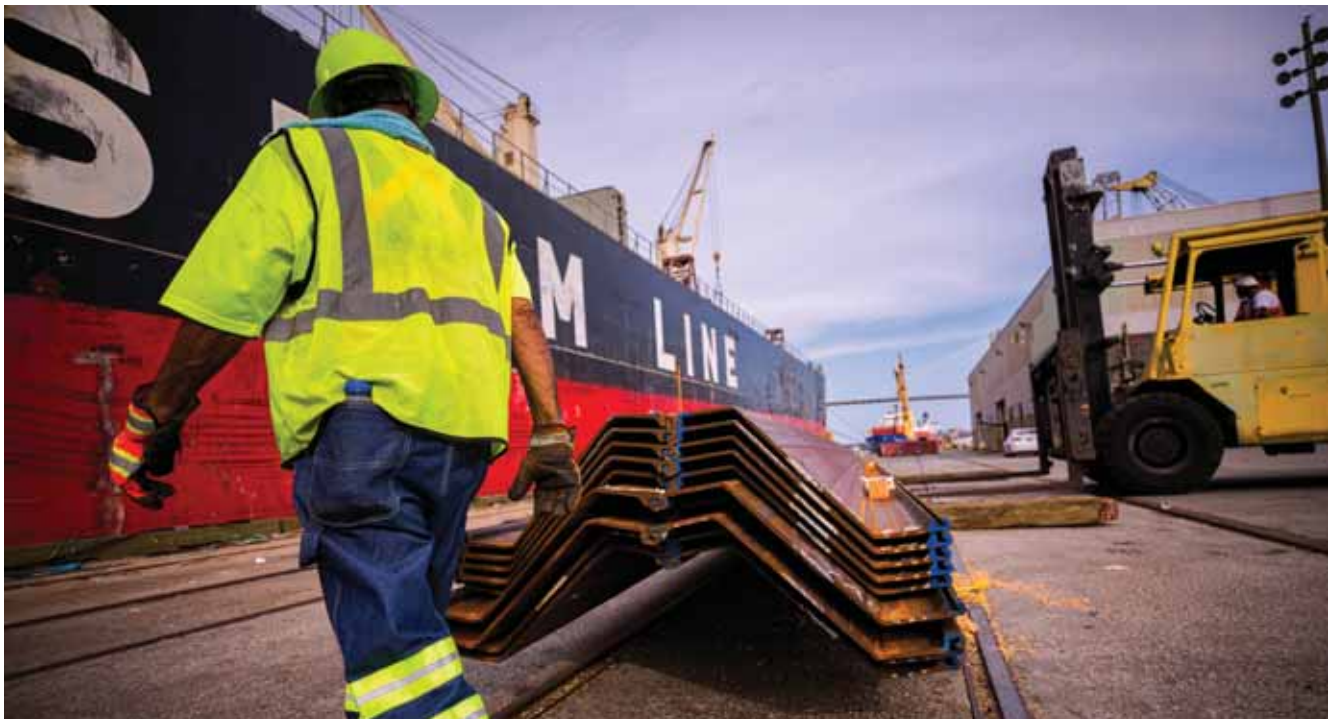
Growing volumes have made the Port of Savannah the fourth-busiest container terminal in the US, and Brunswick the second-busiest US hub for Ro/Ro traffic. Georgia's ports provide greater scheduling flexibility and market reach with direct interstate connections, on-terminal rail, and 37 weekly container services.

Size, scope and location make the Port of Savannah's Garden City container terminal an important link in customer supply chains. As the nation's largest single-terminal operation, Garden City's 1,200-acre footprint eliminates the need to move between leased terminals, delivers greater flexibility in staging cargo and provides nine container ship berths.

The terminal is equipped for the influxes of cargo from New Panamax vessels, with 30 ship-to-shore cranes and 146 rubber-tyred gantry cranes — more than any other US terminal. GPA's 2028 Plan calls for 42 ship-to-shore cranes, 200 yard cranes, new RTG lanes and significant intermodal expansion.

GPA is currently in the process of deepening the Savannah Harbor, which will allow New Panamax vessels to take on heavier loads and transit the Savannah River with greater scheduling flexibility. The US Army Corps of Engineers completed outer harbour dredging at the Port of Savannah in February 2018. Larger vessels burn less fuel than multiple smaller ships, allowing for transportation cost savings. By reducing transportation expenses for American producers, the larger, more efficient ships make US-made goods more competitive overseas.

The first half of the project deepened the outer harbour to 49 feet at low tide (56 feet at high tide). The inner harbor channel will be expanded from its current low-tide depth, 42 feet, to 47 feet (54 feet at high tide).



GPA's Ocean Terminal in Savannah and Mayor's Point Terminal in Brunswick also provide dedicated teams for project cargo, forest products, iron, steel and pipe. Personnel are well-versed in the special handling requirements for each type of cargo. GPA's in-house engineering team provides hands-on analysis for specialized cargo handling, including railcars, trucks and lift equipment.

Across the East River docks in Brunswick, Logistec moves approximately a million tonnes of cargo per year — spanning a diverse mix of bulk commodities. Over the past five years, Logistec and GPA have made substantial infrastructure investments totalling $36 million to improve equipment and services at East River Terminal. Projects included dock upgrades, new sheds, conveyors and hoppers, among other enhancements.

New warehouse space at East River adds more than 221,000ft^2 for wood pellet storage, nearly doubling capacity compared to the two previous warehouses. The new buildings aid GPA's joint efforts to support Georgia's forest products sector — a $35 billion industry and the state's second-largest employer.

For fiscal year 2018, total cargo crossing all GPA docks grew by 8%, or 2.6mt (million tonnes), to reach a record 36mt of containerized, breakbulk and bulk cargoes. Forest products at Mayor's Point Terminal increased by 34.5%, up 35,953 tonnes, for a total of 138,653 tonnes. Machinery, as well as commodities such as rubber and paper, pushed the breakbulk total at Savannah's Ocean Terminal to 1.35mt, up 10% or 122,305 tonnes compared to FY2017.

In addition to larger cargo exchanges from New Panamax vessels, GPA also expects to see growth in the coming years in the plastic resin market. Resin pellets — a byproduct of oil and natural gas refining — are used in the manufacture of more than 70,000 products including carpet, water bottles, phones, computers, corrective vision lenses and tape. With the US petrochemical industry investing more than $185 billion in increased production capacity, the plastic resin industry is gearing up for phenomenal growth over the next five years and beyond.

According to data analysts at Petrochemical Update, four refineries totalling more than 5mt per year of resin capacity will start operations this year along the US Gulf Coast. A further five new refineries are expected to go into operation by 2020. Together, the nine projects will bring 10.3mt (metric) of additional resin capacity into the US market.

Every million metric tonnes of resins results in 40,000 forty-foot containers of cargo. The new production capacity is expected to grow the current yearly export volume from 200,000 containers per year to approximately 600,000.

Incredible growth in resins production, combined with the Port of Savannah's superior connectivity, make Georgia a new supply chain alternative to handle the influx of cargo.

Savannah offers numerous advantages to plastic resin exporters as an alternate gateway including:

- most weekly carrier services on the US East and Gulf Coasts;
- abundance of empty containers;
- high over the road weight allowances; and
- two Class 1 railroads on terminal with near port domestic ramps.

A&R Logistics, based in Louisville, Ky., launched its export packaging and warehouse business at the Port of Savannah's Ocean Terminal in July 2018. A&R's Savannah export business provides a flexible and sufficient supply chain alternative for the export of plastic resins produced in the US. A&R's single packaging line occupies half of a 200,000ft^2 warehouse less than ten miles from Garden City Terminal.

"The opening of A&R's export packaging facility is an exciting addition to the Savannah market's cargo handling capabilities," said Georgia Ports Authority Executive Director Griff Lynch. "With their announcement, Savannah is now a viable alternative for resins produced in the Gulf Coast area." DCi

Turnaround at British Steel augurs well

A mill roll, used in the steel rolling process, being measured at British Steel in Scunthorpe.

British Steel reports strong Q1 profit and announces £50m wire rod investment

In mid-July, British Steel reported a Q1 profit of £21 million (EBITDA) and announced the biggest single investment in its manufacturing operations for a decade.

In its second annual trading update, British Steel said its turnaround remains firmly on track and reported:

- a significant long-term investment plan to support the business for years to come:
  - £50 million will be invested in upgrading the Scunthorpe Rod Mill;
  - £40 million has been committed to other capital expenditure in FY19 to maintain and improve the existing asset base (£120 million in first three years of the business); and
  - a further £500 million of projects are being pursued ;
- annual turnover was £1.4 billion in FY18 versus £1.2 billion in FY17;
- an EBITDA of £68 million pro forma for FY18 (excludes the £47m one-off cost of a blast furnace chill for which the company is pursuing an insurance claim);
- profits rose at FN Steel, the company's first major acquisition in October 2017; and
- 1,000 people have joined the business since its launch in June 2016. Employees are now receiving a staggered 4% pay rise and have been allocated a further one million company shares

British Steel Executive Chairman Roland Junck said: "Our transformation remains firmly on track and continues apace with unprecedented levels of investment going into the business.

"Without the unique blast furnace chill last summer — the impact of which was widely reported by media — we'd have exceeded our year two-target which demonstrates the growing strength of our business.

"This strength is why a number of leading financial institutions continue to provide us with additional financing to support our investment and growth plans. This is not only enabling us to improve our plant, products and services — as demonstrated with our rod mill investment — it's allowing us to expand our portfolio by making strategic acquisitions such as FNsteel.

"Increased raw material costs and fluctuating steel prices continue to be a challenge. It's important safeguarding action is taken to prevent the dumping of cheap steel into Europe following the imposition of steel tariffs by the US. However, we remain in positive talks with the government, and our other stakeholders, and are confident about our

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future. Our order book is strong and we've the capacity and capability to play a significant role in major infrastructure projects such as HS2 [high-speed railway] and the Heathrow [airport] expansion. We continue to invest in our people and products, remain focused on reducing the cost of liquid steel and are growing into new markets across the globe.

"With the support of our employees we've achieved a great deal in a short space of time and while a lot of hard work lies ahead, we've made significant progress towards building a sustainable future."

The £50 million wire rod investment will see a new modern wire rod line open at the company's current Scunthorpe Rod Mill. It's been designed by Primetals which will also oversee its installation. Work is scheduled to start this summer and the new operation is set to be commissioned in autumn 2019.

Paul Martin, British Steel Deputy CEO, said: "This is a major investment in the future of our business, underpinning our commitment to providing customers with higher technical specifications of steel and a diverse, premium product range.

"Not only will this increase our ability to serve the domestic wire rod market, it will allow us to become a more competitive exporter and accelerate the growth of British Steel in line with our company strategy.

"By continuing to make investments like this our aim is to become the steel supplier of choice for more businesses across the world."

To support its growth plans, British Steel has recently secured £90 million of new financing from White Oak Asset Finance, an affiliate of White Oak Global Advisors, LLC. British Steel's bank financing is provided by a syndicate led by PNC Financial Services UK Ltd.

Tom Otte, President of White Oak Asset Finance, said: "Our investment in British Steel speaks strongly to the company's turnaround over the past few years. We are very optimistic on the company's continued growth, and fully expect our capital to finance its organic expansion."

Three significant appointments have been made to British Steel's executive team — Gerald Reichmann has joined as Chief Financial Officer, Ron Deelen as Chief Marketing Officer and Ugur Yilmaz as Chief Operating Officer. The company now employs more than 5,000 people while FNsteel, which has more than 300 employees, is being integrated into the business.

Paul Martin, British Steel Deputy CEO, said: "Our people continue to be our most important asset, they've helped us come a long way in a short space of time. The pay rise, and award of more shares, recognize their incredible contribution to British Steel and I'd like to thank them, the unions and our valued customers and suppliers for the support they continue to give our transformation."

Wire rod being manufactured at British Steel in Scunthorpe.

Marc Meyohas, Greybull Capital partner, said: "We're pleased with the progress British Steel is making and will continue to do all we can to ensure the company thrives for years to come."

Paul McBean, Scunthorpe Site Multi-union Chairman, said: "It wasn't long ago that people were doubting if these works had a future but since the launch of British Steel the business has gone from strength-to-strength.

"The rod mill investment is a fantastic second birthday present for British Steel and the 5,000 employees contributing to our turnaround.

"While we still have a long way to go, investments of this scale – and the ongoing commitment to capital expenditure - demonstrate the great optimism flowing through this company."

British Steel profits

- **FY16:** £79 million loss (previous ownership)
- **FY17:** £47 million profit EBITDA (Year 1 of British Steel)
- **FY18:** £68 million EBITDA full year pro forma (Year 2 of British Steel)
- **FY19:** Q1: £21 million EBITDA quarterly pro forma (Year 3 of British Steel)

About British Steel

British Steel was formed in June 2016 by Greybull Capital. The company is proud of its heritage, but is just as passionate about building stronger futures for its employees, customers, suppliers and local communities.

Internationally, British Steel wants to be a competitive exporter and the right strategic business partner. Nationally it wants to be the champion in its chosen markets — recognized as the centre of competence for steelmaking and the partner of choice. And locally, through positive engagement, it wants to become a leader of business and community re-development in the areas in which it operates.

The company's steel helps people travel, work, eat and socialize every day. It has been, and continues to be, fundamental in creating iconic, awe-inspiring structures around the world. More importantly, it helps keep everyone safe.

British Steel produces more than 2.8 million tonnes of steel every year. From this, it manufactures more than 1,450 different specifications of steel that is rolled into wire rod, sections, special profiles, rail, bloom and slab.

The company employs 5,000 people, 400 of whom are in France. Facilities include:

- Scunthorpe integrated steelworks;
- Teesside Beam Mill, Lackenby;
- Special Profiles, Skinningrove;
- Hayange Rail Mill, north east Franc;e
- Immingham Bulk Terminal (port terminal);
- Redcar Bulk Terminal (port terminal);
- FNsteel, Netherlands;
- Rail logistics hub, Lecco, Italy;
- Engineering business, Workington;
- National design consultancy;
- Associated distribution facilities in the UK and Ireland; and
- International sales offices including USA, Singapore, France, Spain and Germany.

Sennebogen handlers at Europe's largest sawmill

Sawmill, logistics company, and much more: the Ziegler Group focuses on in flexible solutions

With its headquarters in Bavaria, the Ziegler Group is well established in the timber and sawmill sector, not only because it operates Europe's largest sawmill, but also because the family-run company repeatedly draws attention with its forward-thinking innovations. These include a state-of-the-art log yard which opened in the past year. With a total of 12 machines now in operation, Sennebogen's timber handling technology has been a constant and reliable presence in the Ziegler Group for many years, and not only in the log yard.

Founded in 1948 as a sawmill, Ziegler can look back on an eventful 70-year history as a family-run company. With around 1,000 employees at various locations around the globe, the group has recorded impressive growth in recent years in particular. It employs more than 500 staff at Europe's largest sawmill alone, which can be found in the tranquil location of Betzenmühle in the northern Upper Palatinate region of Germany.

It's here that the company, which processes an impressive 1.8 million solid cubic meters of sawn timber every year, has its roots. An issue that has really come to dominate is logistics, as Fabian Hummel explains. He says this is why Ziegler has had its own state-of-the-art container and handling terminal at the rail station in nearby Wiesau since 2011. Employing 120 own trucks and a further 70 subcontractors, Ziegler Logistik GmbH transports wood and other goods from the terminal to locations all over the world. Efficient handling solutions are critical in this context, and it is for this reason that Ziegler has been using Sennebogen material handlers for log handling for around 15 years.

Logistics terminal in Wiesau: two Sennebogen 818 E for loading logs

Just how much timber is moved by Ziegler on a daily basis is best illustrated at the site in Wiesau. Ziegler Logistik handles approximately 25,000 containers at the modern terminal every year, and this number is on the rise. Every day, a freight train travels between Wiesau and Hamburg/Bremerhaven taking containers of sawn timber for export and bringing back logs for the mill from the local area and beyond.

Two new Sennebogen 818 E material handlers delivered by sales and service partner IBS Industrie- u. Baumaschinen Service GmbH in 2017 unload the stake cars on arrival and load trucks that transport the logs to the mill some 20 km

away. The two 818 E machines with undercarriage are equipped with a 1.25m² log grab and 9m-long equipment. Powered by a tier 4 97kW diesel engine, the material handler is designed for demanding, continuous operation. The requirement for low noise emission values was a key criterion, as Florian Fischer (IBS GmbH) explains:

"Due to the central location of the station, we needed machines that are particularly eco-friendly and quiet, despite the challenges of continuous operation and heavy loads.

"The Sennebogen 818 proved to be the right machine for our customer. Thanks to its state-of-the-art engine technology, its noise emission values are significantly below the legal limits set in the Noise Emission Directive 2000/14/EC."

A particular plus point for drivers is the Maxcab, which can be elevated to a height of 5.80 m eye level to provide an ideal overview of the working and loading areas at all times.

The green log yard: nine 735 material handlers in action at the sorting line

Back in Betzenmühle, it is impossible to miss the booms of the green Pick & Carry machines in the log yard. Yard manager Klaus Mayerhöfer has a total of nine type 735 machines in operation, taking care of box removal, transportation, and sorting in the various woodpiles along the three sorting conveyors. The machines are sometimes also required to assist with unloading the 350 trucks that deliver daily to the sawmill.

The reliable 735 material handlers work in two-shift operation and some have already clocked up as many as 40,000 operating hours. Klaus Mayerhöfer tells us that this impressive record is not least credit to the excellent service provided by IBS GmbH, whose team carries out regular maintenance work and supplies spare parts.

In 2017, two new 735 machines from the current E series were added to the machine park. They are equipped with a 224kW diesel engine, variable all-wheel drive, and 11m-long handling equipment attached with a 2.0m² or 2.5m² Sennebogen log grab.

"It is no coincidence that we have been working together with Sennebogen and IBS for so many years. The provision of tailor-made products to meet our timber handling requirements is of course important, but the fact that the machines are so reliable and easy to maintain is also vital for our workflows. Processes that work in perfect harmony are indispensable if we are to continue to develop and expand our portfolio of products and services as a multinational family-run company. Sennebogen machines help us to optimize our logistics processes every single day," says Hummel. DCi

AMECO Group

continues to prosper in the pulp & paper industry

The pulp & paper industry comprises companies that produce pulp, paper, board and other cellulose-based products. The most important raw material for the manufacturing of all these products is wood.

Demand for agricultural products remains strong, especially in areas of forestry, accounting for approximately 4% of the total US manufacturing GDP*.

AMECO Group has a solid presence in North America, which spans over 40 years with the largest pulp & paper mills equipped with AMECO machines. Pulp & paper mills store woodchips in large volumes, and, with the help of AMECO's stacker and reclaimer systems, production can continue even when supplies are intermittent.

AMECO has over 50 circular stacker & reclaimers (CSS), circular bed blending storage systems (CHO), stackers (ST), side scrapers (SS) and portal reclaimers (PS1/PS2) in operation in North America including machines either under construction or going through the design process.

AMECO's client base is continuing to expand globally, and KBH Services Inc., an exclusive re-seller of AMECO equipment based in the USA, has been recently established to better handle the needs of the company's North American clients.

AMECO Group's origins and future

AMECOs origins are rooted in Alsace, a French region bordering both Germany and Switzerland that blends industrial heritage and innovation.

The origins of the French equipment manufacturer AMECO lie in the fertilizer and mining industry. When it was founded in 1932, the company was part of the Alsatian potash mines. It went from providing the potash mines with maintenance services, to supplying them with conveyors, and eventually delivering all types of equipment to fulfil specific material handling needs. This technology allowed AMECO to develop into different markets, such as cement plants and electricity power plants where bigger storage facilities were required at the time.

AMECO circular stacker reclaimer (CSS)

For the pulp & paper industry, AMECO offers both longitudinal and circular stockyard solutions. Its most successful product, however, is the circular stacker and reclaimer (CSS). This type of stacker/reclaimer system can store large

* *Source: http://www.afandpa.org/our-industry/economic-impact, 16 January 2017.*

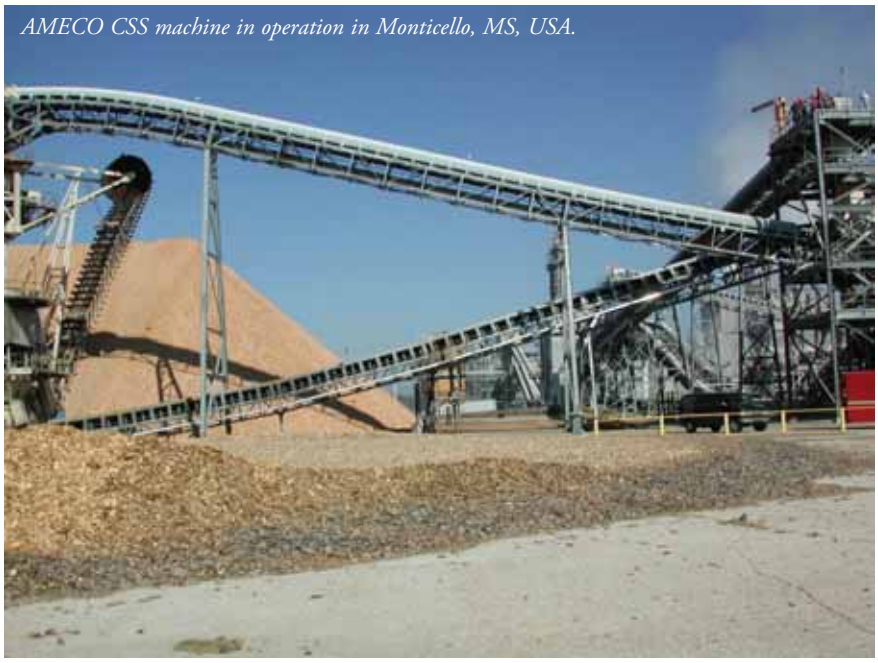
AMECO CIRCULAR STACKER RECLAIMER INSTALLATIONS:

Location	Material handled	Quantity	Stacker capacity (tph)	Reclaimer capacity (tph)
Panama City – FL	Wood chips	2	600	285
Cedar Springs – GA	Wood chips	4	800	540
Perdue Hill – AL	Wood chips	1	800	280
Monticello – MS	Wood chips	2	800	540
Courtland – AL	Bark	1	225	130
Calhoun – TN	Wood chips	2	560	250

quantities of material, while taking up a minimal amount of space on site.

The circular storage system is equipped with a slewing and luffing scraper arm as well as a slewing and luffing stacker boom. The stacker and reclaimer is supported by one central column, which supports the incoming feeding conveyor. This circular stockyard is used mostly in the pulp & paper industry or in the power-generation industry as it is optimizes the storage volume on a low surface of the stockyard. The other major benefit of this stockyard system lies in the fact that workers can easily monitor the operation from the centre of the pile area.

AMECO's boom length for a CSS goes up to 55 metres (180 feet), allowing for the storage of 150,000m³ (196,000yds³) of bulk material.



AMECO CSS machine in operation in Monticello, MS, USA.

Case studies

AMECO circular stacker reclaimer machines in southern USA

AMECO has more than ten circular stacker reclaimer machines installed in southern USA pulp & paper mills alone. These robust machines have been in operation for years, and continue to benefit from AMECO services for inspections of critical parts, maintenance, and spare part requirements.

AMECO has seven machines with one global enterprise, which is prominent in various locations in the USA. The company is proud to have built this trust with one of the world's leading makers of tissue, pulp, paper, packaging, and building products, and to be part of the production process from the very beginning at the raw material phase.

AMECO installs remarkable circular stacker reclaimer for pulp & paper mill in Thailand

AMECO's experience and excellence has led to build one of the largest circular stacker reclaimers in the world to a well-known pulp mill in Kanchanaburi province, Thailand. This is a remarkable piece of equipment with regards to its size.

The capacity of the woodchip stockpile is 150,000m³ (196,000yds³), with a pile diameter of 120m (393ft). The machine stacks the woodchips onto this pile at a rate of 300tph (tonnes per hour) and recovers the material from the pile at a rate of 125tph. These figures make the machine currently one of the largest over-pile stacker reclaimers in the world in terms of pile capacity. See picture on p116.

Replacement of slewing ring for AMECO CSS machine in NSW, Australia.

Beyond the installation: AMECO inspection services

AMECO follows the customer through its journey from the initial installation to the lifecycle of the machine.

AMECO's maintenance teams are always available to its clients for inspections of installed machines, and can often propose improvements that will benefit the daily operations of the plant and extend the life expectancy of AMECO systems.

AMECO revamps circular stacker reclaimer for pulp & paper mill in Australia

In March 2016, AMECO successfully assisted a pulp & paper mill in NSW in Australia with the replacement of the main slewing ring on one of the three AMECO circular storage systems handling woodchips at the plant. The three AMECO circular stacker reclaimer machines have been in continuous operation since they were commissioned in the year 2000. The central slewing ring is a critical part of the machine which allows the rotation of the reclaimer arm, and due to its position on the central column, supports the entire weight of the upper structure of the machine.

The replacement of this slewing ring required disassembly of the stacker boom and the upper part of the central tower, which gave AMECO's technical specialists the opportunity to closely inspect and re-adjust all the elements of the machine. DCi

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