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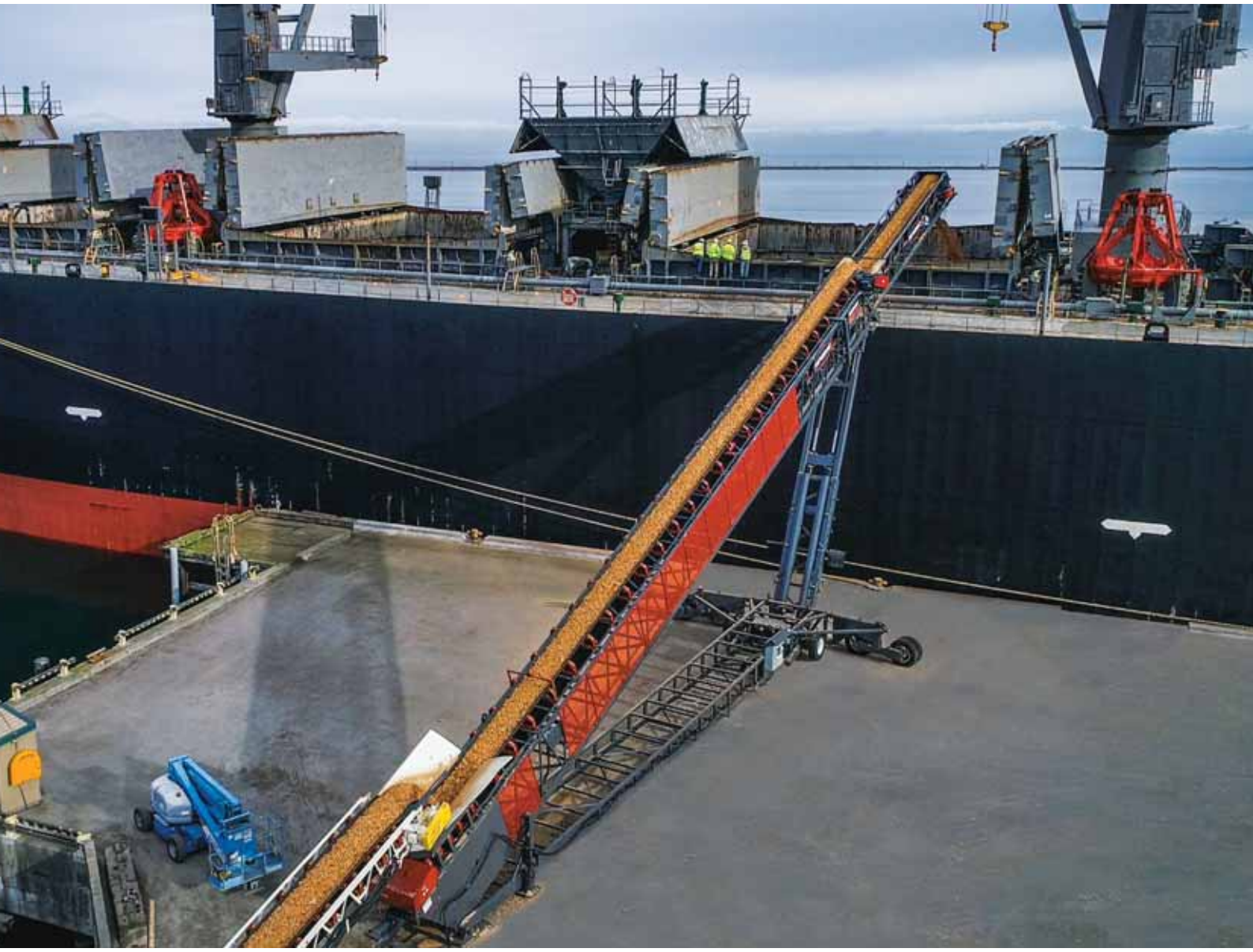

## FEATURES

- Iron Ore Trades
- Ship Unloaders
- Shipboard Grabs & Cranes
- North American East Coast
- HWY $H_2O$ & The Great Lakes/St. Lawrence Seaway System

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# *featuring...*



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# Coal trade growth may be minimal

*Recent indications of commodity import demand around the world over the next twelve months point to limited prospects for growth. Many elements could remain flat and some may weaken. The upwards trend in global seaborne dry bulk trade seems likely to persist, but expansion probably will be slow, based on these signs.*

Another cautionary assessment of economic activity was published at the end of July by the International Monetary Fund. Gross Domestic Product growth In the advanced economies group (mainly USA, Europe and Japan) is estimated at 1.9% in 2019, 0.3 percentage points below last year's rate. In the emerging market and developing economies group (including China), a 0.4 percentage points reduction to 4.1% is estimated. A pickup is projected for 2020, described by IMF economists as "precarious".

## Coal

In the coal sector, comprising about one-quarter of all global dry bulk commodity trade, a possibility of some expansion this year is still visible. Despite the prominent negative background influences, both steam and coking coal segments may at least remain flat and could see increases.

Within the coking coal segment, where import demand relates mainly to steel industry usage, some recent forecasts for 2019 suggest 1% or perhaps even 2–3% growth in the world total, compared with last year. A large part is comprised of imports into Asia, as table 1 shows. Positive influences are clearest in India, experiencing rapidly rising steel production, possibly causing a 6% coking coal imports increase to about 61 million tonnes this year.

## Iron ore

Reduced iron ore trade volume in the current year is becoming a likely outcome after weakness in the first half. Last month the Australian Government published an estimate for 2019, including land movements but mostly seaborne. This update suggested that world iron ore trade could decline by 66mt (million tonnes) or 4% to 1,529mt, from 1,595mt in the previous twelve months. Imports by China and several other countries are expected to be lower.

During the first half of 2019, China's iron ore imports totalled 499mt according to official figures, a decrease of 31mt (6%) from 531mt in last year's same period. During the second half, according to several analysts, a pick up may result from improved ore availability on the world market and some stock rebuilding at Chinese ports, but the annual total still seems likely to fall.

## Grain & soya

The global grain trade outlook continues to indicate only limited potential for growth. There are some signs of likely extra volumes caused by domestic harvest shortfalls in importing countries, but the impact probably will not be large. However, perceptions could be altered by unexpected weather conditions in countries influencing trade.

Revised International Grains Council estimates, prepared last month, showed world trade in wheat plus corn and other coarse grains increasing by under 1% in crop year 2019/20 ending June 2020. The total is put at 370mt, up by 3mt from 367mt in 2018/19. Although European Union imports are expected to decline steeply, other countries including Bangladesh, China, Iran, Mexico, Morocco and Saudi Arabia could see higher import volumes.

## Minor bulks

Seaborne trade in aluminium industry raw materials — bauxite and the processed alumina — has been increasing strongly. The total apparently exceeded 140mt last year and another increase is expected in 2019. China's expanding bauxite imports are a key influence.

## Bulk carrier fleet

New bulk carrier capacity entering the world fleet during 2019 may exceed last year's total by 20% or more, as shown by table 2, reaching over 34 million deadweight tonnes.

Large bulk carriers and ore carriers in the Capesize and Panamax sectors are likely to contribute about three-quarters of this year's annual newbuilding capacity.

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

| | 2014 | 2015 | 2016 | 2017 | 2018 | 2019* |
|---|---|---|---|---|---|---|
| Japan | 74.1 | 70.6 | 74.0 | 71.9 | 70.0 | 69.0 |
| South Korea | 29.9 | 32.5 | 32.0 | 32.2 | 31.2 | 31.0 |
| Taiwan | 10.9 | 10.8 | 10.5 | 11.1 | 11.2 | 11.0 |
| China | 62.3 | 48.0 | 59.3 | 69.9 | 64.7 | 66.0 |
| India | 47.1 | 50.6 | 51.4 | 50.3 | 57.6 | 61.0 |
| **Total of above** | **224.3** | **212.5** | **227.2** | **235.4** | **234.7** | **238.0** |

*source: various & BSA 2019 estimates* * estimate*

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

| | 2014 | 2015 | 2016 | 2017 | 2018 | 2019* |
|---|---|---|---|---|---|---|
| Handysize (10–39,999dwt) | 5.4 | 6.5 | 4.6 | 3.4 | 2.9 | 2.5 |
| Handymax (40–64,999dwt) | 11.4 | 15.9 | 13.2 | 10.8 | 5.6 | 6.5 |
| Panamax (65–99,999dwt) | 12.8 | 9.9 | 9.4 | 8.9 | 5.6 | 10.0 |
| Capesize (100,000dwt and over) | 18.7 | 16.9 | 20.0 | 15.3 | 14.3 | 15.5 |
| **Total** | **48.3** | **49.2** | **47.2** | **38.4** | **28.4** | **34.5** |
| % change from previous year | | 1.9 | –4.1 | –18.6 | –26.0 | 21.5 |

*source: Clarksons Research & BSA estimates for 2019* * estimate*

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# High iron ore prices put pressure on steelmakers

## Turbulent times for iron ore prices

It is simple economics that prices of iron ore at any point will be decided by global demand from steelmakers and supply by mines, *writes Kunal Bose*. Consultancies and trade analysts are on occasions caught on the wrong foot while foreseeing demand for the steelmaking ingredient, as has been played out in 2019. To cite one example, the department of industry, innovation & science of Australian government said in a quarterly report last year that steel production in China, which accounts for half the world output of the metal would top out at 886mt (million tonnes) in 2018 and then likely fall to 861mt in 2019 and further to 842mt in 2020.

The flattening GDP growth in China will lead to demand contraction of at least 34mt over the same time. Canberra believed in the 'suite' of Beijing policies — that include clean environment-driven production cuts and scrapping some loss-making capacity leading to lower use of iron ore — and on that basis it did forecast that free-on-board prices of the ingredient would average $51.90 a tonne in 2019 and $50.70 in 2020. This shows the perils of commodity price forecasting.

The ground reality in China, which has a share of nearly two-thirds of the seaborne trade in iron ore, proved to be different. This is evident in strong growth in steel production so far in the current year backed by high use of the metal. This, supplemented by a supply squeeze of iron ore from two principal sources — namely, Brazil and Australia for different reasons — saw the material prices doubling at Dalian Commodity Exchange (DCE) in China since the beginning of 2019. In several contracts for the most active September delivery, prices recorded are about $135 a tonne. That kind of price is no doubt a squeeze on the margins of steelmakers. A good portion of Chinese steel capacity is back in the red once the spell of low ore prices and high steel rates ended. But the ore is still well behind the record $191 a

tonne in early 2011 or the $160 a tonne during the last big rally seven years ago.

For the sheer size of its steel capacity and massive dependence on iron ore imports, China remains the biggest mover of ore prices. Proving Canberra wrong by a wide margin, China had lifted steel production in the first half of 2019 by 9.9% to 492.169mt from 447.825mt in the same period of last year. In recent weeks, steel capacity use in China has hit around 74%, the best since July 2018, indicating robustness in demand. The World Steel Association's short range outlook released in April said Beijing "is likely to heighten the level of stimulus... to boost steel demand."

Defying trade tensions between the world's two largest economies, which are causing collateral damage to the other economies, steel demand in China had remained strong, with Beijing offering stimulus to keep the local economic wheels moving. Ben Davis, of the UK-based investment banker and researcher Liberum, says of the Chinese scene: "We've had incredibly strong demand for steel, most of it going into housing... The demand side has been the bigger factor than the supply disruption." In a correct description of the reality, Goldman Sachs says if the Chinese steel demand is a surprise on the upside, then the accident-struck Vale production is a surprise on the downside.

Two developments during the year led to slippages in iron ore exports by the world's two leading producers, causing a major rally in prices and inventory drawing down in China. In late January, the collapse of a tailings dam at Vale's Brumadinho mine that left more than 300 people killed or missing forced the miner to close several mines to avoid further accidents. Then a tropical cyclone lashed Western Australia, which led to port closure and disruptions in mines operation. One way of getting a rough measure of the loss in seaborne trade in the first half of 2019 due to setbacks in production in Brazil and Pilbara region in Australia is to consider the pronounced drop in Chinese inventory of iron ore from this year's record of around 149mt in early April to the more recent 115mt.

At the current elevated prices of iron ore, Australian miners such as BHP Billiton, Rio Tinto and Fortescue — which deliver the mineral to China at a cost of $30 a tonne — are making a pile, albeit on cyclone-inflicted lower production. Through a series of efficiency improvement measures that expansion of operating mines aided, the big miners have been able to dig iron ore out of the ground for as little as $13 to $15 a tonne.

It will be recalled when ore prices sank below $40 a tonne in December 2015, the lowest ever recorded by price assessor The Steel Index (TSI), which started compiling data in 2008. Because of falling Chinese demand, many high-cost mines went out of production. There is this theory that high ore prices are subject to self-correction by way of closed mines reopening. The caveat here is that bringing a shut mine back to life is a time-consuming exercise. The high cost is exacerbated by the distinct preference of Chinese mills to feed blast furnaces with high quality ore to improve the environmental friendliness of operations — as is the firm insistence of Beijing — so this continues to shrink the country's own iron ore production. HSBC says in a report that Chinese ore production is around 40% lower than 2017 levels.

The self-imposed squeeze in domestic production has meant annual ore imports of over 1bn tonnes for making steel. In the first half of the current year, however, production disruptions in Brazil and Australia translated into China imports down 5.9% to 499.09mt from the same period a year ago, according to data from Beijing's General Administration of Customs. Principally at the insistence of China, the 40-year-old iron ore pricing

system — based on annual contracts reached by lengthy and often acrimonious negotiations between miners and Japanese steel producers — was replaced with short-term contracts linked to the spot market. That happened in 2010. If anything, China wields a stronger lever today for the sheer size of its imports.

Whatever difficulties Brazilian and Australian miners may have faced in keeping supplies normal, Chinese steelmakers are certainly not pleased with the strong rally in iron ore prices. Not surprisingly, they have made representation to the government to look into the role of "non-market factors" in the market rally. In response, market regulators have promised tightening of supervision of money flows in trade at DCE. They will also be subject to screening as to whether companies are using affiliated entities to place trades on DCE transgressing market rules.

The steel industry also wants the regulators to investigate the methodologies used to assess the physical cargoes of imported ore by S&P Global Platts. This is the spot trade benchmark and a reference for long-term contracts.

In any case, trade tensions between China on the one hand, and Australia and Brazil on the other, caused by a strong price rally are likely to subside as signs of improvement in production and shipments are emerging from the two leading ore-producing countries. In a recent report, Reuters has noticed signs of stability returning to the iron ore trade. This suggests "spot prices may have peaked and forward curve may look too rich." This forward outlook is based on expectations of production improvement both at BHP and Rio and, therefore, improved Australian export shipments. Rio is forecasting 2019 exports in a band of 320–330mt. This is less than 338.2mt despatched last year. But the signal that goes out to traders is that the miner's current half output will be higher than 154.5mt in the first half.

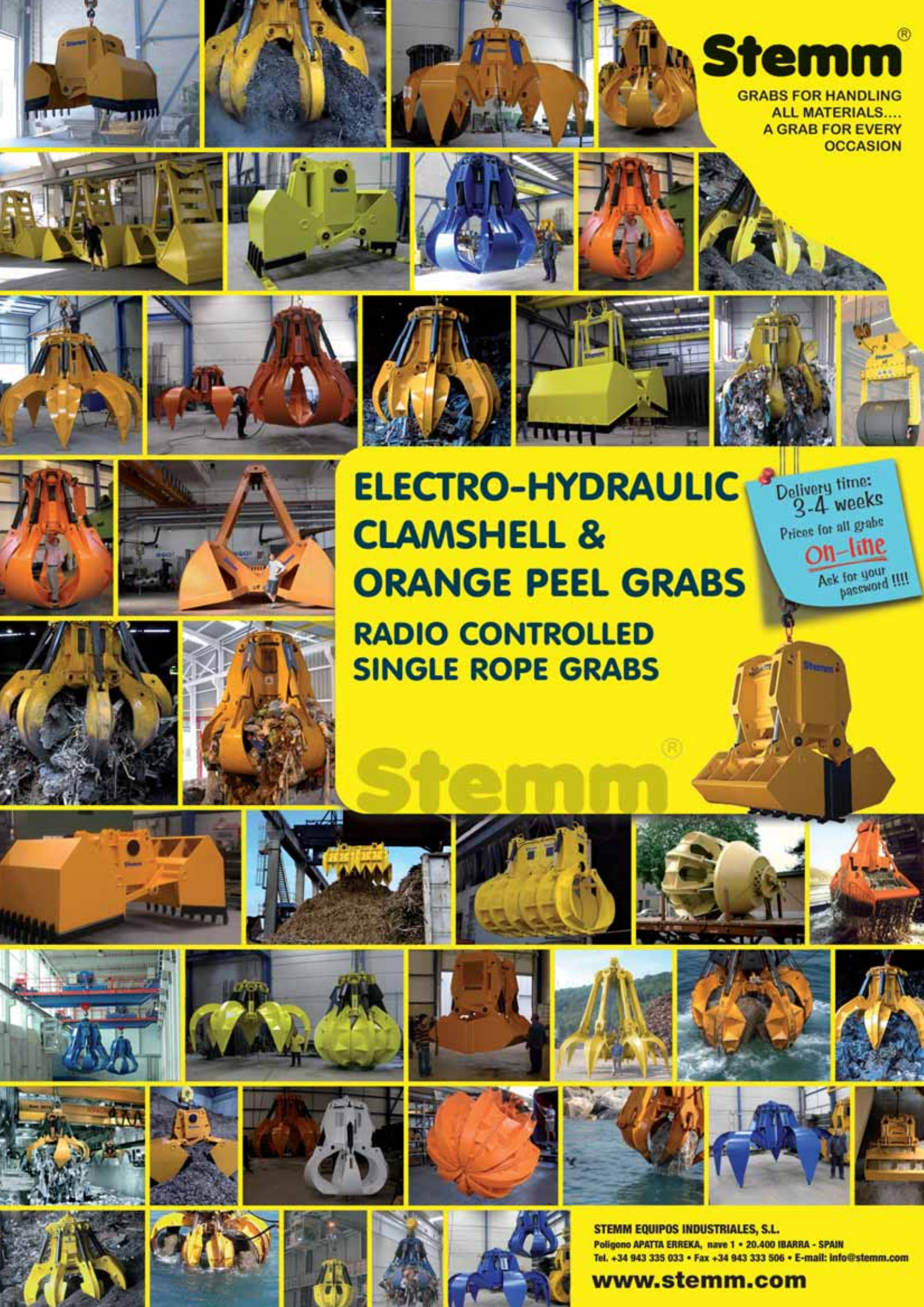
Brazil is also reporting improvement in production and exports, but at a slow pace. No wonder with China port stocks rising from the two-and-a-half year low of 115.25mt on June 28 and reports of shipments rise in Australia and Brazil, the inevitable fallout is weakening of forward prices on DCE.

## Unsettling times ahead for India's iron ore producers

Mineral resources in India from iron ore to bauxite to coal are majorly found in remote centres of Orissa, Jharkhand and Chhattisgarh where people, who hardly figure on the radar of the powers-that-be in Delhi, eke out a difficult existence unless they are employed by mining groups for ore extraction and allied works. No wonder then, when resources remain hidden under the earth, and in the absence of their raisings, the places become fertile ground for the spread of extremist movements.

The fragile peace that exists in the country's sensitive mineral-bearing regions will be put to test as the leases of merchant miners of iron ore and manganese ore will expire on 31 March 2020 under a directive of the January 2015 amendment of the 1957 Mines and Minerals (Development and Regulation) Act. In a questionable wisdom, the authors of the amended Act had, for the first time, made a distinction between merchant, captive and government group-owned mines. In what appears to be palpable discrimination, the 2015 version of the Act prescribes that while the existing leases of non-captive merchant miners are valid till March 2020, that of captive mines will remain in force till March 2030. What is more, captive mine owners alone are given the right of first refusal when their mines are put up for auction.

As for union and state government-owned companies such as Steel Authority of India Limited, National Mineral Development Corporation and Orissa Mining Corporation, they are allowed an extension of existing leases for a period of 20 years at a time beyond the stipulated period of 50 years. Remember, ahead of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# Brazilian iron ore exports down 15% in June

In June, Brazil exported 31mt (million tonnes) of iron ore, which was a drop of 15% compared to June 2018. Half-year figures show that total iron ore exports amounted to 162.4mt, which is down 10% on last year's record tonnage.

The country's leading export company, Vale, has suffered some high profile damage resulting from dam bursts in production areas. Although it has been suggested that these would have a dramatic impact on its end-of-year figures, to date the damage is not as bad as predicted.

In the first two months of the current year, for example, exports were slightly above average, although exports in March were down to 22.1mt and in April to 18.3mt. May was better, with 29mt exported, rising to 31mt in June.

This decline in exports has also had a negative impact on rates, as spare capacity on the largest bulk carriers has increased. China, in particular, imported less iron ore, down 16% on the year to date, with those to Japan down 20%. However, the situation in Europe was better, down just 10%.

*Barry Cross*

2015, there was no distinction between captive, non-captive and government ownership of mines. In every respect, including lease tenure, all three groups got identical treatment under the law. No longer so.

Discrimination part may or may not get set right by way of amendment of the 2015 MMDR Act. But what is of immediate concern is the large number of iron ore and some manganese ore mines owned by merchant groups that will stop operation on lease expiry in March 2020 making in the process thousands of workers unemployed. The same fate is awaiting many more thousands who are engaged in the long chain of logistics between mines and use of iron ore by steel mills domestically and in foreign destinations. This is to happen when the country's unemployment rate is worryingly high and few new jobs are created with deceleration in economic growth.

Minerals industry experts say that there is no way the concerned state governments will be able to complete auction of the merchant mines whose tenure of leases will run out in nine months. Even assuming that auctions are held and successful bidders chosen, it will take them a long time, going by established patterns to secure all the sanctions, including environment and forest clearances (ECs and FCs) before they could start ore extraction. Yes, the Supreme Court has given a ruling that for auctioned mines that were operational earlier, the new lessees would automatically get ECs and FCs transferred to them from earlier lessees. But we are seeing new lessees' frustrating wait for transfer of ECs and FCs for mines in Karnataka.

This correspondent on his recent visits to some Orissa and Jharkhand mines, whose leases are to expire next March, found workers and managers rattled by an unsettled future awaiting them. They have no clue as to whether the central government in view of the inevitability of anarchy setting in mining centres will do the sensible thing of extending leases of merchant miners to 2030 in line with captive mines, or if it will let mayhem happen. The ground reality is this. It emerged at a recent mines ministry coordination cum empowered committee (CCECC) meeting that New Delhi has advised the concerned states to start auctioning mines expeditiously "so that the incoming miners have time to take preparatory steps to make the mines functional." If any proof is needed, this alone is enough to confirm that the administration has no appreciation of the consequences of such a move. In fact, a recommendation of this kind could open a Pandora's Box and the evils that will come out will be difficult, if not impossible to contain.

The law says: "On the expiry of lease period, the lease shall be put up for auction." This means the concerned state governments can start the process of auctioning the iron ore and manganese ore mines only after their current leases expire in March 2020. There are other constraints too. According to rule 12 (gg) of the Minerals (other than atomic and hydrocarbon energy) concession rules, 2016 "a lessee is entitled to remove within six months after the expiry of lease period all or any one mineral excavated during the currency of lease, engines, machinery, plant .... and other works." Furthermore if a lessee is not able to remove all that is his, he will under the law get an extra one month to do so. The lessee, therefore, has a total of seven months after lease expiry to remove all his stuff, including mineral stocks.

In spite of the protection that current leaseholders enjoy under the law, the prospective bidders, emboldened by state governments, may seek to do due diligence of mines whose leases still have months to expire. An Orissa-based mine owner says: "In that event, we most likely will go for legal recourse as due diligence by outsiders will interfere with our day to day operation. All mines stakeholders are living in uncertain times." An agitating issue for iron ore mines in Orissa and Jharkhand is the unsold pithead stocks of 127mt — 85mt in Orissa and 42mt in Jharkhand. The stocks are mostly fines of grades with iron (Fe) content of up to 62% for which there are no domestic buyers. Yes we can find buyers for the low grade ore abroad, particularly in China, provided New Delhi will dispense with 30% export duty on grades of up to 62% Fe content. The ill-advised export tax has robbed Indian ore of global competitiveness.

Some miners have made the suggestion that, in the unlikely event of auctions going through, the successful bidders (lessees) should be "mandated" to pay to the existing lessees for pithead stocks "on the basis of last ex-mine grade-wise prices published by Indian Bureau of Mines."

But why should new lessees carry the cross of massive unsold stocks of departing mine owners, specially when demand for fines and low grade iron ore remain low? Will the government then remove the 30% export tax on iron ore with up to 62% Fe content to facilitate pithead stock disposal in foreign markets? Export duty removal remains the budget expectation of the Federation of Indian Mineral Industries.

However covetous steel mills here unlike their counterparts in China, Japan and South Korea may be of captive mines, steel producers in eastern India without mines ownership are dreadful of the impending prospect of chaos engulfing the iron ore sector. Remember, working mines in Orissa and Jharkhand meet as much as 45% of iron and manganese ore requirements of the steel industry in eastern India. According to rating agency India Ratings, iron ore production disruption following lease expiry will be around 60mt a year.

# Worldwide implications of catastrophic dam collapse in Brazil

The calamitous collapse of the tailings dam at the Vale mine at Brumadinho, in Minas Gerais state, in January this year, still echoes around the world, *writes Patrick Knight.* The collapse caused the death of 250 people, following the release downstream of an estimated 12 trillion cubic metres of waste.

The immediate effect in Brazil was to force Vale to shut down ten of its mines in Minas Gerais state, some to be closed for at least three years. This would mean a loss of about 90mt (million tonnes) of ore each year, in a state where about 150mt is normally produced annually. Further afield, mining companies round the world, have been asked by investors to give them information about the state of tailings dams at their mines, and several have taken action to reinforce them.

Apart from cutting the export of ore sharply, this cut back has had an enormous impact on Brazil's pig iron industry, which is concentrated in the state, and which normally consumes about 300,000 tonnes of ore each month. Companies producing thousands of tonnes of the charcoal used for smelting each month have also been badly affected. In addition to pig iron , most of the mills forming Brazil's 30mt-capacity steel industry are concentrated in, or adjacent to, Minas Gerais, and these mills have had to seek alternative sources for the ore they need. Much of the high-value pellets made in Brazil for export are made at plants at the port of Tubarao, in Espirito Santo, from where most of the state's ore is exported. A world shortage of pellets caused partly by the collapse two years earlier of the dam at the Samarco mine already existed, and a further reduction of pellets made from ore mined from other mines in Minas, means the supply of pellets has fallen again this year.

When the collapse at Brumadinho occurred, the world price of ore was just over $70 a tonne, by April it had increased to about $100 a tonne, more recently it reached about £120 a tonne. But many predict that supply, also affected by bad weather in Australia, is slowly getting back to normal and the price could fall to about $75 a tonne by the end of the year with a price downturn likely to increase further as demand weakens.

For the time being at least, the current high price of ore, is largely compensating Vale for the reduction in its earnings from the sale of a reduced amount of ore from Minas. This will allow the company to pay the $4–5 billion compensation which will have to be paid for the damage caused directly by the Brumadinho collapse. But it is pretty certain that most of the companies which have been prejudiced by the shortfall in ore and the increased cost of logistics, and have seen their costs rise enormously, will take legal action in an attempt to recover some of the costs from Vale.

Vale has announced that it will increase output at one of its mines in the Carajas complex from the current 90mt, to 150mt by 2021. In the meantime, much of the shortfall in ore in Minas is being shipped south from Carajas mines, to the port of Tubarao from Ponta da Madeira. But getting the ore to the steel and pig iron mills in Minas Gerais, costs about $30 per tonne. The facilities at Tubarao were designed to receive ore from mines, mostly by rail, and load it into ships. The equipment there was not designed to unload ore from vessels, and then transfer it to trains or trucks for shipment to its final destination.

Vale is anxious that as many as possible of the suspended mines in Minas can resume output as soon as possible, notably, the largest of them, the 30mt-capacity Brucutu mine, and this may happen soon. The authorities in Minas Gerais state, which get 7% of all its revenues from ore and associated activities, are anxious for their revenues to resume as soon as possible as well. But public opinion has to be taken into consideration, with many of

# Vale not meeting export targets for 2019 so far

In the second quarter of this year, Brazilian exporter Vale exported 64.1mt (million tonnes) of iron ore. This was 10.5mt fewer than sector forecasts. Vale, itself, had initially projected end-of-year estimates in the 307mt to 332mt range, and says that it is currently on course for a figure somewhere in the middle of that range.

After early year problems at its Brucutu mining complex, Vale has now brought around one-third of its temporarily off-line capacity back to production. Waste storage at the dam of Vale's Brumadinho mine overcame defences in January, killing 250 local residents, and resulting in a capacity shutdown that could have cost the company 100 million tonnes this year.

Reduced production has driven up iron ore prices to their highest levels in the last five years, with iron ore futures on the Dalian Commodities Exchange at their highest level since December 2013, because of increased demand by Chinese steelmakers.

Vale, Rio Tinto Group and the BHP Group have all had operational problems this year, spooking Chinese manufacturers. *Barry Cross*

the thousands of people living downstream from threatened dams, opposing the re-opening of mines.

The suggestion by some that the time has come to cease mining activity in Minas Gerais altogether, has been rejected as unrealistic. A huge amount of investment has gone into opening mines, building processing facilities, and logistics, notably in railways, in recent decades in the state. Not surprisingly, on the other hand, tens of thousands of people who live downstream from suspect dams, want action to be slow.

Vale has said it has started to reinforce many of its dams, and the option of switching to dry processing of ore is being explored. About 20mt of ore, mostly of lower iron content than average, is already produced by the dry method, which does not use water to process and purify the ore. But, for the time being, this process is only used at smaller mines and is not now economical at very large mines.

The world mining community as a whole, and those who invest in it, have all reacted to the collapse of dams in Brazil. Shareholders in the largest companies, Anglo-American, BHP, Glencore and Rio Tinto have been concerned about the risks of dam collapses, and the impact this could have. The big companies have promised action, as some of their dams have been identified as being at risk. A further group of 96 investors has written to 683 quoted mining companies, asking for details of their tailings facilities.

Dam failures are not the only problem the usually secretive Vale company faces at the moment. Much of the almost 400mt of ore the company ships each year is sold to countries in Asia, notably to China, a journey of about a month. Because of this, in recent years Vale has acquired a fleet of 40 ex-crude oil carriers, called VLCCs, to complement its own specialized ore carriers. One of these VLCC ships, carrying a cargo of 260,000 tonnes of ore, was lost in the south Atlantic last year, and this has raised questions as to whether VLCCs are suitable for the ore trade. Loading very large ships has always been a delicate matter, and there have been occasional accidents even with the specialist ore carriers owned by Vale. It has been suggested that the VLCCs could be suffering from metal fatigue as result from the stresses caused by loading into ships with very different characteristics from those of specialist ore carriers.

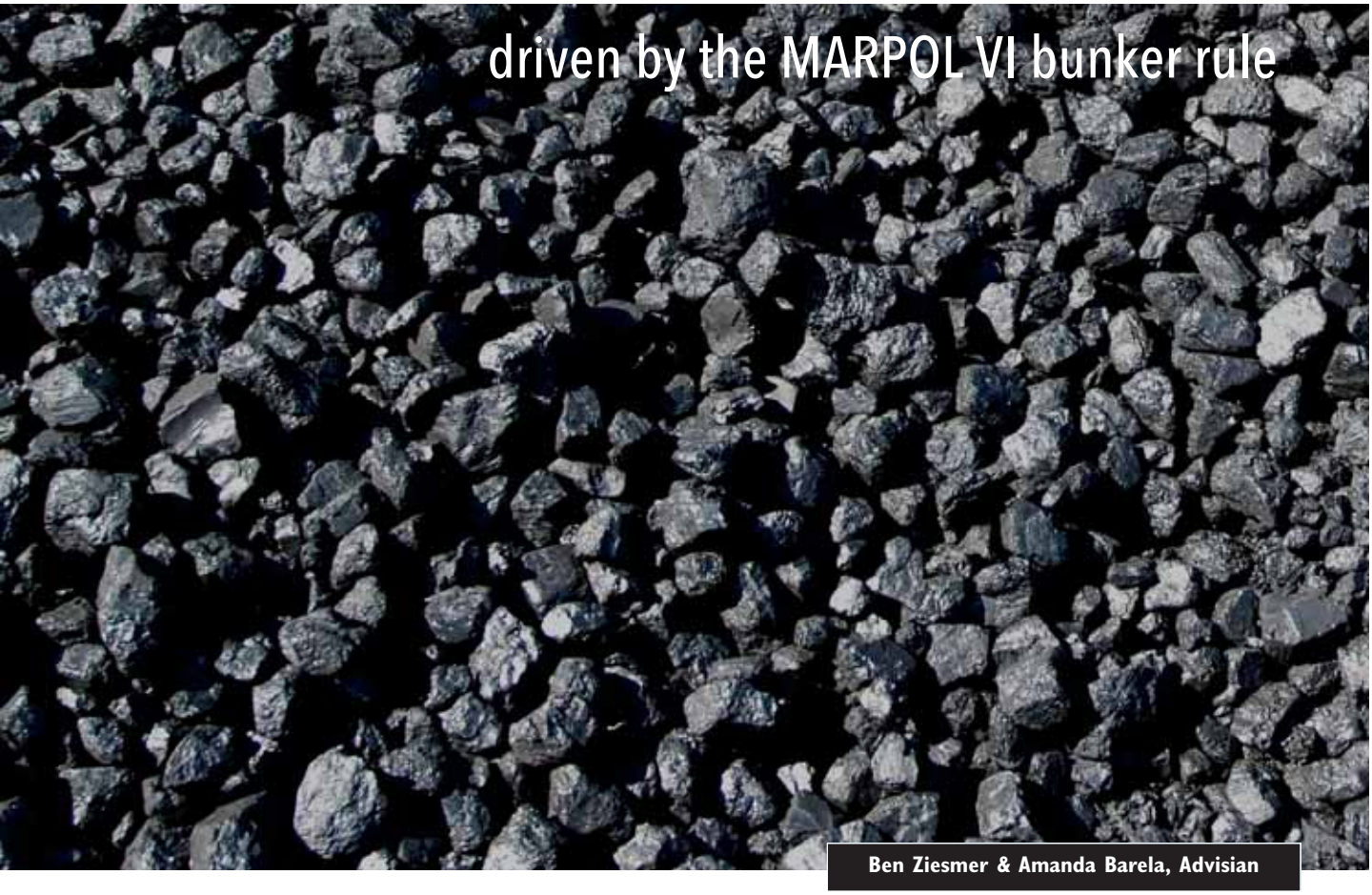
The recent accidents at mines and at sea are raising questions about the long-term prospects for the iron ore trade, and whether, in the not-too-distant future, demand for ore for processing in blast furnaces, may be phased out, or restricted to a few countries in the developing world. In many advanced countries, where large quantities of scrap steel are produced each year, using scrap rather than ore and coal, could come to replace the more traditional methods of making steel, at time when pollution, and the production of $CO_2$, has become such an important global issue.

In the US, of course, the steel industry now relies more on electric arc furnaces than on traditional blast furnaces, while in the UK the survival of one of only two surviving blast furnaces, at the British Steel mill, in Scunthorpe, which is now threatened with closure, is in question. One possible buyer wants to convert the mill to the electric arc system. The UK now produces far more scrap than the steel industry there can absorb and it has become a major scrap exporter, mainly to China and Turkey.

A study has suggested that most advanced countries already produce sufficient scrap to sustain their steel industries without the use of blast furnaces, and the iron ore and coal they need, or will certainly do so in about 30 years' time. By then, the only major markets for ore, might well be in countries Africa, where the production of scrap continues to be very small. DCi

# Petcoke market on the brink of change

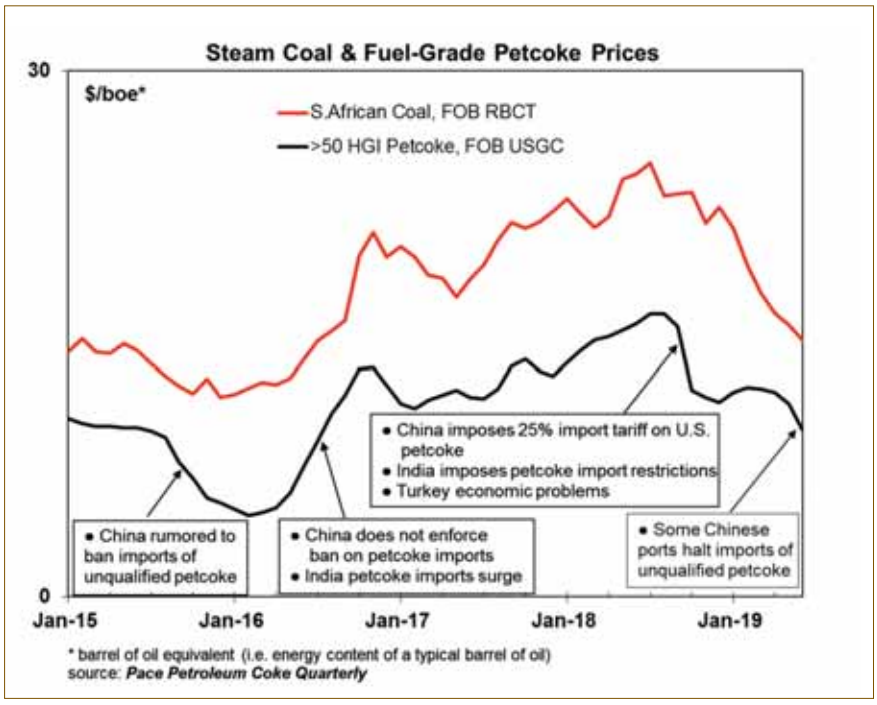
## driven by the MARPOL VI bunker rule



Ben Ziesmer & Amanda Barela, Advisian

Over the last five years, many factors have driven the fuel-grade petroleum coke (petcoke) market including coal prices, environmental regulations, tariffs, and economic conditions in various countries (see Steam Coal & Fuel-Grade Petcoke Prices Chart). Fuel-grade petcoke almost always competes against steam (thermal) coal. It typically trades at a discount to coal because it generally has higher sulphur content, is more difficult to pulverize than coal, and has inferior combustion characteristics compared to coal[1].

Since steam coal and fuel-grade petcoke compete in many markets, there can be a mistaken belief that steam coal and fuel-grade petcoke prices are highly correlated. However, while the price movements of




*1. Petroleum coke does have some advantages compared to coal such as much lower ash content and no detectable mercury content (i.e. <1 ppb).*

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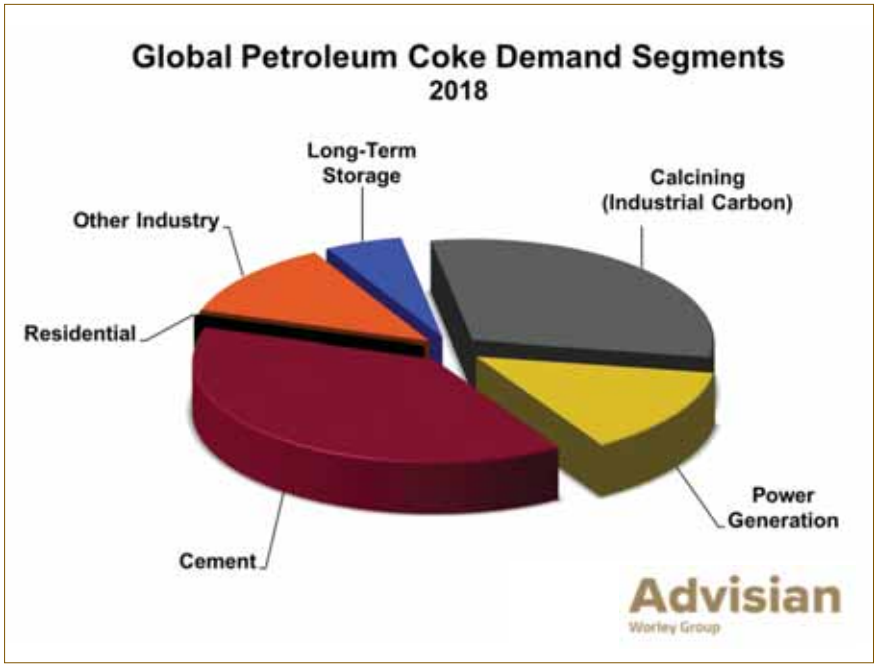
steam coal and fuel-grade petcoke generally have similar trends, petcoke prices can move differently than steam coal prices. For example, in 2015 petroleum coke prices did not start to decrease until months after coal prices started to decline. Then they fell much more significantly than coal prices and continued to fall while steam coal prices stabilized. A greater disparity in price trajectory can be seen from January 2018 through March 2018 when coal prices declined while fuel-grade petcoke prices increased.

Numerous market factors have driven fuel-grade petroleum coke prices during the last five years (see Steam Coal & Fuel-grade Petcoke Prices Chart).

- **Environmental Regulations:** August 29, 2015 China President Xi Jinping signed Presidential Decree No. 31 prohibiting the sale, burning, or importing of 'unqualified' coal and petroleum coke as of January 1, 2016. The decree did not quantify what was 'unqualified' petroleum coke, but it was rumoured in the market that any petcoke >3.0% sulphur would be considered unqualified. This rumour caused Chinese petcoke importers to withdraw from the market for any petcoke >3.0% sulphur, and petcoke prices fell. As 2016 proceeded, it became increasing apparent that Presidential Decree No. 31 was not being enforced and Chinese buyers returned to the petcoke market.

  In August 2018, India's Directorate General of Foreign Trade (DGFT) issued a notification prohibiting importing petcoke except for four industrial uses - cement, lime, and calcium carbide production and gasification[2]. Petcoke prices declined, but the price decrease cannot be attributed to India's actions alone as coal prices declined and other factors also occurred simultaneously (see Tariffs and Economics).

  Beginning about the middle of June 2019, some ports in China began implementing the long idle Presidential Decree No. 31, prohibiting imports of unqualified petroleum coke and coal. Previously, this decree had not been enforced regarding petroleum coke imports. In the case of petroleum coke, the ports that have begun enforcing Presidential Decree No. 31 have interpreted the decree to mean that any petcoke >3.0% sulphur is unqualified. This has caused Chinese petroleum coke buyers to halt all imports >3.0% sulphur out of fear that other ports in China will also start enforcing the decree. Consequently, petroleum coke that would have gone to the Chinese market must find new markets, most likely in Asia. This has caused U.S. West Coast (USWC) petroleum coke prices to decline in June but did not materially impact U.S. Gulf Coast (USGC) petcoke prices.




- **Tariffs:** On 23 August 2018, China imposed 25% import tariffs on $US16 billion of U.S. goods, including non-calcined (green) petcoke and calcined petroleum coke (CPC), in retaliation for 25% import tariffs on US$16 billion of Chinese goods authorized by U.S. President Trump. The tariffs effectively ended USGC petcoke exports to China, put some downward pressure on USGC petcoke prices and caused USWC prices to decrease.
- **Economics:** Sharply lower fuel-grade petcoke prices at the end of 2015/beginning of 2016 induced buyers in India to increase fuel-grade petroleum coke imports. During the summer of 2018, the value of the Turkish Lira (TRY) fell 30% and Turkey's central bank rapidly increased interest rates in response. Consequently, fuel-grade petroleum coke demand by Turkey, which had been the most dynamic European[3] fuel-grade petcoke market for USGC/Caribbean petroleum coke, fell sharply as cement demand plunged due to sharply reduced construction activity caused by high interest rates.

Thus, it is our position that fuel-grade petroleum prices are driven by supply and demand for petroleum coke operating in a solid fuel pricing environment determined by the coal market, but petcoke prices are not directly correlated to the coal market.

The previous discussion referred to fuel-grade petroleum coke prices, not petroleum coke prices generally, because petroleum coke is not only used as a heat source (i.e. fuel) but also as a carbon source in metal production and chemical processes. Petroleum coke that is used as a carbon source requires better quality (e.g., low sulphur and metals content) and commands higher prices that are driven by different factors than fuel-grade petcoke prices.

Green[4] 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. Green petcoke that has been calcined is referred to as calcined petroleum coke (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.

*2. In October the Supreme Court of India allowed limited quantities of petroleum coke imports to support the aluminium smelting industry. This petroleum coke is higher quality than fuel-grade petcoke.*

*3. Advisian considers Turkey to be part of the European petcoke market because Turkey's economy more closely resembles a European, rather than a MENA, economy.*

*4. Technically, all petcoke that has not been calcined is green petcoke (GPC). However, within the petcoke industry, the term GPC is usually only used for petcoke that is being used as calciner feedstock.*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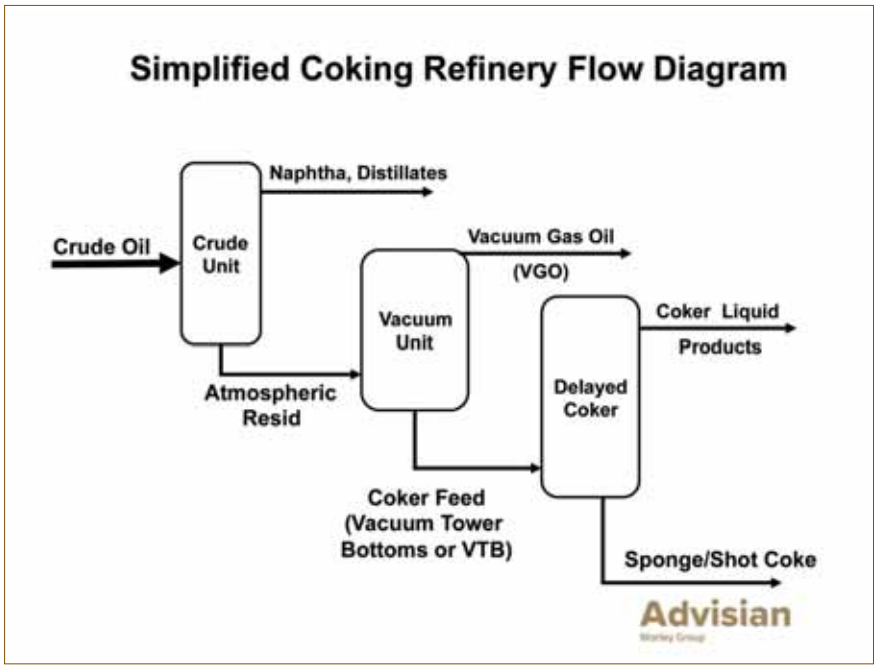
## MARPOL VI 0.5% Sulphur Bunker Fuel Regulation

The various factors that have impacted the petcoke market during the last five years will likely pale in comparison with the impacts that the International Maritime Organization's MARPOL VI global 0.5% sulphur cap on bunker fuel will have. An understanding of the coker process is necessary to better comprehend how the MARPOL VI bunker rule will likely impact petroleum coke.




### Coking background

Petroleum coke 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 lighter material such as light cycle oil to produce residual fuel oil (RFO), or used as coker feed (see Simplified Coking Refinery Flow Diagram).

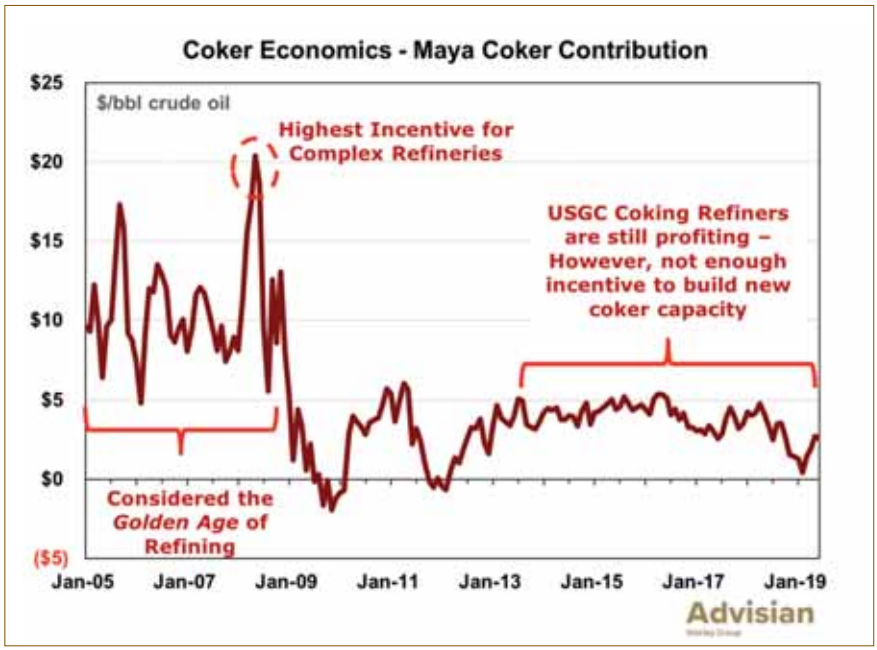
Traditionally, cokers are installed in oil refineries to convert VTB and other heavy residual oils into higher-value light transportation products (e.g., gasoline, jet fuel, diesel fuel). Until recently, a coker almost invariably increased refinery profitability because the yield of high-value transportation fuels is maximized and production of low-value RFO is minimized[5]. 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 refining technology to allow refiners to reduce production of RFO per barrel of crude oil processed and bridge the gap between the growth in demand for light products and RFO demand growth. To summarize, the primary purpose of a coker is to reduce the production of residual fuel oil by converting heavy VTBs into high value transportation fuels (gasoline, diesel, jet fuel, etc.) with petroleum coke produced as a by-product of the coking process.

It is also important to recognize that the percentage of VTBs produced as a result of refining crude oil increases dramatically as the crude oil gets heavier (i.e. lower specific gravity). For example, about 10% (by weight) of light Arabian crude oil becomes vacuum tower bottoms whereas almost 40% of very heavy Mexican Maya or Alberta crude oils become vacuum tower bottoms. Thus, refineries that are designed to process heavy crude oils are much more likely to have coking (or other VTB upgrading technology) capacity than refineries designed to refine lighter crude oil.

Coker contribution ($/barrel crude oil), is a key indicator of coking economics. It measures the difference in gross refining margins of a refinery with and without a coker. The coker contribution reveals the value created for the entire refinery by installing a coking unit at a particular time. As the coker contribution increases, refiners are motivated to make investments in new coker capacity. As rule of thumb, the expected coker contribution needs to be at least $10/bbl for the refining industry to invest in new coking capacity.

During the Golden Age of refining (2005-2008), the coker contribution for Maya crude oil averaged almost $11/bbl and peaked at $20/bbl in June 2008 (see Maya Coker Contribution chart). The incentive for refiners to run heavy, sour crude fell shortly thereafter in 2009.The same contribution has hovered just below the $5/bbl marker for the last few years.

The refining industry uses a measure called the Sweet-Sour spread as a short-hand for measuring the difference in prices




*5. Since the early 1990's cokers have also been 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 is exported as lighter crude oils, and in Canada where upgraders are used to produce SCO from the bitumen derived from Alberta oil sands. Upgrading economics are driven by crude oil economics, not refining and coking economics.*

for sweet (low sulphur) and sour (high sulphur) crudes. Typically, due to the chemistry of crude oil, sweet crudes are lighter and sour crudes are heavier. A price difference between a heavy, sour crude called Maya and a light, sweet crude called Louisiana Light Sweet (LLS) is known as the LLS-Maya spread. This spread is a key indicator of the profitability of running a coker in the United States Gulf Coast area. The Sweet-Sour (LLS-Maya) crude oil price spread averaged over $16/bbl, with the incentive reaching over $20/bbl, in early 2008. The incentive for refiners to run heavy, sour crude fell shortly thereafter in 2009.

Rising US shale oil (i.e. tight light oil) production; constraints on heavy oil production in Venezuela and Mexico; limited exports of heavy crude oil from Alberta, Canada; OPEC production constraints[6]; and U.S. sanctions on Iran and Venezuela have narrowed the Sweet-Sour price spread for the near term and reduced coking incentives. The LLS-Maya spread for the first six months of 2019 averaged around $4.50/bbl. Overall, the crude spread has been weaker in 2019, a disadvantage to refineries that have invested in cokers. Additionally, the migration to a generally lighter global crude oil has reduced the production of high sulphur RFO, causing the price discount of High Sulphur Fuel Oil[7] (HSFO) relative to crude oil to shrink in late 2018/early 2019 (see USGC High Sulfur Fuel Oil – Brent Crude Oil chart).

As we stated earlier, the primary purpose of cokers is to reduce the production of RFO by converting heavy VTBs into high value light products while producing petroleum coke as a by-product. Thus, the economics of coking improves as the discount of RFO compared to light product prices increases (i.e. product value uplift from operating a coker increases). Since light product prices are highly correlated with crude oil prices, the discount of RFO compared to crude oil is a very good indicator of coking economics. Coking economics were very poor in early 2019 (see Maya Coker Contribution chart), and refiners on the USGC responded to lower coking economic indicators by diverting some coker feed to HSFO and/or asphalt production and by advancing some maintenance planned for 2020 into 2019. As coker throughput declined, reduced petroleum coke production kept petcoke supply relatively tight, and petroleum coke prices decreased less than coal prices (see Steam Coal & Fuel-grade Petcoke Prices Chart)

### IMO 0.5% Sulphur Bunker Rule

In October 2016, the International Maritime Organization (IMO) set a deadline of 1 January 2020 for the global implementation of regulations that establish a global cap of 0.5% sulphur on bunker (marine) fuel. Alternatively, vessels can retrofit exhaust gas clean-up system technology that s removes (scrubs) sulphur oxides ($SO_2$ and $SO_3$) from the engine exhaust gases, allowing the continued use of high sulphur fuel oil (HSFO) while complying with the new regulation. . Currently, the most popular scrubbing technology utilizes seawater, which is alkaline, to react with the sulphur oxides in the exhaust gases. The seawater, with the captured sulphates, is then returned to the sea (i.e. open loop operation[8]). The choices of lower-sulphur fuels range from utilizing a low-sulphur marine fuel, which requires very little or no vessel modifications, to using liquefied natural gas (LNG), which requires substantial ship modifications. The low-sulphur marine fuel options include

*6. OPEC producers generally preferentially reduce heavy crude oil production when implementing crude oil production cuts to maximize revenue from reduced volume as light crude oil sells at higher prices than heavy crude oil. Thus, production cuts tend to create more tightness for heavy crude oil than light crude oil, and the discount for heavy crude oil tends to reduce.*

*7. HSFO is HS RFO that meets certain specifications (primarily viscosity) of the marine bunker industry.*

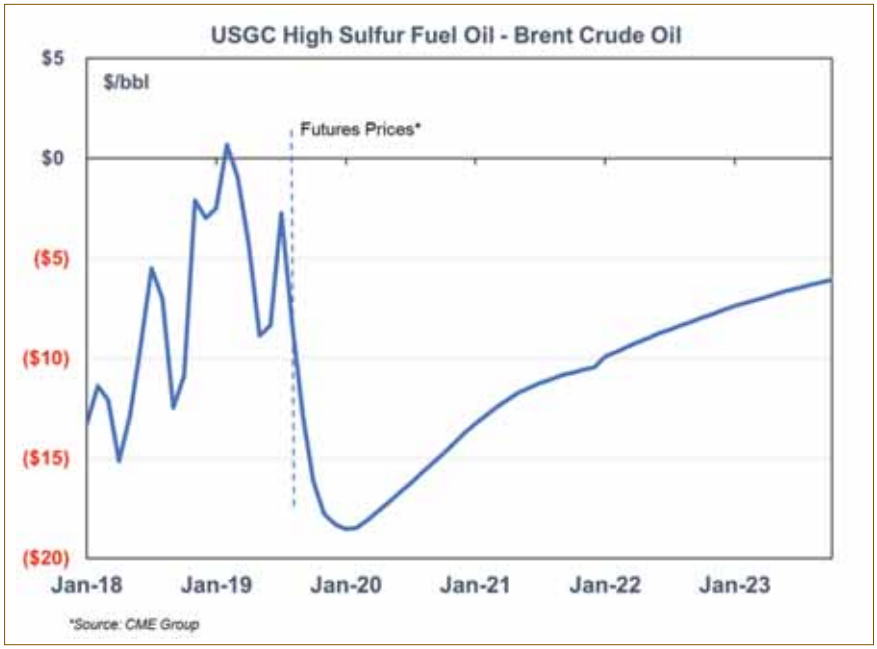
low-sulphur residual fuel oil (LS RFO), low-sulphur marine gas oil (MGO), low-sulphur marine diesel oil (MDO), and blends of these fuels. The IMO estimates that there are 50,000+ vessels of 5,000dwt or larger that will be subject to this regulation.

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 replace this fuel with much lower sulphur fuel and to 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. Despite a recent surge in ships being retrofitted with $SO_X$ scrubbers, it is our understanding from shipping sources that vessels representing 15–20% of HS RFO bunker demand will be retrofitted with $SO_X$ scrubbers by 2020. It is also important to note that it takes around 12–15 months per vessel from order until scrubber installation is complete.

Therefore, the dominant fuel solution for the 0.5% sulphur bunker rule compliance in the short to medium term is likely for ships to use low-sulphur bunker fuel rather than 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 a 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 an increased incentive to process heavy, sour crude oil and maximize the production of MGO/MDO. Thus, as 2020 approaches, we expect that petroleum coke 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 25–40% of current HS RFO bunker demand will be equipped with $SO_X$ scrubbers.

The key fact remains that the 0.5% sulphur bunker rule is going to cause a very large reduction in demand for HSFO, and the price for HSFO is expected to drop significantly (see USGC High Sulfur Fuel Oil – Brent Crude Oil chart). Presently, the price difference between USGC HSFO and Brent crude in Northwest Europe (NWE) appears to be returning to historical differences after narrowing significantly toward the end of 2018/early 2019. The futures prices discount for HSFO increases significantly in the fourth quarter of 2019 and in 2020. Thus, futures prices indicate that the market expects the HSFO discount to crude oil to increase rapidly (i.e. HSFO prices to drop quickly), then gradually decrease as the oil market adjusts to the MARPOL VI 0.5% sulphur bunker rule.

It is very possible that HSFO futures prices for 2020 are too high. As we noted earlier, a significant portion of the HSFO that is currently being sold to the marine market will probably need to be sold to the power market once the MARPOL VI 0.5% sulphur bunker rule goes into effect. Japan has significant under-utilized power generating capacity that can burn HSFO and is equipped with $SO_2$ scrubbers. However, HSFO imports would have to displace liquified natural gas (LNG) imports. Recent data indicates that Japan is making spot purchases of LNG at the equivalent of approximately $32/boe (barrel of oil equivalent), delivered to Japan. Currently the USGC HSFO futures price for January 2020 is approximately $42/bbl thereby eliminating any economic incentive for Japanese power producers to use HSFO instead of LNG, unless HSFO prices drop significantly below $42/bbl (assuming spot LNG prices do not increase).

### Impact on coking

As we stated earlier, the primary purpose of cokers is to reduce the production of RFO by converting heavy VTBs into high value light products while producing petroleum coke as a by-product. Coking economics tends to improve as the discount of RFO compared to crude oil increases.

Refineries that do not have coking or other vacuum tower bottoms upgrading technology will have to sell HSFO at a large discount — most likely to the power industry. We can also expect that refineries without coking or other VTB upgrading technology will be seeking light sweet crudes to produce less residuals — ultimately driving up the price of these crude oils. Overall higher prices for key sweet benchmark crudes such as Brent, West Texas Intermediate (WTI) and Louisiana Light Sweet (LLS) can be anticipated, and discounts for medium sour and heavy crudes versus these lighter sweeter crude oils will increase.

Refineries with deep conversion, such as those with coking units, will see strong margins — especially in 2020.

*8. It is possible for $SO_X$ scrubbers to be designed to operate in closed loop mode, which requires the vessel to carry reagent (e.g. lime) and store the reacted material (i.e. scrubber sludge) for appropriate disposal in port. Closed loop scrubbing is more expensive to operate than open loop. Open loop scrubbing has been banned by some ports, necessitating vessels equipped with scrubbers to either operate in closed loop scrubbing mode or use low-sulphur fuel while in these ports.*

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., gasoline, distillate fuel which is similar to MGO meeting the required sulphur limit of 0.5% maximum, jet fuel, etc.) 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 SOX scrubbers will ultimately consume 0.6–1.1 million bbl/day of HS VTB, the refining industry will be left with large quantities of HS VTBs with no obvious market.

The low-priced high-sulphur residual material displaced from the bunker market because of IMO 2020 will likely provide strong coking incentives for the next few years as markets sort out what to do with this material. Most analysts expect several years of change in the refining/bunker fuel/shipping industries as participants work out the most economic ways to meet the IMO 2020 regulations.

## Conclusion

Seaborne petroleum coke trade flows have been impacted by environmental regulations in India and China, as well as China imposing 25% import tariffs, and recession in Turkey. However, the biggest impact on seaborne petroleum coke will occur beginning near the end of 2019 and continuing thereafter for several years 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, petroleum coke production at existing cokers will increase in response to improved coking economics. Longer-term, some additional coking capacity will be installed to convert excess high sulphur VTBs into higher value light products (and consequently produce more petroleum coke as a by-product). Seaborne petroleum coke trade could increase by 10+% in the near term and, longer term, seaborne petroleum coke trade could increase by 30+%.

DCi

# About the authors

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Advisian (previously 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 petcoke market information.

# Nippon Paint Marine reflects on ship coatings

White paint doesn't look clean for long. Yet ship coatings of a darker hue absorb more heat, increase the heating, ventilation, and air conditioning (HVAC) requirements and, consequently, electrical load, resulting in higher fuel consumption and emissions.

So, what the industry needs is a darker coating that fails to absorb the heat, right? A coating like Nippon Paint Marine's Ever Cool.

Introduced to the market following extensive shipboard trials, Ever Cool is specially formulated to reduce the effect of the sun's infrared rays on ship operations.

The temperature difference between, for example, a deck coated with conventional paint system and one with Ever Cool can be up to about 28°C, with the specially formulated coating reflecting up to 80% of the sun's heat from coloured coatings.

Requiring no special application tools or processes, Nippon Paint Marine uses advanced formulated reflective pigments to prevent surface temperature increases and lower heat transfer through steal plate and other structures.

During tests on the compass deck of a Panamax bulk carrier, heat sensors recorded a surface temperature of 70°C on conventionally coated areas and 42°C on areas applied with Ever Cool.

A similar test carried out over six months took place on the deck above a vessel's wheelhouse. Measuring some 4,379 different points, the sensors registered no solar reflecting effects during the low temperature months of January and February, but when the mercury began to rise from March, "we noticed a huge amount of solar reflectance," said Olaf Töbke, Director, Nippon Paint Marine (Europe).

*Nippon Paint Marine has introduced a range of darker coatings that reflect heat.*

Where a conventional grey polyurethane coat had a deck surface temperature of 71°C, the grey coloured Ever Cool was 23°C cooler. Ever Cool in green had a temperature of 51°C against the 64°C of a similar coloured epoxy. Red coloured polyurethane and epoxy-coated decks each had a surface temperature of 71°C, while the red coloured Ever Cool was 54°C.

Explaining Ever Cool's potential in reducing newbuild and operational costs, Töbke said: "By reducing the surface temperatures of exposed decks, shipbuilders can reduce the insulation requirement, while ship operators can reduce the air conditioning/chiller load, saving fuel and improving the onboard conditions for passengers and crew, especially in tropical climates."

In addition to decks, the heat resistant coating can also be applied to the topside of ballast water and cargo tanks, to ensure their contents remain at a safe and steady temperature. The technology is also applicable to LNG insulated tanks to lower boil-off gases.

While new to the maritime sector, Nippon Paint has supplied solar reflective paint (SRP) to other industries for a number of years.

The technology is used in the building industry to coat aluminium cladding and a Japanese car manufacturer is using the paint to reduce the interior temperature of parked cars. The car manufacturer found that an SRP-coated car can reduce internal temperatures by about 11% compared to a conventionally painted car.

### About Nippon Paint Marine

Nippon Paint Marine is a subsidiary of Nippon Paint, a top five global paint supplier.

Nippon Paint has been producing marine coatings in Japan since the 1880s and has been the leader in the development of all kind of marine paint technology but especially antifouling paints. Nippon Paint developed and launched the world's first self-polishing (SPC) tin-free antifouling paint in the 1990s and followed that by the launch of the world's first low-friction SPC in 2006.

# Scorpio Bulkers orders a further nine scrubbers

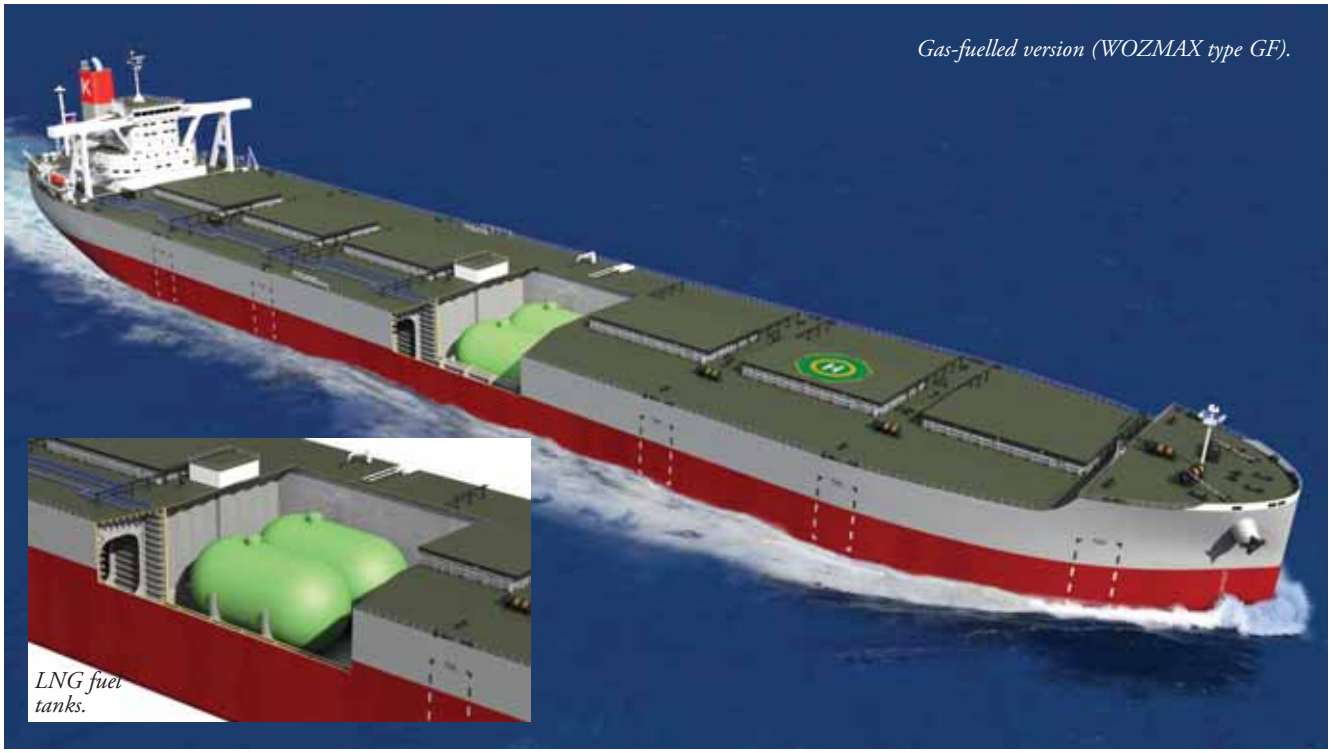
Scorpio Bulkers Inc. has confirmed that it has ordered a further nine ENVI-Marine™ emission control systems, at a combined cost of US$13.0m. The order, placed with Pacific Green Technologies, is on top of the 28 systems already ordered by Scorpio Bulkers, as announced in December 2018. The systems that are being fitted are a 'hybrid ready' design, which allows them to be upgraded to a 'closed loop' configuration at a future date.

Pacific Green Technologies Executive Director Scott Poulter said: "This is a further vote of confidence in Pacific Green's Technologies ... Scorpio Bulkers has invested in the latest generation of fuel-efficient vessels and the hybrid-ready ENVI-Marine™ system will give the company the return-on-investment and flexibility it needs to face the complexities of IMO 2020."

Pacific Green Technologies has the scale and manufacturing ability to deliver large orders thanks to its partnership with PowerChina SPEM. PowerChina is one of the world's largest engineering procurement construction companies with 2018 revenues of $59.93 billion.

"We are one of the few marine scrubbing companies with the scale to fulfil major orders. We now have an order book in excess of US$200m and the technical know-how, the people and the facilities to manufacture our systems on a large scale," added Poulter.

# Joint Approval in Principle for new concept design of LNG-fuelled ore carrier



*Gas-fuelled version (WOZMAX type GF).*

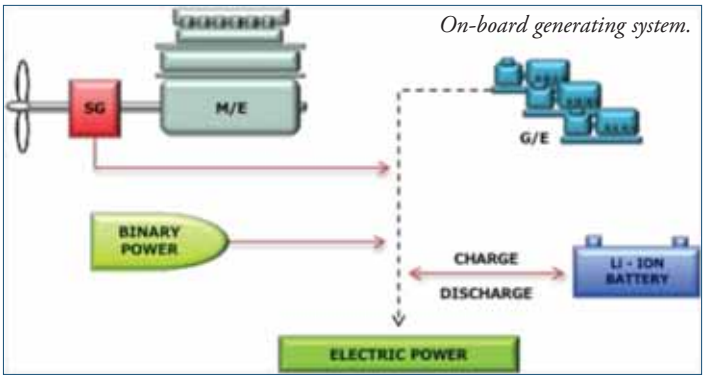
*LNG fuel tanks.*

Kawasaki Kisen Kaisha, Ltd. ("K" Line) and Namura Shipbuilding Co., Ltd. (Namura Shipyard) have joint AIP (Approval in Principle) for the concept design of an LNG-fuelled ore carrier from DNV GL.

Work on this joint project for the development of an LNG-fuelled ore carrier has complied with both environmental and actual operation requirements as follows, based on the second-generation WOZMAX®*1 of Namura Shipyard:

- to keep almost same deadweight and normal service speed as WOZMAX®;
- to keep enough endurance for the round-trip between Singapore and Brazil in gas fuel mode, arranging the LNG tanks in the centre section of the hull; and
- to achieve EEDI phase 3*2 by means of primary fuel changes to LNG.

In addition to LNG fuel conversion, "K" Line studied the possibility of it being combined with shaft generator, binary cycle power generation system and lithium battery so as to further reduce $CO_2$ emissions and confirmed that this system can achieve an additional further 4% reduction of fuel oil consumption.




*On-board generating system.*

"K" LINE is continuously attempting to obtain greater efficiency in its operations, as well as further reduction of $CO_2$ emissions and environmental pollutants, in accordance with the "K" LINE ENVIRONMENTAL VISION 2050*3, its long-term environmental management vision. This system is considered as one of the efficient systems that will help the company achieve its goals by 2050.

Environmental concerns about the greenhouse gas emissions effect is growing and "K" Line will, based on its environmental vision, encourage a lower environmental load from marine transport by operating ships that are highly energy efficient and which contribute to conservation of the global environment.

DCi

*1 WOZMAX (registered brand of Namura Shipyard): an optimum size of vessel that can call main West Australian iron ore loading ports, which stands for 'West' 'OZ' 'MAX'.

*2 EEDI (Energy Efficiency Design Index): the number of grams of $CO_2$ emitted when carrying one tonne of cargo for one mile, and 30% reduction is required in phase 3, compared with the reference value which is the average of vessels built between 1999 and 2008.

*3 "K" LINE ENVIRONMENTAL VISION 2050 can be found on the company's website.

**COMPARISON OF PRINCIPAL PARTICULARS**

| | WOZMAX type GF | Second generation of WOZMAX® |
|---|---|---|
| Dimension | LOA: abt.329.9m x B: 57.00m x D: 25.60m | Same as on the left |
| Deadweight | abt. 250,000 metric tonnes | Same as on the left |
| Service speed | 14.3 knots | Same as on the left |
| Main engine | Dual-fuelled diesel engine x 1 set | MAN-B&W 6G80ME-C9.5 x 1 set |
| Fuel tank | LNG fuel tanks in centre section of the hull | Heavy fuel tanks |
| Endurance (LNG fuel) | Singapore to Brazil in gas fuel mode | |

# ABS appoints global head of cyber security to meet increasing industry challenges

## Maritime digitization driving demand for new approaches to cyber security

ABS has appointed well-known cyber expert Ian Bramson as its Global Head of Cyber Security. In this role, Bramson will lead the development of a cyber security risk reduction programme to meet increasing demand for improved control and visibility of cyber risks.

"Cyber security is a business imperative as our world transforms rapidly and becomes more digital," says Christopher J. Wiernicki, ABS Chairman, President and CEO. "The more connected our people and systems become, the more our industry's operations are exposed to emerging risks."

A recognized leader with a strong track record of success in cyber security, Bramson has been solving cyber security challenges for more than 20 years. He is a recognized and respected thought leader, market developer and change expert that brings solid and effective strategies to meet these challenges.

Bramson has helped organizations solve cyber-related business challenges, such as managing the convergence of information technology with operational technology (OT), supporting risk management and enabling digital transformation. Before joining ABS, Bramson was the Global Head of Cybersecurity Sales and Strategy for Siemens AG. In this role, he worked with top leaders across the energy market to develop strategic cyber security solutions to meet their OT needs.

"As maritime becomes more digital, and cyber attackers increasingly move from traditional IT targets to actively disrupting, delaying and destroying core operations, it is critical that our clients and industry have the right knowledge and tools to reduce the likelihood of an incident and its impact on operations," says Bramson. "I look forward to working with leaders in the Global Marine and Offshore industries to build an efficient and effective solution for sustainable, secure operations."

Bramson's work will build upon the award-winning ABS FCI Cyber Risk™ method. This innovative method is an easily understandable and scalable approach to measuring and managing cyber security risk for a single asset or an entire fleet.

## About ABS

ABS, a major global provider of classification and technical advisory services to the marine and offshore industries, is committed to setting standards for safety and excellence in design and construction. Focused on safe and practical application of advanced technologies and digital solutions, ABS works with industry and clients to develop accurate and cost-effective compliance, optimized performance and operational efficiency for marine and offshore assets.

# Ports of Auckland buys world's first electric tug

Ports of Auckland has signed a contract with Dutch company Damen Shipyards to buy the world's first full-size, fully electric port tug.

The new tug, a Damen RSD-E Tug 2513 to be delivered in 2021, will have a 70-tonne bollard pull, the same as the port's strongest diesel tug *Hauraki*, also built by Damen.

"In 2016 we set ourselves the goal of being zero emission by 2040," says Tony Gibson, CEO of Ports of Auckland. "We set this goal because we recognize that urgent action is needed on climate change, and we wanted to be part of the solution. However, setting that goal created a tough challenge. We have a lot of heavy equipment, like tugs, and in 2016 there were no zero emission options."

"When we first looked into buying an electric tug in 2016, there was nothing on the market," says Allan D'Souza, Ports of Auckland's General Manager Marine, Engineering and General Wharf Operations. "We talked to several manufacturers about building a battery powered tug. They told us we were dreaming. Hybrid tugs were possible, they said, but not battery. No way."

"Luckily for us," said Mr Gibson "Allan doesn't give up. He and Marine Technical Superintendent Rob Willighagen kept talking to manufacturers, kept suggesting ways to solve problems, and they found a partner willing to take on the challenge: Damen Shipyards."

"I would like to acknowledge Damen for their work on this project since 2016. They have invested a significant amount of time and money to develop this innovative vessel. In the fight against climate change, partnerships are important, and Damen have been a great partner," he added.

James Shaw, Minister for Climate Change said, "People who say we have to wait for the technology to emerge before we can set ourselves bold goals have got it round the wrong way. Many of the challenges we face with climate change will require solutions that aren't yet on the market. Ports of Auckland and an increasing number of other businesses across New Zealand are showing that won't stop them finding ways to meet our goals on greenhouse gas emission reductions."

Auckland Mayor Phil Goff said, "Commissioning the world's first fully electric large tug represents a strong commitment by Auckland and its port to reducing carbon emissions and achieving our carbon zero target.

"It's great for the environment, reducing pollution in the city centre and cutting back carbon emissions.

"The life of the tug is around 25 years. By going electric now, we save 25 years of diesel pollution and a net reduction in costs of around $2.5 million because it is so much cheaper to operate."

Gibson said "It was important to us that a new electric tug should be able to carry out normal port operations, just like our existing diesel tugs. Our new e-tug will be able to do three to four shipping moves on a full charge, or around three to four hours work (one shipping move takes an hour on average). A fast charge will take about two hours. This is just what we need."

"One of the other hurdles we had to get over was cost. The purchase price of this tug is significant, at roughly double that of a diesel tug, and that is an important consideration for a business that needs to make a profit. However, we are prepared to wear that up-front cost because our commitment to reduce emissions has to be more than just words.

Fortunately, the cost of operating an electric tug is less than a third of the cost of running a diesel tug. So while we pay more up front, over the life of the tug we'll save around $12 million in operating costs, making our electric tug cheaper in the long term," he added.

# Dunkerque-port rewards clean port calls on its terminals to improve air quality

For more than ten years, Dunkerque-Port has pursued a genuinely proactive policy in favour of sustainable development of the port. Implemented in 2014 by the roll-out of the Structural and Sustainable Development Plan (PA2D) which defines and supervises more than 150 operations in that respect, it has resulted in the use of good environmental practices especially in terms of dredging sediment management and preserving biodiversity. The mature strategy recently developed into an environmental management system, which obtained Port Environmental Review System (PERS) certification in 2018 as part of the ECOPORT network.

Marking the European Sustainable Development Week in May/June, and in order to accentuate the efforts made to reduce atmospheric emissions — in particular through the Regional Climate, Air and Energy Action Plan (SRCAE) backed by the Dunkerque Urban Community (CUD) — Dunkerque-Port has launched an environmental reward system for low-emission vessels calling at Dunkerque. The initiative will help to improve air quality.

Air quality and a reduction in the emissions of sulphur, nitrogen and other fine particles have become international priorities. This is evidenced by the regulatory changes initiated by the International Maritime Organization (IMO).

The maritime transport sector, a contributor to atmospheric emissions, is making positive progress in this direction by offering ever more efficient, energy-efficient vessels and using fuels that have less impact on the environment.

To encourage this change, Dunkerque-Port has joined forces with the Environmental Ship Index initiative (ESI) initiated by the International Association of Ports and Harbours (IAPH), the principle of which is to assign a score to ships based on their atmospheric emissions. The higher the ship's rating, the cleaner its air quality.

Companies and charterers that call at Dunkerque are invited to join this responsible initiative by signing a charter. The latter is intended to underline the willingness of companies and charterers to use more efficient, low-emission vessels for their port calls in Dunkerque. In return, Dunkerque-Port undertakes to pay a financial reward at the end of each year. The latter is calculated on the basis of the number of clean port calls made by the company or the charterer, in proportion to the total number of clean port calls recorded in the port over one year. An annual envelope will be distributed among the signatories of the charter.

Dunkerque-Port is one of the 50 or so volunteer ports in the world that have already approved the initiative.

# Recycled wood chips used to process new wood products at Port of Amsterdam

Mecore BV, a provider of recycling solutions and energy facilities based on the Overslag Bedrijf Amsterdam (OBA) site, exports B-grade waste wood chips sourced from sorted construction and demolition waste and collected industrial waste. The quality of these materials previously only made them suitable for energy generation in biomass plants. By processing the waste materials further so they can be used to manufacture new chipboards, Mecore has created an effective recycling solution for large amounts of B-grade timber in the Amsterdam Metropolitan Area (AMA). According to the company's owner and director, Jack Jennissen, Mecore is a pioneer in the processing of B-grade timber for the first delivery under this contract. "Whereas before we were only able to use higher-quality waste wood (A-grade and A-B- grade), thanks to improved techniques and purchasing practices we can now also process B-grade wood into usable raw materials."

This marks a great leap forward from a logistics point of view. "Since the Netherlands has no chipboard/MDF/HDF/OSB-producing industry, we always relied on road transport to the surrounding countries. The fact that it's now loaded onto a ship immediately after it has been processed and the buyer has its own wharf facilities, road transport is kept to an absolute minimum."

Since January 2019, Mecore has been using a section of the OBA site for wood-chip exports, having reserved part of the coal-processing site for this purpose. For OBA Bulk Terminal, these additional volumes form part of the further expansion if its operations; one of its stated goals is to increase the open transhipment of processed circular and recycling cargo flows. With demand for the transshipment of coal as input for power generation expected to decline, a gradual transition to a multi-purpose bulk terminal on OBA's nearly 700,000-sq. m. industrial site in the western port area is one of the company's key strategic objectives. This is also consistent with Port of Amsterdam's policy to adopt more sustainable practices in the port.

# Antwerp Railhouse offers all-weather rail solution

Antwerp Railhouse, a covered warehouse with two railway tracks, opened at the Port of Antwerp in the Churchill dock at the beginning of May. This investment by Zuidnatie, Conti7 and Edmond Van Dyck & Sons further reinforces Antwerp's position as a breakbulk port. Antwerp Railhouse will also help to increase the share of rail transport in the modal split.

Antwerp Railhouse is located at Quay 472 in the Churchill dock and is 30,000m² in size. The covered warehouse has two rail spurs and is equipped with a 40-tonne gantry crane. Trains can drive directly inside to be loaded and unloaded in a conditioned environment.

Antwerp Railhouse will mainly handle steel products. With a volume of eight million tonnes per year, steel accounts for a significant fraction of breakbulk in the port of Antwerp. Since certain steel products cannot tolerate moisture the covered warehouse is a significant advantage. In addition, Antwerp Railhouse will also handle wood, paper and other weather-sensitive products.

### Aiming to double the rail freight volume

Port of Antwerp aims to double the volume of freight carried by rail between now and 2030. Antwerp Railhouse can help to reach this objective. Indeed, rail transport plays a crucial role in the future plans for development of the Churchill site. Antwerp Railhouse will assure even smoother connections with existing rail lines and hubs.

# Double-digit growth for Hamburg's bulk and container cargo transport on inland waterways


Hamburg is Germany's biggest universal port and, with 9.9mt (million tonnes) throughput in 2018, its second biggest inland port. For the first quarter of 2019, the recently published inland vessel data from the northern statistics office reports 34,640 TEU for the Port of Hamburg. This represents an increase of 20% in comparison with the same period last year. Additionally, in the first three months of 2019, at 2.57mt, the total quantity of cargo carried by inland waterway craft between the Port of Hamburg and its hinterland achieved double-digit growth of 12.1%.

One limiting influence on the further development of quantities by inland vessel this year has been the barely navigable River Elbe caused by low water since May. From Stefan Kunze's point of view; he is head of the Port of Hamburg Representative Office in Dresden, against this backdrop it is difficult to forecast the ongoing development of cargo quantities carried by inland vessels on the Elbe this year. Already last year, for the Middle and Upper Elbe from the Geesthacht lock to the next one at Usti nad Labem in Czechia, that is to say the non-dammed section, navigation was difficult. At times, from June onwards on this section of the river, inland shipping came to a standstill because of inadequate draught.

Fundamentally, the expected increase in seaport-hinterland traffic in the coming years will open up very good prospects for Hamburg for more shipments by inland craft in the Elbe river basin. However, in Kunze's view, this calls for better alignment of the infrastructure to the operating requirements of inland shipping. He stresses that: "Digitalization and intermeshing the various carriers, construction work on the waterways and optimized coordination of inland vessel calls in the Port of Hamburg, will in future lead to more cargo and simplified handling of transport chains along the Elbe and Elbe Lateral Canal."

The sea transport forecast for 2030, predicts above average growth for seaport-hinterland transport in Germany. Kunze believes that to cope with this, apart from the road and rail networks that are already operating at almost full capacity, inland shipping has to be incorporated far more into transport chain planning.

# Avoiding negative results in US ports

## Republic of the Marshall Islands Maritime Administrator remains vigilant

Detentions cost time and money, but all too often ships are detained in the United States (US) for easily avoidable deficiencies. Although all types of vessels can be detained, bulk carriers were the most common type of vessel detained by the US Coast Guard (USCG) in 2018.

According to the USCG's 2018 Annual Report, the top 50% of detentions by deficiency type were attributed to firefighting appliances/fire safety (22%), followed by certificates/logbooks (16%), and finally Safety Management Systems (SMSs) (12%). In total, 3,063 port State control (PSC) examinations were conducted on bulk carriers by the USCG last year, resulting in 35 bulk carriers, from various flag States, being detained in US ports.

## Repeating the same mistakes

Easily preventable deficiencies can cause delays and/or detentions even for quality vessels manned by competent and experienced crew. This is where a quality flag State can provide exceptional value. Although the ship owner and operator are ultimately responsible to operate the ship in compliance with all applicable standards, a flag State works with the ship owner or operator to make sure that vessels are maintained to the highest standards. A quality flag also alerts owners and operators of any additional measures that can be taken, both on board and ashore, to enhance compliance. Often this is just preparing vessels for inspections before they enter port and ensuring the crew can demonstrate compliance during a PSC inspection.

Common deficiencies picked up by PSC authorities can be easily avoided if reported to flag State authorities in advance via the notice of arrival. After all, problems can and do occur. Early action and transparency can prevent delays and avoid deficiencies and detentions. This is particularly true with issues relating to International Safety Management and SMSs. Flag States and PSC authorities recognize the pressures that companies and crews face, which is why collaborating to avoid further problems should be viewed as a partnership, not a punishment. Each player in the maritime industry should be engaged as a partner, to promote safe and secure maritime operations and effectively anticipate and manage risk. Flag States that share the responsibility for compliance and track deficiencies among their fleet can recognize commonly occurring deficiencies, alert operators and crew, and provide resources for training or onboard support, reducing the risk of repeated mistakes or deficiencies.

## A shared responsibility

The key to overseeing safety, security, and environmental compliance on ships is ensuring that the crew on board understands that looking after the safety aspects of a ship is just as critical as moving cargo between ports or terminals. A significant part of the Republic of the Marshall Islands (RMI) Registry's value to its owners and operators is a commitment to addressing compliance issues with PSC authorities. To that end, the RMI has a robust Maritime Safety Program.

This in-house focus on promoting quality and marine safety is led by a team of highly experienced Fleet Operations Managers, who take a hands-on approach to active oversight of the safety of the RMI fleet.

This team also manages a comprehensive global inspection team and engages with PSC authorities worldwide to ensure open, transparent, and fair dialogue. It is this transparency that is so vital to keeping vessels and crew safe.

RMI adheres to the most stringent PSC authority regulations and employs an in-house compliance targeting matrix to identify vessels that may require additional support. This proactive approach can help owners and crew rectify issues before they become significant, so long as there is an open and active reporting dialogue with the flag State.

### A matrix of common-sense clues

The RMI Maritime Safety Program dedicates considerable resources to continuously track and monitor the RMI fleet using a complex matrix of composite data. Vessel age, build, cargoes carried, flag State inspections, and PSC history are important datapoints that go into the matrix. Where deemed necessary, real-time vetting is conducted and port and flag State expectations are communicated directly to RMI vessel operators prior to arrival in a port.

However, support of vessels is not something limited to a complex matrix, to be effective it requires hands-on and real-time collaboration. For example, crews are assisted in completing their Critical Items Checklist prior to arrival in port, a requirement often missed by vessels new to US ports and, which when not completed, can cause significant delays. The RMI team also works closely with the operator and crew to help them maintain real-time compliance, undertaking a quality control boarding if requested or necessary, which includes talking with the Captain and testing critical equipment. This spirit of working together ensures that RMI flagged vessels and crews are not just prepared, but also confident when going through a PSC inspection.

### Strong track record

The RMI's strong PSC performance around the world is reflected in the RMI's recognition on the Paris and Tokyo Memorandum of Understanding white lists. It is also demonstrated by the top flag rating by the International Chamber of Shipping and by receiving Qualship 21 status from the USCG for 15 consecutive years, which is unprecedented.

This means that vessels flying the RMI flag are less likely to be targeted for inspection by PSC authorities. PSC authorities recognize that the RMI works with the owners and their crew to ensure that their vessels are maintained to the highest standards.

### Mitigating supply chain risk

The global nature of the maritime industry requires flag States to maintain worldwide support. Different PSC authorities focus on different areas of compliance. The RMI's Marine Safety Program includes inspectors on the ground worldwide who work to foster co-operative relationships through proactive outreach programmes with PSC authorities. The RMI team of inspectors in the US is extremely experienced. Many come from PSC or class society backgrounds, providing both technical and regulatory support to the operators and crews of RMI flagged vessels.

Port States around the world are increasingly critical in their approach to vessel inspections, and when detentions occur, they are reported in the public domain. Vessels and operators with a history of detentions will begin to find themselves negatively profiled, making it difficult to trade unhindered, creating potentially significant challenges and obstacles in areas from chartering to ship management.

For charterers and traders of dry bulk commodities, engaging vessels with positive PSC records that are registered to a reputable, high quality flag will go a long way toward avoiding negative results and mitigating risk in their supply chain.

# Pilot with sailing drone deployed at the Port of Amsterdam for depth inspection of ships at locks

The *Telemetron*, a sailing drone that inspects the depth of marginal ships at the locks of IJmuiden, shows that drones can do more than just fly. The aim of this pilot, a collaboration between Port of Amsterdam, the Dutch Customs Office, Seabed and Maritime Robotics, is to gain experience in new technologies in nautical processes.

The pilot was set up with a view to gaining more information and experience regarding sailing drone technology. This development, together with autonomously sailing vessels, will have a great impact on future nautical processes. The experiment in early July took the first steps in examining the impact, the potential of the technology for Port of Amsterdam and the steps Port of Amsterdam has to take to prepare for a more structural deployment in the future.

### Customs

The pilot was set up in collaboration with Seabed. This system integrator from Amsterdam brought over the *Telemetron* of Maritime Robotics in Norway to the Netherlands for the test week.

The *Telemetron* is the research vessel of Maritime Robotics on which they test their hardware and software. Seabed provides the measurement equipment on board the *Telemetron*.

The Dutch Customs Office also took part in this pilot, which wants to scan the hulls of vessels entering the ports.

### Passage of marginal ships

For the pilot it was decided to examine the inspection process of marginal ships. Marginal ships are vessels of which the depth is such that they require an exemption for passing through the Noordersluis lock.

The inspection process, which involves a salt measurement at Forteiland and reading out six marks on the hull of the ship, is well-suited for testing drone technology. During the week, the drone was deployed in various sub-scenarios for the depth inspection process simulation. This calculated the depth which, in combination with the salt level, determines whether the ship can pass through the Noordersluis lock or has to be made lighter.

### Safety

The pilot took place amongst regular shipping traffic. Safety therefore required particular attention. A permit was acquired for the pilot. During the test phase the *Telemetron* was 'manned' whilst the sailing drone was able to sail (semi-)autonomously. Joost Zuidema, project manager of Port of Amsterdam, said: "Safety is our number one priority, hence our decision to have a boatmaster on board the *Telemetron* during the test phase. We can test the autonomous sailing in a subsequent phase. Together with the various parties, we want to use this pilot to gain experience and insights into the possibilities, and so be prepared for what the future brings. Foresight is the essence of management."

# Port of Rotterdam Authority launches new company PortXchange to make digital shipping app Pronto available to ports worldwide

On 8 August 2019, the Port of Rotterdam Authority launched its new company PortXchange Products BV (PortXchange). This entity is set up to offer the Pronto platform and application to ports around the world over the next few years. The establishment of a separate company will enable partnerships with a variety of global players.

The launch of PortXchange provides a platform to create new strategic partnerships with ports, shipping companies and terminals, geared towards implementing smart digital solutions like Pronto in ports worldwide. This in turn contributes to the ambition of Port of Rotterdam to become the world's smartest port.

## PortXchange

Trust between parties for the free exchange of data is vital to the successful introduction of Pronto in other ports. The establishment of a separate company enables the solution's neutrality and independence, and improves cooperation between all parties.

PortXchange aims to improve the efficiency of port calls and help clients reduce their emissions — both in the port as well as between ports. To this end, the company provides Pronto: a joint platform that can be used by shipping companies, agents, terminals, port authorities and other (nautical) service providers, which enables them to optimally plan, execute and monitor all activities during a port call based on the exchange of standardized data. In addition, Pronto enables just-in-time sailing, which helps reduce carbon emissions.

## A smart port is a connected port

Taking the lead in digital transformation enables the Port of Rotterdam to become more efficient, reliable and, as result, more competitive. "By making our application available to ports across the world we can optimize the potential of digital solutions. The more ports use smart solutions, the more valuable these become. The establishment of a separate company for Pronto's global roll out is an excellent example of this approach," stated Allard Castelein, CEO Port of Rotterdam Authority.

## Partnerships

The first PortXchange partnerships have already been signed – with Shell and A.P. Moller - Maersk. Castelein: "Pronto will be offered in several ports in Europe and the US before the end of the year. The ambition for the years ahead is to make Pronto available to ports worldwide. Partnerships with major international players like Shell and Maersk play a crucial part in making Pronto a global success."

Grahaeme Henderson, Vice President of Shell Shipping & Maritime: "We are moving towards a global, end-to-end digitally connected operating environment for shipping, as in the airline industry. For example, at Shell, our onshore digital centre is able to analyse 500 data points a second in real time from each ship we manage.

In partnering on Pronto, we can see opportunities to extend this work to optimizing port operations. The results of our trials so far have already shown the great benefits in increased efficiency, reduced fuel and operating costs, and lower emissions."

Kent Stig Hagbarth – Head of Operations Execution at A.P. Moller-Maersk: "We see a significant need and opportunity to improve the collaboration, communication, and single data usage amongst port participants for optimized sailing and port calls for vessels. The aim of the Pronto platform, to enable just in time arrival and optimize the port stay of our vessels, not only enables us to increase schedule reliability to the benefit of our customers but also to achieve our goal of reducing our $CO_2$ emissions."

# Kestrel flying high with project cargo at the Port of Liverpool

## The challenge

Kestrel is a global shipping and logistics company with a diverse client base ranging from shippers and manufacturers to freight forwarders. It has helped to move various types of project cargo, including wind turbine parts. Kestrel has even moved cargo for Peel Ports, shifting container gantry cranes from Liverpool to Greenock.

Wind turbines are rarely manufactured in the UK so are imported in volumes of up to 60 pieces.

One widely used model consists of 116ft blades atop a 212ft tower for a total height of 328 feet. Another model has 148ft blades on a 262ft tower, totalling 410 feet. Handling such cargo safely and efficiently is a huge challenge for any port, requiring specialist facilities and skills.

## The solution

Project cargo is heavily legislated with transport of abnormal loads by road, so logistics providers have to work with the best located ports to get close to end destination.

Liverpool and Clydeport are ideal locations for project cargo, as they are close to industrial areas where end clients are based. Liverpool's direct link with the Manchester Ship Canal provides a great onward water route to help avoid road transport altogether. Liverpool's wider connections provide easy stopping-off points via short-sea shipping to other areas of the North West.

Peel Ports' Clydeport facilities in Greenock and King George V provide suitable cranes for loading and discharging project cargo; the same is true of Liverpool.

All these ports also offer extensive open and covered storage space — vital when needing to set down large components. At Liverpool, there is now even more space due to a new train service which is helping to manage storage and flows of cargo at the port.

Richard Platts, project and breakbulk specialist of North for Kestrel, said: "I've worked closely with Peel Ports over the years. I've shipped cargo through a number of their ports. The facilities at Liverpool and Glasgow are particularly good for project cargo thanks to deep water and storage space. The team is also excellent, with a great attitude to customer service and friendly approach. They understand what we need so we all benefit from providing first-class service that allows us to meet our customer expectations."

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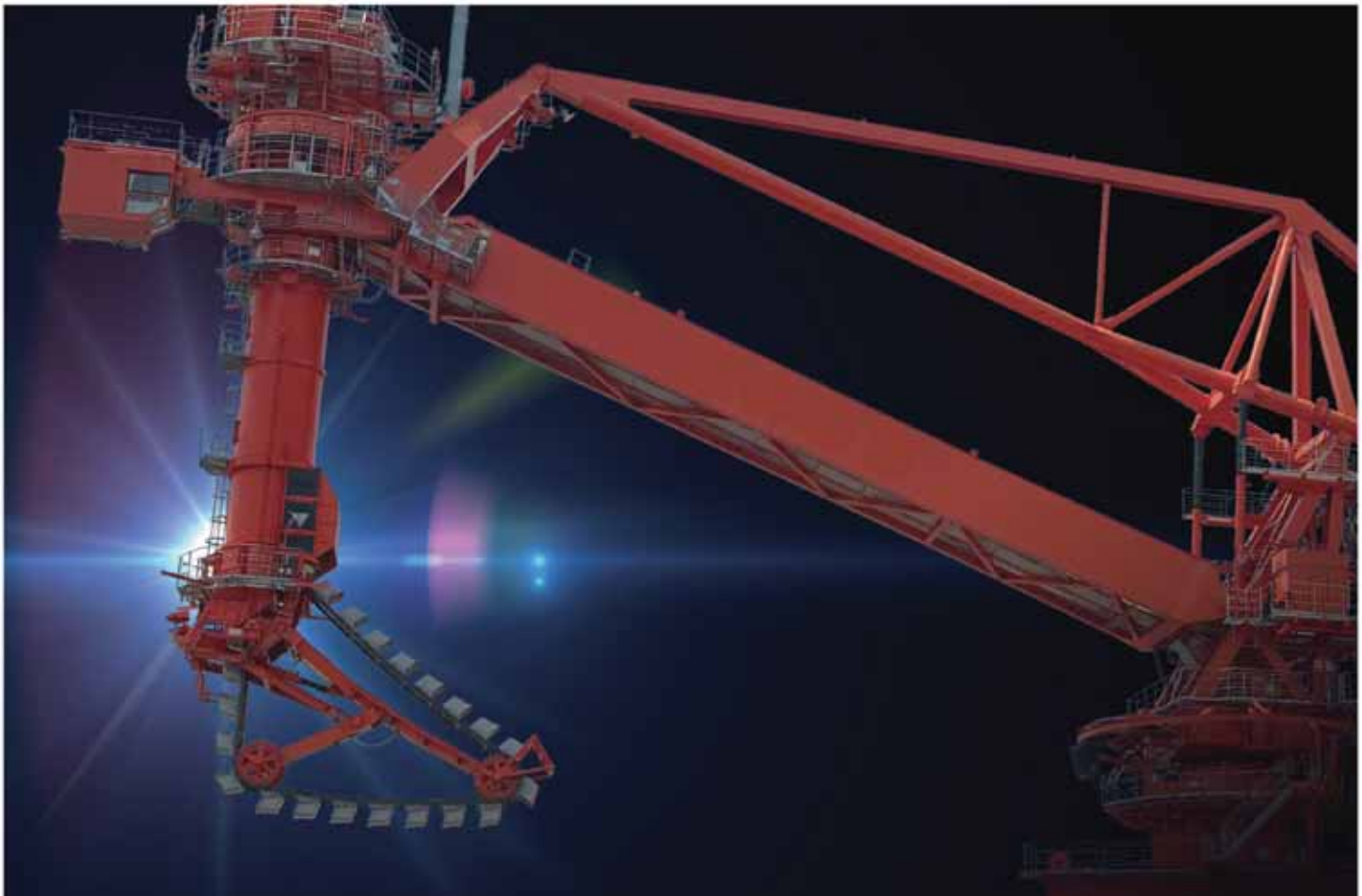

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# Inspection and sampling


## Establishing an effective structural maintenance strategy with CWA Engineers

Facilities worldwide are experiencing issues with ageing infrastructure and the cost of maintaining and replacing these structures is high. An effective structural maintenance strategy is the key to extracting the maximum possible value from structural assets while managing safety and operational risks, allowing maintenance and capital spending to be planned and targeted for maximum effectiveness, and safeguarding against unexpected structural failures.

CWA Engineers Inc. (CWA) assists its clients in developing effective maintenance strategies through its ASSET Reliability Division, a dedicated team of professionals that works closely with maintenance and operations personnel to prolong the service life and enable the safe operation of equipment and infrastructure.

CWA grounds its strategies in an understanding that structural service life ultimately determines asset service life, and that effective structural maintenance is good for safety, good for operating cost and efficiency, and good for the environment. Its strategies are based on a predictive or condition-based maintenance strategy that utilizes performance metrics to determine the condition of in-service equipment and identify when the condition merits maintenance or replacement.

Predictive maintenance is the only real option for extracting the maximum value from structural assets. Unlike reactive maintenance, which would require a structure to fail before being replaced, or preventative maintenance, which requires maintenance or replacement on a regular schedule that isn't tied to the condition of the asset, predictive maintenance allows CWA's clients to anticipate when maintenance or replacement costs will be required with the confidence that the expenditure is warranted.

The principles of predictive maintenance include:

- well-structured data for integration into a computerized maintenance management system (CMMS) to enable analysis and trending;
- tailoring inspection deliverables to the need of the audience by producing detailed inspection reports for maintenance personnel and summary reports for managers; and
- the ability to keep track of repairs as they are made, as well as outstanding items.

Structured data collection starts with disciplined inspection practices. CWA uses an in-house proprietary smartphone application that enforces data structure at the point of collection and requires the selection of the asset and the area of each finding, allowing automated trending and analysis. Inspection data is uploaded to the cloud where software can organize it, analyse it, and output the information into a format that is tailored to the party using it.

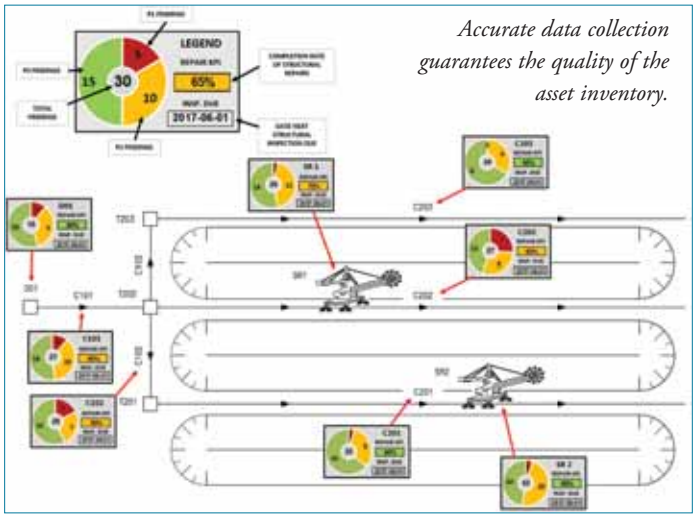
By conducting regular, thorough inspections and collecting structured data, CWA is able to develop asset inventories that allow their clients to make informed decisions regarding the investment of maintenance resources and capital. The asset inventories include heat maps designed to visually indicate the areas that are in the greatest need of attention.

Using the asset inventory, it is easy to identify high-level information such as the assets with the highest number of high-priority findings and the number of findings that will eventually increase in priority if they are not addressed.

The asset inventory can also be used on a smaller scale, enabling CWA's clients to make informed decisions regarding the allocation of resources for individual assets or within components of individual assets.

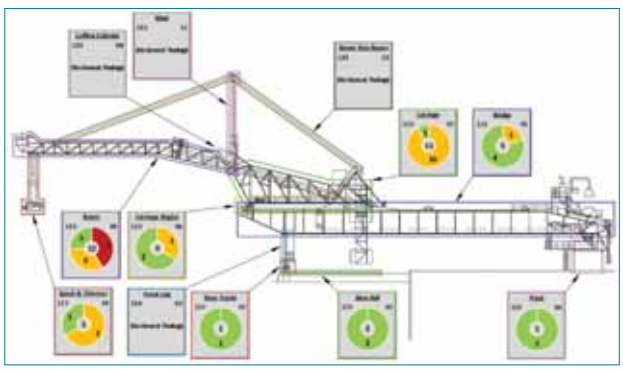

In conjunction with the asset inventories, CWA produces detailed inspection reports for maintenance planners to enable them to plan, coordinate, and monitor repairs, as well as summary reports for managers and executives that allow them to manage the overall condition of a portfolio of structural assets, monitor the performance of a maintenance system, allocate maintenance budgets and resources, and develop long-term maintenance/capital plans.

Overall, CWA's maintenance strategies provide their clients with well-structured data and tailored reporting to allow for more informed decision making. Investment and maintenance decisions can be made with full knowledge of the structural condition and requests for capital funding or maintenance spending can be backed up by hard data.




*Accurate data collection guarantees the quality of the asset inventory.*

Key performance indicators (KPIs) can be used to measure structural maintenance performance, ultimately allowing CWA's clients to extract the maximum value from their assets.



# Eriez offers state-of-the art testing and sampling

Eriez offers a state-of-the-art testing facility in Erie, Pennsylvania, USA, its Central Test Lab (CTL). Providing sample testing with flotation, magnetic and hydraulic separation and filtration equipment, the CTL has a highly qualified staff with years of expertise and a broad range of application experience. The staff includes engineers with advanced degrees at both the master's and doctoral levels along with top-of-the-range field experience.

With more than 15,000ft$^2$ of dedicated laboratory space and an array of lab and pilot equipment, Eriez has the tools to test and provide detailed process analysis and state-of-the-art solutions for nearly any application.

Eriez provides both on-site evaluations and in-house lab services. Its on-site testing services provide quantitative data generated on a demonstration scale in the plant environment. And, with an experienced team of process engineers, Eriez also excels at improving performance by conducting thorough circuit evaluations, determining optimum operating conditions, and finding solutions for problems.

In-house, Eriez possesses laboratory equipment ranging from grinding mills to bench-top and column flotation cells, and complex plant circuitry can even be tested and simulated, rather than the traditional method of independent staged testing.

Eriez also offers a wide variety of processing, mining and flotation laboratory equipment.

Eriez is also known as a world authority in separation technologies. Its product range includes equipment for magnetic separation; metal detection; vibratory feeders and conveyors; metals recycling; fluid recycling; material handling; and size reduction and laboratory equipment.

One of its major projects developments, its new compact suspended overband magnet (see picture below), was unveiled in 2017 at the Steinexpo show. The expo took place in Europe's biggest basalt quarry, and visitors to Eriez's stand were given the first exclusive look at the new compact suspended permanent magnet.

Eriez has focused recent developments on producing higher gradient multi-pole magnet blocks coupled with more compact, lighter weight and streamlined self-cleaning arrangements.

The newly-designed magnet is lighter than a standard Eriez suspended magnet, yet offers comparable performance in achieving the highest levels of metal separation. The slimline, compact design features an internal frame simplifying the belt change process and is ideal for mobile crushers, shredders or screeners.

Eriez offers a comprehensive range of magnetic separators and metal detectors to remove both ferrous and non-ferrous metals to protect downstream processing equipment and reduce costly damage and downtime

For the removal of tramp iron in conveyed material or chutes, Eriez suspended electromagnets have been designed especially for the quarry and mining industries and are most effective when a deeper magnetic field is required. At Steinexpo, a self-cleaning model was on display for the continuous, automatic removal of tramp iron. They are recommended where a large amount of tramp iron is expected or where there may be limited access to the magnet for cleaning purposes.

Completing the product line-up at the show is the MetAlarm QM3500 bridge coil metal detector, suitable for use with steel-corded conveyor belts. The dual sensor coil model is ideal for higher material burdens and higher belt speeds. It is able to detect tramp metal above the customer critical metal size only, ignoring smaller pieces and preventing unnecessary stoppages of conveyors.

Gareth Meese, Sales Director at Eriez Europe, explains: "There have been many developments with the ferrous and non-ferrous metal recovery solutions that we offer in the last few years. Eriez continues to focus on research and product development to ensure that the equipment we offer develops with ever-changing customer and market demands. The equipment on display at Steinexpo this year is testimony to this."

## About Eriez Europe

Eriez Magnetics is recognized as a 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.

# Analysing coal with equipment from Scantech International

Scantech International Pty Ltd designs, manufactures and supplies analysers for measurement of conveyed coal utilizing various technologies depending on the parameter to be measured. The COALSCAN range of ash, moisture and elemental analysers has been on the market for over 35 years and continues to expand. Initially, the company was focussed on commercializing dual-energy transmission technology for ash measurement in the early 1980s. With hundreds of installations this was, and still is, a very robust design with some units installed in the 1980s still operating. The COALSCAN 2100 ash analyser typically achieves accuracies of better than 1% ash. Main applications are measuring raw coal feed to wash plants and washed coal quality. The COALSCAN 1500 uses natural gamma sensing to calculate the ash content of coal without the use of radioactive sources as in the COALSCAN 2100.

Moisture analysis is commonly used in conjunction with ash analysis to enable calculation of heating value of coal. TBM systems utilize microwave transmission technology to detect free moisture by measuring the attenuation and group delay of microwaves passing through the conveyed coal. A signal from a belt weigher is used for the total mass flow and the TBM determines the moisture content to accuracies better than 0.5% moisture. Moisture measurement can be used to monitor TML, assist with optimal filter or dryer operation, and for dust management.

In some cases more detailed information on coal quality, such as sulphur content and other ash components is also needed, particularly for thermal coal where power stations may require coal with strict composition requirements. The COALSCAN 9500X has been used to provide accurate elemental analysis on full flows rather than sample streams which may not be representative. A chute-based version has also been supplied where opportunities to measure have been limited by high chlorine content in conveyor belts or space has been limited on existing belts. Measurement accuracy is typically close to 0.5% ash.

The latest models use a common interface and include remote access capability. All models measure through the full bed depth continuously and provide results second by second or minute by minute. Scantech analysers are considered a premium product due to high specification, robust design and comprehensive shielding particularly for the PGNAA-based COALSCAN 9500X which requires no additional isolation area around the unit.

Recent comparisons to other products on the market by a customer indicated the COALSCAN 9500X had one quarter the radiation levels of a newer competitor product claiming to be the latest and most advanced system in the market with a smaller source, but evidently also much less shielding.

No two products in the market are the same so a thorough due diligence process involving reference checks should be considered in all purchasing decisions.

Scantech's latest addition to its range is the SizeScan PSD (particle size distribution) analyser developed by COREM in Canada and commercialized by Scantech. It is a next-generation PSD system using a 3D infrared camera and advanced algorithms that overcome known problems in particle recognition using segmentation software. The 3D IR camera is unaffected by dust and lighting controls required for traditional 2D digital camera systems which add significantly to installation and operating cost and maintenance of those systems. SizeScan has the added advantage of reporting every five seconds the conveyed volume and belt speed with the PSD data. Where bulk density is consistent the SizeScan becomes a reliable mass flow measurement device comparable to a nucleonic weigh scale in performance. SizeScan does not require ongoing calibration or support, unlike other measurement systems.

Scantech offers various installation services. Installation manuals are available to clients wishing to install equipment themselves. Installation supervision, engineering, fabrication, or full turnkey options are also available. This limits risk of cost or schedule blowouts and ensures analysers are installed correctly the first time, every time. Clients have analysers operating sooner and providing benefits in the shortest possible timeframe after purchase.

Ongoing service and support for analysers is handled by qualified service engineers based near concentrations of analyser installations in Europe, Africa, Asia, Australia, North America and Latin America. A central pool of engineers provides support as needed for commissioning and calibrating analysers as well as R&D.


*Scantech's new SizeScan on-belt analyser for particle size, volume and belt speed measurement.*

# SGS: inspection and sampling services add value to bulk cargo shipments

The value of bulk cargo shipments is best determined by a quality and quantity assessment based on impartial sampling and analysis.

SGS has been a trusted supplier of trade inspection and commercial sampling services since 1878. SGS can reduce the commercial risk — for buyers, sellers and transporters of bulk commodities — by ensuring that all shipments meet international standards and customer specifications.

SGS's inspectors and samplers are well-trained professionals who can represent its clients' interests at ports and terminals around the world. They are experts in all aspects of trade inspection, equipment inspection, bulk cargo sampling, concentrate sampling and commercial analysis.

SGS delivers a broad spectrum of independent evaluation services focused on reducing risk and verifying the quantity and quality of the shipment. Its bulk commodity trade inspection and sampling services include:

- cargo and vessel services;
- visual inspection;
- stockpile inventory management;
- equipment inspection services;
- traditional and mechanical sampling;
- commercial analysis; and
- product conformity assessment.

SGS has earned a reputation for professionalism and integrity. Its certificates are recognized by buyers and sellers of bulk commodities and in the international financial community.

## Comprehensive iron ore capabilities

SGS provides a wide range of services to support the exploration, treatment and trade of iron ore.

SGS can help minimize its clients' operational and financial risk through its industrial expertise and improve their operational efficiencies with its technical leadership. Together with its clients, it develops innovative services and technologies that are customized to add significant value to their iron ore projects and operations.

### Exploration services

- geochemical exploration services;
- Mobile Metal Ion (MMI™) technology;
- project management;
- environmental baseline studies;
- orebody modelling and resource estimation;
- geometallurgy;

*Iron ore operations.*

- metallurgical testing;
- high definition mineralogy; and
- NI 43-101 and JORC Technical.

### Pre-feasibility & feasibility services

- geometallurgy and ore variability studies;
- orebody modelling, resource and reserve estimation and audit;
- metallurgical flowsheet development and pilot plant testing;
- plant design services;
- environmental services; and
- mine closure planning.

### Production support

- on-site laboratories;
- plant evaluation and audits;
- process control and troubleshooting;
- advanced systems;
- production forecasting and optimization; and
- asset management.

### Processing support

- in-plant audits and optimization;
- beneficiation;
- hydrocyclones;
- spiral concentrators;
- magnetic separation;
- gravity separation;
- flotation;
- hydrometallurgy;
- metallurgical accounting; and
- comminution and flotation simulation and modelling.

### Trade & inspection services

- analytical services;
- umpire and settlement analysis;
- proficiency testing programmes;
- marine services;
- quality and quantity inspection;
- collateral management agreements; and
- E-Reporting and E-Certification.

### Sampling

- sample collection and lot sub-sampling
- mechanical sampling systems
- manual and auger sampling.

### Environmental services

- complete environmental analysis;
- air, water and soil testing;
- environmental baseline studies;
- water and effluent testing and acid rock drainage treatment, prediction and mitigation;
- environmental mineralogy;
- silica, dust and noise analysis;
- land reclamation; and
- greenhouse gas emissions audit and verification.

### Auditing & certification

- ISO 9001:2008 (Quality)
- ISO 1400:2004 (Environmental)
- BS EN 16001:2009 (Energy)
- OHSAS 18001 (Health and Safety)
- SA 8000 (Social Accountability)

## SGS as a trusted partner

SGS provides independent, technical advice and a trusted strategic partnership to companies across the minerals sector. It offers:

- a vast, global network of laboratory services;
- technology, expertise and project development support; and
- a presence in all of the world's transportation hubs for trade services

SGS's range of value-added solutions contains costs, reduces risk and enhances value.

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# Scrap recycler SWRN GmbH relies on SENNEBOGEN material handler

## Black Beauty near Nuremberg's inland port

Since the end of 2018 there has been something new to catch the eye in the industrial area of Nuremberg's port — an 825 SENNEBOGEN E-series material handler painted black, the colour of choice for SWRN GmbH, but still green at heart. The family company uses the mobile scrap specialist with a 129kW diesel engine for on-site sorting, loading and processing of old scrap.


*Working with a scrap magnet.*

## Flexibility required for material range

Each month 4,500 tonnes of mixed old scrap are delivered to the 12,000m² site to be processed and recycled. It consists mainly of non-ferrous metals and scrap cable that can be processed further both nationally and internationally. "We need specific storage areas for the 50 different types of scrap that we sort on a daily basis and this automatically reduces the space we have for machines. For this reason, we need a very agile but at the same time robust solution, which we have found in our SENNEBOGEN 825 E," explains SWRN's Technical Director, Robin Reindel.

In addition to the machine's compact size, the stick's quick change system contributes to the machine's on-site flexibility. "We can react quickly to the different material types and, where necessary, switch immediately between the orange peel grab and the magnet plate," says Reindel.


*Robin Reindel, Technical Director at SWRN with the extraordinarily painted material handler.*

## Multi-functional, safe and comfortable

The standard at SENNEBOGEN is to never build a standard machine — this is true of SWRN's 825 E which has numerous features that cater for the customer's individual requirements. In addition to the extraordinary customer-coloured paint job, those responsible also chose the spacious Maxcab Industry, which can be elevated by up to 2.7m, with continuous windshield and bullet proof glass. This guarantees that the operator can both see their work area without anything getting in the way and also be as safe as possible.

The 14m-long equipment is perfectly suited to the challenging tasks on site. The quick change system means that the orange peel grab or the magnet plate can be fitted in minutes. The magnet plate is run from an additional 15kW magnet generator. The generator and the machine's hydraulic system are finely co-ordinated to achieve the best energy efficiency levels.


*Efficient and flexible: the SENNEBOGEN 825 E working in Nuremberg with an orange peel grab.*

## Personal service

In addition to the quality of SENNEBOGEN's material handlers, Robin Reindel says the intensive personal contact from sales and service partner IBS Baumaschinen was also a decisive factor in the purchase decision. "Our contact person is just around the corner, in the neighbourhood. We know that we can expect any service-related queries to be handled quickly and reliably, which is very important to us!"

# MacGregor completes acquisition of marine and offshore businesses of TTS

In February 2018, MacGregor entered into an agreement to acquire the marine and offshore businesses of TTS Group. After receiving the required regulatory approvals, the acquisition has now been completed and the integration has started.

"Together, we aim to be the preferred provider of best total cost and the highest lifecycle value to our customers," says Michel van Roozendaal, the president of MacGregor.

Roozendaal acknowledges that while the maritime industry is going through some challenging times, MacGregor remains fully committed to the industry and has absolute confidence in the long-term opportunities for growth.

It is this confidence that has led to the substantial investment involved in acquiring TTS. Roozendaal believes that, building on the combined strengths of MacGregor and TTS, it will be possible to create additional value for its customers and enhance its ability to fully meet their requirements.

The acquisition brings together the knowledge, expertise, product portfolios and service networks of two major companies in the industry. The integration also creates exciting opportunities for further innovation and technology development.

MacGregor received acquisition approval from the Chinese competition authority subject to certain conditions relating to existing TTS joint venture arrangements in China. As a result of these, MacGregor will continue to compete with the TTS JVs on hatch cover, RoRo, and merchant crane business in China for two years. During this period, the TTS JVs will continue to serve their customers in accordance with the original joint venture scope and will operate fully independently from MacGregor, with this being monitored by the Chinese competition authority.

Following commencement of the integration process, both MacGregor and TTS product and service portfolios will remain and all signed contracts will be executed as committed. Combining the MacGregor and TTS service networks, will enhance global support coverage and capabilities.

Existing customers are reassured that contact points within both companies will remain the same, so the acquisition will be seamless.

# Contract for dual-loop waste heat recovery project with ORC technology awarded to CTP Italy

**After the first successful WHR (waste heat recovery) project in Turkey, CTP Team is bringing its energy saving expertise to Sonmez Cement plant**

In March this year, CTP Team Italy signed a turnkey EPC contract for WHR with Sonmez Cimento Yapi ve Madencilik. The project consists of a WHR system with dual-loop configuration. The heat will be recovered from two sources available in Sonmez Cement plant: the kiln pre-heater and the clinker cooler. Two different heat exchangers are fed with thermal oil and designed accordingly to ensure the specific temperature and inlet gas flow, to break down the temperature of the exhaust gas coming from the clinker production process.

In the WHR module, a highly efficient turbine of 7.8MW at 3,000rpm is coupled with a turbo generator of 9.2MVA to produce electricity to support the internal consumptions of cement plant. Thanks to its proven record of availability, the new ORC (Organic Rankine Cycle) will provide an expected net power generation of 51 million of kWh per year, covering approximately 30% of the current plant's electricity needs.

From an environmental point of view, the new system will drastically reduce $CO_2$ emissions from the cement plant by a total of 23,500 tonnes per year. In addition, the system provided by CTP is totally water free, without any need to treat residual waters from the process.

CTP will design a fully automatic system to reduce drastically the presence of operators during the daily operation. Thanks to this specific advantage of organic cycles and to the total absence of water treatments in the process, the OPEX are reduced by 75% compared with an equivalent WHR based on traditional steam Rankine cycle.

CTP Team's in-depth knowledge of process conditions makes it possible to fully integrate WHR into the existing plant guaranteeing a smart tie-in, without affecting production parameters. Furthermore, CTP Team directly designs and manufactures heat recovery boilers for WHRs, ensuring for its customers the highest quality standards.

The WHR plant is scheduled to start operating within the first six months of 2020 (the next 13 months). The WHR solution designed for Sonmez Cement plant maximizes electric power production and avoids water consumption for the mutual benefit of a lower environmental impact, and lower reliance from the grid.

## About CTP Team Italy

CTP is a renowned and respected engineering and manufacturing company with 50 years of experience in components for cement plants for their EP & EPC projects, in the field of dust collectors, filtration & related equipment, chemical treatments, heat exchangers and waste heat recovery (WHR).

CTP is able to design different types of customized installations to meet the needs and expectations of its customers, with a strong understanding of cement production processes and related equipment. In addition to its headquarters in Milan, Italy, through its manufacturing workshop located in Turkey with a team of up to 140 people, CTP can offer its customers continuous assistance, with a local manufacturing workshop and the presence the qualified teams that can operate in emergency during the full life of the plant.

# Tenova contracted for 14th EAF Consteel® Evolution in China

Tenova, a Techint Group company specialized in innovative solutions for the metals and mining industries, was recently awarded an EAF (Electric Arc Furnace) Consteel® Evolution by Sichuan Guanghan Desheng Iron & Steel Co., LTD, in Sichuan Province, China. This contract represents the 14th state-of-the-art EAF Consteel® Evolution project in China, in the last 18 months.

The shift from BF-BOF (integral steelmaking) plants towards EAF technology, sustained by the reforms of the Chinese government, has led to the demand for advanced equipment and technologies that increase production and provide environmentally friendly solutions.

Tenova EAF Consteel® Evolution offers high quality standards as well as a more environmentally friendly approach to production compared to traditional steelmaking methods. With more than 75 references worldwide, Tenova EAF Consteel® is considered the best available proven technology in terms of balance/mix between innovation, reliability and sustainability. Safety and increased productivity are enhanced by tailor made solutions in addition to Tenova standard technologies. Chinese steel makers are paying more and more attention to these topics in order to stabilizing productivity and quality.

"Once again our technologies were recognized by the client with whom, from the first technical discussion, the co-operation was fruitful and satisfying", stated Mario Marcozzi, Sales Director in Tenova Metals. "Our previous reference pays a fundamental role in building this environment of trust. This is in line with Tenova's top priority: to be a reliable partner and to always improve our service."

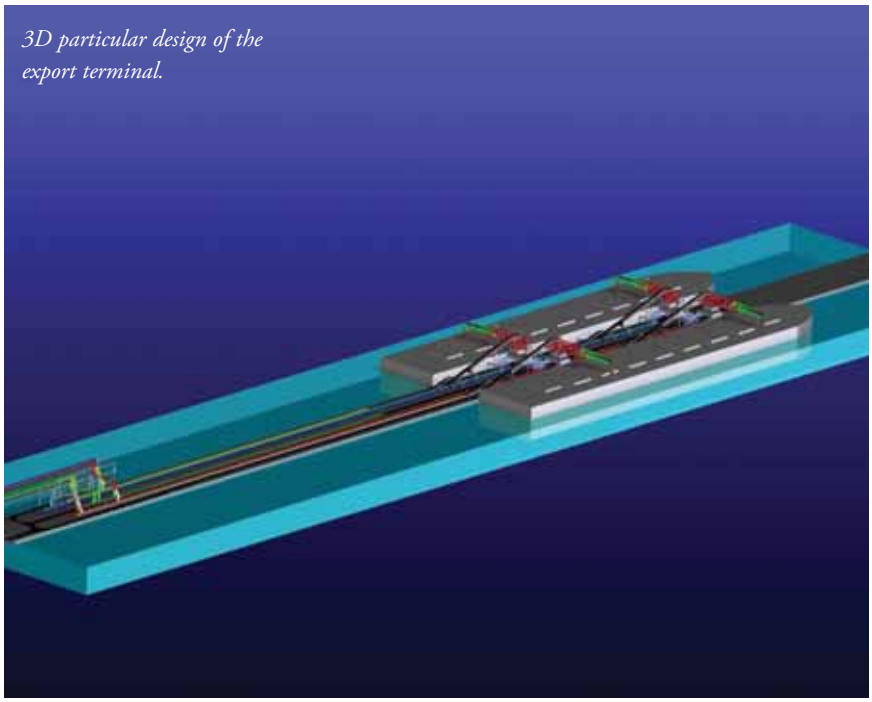
## About Tenova

Tenova, a Techint Group company, is a worldwide partner for innovative, reliable and sustainable solutions in metals and mining. Leveraging a workforce of over 2,500 forward-thinking professionals located in 19 countries across five continents, Tenova designs technologies and develops services that help companies reduce costs, save energy, limit environmental impact and improve working conditions.

# Bedeschi strengthens its presence as supplier of complete turnkey plants

As part of a continuous improvement process, on 1 July, Bedeschi finalized the corporate merger for the integration of ONT - Officine Nastri Trasportatori, (based in Bergamo) and Bedeschi Handling (based in Genoa) already part of the group. Bedeschi is an historic Italian company, which is a major supplier of bulk handling and onshore and offshore logistics solutions.

This development optimizes the operating, financial and administrative management of the companies involved. It also keeps the headquarters and facilities and completes the acquisition of expertise — specifically about belt conveyors and plant engineering — which started a few years ago.



*3D particular design of the export terminal.*

## Russian project

Bedeschi is further strengthening its global presence with the opening of a new subsidiary in Moscow (in addition to those in the USA, Morocco, India and Dubai). Bedeschi Russia will actively contribute to the project management of the new OTEKO project in Taman. The project consists in the supply of a fully automated coal export terminal with a total aggregated capacity of more than 50,000tph (tonnes per hour) on the six loading lines.

The supply includes bucketwheel stacker-reclaimers, several kilometres of conveyors, and shiploaders. The system allows for the blending of different types of coal.

## Focus on innovation, diversification and green solutions

For more than a century, Bedeschi has provided effective and reliable solutions in a wide variety of industries (cement, coal, fertilizer, grain and many more), capitalizing on synergies and cross competences. Diversification is a major asset of the group, reinforcing its focus on continuous innovation with its products and service, to ensure that it can offer tailor-made solutions for its customers.

Bedeschi always pays great attention to the environment, and to international standards that relate to safety and

*Example of Bedeschi coal application.*

## for the material handling market

protecting the world around us.

For this reason, Bedeschi will be one of the companies involved in the former Ilva project, now ArcelorMittal, plant that is going to be one of the most advanced and environmentally friendly facilities in Europe.

The company from Padua was awarded a contract for the supply of the stacking and reclaiming system inside the Primary Parks (mineral and fossil).

The supply of the new machines, along with other works related to keeping the parks safe and contained, will have a key role in reducing the dust spillage towards the city, with remarkable energy savings, all while improving the efficiency of the production and the reliability of the whole plant.

Already at its production phase, the plant will be operational by spring 2020, and will involve many local contractors for its installation.

*Example of Bedeschi coal application.*

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# Unloading with ease

## efficient ship-unloading systems smooth the cargo handling process

Louise Dodds-Ely

## Ship-to-shore unloading with mobile technology from Superior Industries

### Highly-mobile conveyor technology unloads & distributes multi-million-tonne aggregate shipment for terminal project

The South Carolina Ports Authority (SPA) is deep into construction of the only permitted new container terminal on the US East and Gulf Coasts — the Hugh K. Leatherman Sr. Terminal — which is targeted to open this year. Citing the project as its largest capital improvement initiative to date, the SPA says its goal is better accommodating the bigger container ships travelling through the newly-expanded Panama Canal. The facility will ultimately handle up to 1.4 million cargo boxes annually, which boosts the SPA's current containerized cargo capacity by more than 50%.

Construction on the 115-hectare site is designed for substantial mitigation of community and environmental impacts. Notably, the SPA wanted to avoid the emissions, dust, noise and congestion of bringing in nearly 3.6 million-tonnes of aggregate fill material via trucks. Instead, 63,500 tonness of crushed stone is shipped each week on a rotating series of barges from a quarry in Newfoundland.

Carver Companies, an East Coast marine offload specialist, handles the unloading of the aggregate from the vessels; while also conveying the material, and placing it in short lifts within a large containment area. When filled, that area will be paved and used to store incoming and outgoing cargo containers.

"We've made big investments in highly-mobile loading and unloading conveying systems, so that we can custom-configure offloading services to meet the needs of any project," says Carver Companies President Carver Laraway. "We operate flexible, versatile equipment designed to handle a variety of vessels, and a variety of materials," he says, adding that he accesses equipment manufactured by Minnesota-based Superior Industries, a company that has long been a prominent supplier of mobile conveying technology. Versus costly stationary shiploading/unloading systems, mobile conveying systems offer lower operating costs, quick assembly, efficiency within a small footprint, and ease of relocation.

### Offloading system specifications

To design the system, Laraway worked closely with Jerry Kern, the aggregate sales consultant for General Equipment, a dealer

for Superior Industries. Operating offices in North Dakota and Minnesota, General Equipment maintains a large inventory of equipment for rental and sales; and they had worked with Carver Companies on a previous ship-unloading project. Laraway says that Kern was instrumental in the layout and design of the system. Also, Laraway stresses that General Equipment had the units in stock and could deliver as requested. After all the equipment was delivered to the site, assembly of the system took just about a week. "I'm big on buying American-made equipment and the Superior equipment is top notch. Plus, the support that Jerry Kern gave us was an extreme blessing," he says.

Offloading at a rate of 900tph (tonnes per hour) to 1,200tph, Carver Companies is 'transloading' the aggregate material from the incoming ship to a 32m x 135m stationary barge that's outfitted with four hoppers. "It takes an average of 80 hours to unload one ship, and about 14 months to complete the entire offload project," says Laraway. Cranes with 18-tonne clam buckets load material into the hoppers. Under each hopper is a 1,066mm x 110m Superior Zipline® conveyor, which is a pre-engineered, modular overland conveyor that's designed for quick, tool less installations; and ease of relocation.

Superior Industries engineers say that

**GOLFETTO SANGATI**
GRAIN MILLING AND HANDLING

# DESIGNED, ENGINEERED AND BUILT

## WITH 90 YEARS OF EXPERIENCE AND EVOLUTION

Golfetto Sangati is an Italian company designing, building and installing turnkey equipment for grain handling and milling. This strong industrial reality is born from the merger of three historic Italian brands: Golfetto, Sangati and Berga. The company fulfills the market demand in a competitive way and with state-of-the art technologies based on research, experience and in-depth technical knowledge.

Golfetto Sangati is a reference point for the design and construction of complete port systems for loading and unloading ships. The company designed and built more than 50 port systems all over the world and plays a primary role in technological advancement from the first pneumatic ship unloader to the more advanced mechanical loaders and unloaders.

The company supplies a large range of handling, processing and storage, loading and unloading systems on tires or rail with a capacity of 50 to 2,000 tons per hour implementing the best technical principles.

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when compared to conventional 'spec-by-spec' highly engineered overland systems, the Zipline conveyor is a lower-cost alternative designed with off-the-shelf components for easy replacement of idlers and pulleys. The system also features a modular design that allows for easy structural additions or deletions when required.

A belt feeder on each hopper regulates the feed to each Zipline conveyor at 318tph. Running parallel to the barge, the Zipline conveyors feed an onshore 1,066mm x 45.7m TeleStacker® conveyor, a multi-functional telescopic radial stacking unit that can load, unload, and stockpile. Importantly, the unit allows operators to maintain material specifications from the ship to the stockpile. According to Superior, the TeleStacker conveyor achieves 45% more extension over that of conventional conveyors; and it's designed to move inline, transversely, and radially for fast, efficient movement within the footprint.

From the telescopic radial stacker, material is transferred to the containment area by a Superior Trailblazer® conveyor, a 152m preassembled portable groundline system that transports from site to site in one 25.6m towable load; and allows rapid deployment from the road to working status in about an hour. With a gravity-style take-up built into the trailer structure, the Trailblazer conveyor simply folds in or out in an accordion-fashion from its chassis, with a small crew required to position the supports. Beyond this groundline system, Carver Companies uses a series of portable jump conveyors to transfer material where needed in the containment area. The portability of these conveyors allows the crew to shift units in and out of the lineup as required.

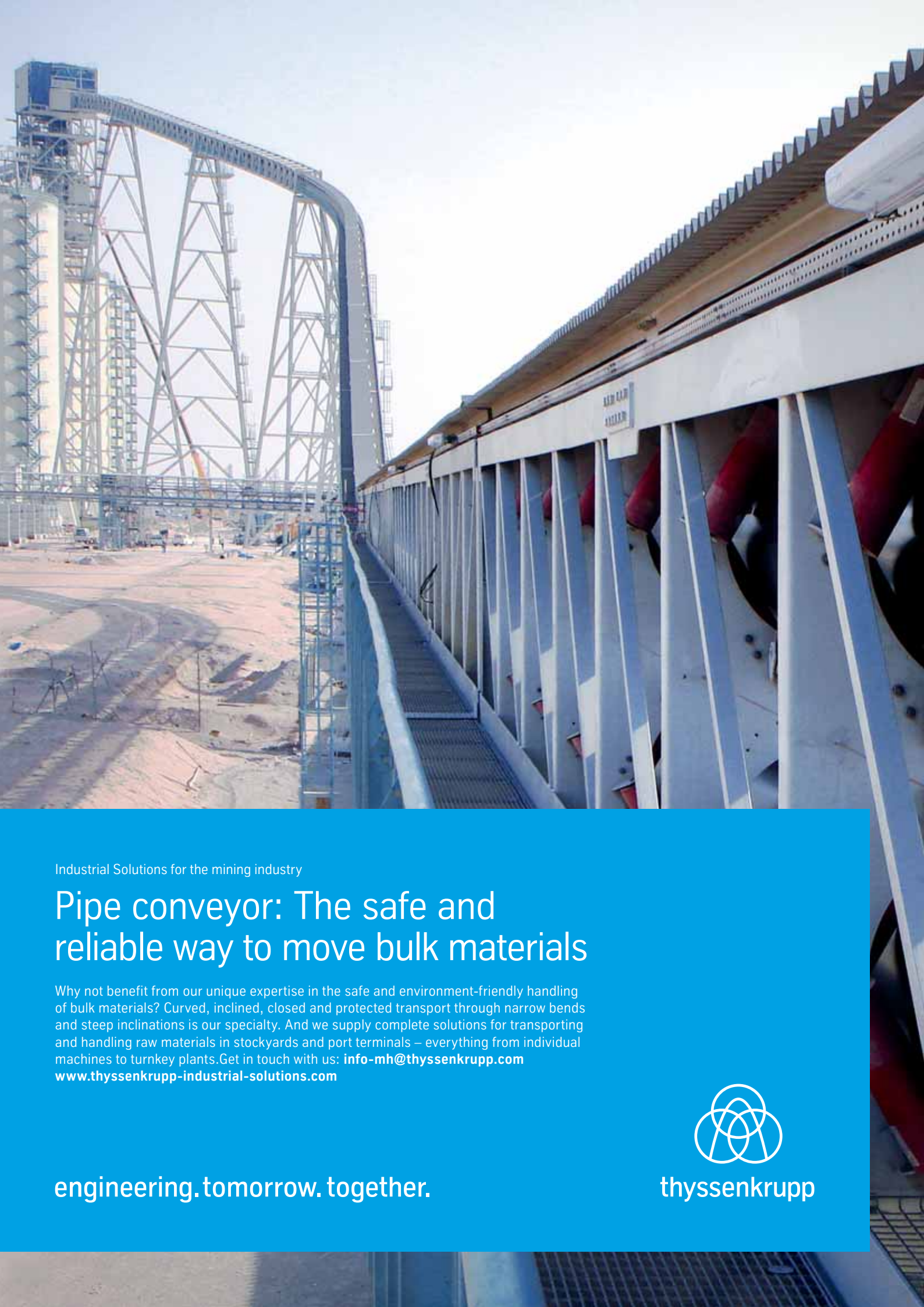
Within the 610m x 610m containment area, Carver Companies uses two additional 1,066mm x 45.7m TeleStacker conveyors to properly distribute the material, readying the site for future paving. As the project requires placing material in short 1.2m to 1.5m desegregated lifts, the stackers are constantly moving about the site.

The FD axle setups on the stackers allow for easy movement and rotation. Additionally, General Equipment assisted Carver Companies in acquiring two used track-mounted 'tuggers' to aid in safely moving the stackers where needed over terrain that may not always be level or firm.

## Poised for growth

In past years, Laraway says he had always been concerned about the costs of the multiple handling of material. "Trucks would come to the dock and dump the aggregate material on the ground. A loader and an operator would push up the piles, while a material handler and an operator would scoop it up and load it on the barge. That is hardly efficient," he stresses. "Today, we can relocate our systems wherever they are needed. Once our mobile conveying system is configured to meet project specifications, the operator flips a switch and it's up and running. That's a big advantage over the labour, overtime, and fuel associated with using wheel loaders to move material," says Laraway.

Currently, Carver Companies has three offloading operations moving material along the East Coast — and Laraway says that his company is "poised for further growth because we have the right mobile conveying equipment."



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# TAIM WESER offers wide range of high-capacity ship-unloaders

*Grab type ship-unloader at a coal transshipment port terminal.*

Nowadays, the concentrated availability of bulk materials has improved the connectivity between countries in the world and the need to handle — and unload — cargoes is increasing every day.

TAIM WESER is able to supply high-capacity ship-unloader cranes to unload large quantities and varieties of bulk materials at port terminals, as well as special bridge and gantry grab cranes for major industries such as oil & gas, nuclear, mining, fertilizers and steel.

TAIM WESER's ship unloaders are designed and developed according to the specific requirements of the customer, and always providing solutions based on the principles of safety, high performance, precision of movement, low maintenance and operational costs, and maximum availability with the aim of facilitating, improving and optimizing the logistics process required by its customers.

All essential processes pertaining to the design and fabrication of cranes are carried out, and supervised, in the company's own facilities. Additionally, all the cranes are pre-assembled and tested in its factory, without load or even with it, if required by the customer. This process enables TAIM WESER to develop a high quality final product, and guarantees that no major unforeseen problems happen during installation and commissioning on site.

TAIM WESER's rail-mounted grab-type ship-unloader cranes are used to transfer high-density bulk materials from the ship's hold to the handling system on the jetty or wharf. These unloaders can be equipped with the 'rope trolley' and the 'onboard hoist trolley' solutions, as well as units with hydraulic grabs. All these are suitable for handling a wide variety of products, including: iron ore, coal, petroleum coke, potash, limestone, sulphur among others.

These ship-unloaders are equipped with anti-sway systems to reduce unloading times; short cycle times in combination with high capacity clamshell grabs and the most advanced equipment offer high unloading rates and optimize operation and

*Gantry crane for petroleum coke unloading at a refinery.*

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TAIM WESER

120th anniversary 1899 - 2019

# Siwertell road-mobile capabilities added to Ashdod's sulphur-handling operations


Bruks Siwertell has secured a further Siwertell ship-unloader order from Israel's Ashdod Port Company Ltd. Supporting Ashdod's major expansion plans, the Siwertell 15 000 S road-mobile ship-unloader will deliver flexible, environmentally-friendly sulphur handling operations and complements the high-capacity capabilities of the recently ordered rail-mounted Siwertell ST 490-M ship-unloader.

Both unloaders will handle the highly volatile and corrosive commodity, sulphur, without dust or spillage. "The customer chose to invest in Siwertell technology because we have decades of well-proven experience in sulphur unloading," notes Siwertell President, Per Karlsson. "Current grab crane unloading systems simply no longer meet the port's requirements when it comes to efficiency, safety and environmental protection.

"Furthermore, due to Ashdod's intake of sulphur in both large and small vessels, the 15 000 S was the best choice to secure safe, high-capacity through-ship operations for the smaller vessels," says Karlsson.

The unloader will be based in the Port of Ashdod, on Israel's Mediterranean coast and will offer significant flexibility. "The operator plans to deploy the unloader at different locations within the port area," adds Karlsson. "It is ideal for this purpose."

It features a double-bellows system to ensure efficient truck loading capabilities and will also be fitted with the Siwertell Sulfur Safety System (4S), which detects and extinguishes fires early, shutting down the system to stop their spread, and safely containing them before they become a risk.

The fully-enclosed road-mobile unit will offer a rated capacity of 350 tonnes per hour for the continuous discharge of sulphur from vessels up to 15,000dwt. It will be built in Sweden and is planned for delivery in September 2020.

## About Bruks Siwertell

Bruks Siwertell designs, produces and delivers systems for loading, unloading, conveying, storing, and stacking and reclaiming dry bulk materials, alongside equipment for chipping, screening, milling and processing wood for the biofuel, board, saw mill, pulp and paper industries.

All equipment is designed to ensure environmentally-friendly and efficient cargo operations.

maintenance activities. Discharge of materials from the vessel is usually into a hopper that feeds the bulk material directly to a belt conveyor system, both also supplied by TAIM WESER. Depending on the environmental conditions and the product handled, the hopper can be equipped with dust-suppression and collection systems and spraying devices to minimize dust emission.

TAIM WESER's wide-range of equipment ensures a safe and efficient way to unload various material types — grains, minerals, fertilizers as well as bagged materials — both at sea and at inland dry terminals. All equipment takes into account the required tonnages and even vessel size and type, improving the processes to reduce unloading times, while always respecting the environment.

*3D model of a grab ship-unloader engineered by TAIM WESER.*

TAIM WESER has been supplying unloading equipment to major industries since 1899. The company has an especially strong presence in the oil & gas industries, where it specializes in the supply of full availability grab unloading cranes to transfer the petroleum coke from the coke pit located below the drums, up to the hoppers which feed a the belt conveying system to transport the material to the storage area of the refineries. These unloaders are designed to work in highly aggressive, humid and caustic environments, explosive atmospheres with abrasive dust and bad weather, so they are protected against heat, corrosion and dust, but also against explosive atmospheres according to the customer's requirements. For that reason, all of TAIM WESER's equipment meets the standards set down in ATEX regulations.

At the moment, TAIM WESER is working on several ship-unloading projects in the Asia Pacific region. One of the projects includes three grab-type ship-unloaders for a new coal-fired power plant, with a capacity of 1,000tph (tonnes per hour) to unload coal and limestone from ships and barges from 1,500dwt to 25,000dwt.

Another project for a thermal power plant will include a new coal ship-unloader with a capacity of 350tph for barges up to 10,000dwt.

Finally, TAIM WESER is also developing a new project for a coal port terminal that includes two rail-mounted grab ship-unloaders, with capacities of 1,500tph each, to unload coal from ships of up to 195,000dwt.

## TAIM WESER: INNOVATION AND TECHNOLOGY

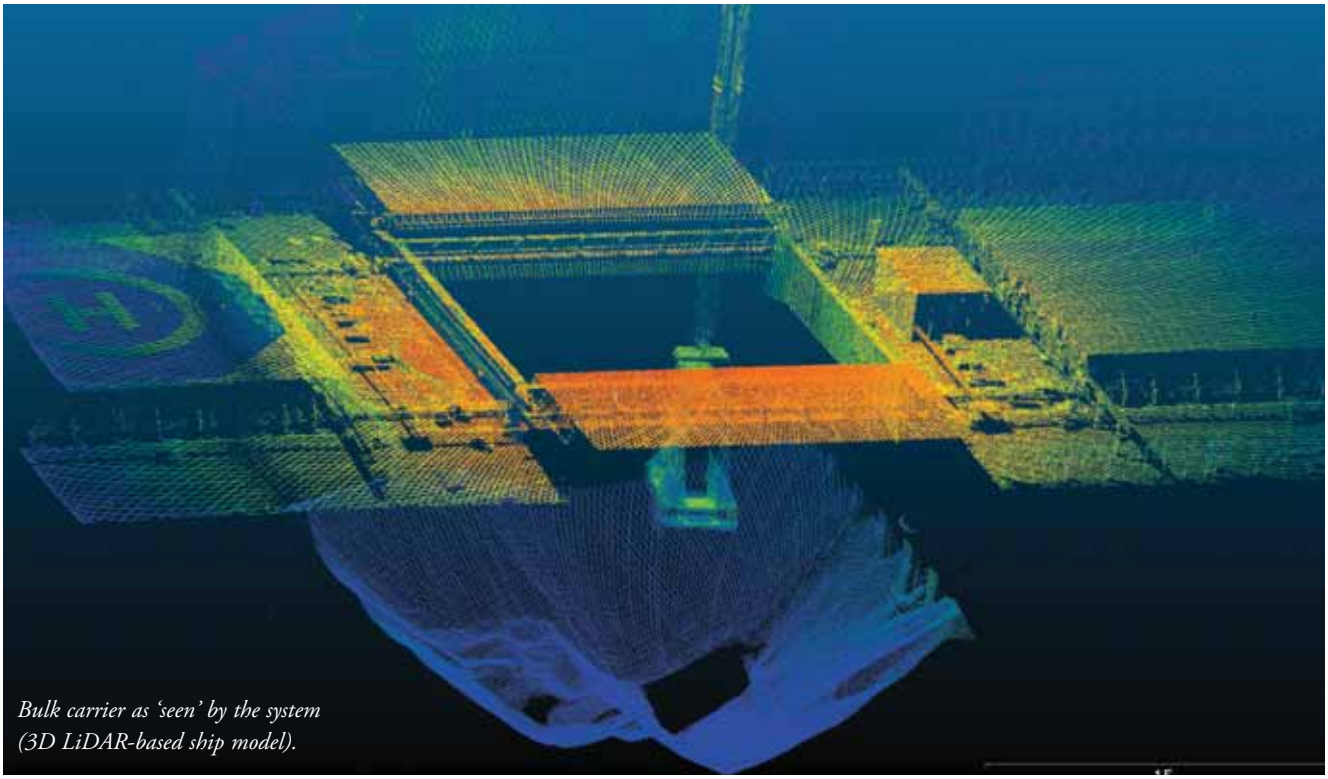
TAIM WESER is a worldwide company which specializes in the development and supply of tailor-made integrated solutions to meet today industry's challenges with tomorrow technologies. These include i4.0 systems, virtual/augmented reality (VR/AR), remote access, data analytics, drones support as well as stockyard automation systems to improve the design and operation of machines and conveyors.

TAIM WESER is proud to have reached the 120th anniversary of it providing solutions in the fields of special lifting of loads and handling of bulk materials.

Over the years, TAIM WESER has established itself as one of the world's foremost companies with installations in more than 65 countries and continues to strengthen its global presence, positioning itself as a reliable key partner in developing customized solutions for its customers. The company's headquarters are located in Zaragoza (Spain), in facilities covering 64,000m$^2$, 23,500m$^2$ of which are covered and assigned to production processes. In Germany, the group has an office in Bad Oeynhausen and in Brazil, a plant in Curitiba (PR).

TAIM WESER's highly qualified technical team is always focused on the development of tailor-made solutions, applying leading edge technology to fulfil each customer's specifications.

# iSAM driverless grab ship-unloaders (GSU) for bulk carriers



*Bulk carrier as 'seen' by the system (3D LiDAR-based ship model).*

## 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 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 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.

## Grab ship-unloader in autonomous operation

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 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.

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 — regardless of the weather conditions, 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

*Grab ship-unloader in autonomous operation.*

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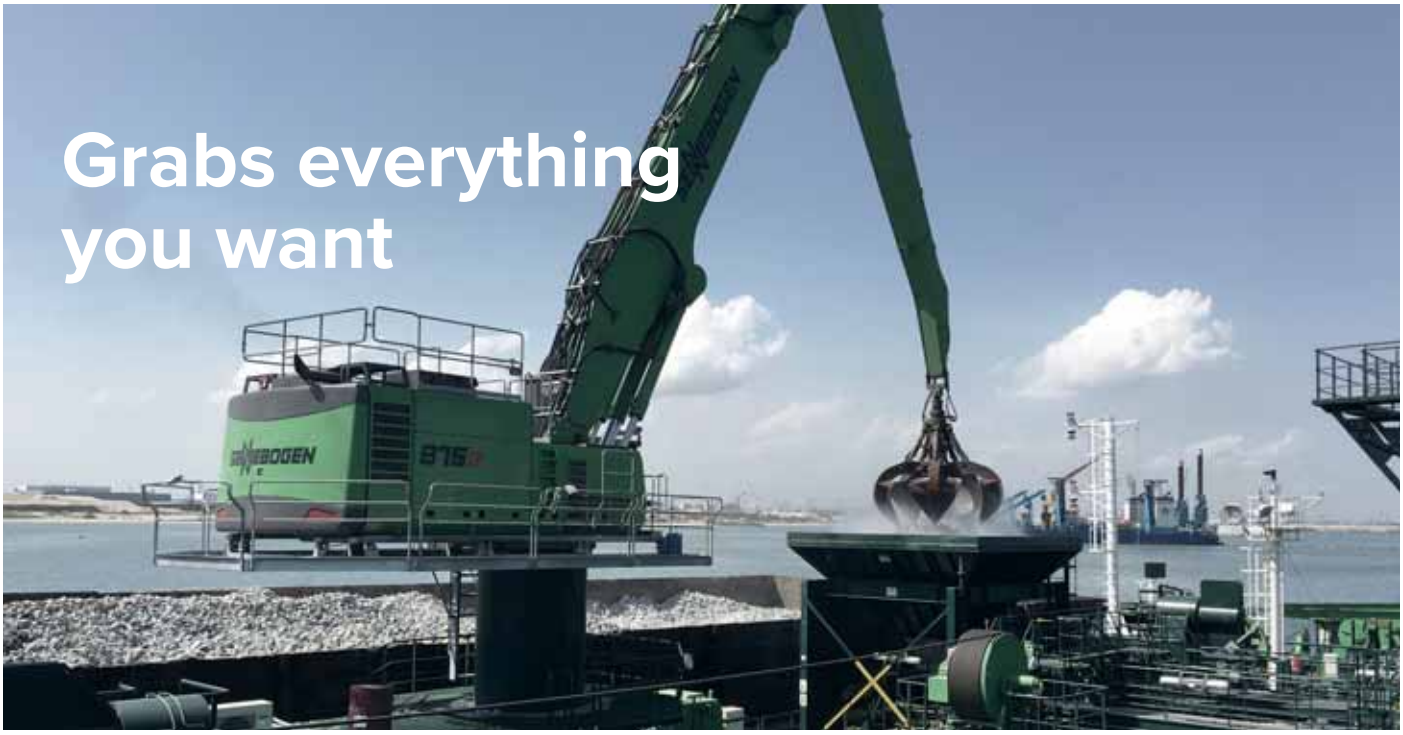

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- Multipurpose Spreader

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**We grab everything you want!**

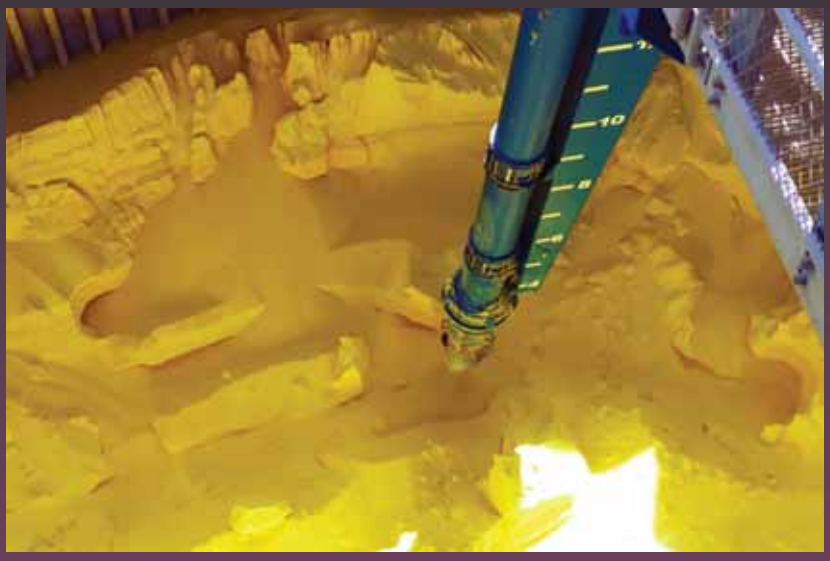
# Siwertell ship-unloader secures safe sulphur handling for Israel's largest port

Bruks Siwertell has signed a contract with Ashdod Port Company Ltd for the delivery of a Siwertell ST 490-M screw-type ship-unloader destined to serve Israel's largest sea port. A fundamental requirement of the port was environmental protection; the totally-enclosed Siwertell unloader was the only system that could meet the standard and also offer safe, high-capacity through-ship performance.

"Ashdod Port Company chose Siwertell technology to secure its substantial and growing dry bulk cargo volumes for a number of reasons," explains Bertil Andersson, Siwertell Sales Manager. "Most significantly, our Siwertell unloaders are the only proven solution for safe, enclosed and continuous sulphur unloading. They also meet the port's strict environmental requirements, handling materials without dust or spillage."

Ashdod is Israel's largest sea port in terms of cargo volumes and is a major gateway for the State of Israel. The new Siwertell ship-unloader has been ordered as part of the port's major expansion plans. It will be rail-mounted and used to discharge sulphur and petcoke at continuous rated capacities of 600tph (tonnes per hour) and 500tph respectively from vessels up to 60,000dwt.

Although a valuable and widely used commodity, sulphur is highly toxic, volatile and corrosive. For these reasons, it is now environmentally



unacceptable for it to be spilled during unloading. However, its containment increases the likelihood of 'hot spots' creating the potential to explode and cause fires.

"We know how to deal with these dangers," notes Andersson. "Our sulphur-handling ship unloaders have been supplied to the market for over 30 years. All these units are fitted with the Siwertell Sulfur Safety System (4S), which detects and extinguishes fires early, shutting down the system to stop their spread, and safely containing them before they can become a full-blown blaze. To contain explosions, steel casings are reinforced and explosion-venting valves are fitted along the conveyors to relieve pressure."

Ashdod's bulk terminal operates 24 hours a day and the new ship unloader is destined to serve this facility. It will be built and transported fully-assembled via heavy-lift vessel for installation at the port. Delivery is scheduled for April 2021.

### About Bruks Siwertell

Bruks Siwertell designs, produces and delivers systems for loading, unloading, conveying, storing, and stacking and reclaiming dry bulk materials, alongside equipment for chipping, screening, milling and processing wood for the biofuel, board, saw mill, pulp and paper industries. All equipment is designed to ensure environmentally-friendly and efficient cargo operations

Siwertell is part of Bruks Siwertell Group.

to reliably detect coal from a distance of up to 100m, under virtually any weather conditions.

While 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".

## 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.

## References

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

- four autonomous grab ship-unloaders up to Capesize class vessels (Hansaport, Port of Hamburg, Germany);
- three autonomous grab ship-unloaders 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.

## 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.

# Flexibility and optional customization make Buttimer's DOCKSOLID ship-unloading hoppers a popular choice

Buttimer Engineering has been designing and manufacturing mobile handling systems to handle all types of dry bulk materials since it was established in 1978. The company, through decades of experience and innovation, has positioned itself at the forefront of the cargo handling industry both domestically and abroad.

Over the years Buttimer as a company has expanded and diversified into one of Ireland's most innovative mechanical engineering companies. A key part of this has been the emphasis placed on the mobile ship-unloaders and other port equipment.

Buttimer Engineering owns the DOCKSOLID brand, which is well known within the industry for providing mobile bulk hoppers. DOCKSOLID port unloading equipment is the result of more than two decades designing, refining and maintaining ship unloading hopper systems.

The DOCKSOLID range has been meticulously designed for use in situations

*The DOCKSOLID hopper, with filters to protect the environment.*

where ease of use, robustness and effectiveness are the key considerations.

Undoubtedly the most popular piece of DOCKSOLID port unloading equipment is the ship-unloading hopper, which has become a cornerstone of the brand. Buttimer's ship unloading hoppers compete on their state-of-the-art dust control techniques, but also on their reliability. The sophisticated design of DOCKSOLID range of ship-unloading hoppers guarantees that the equipment is easy to use, easier to maintain and repair, and therefore has greater availability and longevity for the operator. Ship-unloading equipment is designed with a detailed understanding of the impact and dynamic forces and loads exerted during the unloading and flow of the specified dry bulk cargo, to ensure a robust structure and frame. The hoppers have to be 'fit-for-purpose' in a demanding environment, therefore, all the equipment is custom made to meets Buttimer's customers' needs.

On top of providing excellent 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.

*DOCKSOLID hopper, in operation at the Port of Cork.*

One of the key competencies of Buttimer Engineering 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 customer's request. Whilst the standard hopper can perform the vast majority of cargo handling duties, Buttimer offers 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 one 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 excellent manoeuvrability, amongst other things, Buttimer also offers rail-mounted or static hoppers. The rail-mounted hoppers are 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 reasons why Buttimer and DOCKSOLID have proven to be so successful in the ship-unloading market.

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. The company can also offer units that are rail-mounted or pneumatic tyre-mounted, but arguably the most impressive aspect is not just what it 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.

Whilst everything that Buttimer Engineering offers as part of the DOCKSOLID range is of the highest standard, what truly sets the company apart from competitors are patented innovations.

*Unloading at the Port of Cork.*

- **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 other mobile equipment.
- **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.

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# Neuero installs M600 unloader at Gunsan Port in South Korea


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.

## SunKwang, Gunsan, South Korea

Neuero has just completed the installation and commissioning of a new M600 unloader for SunKwang in Gunsan Port South Korea. The new M600 will work alongside a Neuero M600 that was supplied ten years earlier. The new M600 features a 30m boom with a 15-tonne auxiliary winch. The unloaders handle a variety of grains and meals. SunKwang achieves high unloading efficiency levels with all products.

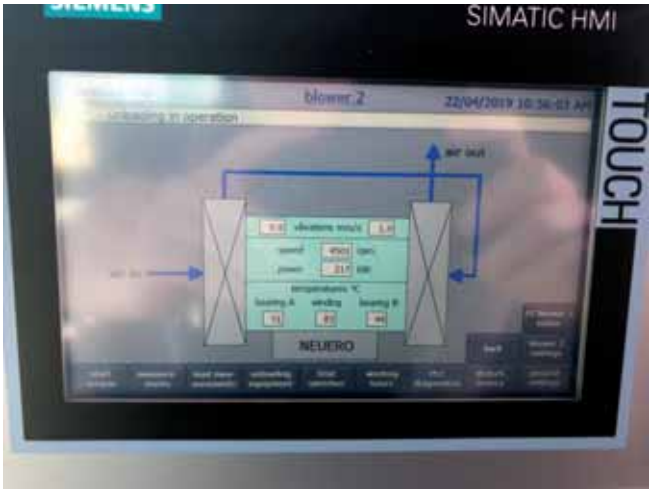
When planning for a new ship-unloader or loader it is very important to consider all variables affecting the equipment design. Neuero has developed design and sensor visualization to allow its clients to consider all variables affecting their specific application.

Predictive maintenance is achieved with the newest generation Neuero blower design that includes temperature sensors at the bearings and motor winding as well as vibrations sensors.

As the screen picture shows, blower 02 shows the bearing A with temperature 51°C and bearing B with temperature of 44°C and the winding operating at 83°C. The blower assembly includes frequency inverter and the normal rotating speed is 4.500 rpm with a moment power consumption of 217kW.

To complete the shown information the vibration of bearing A is 0,6mm/s and bearing B is 1.0mm/s.

This information is important to monitor the bearing and motor situation. A high temperature is a strong indication of a problem with cooling, or bearing damage. The vibration sensor gives a double check at the bearing to anticipate any possible problem.




The idea is to prevent more significant damage and allow maintenance programming. There are two phases programmed at the PLC, depending of temperature and vibration levels. The first level starts an alarm and shows at the touch panel, and must be acknowledged to disappear. This is to keep an eye and prepare a replacement in future. This saves important time to work when time is available and not in middle of a ship-unloading operation. A common strategy to give more operating time is to reduce speed and check temperature and vibration. If the level of vibration and or temperature reach a second level, the machine stops and alarm is shown. This prevents greater damage to the key component a immediately change is necessary.

Besides the vital sensor monitoring the Neuero blower design redundancy is built in, allowing the unloader to still operate (50tph capacity achieved), even if one blower is shut down for some reason.

# Borghi Assali: the driving force behind ship-unloaders (and loaders)

Italian company Borghi Assali designs and builds moulds and equipment for the cold forming of sheet metal.

After an international research project in 1992, the business started to produce steering axles for forklifts and airport tractors. The company now manufactures units for ship-unloaders and loaders in ports, and its units are in use in Europe and internationally.

## Technical prowess

Borghi Assali's designing and manufacturing abilities have allowed it to be involved in projects connected to the electric handling of special port cranes and shiploaders and unloaders. This has been made possible thanks to the significant experience that Borghi Assali gained during its years in the electric traction field. Its units are also used on large-dimension cranes, with a total weight exceeding 500 tonnes, equipped with 14–20 steering units, and a structure height over of 50 metres.

## Shiploaders/unloaders and RTG/STS

Shiploaders and unloaders represent a very active market. It is important to take into account that a lot of producers of these machines have begun to use electric — instead of hydraulic — propulsion. The company is very active in every field of row material handling, and it is able to provide wheels for every type of shiploader/unloader. Even for the most well-known harbour machines — such as RTGs, gantry cranes, straddle carriers and STS — Borghi Assali provides wheeled tyres or wheels that can be used on rails. Considering that these machines can have only four support points, the wide range of wheels (that can cope with up to 120 tonnes of load) allows the company to find the best solution for every type of RTG/STS.

## Case study: port cranes

Borghi Assali provides its clients with many types of drive wheels, according to their special needs, making it possible to meet every technical requests that the clients make.

An example of the company's abilities is the EBo1450.000C (electric horizontal drive wheel). This wheel was assembled on a port crane of 520 tonnes in weight, and its movement is guaranteed by 14 groups of Borghi's EBo 1450 with 36 tonnes of load capacity each. For these groups, eight have been produced with both traction and steering and six have been created with only the steering. Taking into account the environment in which these machines operate, it was necessary to provide them with special treatments against the saline mist for all of the components that are not painted.

On the other hand, a specially developed coating — C5M — was provided for all the parts that are paintable. With such a heavy weight, the primary necessity was that all of the 14 EBo 1450 would be in contact with the ground even on unstable pavements, during the movement of the crane, to prevent overloads. Borghi Assali therefore created a hydraulic levelling for every unit, created with a toggle suspension and a hydraulic cylinder.

## Case study RTG/STS

Borghi Assali has collaborated with an important Australian company, which has made it possible for it to develop 30-tonne hydraulic units, to move RTGs that are used in the construction sector. This model is the EBo1450.000A. The traction and the steering are ensured by hydraulic motors connected to epicycloidal reducers.

Borghi Assali is especially proud of this collaboration, which means that its wheels

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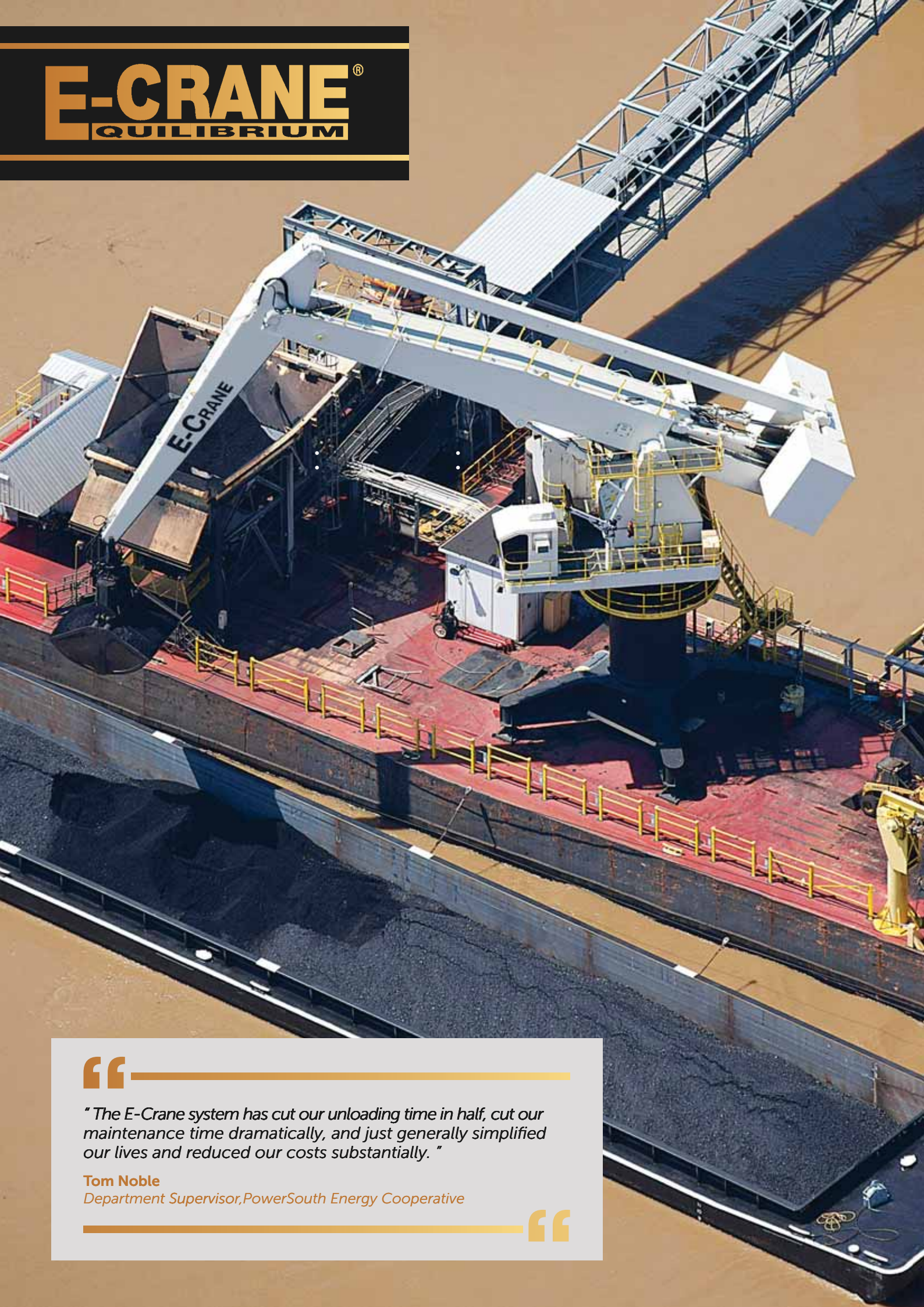
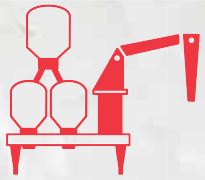



*" The E-Crane system has cut our unloading time in half, cut our maintenance time dramatically, and just generally simplified our lives and reduced our costs substantially. "*

**Tom Noble**
*Department Supervisor,PowerSouth Energy Cooperative*

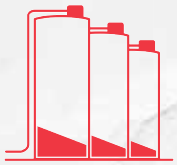
# The answer to your bulk handling questions

Ship unloaders



Road mobile ship unloaders

Storage & reclaim



Convey units

Truck loading

Ship loaders

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are in use on the other side of the world. For this project, a system of motorized steering has been installed. This is because, at the beginning, the project had a system of steering which included fifth wheel, pinions and hydraulic motors, but this wasn't successful enough. These wheels were created with the purpose of guaranteeing the requested load and the structural strength even in heavy duty conditions.

## Case studies shiploaders/unloaders

Borghi Assali collaborated with an important English company which needed to equip its shiploaders with hydraulic traction groups. Some groups of two tyres (35 tonnes and 45 tonnes), and four-wheeled bogies (70 tonnes and 90 tonnes) were studies, designed and produced for these big shiploaders.

Borghi Assali was chosen because of its ability to provide the wheels in a very short time, and because it can guarantee an adequate structure to support the customer's company, even during production increases.

This project involves the use of hydraulic traction systems and electric traction systems, separately. The client's ultimate purpose is to be able to offer the same machine to the market, in both hydraulic and electric versions, with group traction/steering using the same layout, which offers significant advantages in the management of replacement parts.

The design for the bogies was very complicated, because they had to be completely steered independently and they had to fit perfectly to the machine's frame.

The quality of Borghi Assali's products is determined by: the high designing accuracy;the high quality of all the components; the demanding tests on the materials and components; the precision of all the mechanical work; the precision of the assembly procedures; and the accurate functional tests. All these operations, that

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Borghi Assali provides to its clients guarantee the installation of faultless, reliable and lasting products.

Another type of shiploader is the one in which four groups of EBo 715.000S are placed, with a load capacity of 4.5 tonnes each. This machine has hydraulic propulsion. Two of the groups were created with both traction and steering, and the other two with only steering. This is because the high power of Borghi Assali's hydraulic motors made it possible to achieve the requested performance by using only two traction motors.

The designers requested a maximum speed of 1.2km/h and a maximum gradient that can go up to 5%. All these performances were easily achieved because of Borghi Assali's EBo715.000S wheels.

The same characteristics can be found in other projects that the company has carried out, such as the EBo1100.000C and the EBo715.000P, which are respectively fitted on a shiploader and on an RTG. The shiploader has a weight of 100 tonnes, with wheeled groups and a load capacity of 25 tonnes each, while for the RTG (in collaboration with an American company), classic six-tonne units were created.

With all of these projects, and taking into account the environment in which the machines operate, everything had to be provided with special treatments to protect against saline mist (for the components that are not painted). As before, all the paintable parts have been supplied with the C5M coatings.

Last but not least, it's important to mention the hydraulic horizontal drive wheel EBo715.00AA and EBo715.00AB, wheels fitted on a shiploader with a total weight of 55 tonnes. The movement is ensured by these two EBo715.00AA groups, with a load capacity of 23 tonnes, and two EBo715.00AB groups, with a load capacity of 4.5 tonnes. In relation to these groups, which are all hydraulic, EBo715.00AA were created with twin tyres and EBo715.00AB with single tyres. All the groups have a traction motor and hydraulic steering. This shiploader's designers requested a maximum speed of 1.3km/h and a maximum gradient of 5% and all of this was easily achieved thanks to Borghi Assali's wheels. Finally, to limit the overall height of these groups (but at the same time securing the load requested), some cushion press on tyres were employed instead of using pneumatic tyres.

# Traditional company on the banks of the Rhine chooses the SENNEBOGEN 870


*870 Mobile: unloading a barge on the Rhine in Germersheim.*

## Freyer Hafenlogistik receives support from Lower Bavaria

There's a new eyecatcher at the Germersheim inland port: family-owned company Freyer Hafenlogistik is starting 2019 with an 870 E-Series mobile material handler. With a 2m-tall pylon, the port machine weighs an impressive 110 tonnes, yet remains manoeuvrable and flexible.

The philosophy of family businesses is largely the same no matter where you go: great diligence and tradition, as well as long-standing and reliable partners with which you can form excellent cooperative relationships. One such family business is Freyer Hafenlogistik in Germersheim am Rhein, Germany, which is now in its fourth generation. In 1902, the great-grandfather of the current managing director, Peter Freyer, began mining gravel and sand in Neckarsulm.

In 1969, the business was successfully relocated to the port of Germersheim and underwent a transformation. Since then,

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everything has revolved around the loading and unloading of ships.

"Our field of activity has become much more varied over the years. For us, keeping up with the times meant being able to react more flexibly to market requirements. That's why we have expanded our repertoire since the turn of the millennium and now serve the field of port logistics as a whole. In addition to gravel and sand, we now deal with a wide variety of goods, including scrap and crude iron as well as grain and fertilizers," says 71-year-old senior manager Erich Freyer when asked about the further development of the business.

## Fleet expansion for even more flexibility in the port

At the beginning of 2019, Freyer further developed its fleet with the new 870 E mobile material handler from SENNEBOGEN in order to provide the required flexibility. In addition to two older 305 telehandlers and a smaller 860 from SENNEBOGEN's D-series, the new port machine fits perfectly into the on-site processes.

Thanks to the machine, which has a total length of 25m, all the ships arriving at the port can be served. During the project planning phase, done in co-operation with Schlüter Baumaschinen, it was particularly important to ensure the filling of the existing 16m-high silo. Thanks to the generous boom length and high stability of the 110-tonne machine, this is no problem at all.

Another remarkable aspect is the volume that can now be handled following the machine upgrade. Within just 2.5 hours, ships arriving in Germersheim with around 2,000 tonnes of gravel can be completely emptied. In total, the 27-man site transports 350,000 tonnes of bulk and general cargo each year.

"Of course, we don't make machine decisions just like that. As a family business, we must consider things very carefully. We were extremely impressed with the mobile 870 E from SENNEBOGEN. It features the

*Best range when filling the silo thanks to 25m equipment.*

*Satisfied project partners: Jens Kümmerle, Michael Köhnlein, and Özgü Öztura (Schlüter Baumaschinen); Erich Freyer and Peter Freyer (Management of Freyer Hafenlogistik); Kerstin Wabner (SENNEBOGEN). Behind: Machine operator Sascha Willner (Freyer Hafenlogistik).*

smallest yet most stable mobile undercarriage on the market. This allows us to be agile on site and use the machine flexibly," explains Peter Freyer.

A further criterion in addition to flexibility in the port was the sensitive joystick control, which lets the driver handle the heavy loads comfortably and precisely. Despite its compact design, the spacious Maxcab offers the necessary space for comfortable and ergonomic work. It boasts an air-suspended seat with back support and climate control. In addition to the standard camera equipment at the rear and on the right, Freyer had an additional camera mounted on the compact boom for safety reasons; this supports the driver when filling the silo.

Since 2009, Freyer has been working successfully with SENNEBOGEN dealer and service partner Schlüter Baumaschinen — also a family-run business, and which is part of the Germersheim port logistics company's trusted circle of partners.

# KPI-JCI and Astec Mobile Screens: wide product range includes shiploading and unloading solutions

Kolberg-Pioneer, Inc. (KPI), Johnson Crushers International, Inc. (JCI) and Astec Mobile Screens, Inc. have led the way as global manufacturers for the aggregate, mining, industrial, construction and recycling industries for the past 90 years. As a member of the Astec Industries family, KPI-JCI and Astec Mobile Screens set themselves apart by designing, manufacturing and selling the most innovative, productive, reliable and safe equipment for the industries it serves, coupled with excellent customer service. Among the products offered are ship-unloading solutions.

KPI-JCI and Astec Mobile Screens take great pride in knowing that their wide range of product lines provides comprehensive solutions that no competitor can match. To that end, the companies offer a complete line of crushing, screening, conveying and washing and classifying components ideal for a diverse range of applications. Their solutions are designed to the highest standards, guaranteed and supported throughout the lifespan of the equipment by their global market channels.

KPI-JCI's and Astec Mobile Screens' dedication to the customer is not just in manufacturing extremely high quality equipment, but also in understanding that every wasted minute impacts the bottom line. Producers can expect unparalleled customer service that is demonstrated every day through their continuous devotion to meeting the needs of their customers.

KPI-JCI and Astec Mobile Screens offer a wide variety of material handling equipment including portable and stationary conveyors, stackers, telescoping stackers and hopper feeders.

The Kolberg-Pioneer SuperStacker® Telescoping Radial Stacker features an innovative design that gives producers up to 30% more stockpile capacity and uses state-of-the-art technology to design custom desegregated stockpiles for maximum efficiency. The SuperStacker® conveyor can also be used to load and unload a variety of bulk materials.

SuperStacker® conveyors utilize Kolberg-Pioneer'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 the 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 the most up-to-date technology and convenient operational flexibility.

The telescoping stacker also features built-in counterweights for safety, cam-arm linkage connections for maintaining a constant radius and a gullwing axle for easy transportation. An optional track dolly can also be added to the tail end of the SuperStacker® conveyor to allow for on-site mobility.

In addition, the new track tugger from Kolberg-Pioneer can be used to provide in-pit mobility for the SuperStacker® conveyors. Producers are able to hook the

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SuperStacker® conveyor 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.

The SuperStacker® conveyor is available in sizes ranging from 130' to 190' and can process a wide variety of applications, while keeping material in spec from ship to stockpile.

The radial stackers offer versatility, portability and ease-of-use. Available in sizes up to 42" x 150', these conveyors partner seamlessly with the companies' lines of portable and stationary crushing, screening and material handling equipment.

The radial stacker features options like power-fold head and tail sections, gullwing axles and air brakes to make set up easy and efficient and lighting packages for exceptional road portability. In addition, an optional manual or hydraulic, top-folding frame is available on larger radial stackers for travel.

KPI-JCI and Astec Mobile Screens also manufacture portable and stationary feed systems with heavy-duty construction designs and easy set up. These systems are compatible with their 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

*ORTS grabs discharging cement clinker.*

# Equipment afloat

## Shipboard cranes and grabs

Jay Venter

## ORTS multi-purpose grabs prove popular

In the last two to three years, it has become increasingly obvious to ORTS GmbH that its dual-use grabs have become more attractive to shipping companies, stevedore companies and port authorities.

Evidence suggests that the dual-use possibilities of the ORTS independent working diesel-hydraulic grabs have became better known by those companies.

ORTS diesel-hydraulic grabs can operate with deck-cranes, port-cranes, truck cranes and building cranes.

The smaller ORTS diesel-hydraulic grabs became popular for cleaning the digesters of biogas plants. Several units of these ORTS diesel-hydraulic grabs, named DHZ, are working in the economic sector in Germany.

But agriculture companies/ co-operatives and owners/operators of biogas plants do not use the ORTS DHZ grabs for this task only. It is a multi-function unit, which is also appropriate for digging and the handling of other bulk materials in the agriculture business. Because they are small, with a low dead weight, and only need a hook, they can be used on a variety of different crane types.

The DHZ grabs are available with clamshells of 2m³ and a maximum of 5m³.

The independent diesel-hydraulic grabs DHS-B and DHM are made for unloading


*Independent radio controlled DHS-B 12m³.*

# The special advantage of ORTS diesel-hydraulic grabs

The special advantage of ORTS diesel-hydraulic grabs, compared with the standard single-rope grabs, is their working height. When a standard single-rope grab has its clamshell/bucket closed, there are several metres (up to 10m) space between the crane-hook and the top of the grab. If you add the height of the grab itself, you easy reach 14–15m. This causes trouble during unloading operations in ports with tides. During low tide/ebb tide the vessel is at such a low level to the quay wall, that the deck cranes of the vessel cannot reach the hoppers with standard single-rope grabs. So the operation has to be interrupted for several hours, until a rising flow tide brings the vessel up again and enables the deck cranes to reach the hoppers with the standard single-rope grabs.

This problem does not exist with ORTS diesel-hydraulic grabs — they are directly linked with the crane hook.

ships and operation in ports. With the deck-cranes of a bulk carrier, and with mobile cranes or port cranes, they can work everywhere. These grabs can operate in different places in a port, because they are independent. The performance and control features are the same as electro-hydraulic grabs.

ORTS's independent diesel-hydraulic grabs are available as two-clamshell grabs up to 20m³ and as orange-peel grabs up to 12m³.

The ORTS electro-hydraulic grabs EHS-B, known for its long lifetime, robust construction and low dead weight in relation to its clamshell-volume, are mainly made for being on-board grabs of bulk carriers with their own cranes. But they also prove their capabilities with mobile harbour cranes.

ORTS GmbH is a family-owned company and production all takes place in Germany.

*Above: DHM 12m³ with radio control device. Left, EHS-B 12m³ electro-hydralic grab on board. Below, EHS-B 12m³ grabs on the way to the ship for installation.*

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diesel-hydraulic grab


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# Liebherr ship cranes for efficient cargo handling

Liebherr ship cranes for dry bulk handling are designed to withstand salt water, wind and sun as well as dust and vibration in the long-term.

Thanks to their low height, these versatile cranes facilitate high visibility and are easy to control.

The compact overall design has a positive effect on the ship's structure and requires very little space on board, which means more space for the transportation of goods. High performance winches designed for continuous operation guarantee reliable and fast material handling on board and ship to shore. The minimal maintenance requirements ensure prolonged service life and low costs.

## Flexibility

Dry bulk cargo vessels equipped with ship cranes are independent of land-based loading and unloading facilities. When space in the harbour is restricted, the use of ship cranes even makes it possible to transfer loads at sea.

## Reliability

Liebherr ship cranes are designed for continuous use and also to withstand constant dusty conditions during bulk handling. The components offer a particularly high level of resistance as well as simple and low-cost maintenance.

## Efficiency

The in-house-developed Liebherr Litronic control system makes it possible for the crane operator to set route markers. This accelerates the slewing movements of the crane and actively supports the crane operator. Material handling can therefore be carried out more quickly without sacrificing control and overview.

## Types of Liebherr ship cranes

### CBW Series

Multipurpose and container handling vessels require space-saving and reliable cranes. Liebherr's cylinder luffing CBW cranes are the successful combination of economic and performance-orientated criteria. The product range covers lifting capacities of up to 90 tonnes SWL and outreaches of more than 40m.

Due to the compact design and low height of the crane, a minimum of container space is lost for positioning the crane whereby optimal view of the deck is ensured. The CBW crane is very easy to maintain thanks to the hydraulic and electronic components used.

*A versatile and compact CBW 2800 ship crane handling gravel.*

Furthermore, the crane operates without direct influence on the on-board electronics therefore producing no reverse current whatsoever.

### CBB Series

The CBB series distinguishes itself through its advanced wire-luffing reeving concept. CBB cranes are suitable for all ship crane segments, ranging from simple container and multipurpose vessels up to highly specialized heavy lift carriers.

### CBB — Heavy Lift Series

Based on the CBB series Liebherr has designed a high performance heavy lift crane. With capacities ranging from 120 tonnes to 450 tonnes, CBB cranes cover the main area of the heavy lift segment.

### Special Cranes — Liebherr CCB

The C-design developed by Liebherr offers a lower weight than the usual gantry solution. Additionally, the CCB installation is more compact than the equivalent U-shape solution. Therefore, the C-design is capable of handling 50 containers per hour. Two parallel independent hydraulic power packs for hoisting, trolley travelling and gantry travelling systems optimize the power consumption and offer maximum operational safety.

## Customer service

### Testing

Liebherr ship cranes go through an extensive testing programme. Prior to delivery, all electrical and hydraulic installations undergo detailed examination.

After assembly at the shipyard Liebherr service engineers conduct final adjustments of limit switches and proof the crane's functions through to an overload test.

### Assembly

Crane parts are transported in maximum pieces and assembled and commissioned by a team of experienced engineers.

### Training

Liebherr offers a range of flexible, high quality training solutions to fulfil specific customer training needs. Thereby, the main focus lies on creating a sustainable awareness for efficient and safe crane operations.

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# Guven Grabs radio remote control grabs

Between 20014 and 2016 more than 5,000 grab units have been manufactured by Guven Grab and Machine Ltd. Co (Guven Grabs). About 1,000 vessels have Guven Grabs' units on board.

Seventy-five per cent of the total production capacity of the company consist of radio remote control grabs.

Produced in sizes ranging from 2m³ up to 50m³, Guven's radio remote control grabs operate with a cental cylinder and with their own gravity circulating oil. These grabs are very popular for new generation bulkers, preferred instead of electro-hydraulic grabs. The grabs operate with batteries and remote control units, without any motors, pumps or electricity supply. The Guven radio remote control grab does not require a cable drum system, or grab stabilizer on the crane jib. It can be attached onto the hook of any kind of crane and the handling of the load can be started.

It can be controlled through a remote control unit up to a distance of 100 metres and be used for the handling of every type of bulk cargo.

## The full range of Guven Grabs

- radio remote control grab;
- electro hydraulic clamshell grab;
- electro hydraulic orange peel grab;
- mechanical single-wired touch down grab;
- mechanical double-wired clamshell grab;
- mechanical single- and double-wired polyp peel grab;
- mechanical single-wired coal grab;
- mechanical log grab;
- mechanical rock grab;
- electro hydraulic orange peel dredging grab;
- hydraulic orange peel excavator grab;
- mechanical double wired orange peel grab;
- mechanical hand-trip grab; and
- mechanical round-nosed grab for dredging.

## About Guven Grabs

Guven Grabs' production takes place at its plant in Cayirova Kocaeli, TURKEY which has been set up over an area of 10,000m² in total.

There are four units of CNC (computer numerical control) cutting machines, 11 units of CNC lathes and 28 cranes for various purposes, and with differing capacities, at its machining centres. The Guven Grabs team consists of 85 people working on production and in offices.











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# Verstegen specialized ship grabs

## Ship cranes

Ship cranes, or deck cranes, offer practical bulk solutions for various vessels including bulk carriers, barges and transshippers.

Verstegen specializes in mechanical rope operated grabs for four-rope ship cranes.

## Multiple solutions

Ship cranes are used in many ways. Barges can have a single deck crane, and large bulk carriers can have four or five deck cranes.

The range of crane capacities is normally between 25 and 50 tonnes with a working radius from 20 to 38 metres. To improve the outreach and positioning performance, the cranes can be installed on eccentric platforms.

Besides the single boom cranes there are special double girder deck cranes especially designed for use on board transshippers, where very high turnover rates and continuous operation are required.

## Self-unloading stations

Some vessels are complete self-unloading stations with deck cranes, hoppers and conveyors. These self-unloaders can be used for transshipment or unloading without the need for shore-based unloading systems.

*Verstegen clamshell grabs on MPG cranes handling iron-ore.*

*Verstegen trimming grab handling bauxite.*

*Verstegen trimming grab on a Gottwald floating crane handling bauxite.*

## High capacity grabs

Verstegen developed a wide range of bulk handling grabs, optimized for specific materials. Clamshell grabs can be used for most bulk materials. For certain materials or specific operations, other grabs are a better solution.

### Clamshell grabs

Clamshell grabs are used for normal free-flowing bulk materials. Verstegen has developed a range of clamshell grabs optimally designed for common bulk materials.

### Orange peel grabs

For difficult-to-handle materials — like iron scrap, stones and rocks, or pig iron — Verstegen orange peel grabs are an ideal solution.

### Trimming grabs

For heavy and coarse materials, Verstegen trimming grabs are a highly efficient solution. Trimming grabs are in operation for handling coarse materials like stones, ferro-chrome, pig iron, DRI and HBI.

### Single-rope cranes

Single-rope grabs are normally used when port cranes are not available and shipboard cranes must be used. Most of these ship cranes are single drum cranes that cannot operate two- or four-rope grabs. In these cases, Verstegen single rope grabs can be a good solution. The grabs can be connected to any crane — just hook the grab onto a crane with sufficient lift capacity and it is ready for operation.

### Dredging grabs

For underwater operations, Verstegen offers grabs for maintenance dredging (mainly silt and mud) and special grabs for digging operations (clay and hard ground layers). The grabs are available in two- and four-rope versions.

## Optimized Verstegen grabs

Stevedoring companies and port authorities — as well as steel works and power plants — are using Verstegen grabs for handling all kinds of bulk materials. As each commodity has different handling requirements, Verstegen has used its experience to develop a range of grabs, each optimized to handle a specific commodity.

In excess of 10,000 Verstegen grabs operate in more than 100 countries worldwide.

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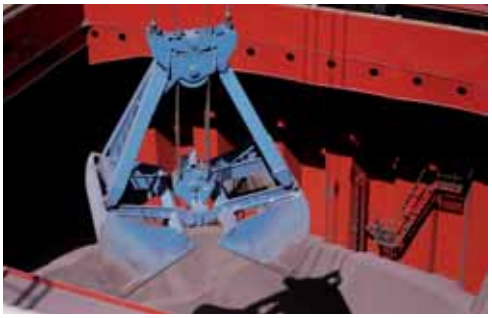

## Are you looking for a new grab?

Please contact us. At Verstegen we are fully specialised in rope-operated mechanical grabs. Our goal is to provide the optimal grab for your specific operation. A new Verstegen grab leads to higher production rates and lower maintenance costs through extreme reliability and long lifetimes. Tell us how you want to improve your operation and together we will find the best solution.

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# A look at TTS bulker cranes

## TLB — ELECTRO-HYDRAULICALLY DRIVEN BULKER CRANES UP TO SWL 50T

**Capacity:** SWL 30–50 tonnes
**Operation:** bulk carrier

**CHARACTERISTICS:**

The TLB bulker crane is characterized by high cycle times and robust design. Like all TTS cranes, the TLB has an unlimited slewing range of 360° and the equipment and machinery is mounted inside the crane housing to protect it against the maritime environment. Operation in the first layer on the winch drum ensures a long lifetime of the wires.

The TLB crane is equipped with proven TTS electronic control PLC (programmable logic controller) and digital operation display in the crane cabin as standard. All movements can be done simultaneously and are steplessly operated. To ensure a safe workflow, the TLB has an automatic speed reduction of hoisting and luffing before the limit switch is activated. Additionally the driver's cabin is protected by a security cage.

**ADDITIONAL FEATURES:**

- air conditioning in driver's cabin;
- anti-collision system; and
- remote maintenance system.

## TLB — E — ELECTRICALLY DRIVEN BULKER CRANES UP TO SWL 45 TONNES

**Capacity:** SWL 30–45 tonnes
**Operation:** bulk carrier

**CHARACTERISTICS:**

Based on successful TLB design the TLB-e is a further development in TTS's crane portfolio. As part of the TTS e-line, all major parts of the TLB-e (hoisting- and luffing winch as well as slewing motors) are electrically driven.

One of the major benefits of the TLB-e crane is an improved energy efficiency compared to a conventional hydraulically driven crane. One the one hand, it is based on less absorbing energy conversions, meaning that energy from the ship generator must not be modified to hydraulic pressure and can be used directly for crane operation.

On the other hand, the TLB-e needs no permanent basic hydraulic pressure, meaning that energy is consumed only if the crane moves. In combination with usage of reverse power during lowering cargo the benefits for bulk operation are significant.

Another major aspect is the reduction of running costs for maintenance as changing of hydraulic oil, filter and hoses is not needed anymore.

High cycle times, a lower noise level and easy operation due to standard controller complete the TLB-e characteristic.

**ADDITIONAL FEATURES:**

- air conditioning in driver's cabin;
- anti-collision system; and
- remote maintenance system.


*Type V – electro-hydraulic cranes up to SWL 40 tonnes.*

*TLB bulker crane.*

## TYPE V – 4 ROPE BULKER CRANES UP TO SWL 40 TONNES

**Capacity:** SWL 25–40 tonnes
**Operation:** bulk carrier, transshipment barges

**CHARACTERISTICS:**

This four-rope grab crane is designed to provide excellent visibility for the crane operator as well as safe and efficient cargo handling. TTS's four-rope grab cranes are designed to operate under rough environmental conditions and to handle with a higher volume of cargo compared to conventional deck cranes.

**ADDITIONAL FEATURES:**

- air conditioning in driver's cabin;
- anti-collision system; and
- remote maintenance system.

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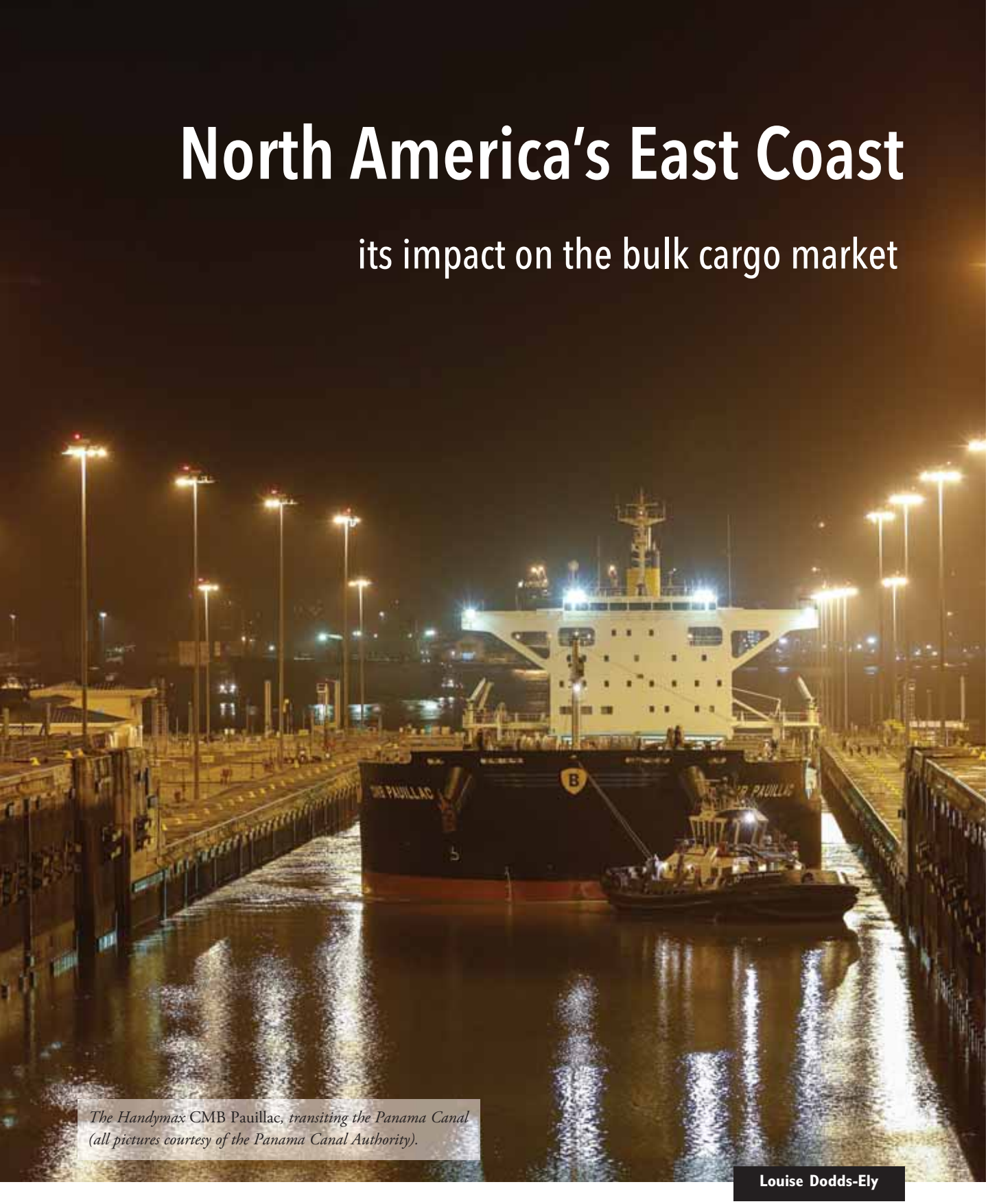
# North America's East Coast

## its impact on the bulk cargo market



*The Handymax* CMB Pauillac, *transiting the Panama Canal (all pictures courtesy of the Panama Canal Authority).*

Louise Dodds-Ely

## Panama Canal: a vital link between the Atlantic and Pacific Oceans

The Panama Canal Authority (ACP) is an autonomous legal entity of the Republic of Panama, with exclusive charge of the operation, administration, management, preservation, maintenance, and modernization of the Canal, as well as its activities and related services. This means the Canal can operate in a safe, continuous, efficient, and profitable manner.

Because of its importance and uniqueness, the ACP is financially autonomous, has its own patrimony, and the right to administer it.

An Administrator and a Deputy Administrator head the ACP under the supervision of an 11-member Board of Directors. The Administrator is the highest-ranking executive officer and legal representative of the Authority, and is responsible for its administration and the implementation of the policies and decisions of the Board of Directors. The Administrator is appointed for a seven-year term, and may be re-elected for an additional term.

The Panama Canal constitutes an inalienable patrimony of the Republic of

Panama; therefore, it may not be sold, assigned, mortgaged, or otherwise encumbered or transferred. The legal framework of the Panama Canal Authority has the fundamental objective of preserving the conditions for the Canal to always remain an enterprise for the peaceful and uninterrupted service of the maritime community, international trade, and the Republic of Panama.

*The Capesize* Satori *approaches a lock along the Canal.*

## This is the Canal

The Panama Canal is approximately 80km long between the Atlantic and Pacific Oceans. This waterway was cut through one of narrowest saddles of the isthmus that joins North and South America.

The Canal uses a system of locks — compartments with entrance and exit gates. The locks function as water lifts: they raise ships from sea level (the Pacific or the Atlantic) to the level of Gatun Lake (26m above sea level); ships then sail the channel through the Continental Divide.

Each set of locks bears the name of the townsite where it was built: Gatun (on the Atlantic side), and Pedro Miguel and Miraflores (on the Pacific side).

The lock chambers — steps — are 33.53m wide by 304.8m long. The maximum dimensions of ships that can transit the Canal are: 32.3m in beam; draught of 12 meters in tropical fresh water; and 294.1m long (depending on the type of ship).

The water used to raise and lower vessels in each set of locks comes from Gatun Lake by gravity; it comes into the locks through a system of main culverts that extend under the lock chambers from the sidewalls and the center wall.

The narrowest portion of the Canal is Culebra Cut, which extends from the north end of Pedro Miguel Locks to the south edge of Gatun Lake at Gamboa. This segment, approximately 13.7km long, is carved through the rock and shale of the Continental Divide.

Ships from all parts of the world transit daily through the Panama Canal. Some 13,000 to 14,000 vessels use the Canal every year. The Panama Canal serves more than 144 maritime routes connecting 160 countries and reaching some 1,700 ports in the world.

The Canal has a work force of approximately 10,000 employees and operates 24 hours a day, 365 days a year, providing transit service to vessels of all nations without discrimination.

## The Panama Canal implements speed limits to protect whales

Starting August 1 and until November 30, 2019, the Panama Canal will promote the implementation of the International Maritime Organization's (IMO) annual recommendations on speed and maritime transit aimed at protecting cetaceans, which include whales, dolphins and other large aquatic mammals, during their nearby seasonal migration.

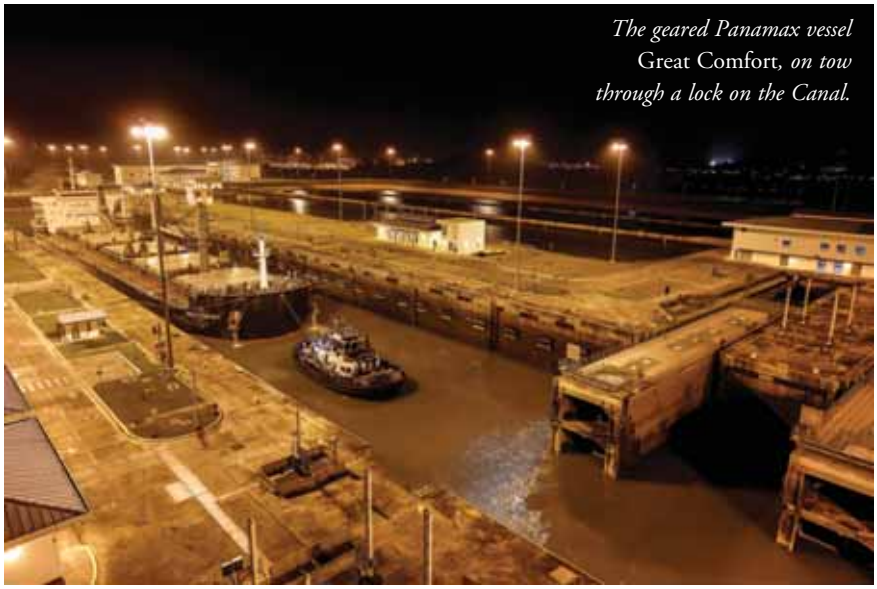
With these measures, ships should proceed at a speed of not more than ten knots in specified areas. Panama has monitored this requirement since 1 December 2014 when maritime traffic separation devices (TSS) were installed by both the Caribbean Sea and Pacific Ocean entry points to the Canal.

"The Panama Canal is committed to sustainable development and the conservation of biodiversity, including the conservation of cetaceans by encouraging the maritime community to follow the recommendations and guidelines established by existing maritime traffic devices. These measures seek not only to protect cetaceans from collisions with vessels, but also to promote an orderly management of the ocean and its resources," said Administrator Jorge L. Quijano.

These recommendations are included in the Maritime Traffic Organization publication issued by the IMO that aims to increase navigation safety in converging zones and areas of high-traffic density, or where the freedom of movement of vessels is limited due to space restrictions, obstacles to navigation, depth limitations, unfavourable weather conditions, exploitation of fishery resources or sensitive coastal and marine areas flagged as important for the protection of species and their habitats.

The introduction of these devices has significantly reduced the likelihood of serious incidents and accidents involving humpback whales and other cetaceans, assuring maritime safety and control of vessels transiting our waters.

"The joint work and the holistic approach of the Canal's Green Route not only promote the preservation of biodiversity, but also contribute to national conservation efforts through



*The geared Panamax vessel* Great Comfort, *on tow through a lock on the Canal.*

commitments made to the IMO and international maritime transport community," added the Panama Canal Environmental Specialist Alexis Rodríguez.

The above initiative is part of the Panama Canal's broader efforts to incentivize environmental stewardship and includes watershed conservation initiatives, innovative water-saving basins, and other programs aimed at implementing technologies and standards to help reduce greenhouse gas emissions.

## The Panama Canal and UN Environment join forces on sustainable development and climate action

In late July this year, the Panama Canal and UN Environment signed a co-operation agreement to join efforts on sustainable development and combatting climate change.

Signed by the Administrator of the Panama Canal Jorge L. Quijano and the Regional of UN Environment in Latin America and the Caribbean Leo Heileman, the agreement includes the exchange of experiences and knowledge, the development of programs and research in areas of shared interest, and human resources training across both institutions.

The disruption of rainfall patterns due to climate change is one of the main threats to water levels in the watershed of the Canal, that sustains more than two million inhabitants, while producing energy and enabling the operation of the interoceanic route which serves approximately 2.5% of world trade.

"The Panama Canal is an engineering marvel that has helped the world become more interconnected and has accelerated progress by enabling the exchange of goods and knowledge," said Heileman.

"We will work closely to protect the environment and promote climate change mitigation and adaptation programmes that guarantee the water supply for the interoceanic route," he added.

Administrator Quijano indicated that the Panama Canal maintains a policy that complies with the best environmental practices by minimizing their impact on the waterway operations and ensuring a rational and sustainable use of natural resources with emphasis on water.

"In pursuit of environmental sustainability, we have invested vast resources and time over the last decade to ensure our operations are cleaner and produce less emissions so we can minimize our impact on global warming," Quijano mentioned.

The arrangement includes co-operation efforts between both organizations in areas such as the creation and management of environmental economic incentives, integrated watershed management, water availability, air quality, renewable energy, energy efficiency and electric mobility, among others.

By constitutional mandate, the Panama Canal is responsible for the management, maintenance, use and conservation of the water resources of the watershed, which includes the water in the lakes and tributaries.

To guarantee water availability and quality, the Panama Canal works closely with communities on sustainability projects in the Colon and Panama Provinces. These efforts include reforestation initiatives and the Environmental Economic Incentives Program (PIEA).

The waterway also promotes a rewards program for ships that meet the highest standards of environmental performance and promote the reduction of greenhouse gas (GHG) emissions in maritime transport.

## About UN Environment

UN Environment is the leading global voice on the environment. It provides leadership and encourages partnership in caring for the environment by inspiring, informing, and enabling nations and peoples to improve their quality of life without compromising that of future generations. UN Environment works with governments, the private sector, civil society and with other UN entities and international organizations across the world.

# Port Canaveral purchases US's largest mobile harbour crane

Port Canaveral handles a variety of dry bulk products, including: slag, salt, granite; and aggregates. The port's top tenants for bulk include: Lehigh Hanson; Morton Salt; SeaPort Canaveral; Martin Marietta; Continental Florida Materials; and TransMonaigne. The stevedores/agents which handle bulk at the port are: ASI; Norton Lilly; Moran; and Fillette.

## Port statistics

In the past year, there has been a significant increase in the throughput of dry bulk cargoes at Port Canaveral. Comparing the October to May FY18 to the same months in FY19, there has been an increase of 13% in the handling of slag (also because of the construction boom, including housing and 14 roadway projects); and 14% in the handling of salt. Between 1 October 2018 and 31 May 2019, 235 ships called at the port; cargo revenue totalled $6.2 million; and cargo tonnage reached 4.4mt (million tonnes), a 3.6% increase over FY18.

*Salt being discharged.*


*Port Canaveral's new mobile harbour crane from Liebherr has the heaviest lift capability in all of Florida*

## Crane purchase improves heavy lift capabilities

Port Canaveral recently purchased a new Liebherr LHM 600 mobile harbour crane, the largest mobile harbour crane in the US, to accommodate the port's growing diverse cargo throughput, adding flexibility and extended lift capability. The multi-wheeled, 1.19-million-pound crane has an 18-container reach and capabilities to hoist heavy cargo, including oversized space components. It has the heaviest lift capability in all of Florida at 154 tonnes plus an outreach of 18-containers across. It can also handle bulk cargoes. Cost: $6.2 million.

The delivery of the mobile harbour crane to Port Canaveral in January 2019 was a heavy-lift project in itself.

Says port CEO Capt. John Murray: "We're excited to bring ashore this versatile, state-of-the-art crane. This kind of equipment adds value to our capabilities with wide ranging deployment options to service current and future demands."

## Investing in infrastructure

In response to increasing demand for bulkhead space, the port is developing North Cargo Berth 8 (NCB8) as a multimodal/intermodal berth to handle heavier, more diverse cargo, including space components. Scheduled for completion in Spring 2020, the $18.5 million berth project will accommodate vessels up to 850-foot long with 35 feet of draught.

Says Murray: "Port Canaveral has a significant role and responsibility in building and sustaining a strong economy on the Space Coast, and throughout Central Florida. To do this successfully, we must continue to invest in infrastructure to promote solid growth and economic prosperity for the region."

To accommodate more cargo as part of an overall infrastructure improvement plan to maximize existing bulkhead space, the port recently modernized North Cargo Berths 1 and 2, adding new concrete decks, marine fenders, bollards and concrete curbs.

Future plans include rehabilitating and expanding existing North Cargo Berths 3 and 4 to accommodate future growth.

## About Port Canaveral

Led by the elected five-member Canaveral Port Authority Board of Commissioners and Port Director and CEO, Captain John Murray, Port Canaveral is one of the world's most dynamic and exciting ports. A world-class gateway for cruises, cargo, recreation and logistics, as well as a gateway to new frontiers, including space, Port Canaveral hosts more than 4.5 million revenue cruise passengers through its state-of-the-art terminals and more than 6mt of cargo annually, including bulk, breakbulk, project, and containerized.

The port is strategically located to service all Florida markets, as well as the Southeastern United States. In addition to world class cruise facilities and diverse cargo operations, Port Canaveral offers more recreational opportunities than all other Florida deep-water seaports combined, including public parks, free public boat ramps, marinas, an entertainment district, and the seven-story interactive exhibit and event venue Exploration Tower.

*North Cargo Berth 8.*

# Impala Terminals Burnside, Louisiana: essential link in the commodity chain

**Impala Terminals Burnside, Louisiana — providing an integrated and efficient supply chain route from the United States to international markets through the Gulf of Mexico**

Impala Terminals Burnside in Ascension Parish, Louisiana is Impala's state-of-the-art bulk facility in the US for coal, petroleum coke, bauxite, alumina and other dry commodities.

Impala Terminals Burnside is an essential part of the commodities supply chain to Central and South America, the Caribbean, Western Africa, and the Euro-Mediterranean region. Further recent expansion of the Panama Canal has allowed larger vessels to cross-transit, making it possible for its customers to reach Asian markets.

Located at mile marker 169 on the Lower Mississippi River, Impala Terminals Burnside is a multi-modal terminal with access to ocean, river, and truck connecting the US coal and petroleum coke producing heartland to domestic and international markets.

This strategic location provides ready access to the entire 25,000 nautical miles of the US Inland river system, immediate access to the US Interstate highway system, all class one railroads and direct access to the Gulf of Mexico via the Mississippi River shipping lanes.

Since acquiring the site in 2011, Impala has invested significantly in the terminal transforming it into one of the top bulk exporting facilities in the US. To date US$300+ million has been injected into the project with a further US$150+ million envisaged for a further phase of redevelopment incorporating a state-of-the-art rail unloading system. Over the last year volumes handled at Burnside grew to 4.4mt (million tonnes) of coal and coking coal and 1.1mt of bauxite and alumina, a combined increase of 2.1mt from the 3.4mt handled in 2017.

Impala Terminals Burnside not only offers immediate storage on a soil cement pad and blending facilities, but also operates a mid-stream berth with both barge-to-ocean vessel and ocean vessel-to-barge transfer capabilities. The mid-stream vessel operation is capable of transfer rates up to 20,000 tonnes per day of all types of bulk cargoes, including coal, petroleum coke, grain products, ores or alloys and fertilizers.

Impala Terminals Group is delivering on its promise of running a state-of-the-art facility with a focus on quality, efficiency, environmental stewardship and reliability.

# GT USA Wilmington marks successful implementation of new terminal operating system

## New system to enhance company's operational excellence in terminal management and customer service

In late July this year, GT USA Wilmington announced the successful implementation of an Integrated Port Operating System (IPOS), to upgrade and optimize the IT system for the future development of the port. The system was deployed over recent months at the Port of Wilmington with employees and customers receiving end-user and user acceptance training, with outstanding results being registered.

The system upgrade is already enhancing GT Wilmington's operating processes and customer service by improving job orders, vehicle routing processes for container pick-up/delivery, the optimization of layout and travel distances within the terminal and integration with customer systems for complete visibility throughout the supply chain.

The resulting efficiencies to key operational processes are allowing the company to boost terminal productivity and improve service quality, enabling the business to identify and solve potential problems before they occur.

Eric Casey, CEO of GT USA Wilmington said: "I'd like to congratulate everyone involved in the roll out of the IPOS system. Everyone came together to ensure that the go-live was completed on its scheduled date with no glitches. The implementation of IPOS reiterates GT Wilmington's continued commitment to improving operational systems for a better customer experience.

The roll out of the IPOS is the first step in our technology transformation strategy and having this new system at the heart of terminal operations will play a crucial role in boosting our overall performance; we are enhancing efficiency and productivity

while adding substantial value for our customers. Most importantly, vessels arriving at our port will benefit from the considerable reduction in wait times that comes with synchronized operations."

## About the Port of Wilmington, Delaware

Founded in 1923, the Port of Wilmington is a full service Mid-Atlantic seaport on the Delaware River strategically located to provide overnight access to 200 million North American consumers. Wilmington ranks as North America's top banana port and the nation's leading gateway for imports of fresh fruit and juice concentrates. The port was one of the originally certified '360 Quality' marine terminals in the United States, underscoring its high-quality handling standards for perishable cargo. The port also handles dry bulk commodities, including chemical-grade salt, road salt, speciality ores, petroleum coke (petcoke) and speciality chemicals. The port also handles a variety of breakbulk cargo, including ferrous scrap; wire rod and coils; rebar; steel sheets and coils; steel plate; bulb flats; structural beams; and slabs. Forest products — mainly sawn timber in bundles — also regularly pass through the port. The port also deals with a considerable volume of paper, including paper rolls, newsprint, magazine stock and liner board.

An economic engine for the State of Delaware and the region, business activity at the port creates over 5,900 family sustaining jobs and annually generates $436 million in business revenue, $409 million in personal income and $41 million in local taxes. The port is operated by GT USA Wilmington, LLC.

## About GT USA

GT USA is the US division of Gulftainer, the world's largest privately-owned independent port operator and logistics company with operations and business interests in the Middle East, the Mediterranean, Brazil and the United States. GT's presence in North America expanded in 2018 with the signing of a 50-year concession agreement with the state of Delaware to manage and operate the Port of Wilmington, a deep-water port and marine terminal serving the Eastern Seaboard. The company's first venture into the USA came in 2014 with the signing of a 35-year agreement to operate Canaveral Cargo Terminal, a multi-purpose cargo and container terminal in Florida. DCi

# Great Lakes celebrates its diamond anniversary


*Fednav's* Federal Clyde – *Trois Rivières.*

## The St. Lawrence Seaway – ready for the future

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 Montréal 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 nearly three billion metric tonnes of cargo in 50 years, with an estimated value of over $450 billion. Almost 25% of this cargo travels to and from Canada and nearly 50 other nations, 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

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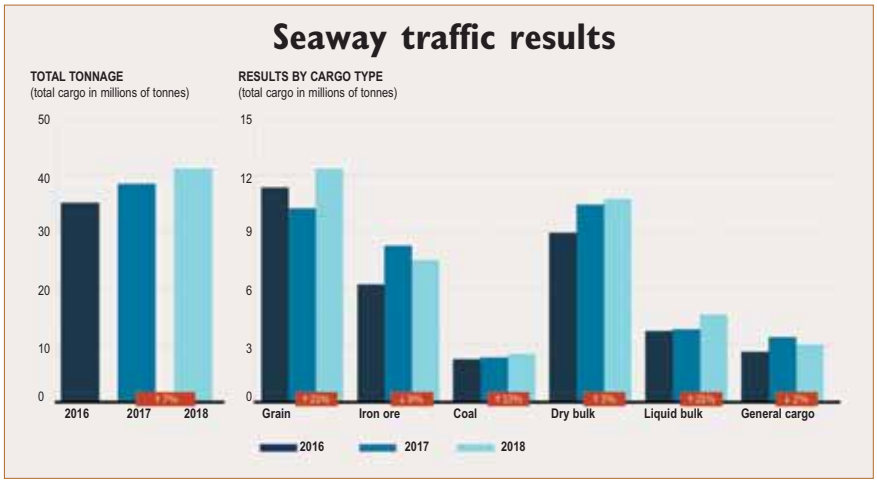
The Great Lakes/St. Lawrence Seaway was built as a binational partnership between the US and Canada, and continues to operate as such.

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.




## 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 Montréal 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, the successor to the St. Lawrence Seaway Authority, was established in 1998 as a not-for-profit corporation by the Government of Canada, Seaway users and other key stakeholders. In accordance with provisions of the Canada Marine Act, the Corporation manages and operates the Canadian assets of the St. Lawrence Seaway, which remain the property of the Government of Canada, under an agreement with Transport Canada.

### Message from the President of the SLSMC

In the SLSMC's most recent corporate, President and CEO Terence Bowles focused on the Seaway's 60th anniversary, which takes place this year.

"We marked this significant milestone on March 26th at the official opening of the navigation season," said Bowles. He went on to praise the innovative hands-free

# Rand Logistics announces American Bureau of Shipping certification of Conneaut Creek Ship Repair, Inc.

In mid-June, Rand Logistics, Inc. (Rand), a major provider of bulk freight shipping and ship repair services throughout the Great Lakes Region, announced that Conneaut Creek Ship Repair (CCSR), Rand's full-service ship repair, fabrication and industrial maintenance company, has been certified by the American Bureau of Shipping (ABS) as a Recognized External Specialist in Hull Gauging, effective April 18, 2019. With this ABS Certification, CCSR is eligible to perform classification-related services on ABS-classed units with demonstration of conformity to recognized industry standards and applicable ABS rules.

"We are proud to announce that we have achieved ABS certification as a Recognized External Specialist in Hull Gauging including Ultrasonic Thickness Gauging, which expands our service offerings to customers in the Great Lakes Region and throughout North America, in addition to our Company's fleet of 14 US- and Canadian-flagged vessels," stated Joseph Craine, President of CCSR. "With this ABS certification, we will also be able to fulfill additional requests from equipment manufacturers, vessel owners and other new clients."

With more than 35 years of marine and heavy industry repair and maintenance expertise, CCSR offers innovative solutions, quality work and superior service to a variety of customers throughout the Great Lakes Region, and is fully-staffed to manage projects of all sizes. CCSR's capabilities and service offerings include, but are not limited to, heavy fabrication and repair services including steel, stainless steel and aluminium fabrication; ship repair while dockside or underway; new construction; custom-designed barges and truckable work boats designed by a naval architect on staff; remediation; industrial maintenance including ASME "R" Stamp, repair and alterations; conveyor and track repairs; engine and generator replacement/ repowering; heavy duty winch repair and maintenance; and dock fabrication, installation and repair. Conneaut Creek Ship Repair is located in Ashtabula, Ohio.

## About ABS

ABS, a major global provider of classification and technical advisory services to the marine and offshore industries, is committed to setting standards for safety and excellence in design and construction. Focused on safe and practical application of advanced technologies and digital solutions, ABS works with industry and clients to develop accurate and cost-effective compliance, optimized performance and operational efficiency for marine and offshore assets.

## About Rand Logistics

Rand Logistics, Inc. is a major provider of bulk freight shipping and ship repair services throughout the Great Lakes region. Through its subsidiaries, the company operates a fleet of three conventional bulk carriers and 12 self-unloading bulk carriers, including three tug/barge units, and two ship repair companies. The company is the only carrier able to offer significant domestic port-to-port services in both Canada and the US on the Great Lakes. The Company's vessels operate under the US Jones Act (which reserves domestic waterborne commerce to vessels that are US-owned, built and crewed) and the Canada Coasting Trade Act — which reserves domestic waterborne commerce to Canadian-registered and crewed vessels that operate between Canadian ports.

mooring system. "We have just emerged from the most transformative era in the Seaway's history with the completion of our modernization programme," he said. "Hands Free Mooring has brought about the greatest advancement in operations since the Seaway's inception in 1959.

"The theme for this year's report reflects the substantial progress that has been realized since The St. Lawrence Seaway Management Corporation was established in 1998. Thanks to substantial gains in safety, reliability and efficiency, the St. Lawrence Seaway is 'ready for the future'," said Bowles.

Bowles stressed that the 2018/19 fiscal year showed strong gains, with cargo tonnage rising 7% to over 41mt (million tonnes), the best result since the Global Financial Crisis hit in 2008. Revenues, increased by $4 million to $87 million. With manageable costs coming in at $51 million, a $9 million reduction from the previous year, revenues exceeded manageable costs by $36 million.

In terms of asset renewal, the total investment made last year was $61 million, $7 million less than the previous year. These results allowed the Corporation to contribute over 50% of the investment required for Seaway asset renewal.

Operationally, the SLSMC had another strong year with system availability once again exceeding 99%, testament to its proactive approach to system maintenance and its skilled workers

Says Bowles, "Over the last 20 years since the Seaway was commercialized, we have worked closely with our industry partners to reinforce the Seaway's competitiveness. This has resulted in the following achievements:

- system availability has exceeded 99%;
- $1 billion invested in asset renewal;
- covered operating costs and contributed to asset renewal;
- completed modernization programme, installing hands free mooring and converting the locks to remote control operation;
- cumulative toll increases over the last ten years held to less than CPI;
- creation of Hwy $H_2O$ market development programme;
- instituted toll incentive programmes to encourage new traffic;
- implemented automatic identification system and draught information system to maximize ship efficiency; and
- optimized length of navigation season (+10 days) and working to extend this further.

In terms of the future, the SLSMC is exploring ways to further increase the efficiency and competitiveness of the

Seaway. Encouraging more shippers to use the Seaway is an excellent way to promote both economic growth and a low-carbon economy. With strong advancements in safety, reliability, and efficiency, the stage has been set for a St. Lawrence Seaway that will effectively serve its stakeholders for decades to come.

"As we celebrate the Seaway's 60th anniversary and take stock of the progress made, we can truly say that we are ready for the future!" says Bowles.

### Traffic results

Seaway traffic in 2018 totalled 41mt, an increase of 7% or 2.7mt compared to 2017 and was the highest level achieved over the past 11 years. Both international and domestic movements of bulk and breakbulk commodities such as grains, salt, liquid cargoes and steel slabs have played an important role in supporting the growth in tonnage.

Vessel traffic increased in step with tonnage.

## 2018 new business results

The New Business Incentive programme, which offers reduced tolls for eligible 'new' cargo movements, attracted 97 applications in 2018, of which 84 were approved. This translated into 1.5mt of new cargo, led by movements of salt, coke, and grains, generating revenues of $2.7 million.

### Seaway tolls & incentives

Tolls increased by 1% for the 2018 navigation season and, likewise, increased by 1% for the 2019 season. The Corporation's various toll incentive programmes will remain in place in 2019. These programmes currently consist of the New Business Incentive, the Volume Incentive, the Service Incentive, and the Gateway Incentive. The newest addition, the Gateway Incentive, offers shippers a negotiated percentage reduction in cargo toll rates, in order to attract shipments to the Seaway that are currently moving via a competing gateway.

## Bi-national marketing initiatives

The SLSMC and the SLSDC continue to work together to create and implement joint strategic initiatives. These initiatives are anchored by the HWY $H_2O$ programme, and include the sponsorship of various marketing campaigns, hosting of the annual HWY $H_2O$ Conference, and participation in trade shows and workshops.

## High-performance workforce

The SLSMC's vision for its people is driven by leaders at all levels, who actively develop and maintain a skilled, versatile, engaged and accountable workforce.

- **Bob Swenor Award:** the annual Bob Swenor Living the Values Award is given to a Seaway Employee who lives the corporate values, demonstrates continuous personal development, shows commitment to the Corporation and the community, and holds a strong belief that people make a difference. In 2018, the recipient was Michel Thibault, a civil inspection engineer. Thibault is relatively new to the Seaway. His colleagues recognize him as someone who readily adopts new methods and technologies. Safety is always a priority, and his colleagues describe him as a respectful and active listener. Thibault participates in conferences and seminars on innovation and research in the field of cement and concrete, both within Quebec and internationally, sharing his knowledge while showcasing the Seaway in a positive light.
- **Continuous Improvement:** the Corporation's continuous improvement (CI) culture manifests itself in many different ways. Traditional lean six sigma (LSS) projects utilizing a structured, data-driven process improvement methodology is applied to all aspects of the business. Yellow, green and black belt facilitators lead teams to a more scientific means of decision-making by deploying a disciplined analytical approach to identifying root causes to problems. An idea generating platform (also known as iGen) enables employees at all levels to present and collaborate on ideas. For the third consecutive year, the Corporation achieved in excess of $1 million in value from continuous improvement initiatives, which demonstrates a heightened awareness for CI in the mindset of employees. The 2018 Continuous Improvement Most Valuable Project/Person award was presented to Sandro Pasqualetto (Supervisor, Canal Services and Operations) recognizing his persistence and leadership as it pertains to CI efforts in his daily activities.

## 60th anniversary

With the advent of the St. Lawrence Seaway's 60th anniversary, the Corporation seized upon a number of opportunities to highlight the St. Lawrence Seaway and the many benefits that its operation provides.

- **corporate video:** a new four minute corporate video was created to celebrate the 60th anniversary. Painting a vivid portrait of the modernization programme and the advances made possible by Hands Free Mooring and remote lock operation, the video impresses upon viewers the Seaway's bright future as the lynchpin tying together a vital marine supply chain that lies at the heart of a $6 trillion economy.

## A waterway ready for the future

With strong advancements in safety, reliability, and efficiency, the stage has been set for a St. Lawrence Seaway that will effectively serve its stakeholders for decades to come.

# Port of Hamilton tenants grow their businesses at the port

*Parrish & Heimbecker at the Port of Hamilton.*

## P&H expanding milling operation in Hamilton

Parrish & Heimbecker Limited (P&H) has announced it is expanding its Hamilton flour mill and grain terminal, bringing increased capacity, capabilities and facilities to producers.

The Hamilton grain terminal expansion will continue to increase the company's ability to connect Ontario producers with global grain marketing opportunities. Work is already under way to have the P&H Hamilton site also become the home of an expanded flour mill, which will make P&H the single largest user of Ontario wheat.

"Canadian producers are known for growing top quality crops and we are dedicated to not only helping them continue to maintain excellence in crop quality through our crop inputs division but also providing producers with access to worldwide markets through our grain handling, processing and marketing capabilities," said John Heimbecker, President of Grain Division and Executive Vice President, Parrish & Heimbecker, Limited. "We are dedicated to continuing to make strategic investments to bring global opportunities to the Canadian farm gate and look forward to continuing to maintain first class partnerships with agricultural producers across Canada."

The existing P&H Hamilton flour mill, which came online in 2017, was the first new flour mill to be built in Ontario in 75 years. This mill significantly increased the company's capability to receive and process locally-grown Ontario wheat. The new expansion of the Hamilton flour mill will effectively double its capacity and is scheduled to come online in 2020

## Sucro Sourcing announces new sugar refinery in Hamilton

Sucro Sourcing announced the completion of its new granular sugar refinery in Hamilton, Canada. The refinery was completed with the support of the Port of Hamilton and will begin refining sugar immediately.

The construction of the granular sugar refinery represents a modern solution for the customer challenges of today. Sucro's smaller size and greater flexibility will provide its customers with valuable competitive options and lead to greater collaboration on sustainability and supply chain initiatives.

"At Sucro Sourcing, we are focused on creating value for our customers through continuous innovation and unique supply chain solutions," said Jonathan Taylor, CEO and founding owner of Sucro Sourcing LLC. "Our innovative approach to micro sugar refineries, and the proprietary process technology utilized, allows Sucro to reduce costs for our customers and conduct business in a way that is more sustainable and aligned with our customers' needs."

Sucro Sourcing is the first successful sugar production facility built in Canada since 1958, supplying some of the leading multinational food manufacturers in Canada since 2014.

Sucro Sourcing has partnered with BMA, the global leader in mechanical and plant engineering for industrial-scale sugar production, in developing a unique sugar processing technology. BMA and Sucro have collaborated to provide the essential design, engineering and installation of Sucro's Hamilton sugar refinery and its unique processing capability.

Sucro Sourcing's innovative refining system allows it to refine sugar in close proximity to its customers, creating value through logistics efficiencies, supporting sustainability initiatives and greater supply chain transparency.

"The Hamilton-Oshawa Port Authority is proud to work with Sucro Sourcing as they grow their business here at the port," said Ian Hamilton, president and CEO of the Hamilton-Oshawa Port Authority. "We provide space for modern, sustainable industry, supported by first-class multimodal transportation solutions. This sugar refinery is a tremendous addition to the $1 billion-and-growing Hamilton agri-food cluster."

# Bringing value to customers: innovative mills services from QSL

*Québec-Beauport terminal.*

As a long time partner and key player in the handling and transshipping of iron ore, QSL has now extended its scope of services provided to customers. "Overtime, our expertise has grown and our relationships with our clients have really become partnerships," says Geoff Lemont, VP Sales and Marketing – Bulk Division at QSL. This is how additional services such as iron pellet screening have taken place on the docks. This procedure reduces fines, therefore offering added value to clients.

The traditional expertise of handling iron ore, combined with new senior

*The iron pellet screening process in operation.*

*Operations in Beauport.*

management originating from the steel industry and the problem-solving culture of QSL, has led the company to develop a new service in the Great Lakes: briquetting. This method produces metallurgical furnace briquettes that reduce landfill waste. "Our client was faced with a challenge pertaining to waste material. We have conducted several conclusive tests to date and are very thrilled with the idea of offering this service shortly to our clients. This service will reduce costs, save money and is a great example of circular economy," says Venkat Saranadhi, VP, Mills Services at QSL America.

The steel industry is being very proactive in addressing sustainability challenges. Briquetting will now be among the solutions to achieve great results. Indeed, this recycling process makes a positive impact on the environment and on the bottom line.

QSL is really enthusiastic to see its service offer extend to also help clients on their premises by offering mill services. "This tailor-made solution philosophy has always been in the DNA of QSL and I am very proud to see the company extend its services and bring our business relationships to a new level. Bringing value to our customers, this is exactly what QSL is all about," concludes Robert Bellisle, President and CEO of the company.

## About QSL

QSL is a world-class maritime terminal operator and stevedore, which develops tailor-made solutions to offer innovative handling methods, while paying careful attention to the cargo and listening to the specific needs of the customer.

# Bécancour enjoys stellar year with significant increase in cargo volumes

The Port of Bécancour (Société du parc industriel et portuaire de Bécancour – SPIPB) is known for its strategic location on the south shore of the St. Lawrence River in Bécancour, midway between Québec and Montréal.

The port has just experienced an exceptional year, with an increase of 15% in cargo volumes compared with 2018. Indeed, due to the volume of cargoes transiting through the port having risen considerably in the last two years, the port forestalled some of its planned projects to allow it to focus on meeting the demands on its storage capacity, intermodal requirements and port access. To maximize customer experience and meet the highest standards of the industry, the port's priority has had to be working together with stevedoring companies operating in Bécancour to ensure efficiency for all its customers, no matter the type of cargo.

In 2018, partly as a result of the needs of its customers — and bearing in mind the growth of port activities along the St. Lawrence River — the port has invested in the expansion of is storage capacity, enlarging its capacity by 75,000m$^2$, from 100,000m$^2$ to a total of 175,000m$^2$. Just a few days after this expansion was completed, this area was already being used to handle various cargoes.

In connection with this storage capacity expansion, the cargo volumes seen so far in 2019, and the promising forecast for the years to come, have led the port to make plans to develop its infrastructure further, and it intends to increase import/export capacities for dry bulk, breakbulk and liquid bulk cargoes. In this way, the port is fully assuming its mission to promote the economic development of the province by developing and operating self-financed port facilities and industrial park. In fact, there has been a growing demand from many companies to use the Port of Bécancour as a logistic hub, which has led to a review of all facilities in general, including railway line link, liquid bulk terminal and road access.

To support growth, the port plans, with its partners, to implement a concerted development vision to maintain the quality services that are currently available to its customers, the review of all is facilities and solid development planning.

The strong relationships that the port has with the industry and community members who plays a fundamental role in its growth will be a key factor in the port's successful evolution.

# Port of Montréal resumes grain operations, with great success

*The Contrecœur terminal at the Port of Montréal.*

The Port of Montréal is a major diversified transshipment centre operated by the Montréal Port Authority (MPA), writes the port's *VP Growth and Development Tony Boemi*. Located 1,600 kilometres inland from the Atlantic coast, at the centre of a fully integrated rail, road and pipeline network, the Port of Montréal is an essential link in the supply chain of the major consumer markets of Eastern Canada and the US Midwest and Northeast.

The Port of Montréal's strategic geographic location, makes it the shortest direct route between the world and North America's heartland in Canada, with access to 110 million consumers within two truck or rail days. Connected to both Class 1 railways, the CN and CP, the Port of Montréal's rail partners provide efficient and reliable service, offering two daily departures to and from major Canadian and Midwest Markets.

With a record fifth consecutive year in 2018, and continued growth in most of its sectors, the port's biggest challenge will be to accommodate this growth in the near future.

The diversification of cargo handled at the Port of Montréal will continue to be a guarantee of success in 2019 (containers, liquid bulk, dry bulk, breakbulk and cruises).

For the bulk sectors, the resumption of the grain operations with Viterra in September 2018 restored grain shipments through our gateway. This resumption combined with the port's other sectors will contribute towards what is expected to be a sixth consecutive record year for the port of Montréal in total tonnage in 2019.

## Dry bulk

A hub for dry bulk cargo handling, the Port of Montréal is a vital gateway for raw materials such as iron ore and salt minerals for roads, as well as gypsum, gravel, raw sugar and other products.

The 12 solid bulk berths in Montréal and Contrecœur as well as direct access to the CN and CP rail networks give the Port a competitive advantage for shipping goods.

### Grain handling

The large cargo capacity makes the Port of Montréal grain elevator one of the fastest and most efficient on the Saint Lawrence River. Its year-round operations and ability to accommodate unit trains allow the facility to maintain links with international markets at all times. The Port of Montréal also has a facility dedicated to the containerization, storage, cleaning, sifting and packaging of agricultural products. This facility is strategically located near the container terminals.

### Breakbulk:

With the strongest cranes in North America, the Port of Montréal has operators with experienced teams who can securely handle all types of breakbulk, general and oversized cargo.

## Infrastructure developments

With growth rates forecast at 8% for this year, and with all sectors having exceeded expectations since 2017, the Port of Montréal has much to look forward to. The completion of the expansion at the Contrecœur terminal is reaching critical status.

Other improvements include the development of the Bickerdike terminal. This terminal handles not only containers, but also project and breakbulk cargoes. The design process has been completed, and work is scheduled to start this month to:

- redevelop truck access (fluidity and security);
- increase and upgrade electrical capacity;
- replace buildings;
- redevelop container and cargo storage areas; and
- redevelop handling areas for cruise ships.

Montréal is also working to increase rail capacity at the port. The design and planning phase for this began in June last year, with work to begin shortly. The project includes $18.4 million in financial support granted by the Government of Canada to optimize its intermodal network under the National Trade Corridors Fund, as well as $18.3 million in financial support granted by the Government of Quebec under its Maritime Strategy. Total project cost is estimated at $50 million.

The Port of Montreal's rail network currently has close to 100km of railways to serve all 14 terminals. Every year, it supports 2,500km of rail cars. An increase in rail freight capacity will support the growth of the Canadian economy. Works will include:

- laying 6km of rail tracks;
- complementary works developing the internal rail network; and
- relocating the port road (sewer, water supply system, electricity network along with the road).

In terms of dry bulk projects, investments will be made at several bulk terminals operated by Logistec. The following elements are currently undergoing:

- construction of a BCR slab and related services (sewer, water, lighting, etc.) for the reception of solid and general bulk to increase handling capacity in Montréal and Contrecoeur Terminals; and
- demolition and reconstruction of hangars to optimize the port's covered storage.

# Major developments taking place at Port of Indiana-Burns Harbor

The Ports of Indiana is a statewide port authority operating three ports on the Ohio River and Lake Michigan. Ideally situated on two major North American freight transportation arteries — the Great Lakes and the Inland Waterway System — the state's three-port system serves the world's most productive industrial and agricultural regions.

Port of Indiana-Burns Harbor is designed to quickly and efficiently transport products by truck, rail, barge or ship. Every year, approximately 100 ships, 400 barges, 300,000 trucks, 12,000 railcars and 200 laker vessels move cargo through the Port of Indiana-Burns Harbor.

## Maritime advantages

- the harbour provides 5,500 feet of ship and barge berths, Seaway draught and 1,600-foot diameter turning basin for large vessels;
- one 1,000-foot Great Lakes ship can move the equivalent of 2,300 truckloads of cargo;
- one towboat with 15 barges can haul 1,000 truckloads of cargo; and
- waterborne shipping uses less fuel and emits fewer emissions than truck and rail.

## Bulk operations

Ships come through the St. Lawrence Seaway directly to the Port of Indiana-Burns Harbor, on Lake Michigan, where the cargoes are unloaded and shipped by rail, truck, or barge to their destinations. Like the river ports (Port of Indiana-Jeffersonville and Port of Indiana-Mount Vernon), Port of Indiana-Burns Harbor also receives barges via the inland waterways system. Outgoing cargoes can be placed on ships which navigate the Seaway to access global markets through the Atlantic Ocean, barges that travel the river system, or truck or rail for more local markets.

A wide variety of dry bulk products move through Port of Indiana-Burns Harbor. The list includes but is not limited to, scrap steel bound for NLMK Indiana, a steel mini-mill at the Port; import and export grain cargoes via Cargill; limestone for Carmeuse; and fertilizer, sugar, lime and salt bound for Frick Services, Inc.

Several other large handlers of bulk products include Mid-Continent Coal and Coke Company, which handles a wide variety of import/export coal and coke products, and Phoenix Metal Services, LLC., whose core services include handling steel slag.

Metro Ports operates the marine terminal at the Port through which the bulk material moves. In addition to cargoes for port tenants, they also handle cargoes for companies scattered throughout the Midwest. These cargoes include items such as cottonseed, magnesite and many of the materials used to produce steel at the integrated steel mills located throughout the Northwest Indiana region. Metro Ports uses equipment such as Liehberr and Sennebogen.

In terms of shipping companies, Port of Indiana-Burns Harbor sees cargoes from international carriers such as Fednav, Polsteam, Canfornav, Wagenborg and Spiethoff. It also handles vessels that primarily trade only the Great Lakes. These owners include American Steamship Line, Interlake, Algoma Central and Canada Steamship Lines. There are also barge companies that ply the Great Lakes (McKeil Marine and Purvis Marine), as well as barge companies that move cargoes on the inland river system (ACL, Marquette Transportation, Ingram and Canal Barge). Burns Harbor is close enough to the river system that these barges can ship to and from Burns Harbor.

**2018 BULK CARGO TONNAGES**

| | |
|---|---|
| Grain | 61,000 |
| Fertilizer dry | 84,000 |
| Salt | 102,000 |
| Scrap Steel | 111,000 |
| Coke | 69,000 |
| Coal | 65,000 |
| Magnesite | 56,000 |

## Major projects under way

The Port of Indiana-Burns Harbor is undertaking a range of projects to improve and expand its services. The most significant of these for the bulk market will be the construction of a new berth that is being built strictly for the handling of bulk cargoes. This berth, when coupled with the port's new rail yards that will be able to accommodate unit trains, will make shipping bulk cargoes through the Port of

*Port of Indiana-Burns Harbor (all photos: Josh Smith).*

Burns Harbor even more competitive than it is now.

Because the port does not have facilities to effectively transfer bulk commodities between modes, it will undertake a major redevelopment to enable its tenants to leverage more efficient and less costly modes by shifting a portion of their bulk commodities off the road system.

The port's redevelopment will include:

- construction of a 2.3-acre bulk berth facility (Berth 5) to expand the port's transloading capabilities. Two bulk mooring cells will be constructed to provide a dedicated space for high-speed loading and unloading of waterborne vessels with train and truck.
- Construction of a conveyor system and a bulk truck-rail dump just south of the new bulk cells to provide for transloading between ship, barge, rail and truck. The conveyor system will eliminate need for trucks to support all intermodal transfers at northeastern end of the port and create synergies by establishing a direct interface for rail-to-water transfers.

- Construction of east side rail yard with capacity for 93 rail cars and the relocation of East Boundary Drive to the west side of the rail facilities near the eastern border of the port. Expanding the east side rail infrastructure beyond the existing single track to a yard with four unrestricted tracks will leverage the new rail-to-water interface created by the conveyor system and rail dump. Port tenants have stated the need for rail storage and providing this capability will allow shippers to move more goods by rail instead of truck. The rail yard will also accommodate a 75-car unit train which is critical to increasing throughput at the grain terminal and introducing new commodities that currently are transported by truck.

# Fednav drives the development of the next-generation bulk carrier

## What will the next-generation bulkers be like?

"Just like tomorrow's job for my grandchild doesn't exist today," said Tom Paterson, Fednav's Senior Vice President, Shipowning, Arctic, and Projects, "we must accept that tomorrow's ship doesn't exist today. That means we can't sit still. We have to continue our innovative moves forward."

At Fednav, the leading Canadian bulk shipping company, reducing costs for customers is what drives the company's long history of innovation in newbuilds.

Over the past two decades, the company has invested more than $1.5 billion in renewing its fleet with more efficient and environmentally friendly vessels. Since 1997, Fednav has ordered over 20 vessels from Oshima Shipbuilding in Japan. Two Handysize bulkers will deliver this year, representing third-generation Oshima vessels, with four more to be delivered in 2021.

Even as Fednav receives these third-generation vessels, the company is working closely with Oshima and other key strategic partners to develop its fourth-generation vessels.

## The customer's number 1 priority

Fednav's customers expect the best and that future generations will inherit a protected ocean.

Thus, Fednav's innovation focuses on developing the most efficient ships consuming the least harmful fuel in the smallest amounts. The company's history suggests continued success in accomplishing these goals.

For example, Fednav's generation-three vessels, which the company has taken delivery of since 2016, are more powerful and versatile while also being 30% more fuel efficient than the original Oshima ships delivered in 1999.

This progress in reducing customer costs and environmental footprint resulted from focusing on four key areas of ship development.

- **More hydrodynamic hulls.** Through advances in computer modelling, Oshima's designers were able to improve the water flow across the rudder and the propeller, which was increased in diameter. Low-friction paint on the hulls adds to these efficiencies.
- **More efficient engines.** Manufacturers developed engines with a longer stroke and lower propeller RPMs. So 25 years ago, a standard bulk-carrier's propeller at full steam would be turning at 110RPM; now, it would be closer to 85.
- **Safer ships.** Today's efficient hull architectures are complicated structures. They use high-tensile steel to provide strength without additional weight. They also incorporate stronger bulkheads to create a more secure,

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HWY $H_2O$

safer ship, resulting in more reliable deliveries.

- **More powerful, versatile vessels.** New heavier cranes can lift heavier steel coils for customers along the St. Lawrence Seaway, while the ships' versatility enables them to comply with all ocean-going regulations.

## Striving for ever more eco-friendly ships

The new rules for low-sulphur fuel usage that the International Maritime Organization's (IMO) is implementing in January 2020 will impact all shipping. In keeping with Fednav's sustainability priorities, the company decided two years ago not to deploy open-loop scrubbers. This technology removes the sulphur in non-compliant fuel, but potentially creates harmful waste-water. To avoid the after-effects and inefficiencies of such a system, Fednav vessels will consume IMO-compliant fuel.

As a founding member of Green Marine, a voluntary North American environmental program, the company takes its role to improve the health of the world's waterways very seriously. Fednav has been investing in new technologies for treating ballast water since the early 2000s. As part of its R&D in reducing environmental footprint, it is also exploring other options.

- **Zero footprint in port.** Determined to develop a vessel that does not consume fuel in port, Fednav is looking at developing ships that are powered by on batteries in port. The key obstacle is obtaining access to the 400 amps necessary from shore-based recharging facilities. With the right technology in place, Fednav vessels could also move electrically through the locks of the St. Lawrence Seaway.
- **Battery-operated cranes.** Fednav is experimenting with this equipment with some success; given the IMO's 2050 directive to cut total annual GHG emissions by at least 50%, Fednav is keeping its eye on promising developments in alternative sources of power including battery-driven and hydrogen options.

## Using technology to reduce customer costs

With crew costs making up about 60% of operating expenses, Fednav is investing in technology to help reduce these costs for customers.

As artificial intelligence (AI) increases its presence in Fednav's digital transformation, the company will count on AI's predictive capacities to better plan the scheduling of ships to enhance customer service. Since June, Fednav has been working with CargoMetrics Technologies LLC, a maritime innovation company, to develop software solutions that will add transparency and speed to both internal and customer operations.

## Forward-thinking takes the right partnerships

To design and plan innovations on the multifaceted scale that next-generation ships require, Fednav has built strong long-term relationships with the following like-minded partners Like Oshima Shipbuilding, DNV GL, Anglo-Eastern Univan Group, and the Marshall Islands flag registry.

## A forward-thinking culture starts at the top

Naturally, the company's farsighted and innovative mindset has roots in Fednav's ownership and the organizational culture that encourages employees across the board to speak their mind and to be creative and innovative.

# Tonnage records, new pellet highlight Great Lakes iron ore trends


Long a hallmark of commercial shipping on the Great Lakes, iron ore carriage continues to thrive in the region. Its journey begins on the western edge of Lake Superior, where pelletized iron ore arrives via rail from Minnesota's Iron Range and then pours into immense ships — some reaching 1,000 feet in length — at the Port of Duluth-Superior, as well as nearby Two Harbors, Silver Bay and Taconite Harbor.

The first of this ore departed Duluth, Minnesota, in 1892. Nearly 130 years later, it's still in demand and on the move. According to the Lake Carriers' Association, United States-flagged ships hauled more than 18 million net tonnes of iron ore across the Great Lakes between late March and midsummer, a pace almost 13% ahead of last season. Specifically in the Port of Duluth-Superior, iron ore tonnage to date topped its five-year average by 9%, signalling a continuation of last season's momentum, which produced the port's highest iron ore tonnage in 23 years.

Primarily driven by increased demand for domestic steel, the upswing has also been buoyed by extraordinarily high Great Lakes water levels during the 2019 shipping season. Because of the high water, bulk carriers can load to deeper draughts, carrying more ore per trip. This has been evidenced throughout the summer by multiple tonnage records set at the Soo Locks in Sault Ste. Marie, Michigan.

Another recent and noteworthy Great Lakes iron ore development is the debut of a new purer pellet with low silica content. The Cleveland-Cliffs mining company spent more than US$100 million upgrading its mill in Silver Bay, Minnesota, to produce this new kind of pellet, one that can be used in electric arc furnaces to make steel. Cleveland-Cliffs said it's the first U.S.-based iron ore processing facility to produce this new pellet, which premiered in late June.

"These DR-grade pellets will ensure that here in northern Minnesota we will have this [plant] going for at least another 100 years," Cliffs CEO Lourenco Goncalves said during a ribbon-cutting ceremony for the upgraded facility.

# Algoma continues to invest in its 'Equinox'-class fleet renewal programme

Algoma 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 and has a 50% interest in NovaAlgoma, which includes a diversified portfolio of dry bulk fleets operating internationally. 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 provides flexibility for shippers who require their cargo to be delivered to customers that do not have the capabilities to load/unload cargo at their facilities. Self-unloading bulk carriers discharge their cargo using onboard equipment. Cargo flows from the cargo hold through gates to conveyors located below the hold. The cargo is carried through the ship and then elevated to an unloading boom at deck level. These booms are 75–80 metres long and can rotate out to 90° from each side of the vessel. Self-unloaders discharge cargo to either stockpiles or directly into receiving storage facilities.

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.

## 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 US grain harvests eastward through the St. Lawrence Seaway system, and iron ore shipments back to the Great Lakes.

## Recent developments

- Algoma has reported that market demand for its vessels remains strong.
- As part of its fleet renewal programme, the company made firm an order for a new *Equinox*-class gearless bulker with YZJ Shipyard in China. The vessel will be the ninth new vessel since Algoma's *Equinox*-class fleet renewal programme began in 2010.
- Water levels in the Great Lakes are high; this is positive for some trades but a challenge in other areas.
- Algoma added the *Algoma Conveyor* to the fleet this year; making her its third *Equinox*-class Seawaymax self-unloader
- Algoma now has eight vessels in the dry bulk fleet and one cement vessel with scrubbers, in the lead up to IMO 2020.
- Algoma expanded its international Handy and Panamax-size ocean self-unloader fleet by three vessels, bringing the total to eight vessels which operate in the world's largest pool of ocean self-unloaders. This was part of the company's strategic intent to leverage its local expertise on a global scale
- Algoma continues to have a strong focus on employee training, development and providing stable employment.


*The* Algoma Innovator, *like all* Equinox *class vessels, is equipped with an exhaust gas scrubber.*

# Port of Johnstown's $10m makeover will help satiate booming demand for Canadian grain


**TRADE AGREEMENTS FUELLING HUGE INCREASE IN GRAIN EXPORTS FROM THE PORT**

Some $10 million will be used to replace nine ageing grain spouts at the port with four modern spouts that will be able to load bigger ships even faster than before.

The Port of Johnstown, where local farmers from across the region bring grain destined for international markets, is up for a multimillion-dollar makeover.

The federal government is investing $4.8 million, almost half of what's needed, to help refurbish the port's ageing infrastructure.

The changes will make it easier to get grain onto ships in a timely fashion.

"When the shiploading slows down, we slow down the whole harvest season," said Pat Sayeau, mayor of the Township of Edwardsburgh/Cardinal, which owns the port about 65km south of Ottawa.

"Everybody benefits from our efficiency to load the [grain] and get that out of the way and free up the space."

The Port of Johnstown handles product from 1,600 farms in Ontario and Quebec, and sends out about 15 to 20 shiploads of grain per year through the St. Lawrence Seaway, Sayeau said.

New trade agreements have fuelled a 150% rise in exports at the port since 2011.

The federal government has said the new refurbishment project is hoping to meet the demand from international markets for Canadian grains.

The township will match the investment by the federal government.

# Breaking the ice: Canadian Coast Guard ensures the safety of the Great Lakes region, and supports the shipping industry by keeping cargo moving

*CCGS* Samuel Risley *icebreaking on the St Clair River.*

The Canadian Coast Guard provides icebreaking support, escort, and ice management services to support the safe and efficient movement of people, ships, and goods across Canadian waters.

Shipping on the Great Lakes remains active during the winter months, and the Coast Guard supports the shipping industry to keep cargo moving. Coast Guard icebreaking service is an economic enabler. Icebreaking is an important government service that helps the

*CCGS* Griffon *icebreaking on Lake Erie.*

Canadian and United States economies. The Coast Guard also plays an important role in public safety, breaking ice to prevent the formation of ice jams, which can cause flooding.

The United States Coast Guard District 9 and Canadian Coast Guard, Central and Arctic Region have developed a long-standing partnership in building an inter-operable, bi-national Coast Guard service in the Great Lakes. The Canadian/United States Coast Guard Memorandum of Understanding strengthens the mutual commitment for ensuring vital icebreaking operations in the Great Lakes region including the main connecting navigable waterways, Georgian Bay and the St. Lawrence River from Tibbetts Point, New York, to as far east as Cornwall, Ontario. It was renewed in 2018.

"With our partners at the United States Coast Guard we are truly one team supporting the safe, economical and efficient movement of ships in the heart of North America," said Julie Gascon, then-Assistant Commissioner of the Canadian Coast Guard's Central and Arctic Region. "Our updated Memorandum of Understanding allows us to better share information, equipment and personnel between countries. By working together we ensure scheduled vessel traffic can move through the shipping channels and into and out of community harbours."

"Our partnership with the Canadian Coast Guard is crucial for our mutual success on the Great Lakes and surrounding waterways," said then-Rear Admiral Joanna Nunan, Commander, U.S. Coast Guard Ninth District. "As the beginning of this winter's severe conditions have demonstrated, we need to work together to provide seamless service to our communities and keep commerce flowing."

The icebreaking MOU authorizes the exchange of personnel on Coast Guard icebreakers. Temporary exchanges, when conditions allow, will enhance familiarity with each other's procedures when cooperating in shared waters, often on joint missions.

The Coast Guard works closely with the shipping industry requesting icebreaker assistance and the United States Coast Guard to plan icebreaking operations. The Coast Guard's icebreaking programme extends to the skies over the Great Lakes. Its helicopters allow crews to conduct ice reconnaissance missions. The information gathered from the flights assists both Coast Guards and the shipping industry in planning their routes and schedules.

## Winter season 2018/2019

On the Great Lakes, icebreaking services are provided by the Canadian Coast Guard and the United States Coast Guard working together as one team.

Although the St. Lawrence Seaway, Welland Canal and Sault Ste. Marie Locks are closed during the winter months, shipping is still active on the Great Lakes and connecting waterways — Lake Erie, Detroit River, Lake St. Clair, St. Clair River, Lake Huron, St. Marys River and Georgian Bay. The Canadian Coast Guard has two icebreakers assigned to the Great Lakes for the entire winter season: CCGS *Griffon* and CCGS *Samuel Risley* and is supported by additional Coast Guard vessels during the beginning and end of the icebreaking season.

### Canadian Coast Guard icebreaking support from shore

Officers at the CCG's Regional Operations Centre in Montreal co-ordinate icebreaking requests with the United States Coast Guard Sector Detroit and Sector Sault Ste. Marie. Industry

*NB: Much of the information on the Canadian Coast Guard dates from 2018.*

representatives meet with Coast Guard officials daily via operational conference calls. During the calls Ice Service Specialists from Environment and Climate Change Canada provide information to shippers from both countries about ice extent, concentration, and thickness. Further information about ice conditions in the region is also gathered from the air during ice reconnaissance missions using Canadian and US Coast Guard helicopters.

Marine Communications and Traffic Services (MCTS) Officers in Sarnia and Prescott are in contact with mariners 24 hours a day proactively providing information, managing marine traffic, and responding to calls for assistance. Winter maritime search and rescue operations are coordinated by the Joint Rescue Coordination Centre in Trenton. Coast Guard icebreakers and other vessels may be called upon to assist if required. Aircraft from the Department of National Defence and the United States Coast Guard are also involved in maritime search and rescue operations, as necessary.

### Additional Coast Guard duties on the waterways during the winter months

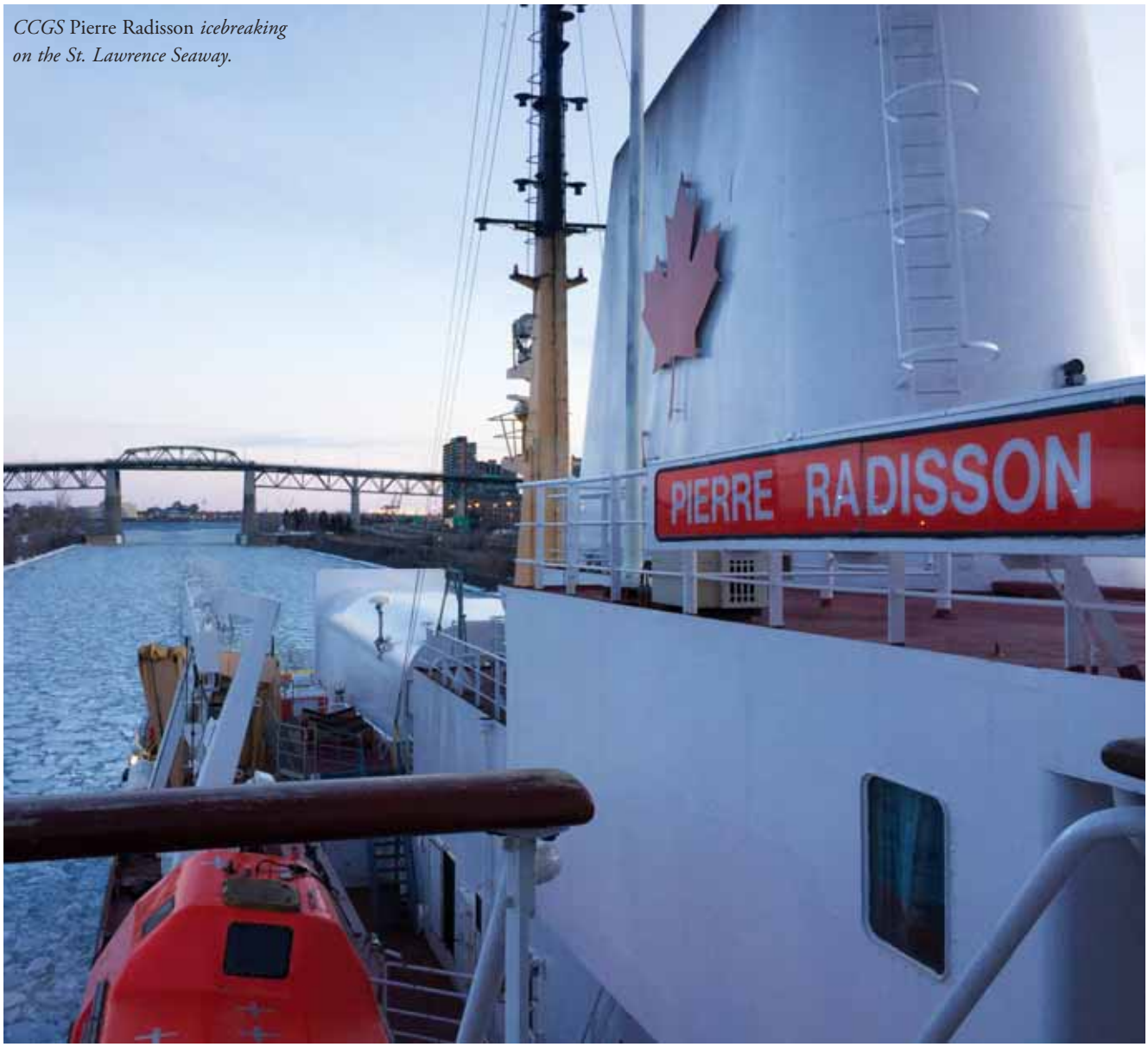
In addition to icebreaking for clients, both the Canadian Coast Guard and the United States Coast Guard work to prevent the formation of ice jams and flooding in coastal communities. Problems can occur when ice accumulates and blocks the flow of a river. Known as an ice jam or ice plug, this can cause flooding as water builds up and overflows the banks. Ships are also ready to respond to environmental incidents or other urgent or humanitarian emergencies.

All ice surface users should plan their ice activities carefully, use caution on the ice and avoid the shipping lanes and icebreaking operations. Broken and fragmented ice tracks and ridging left behind by passing icebreakers or commercial vessels may not freeze over immediately. This can result in hazardous conditions for ice users. In addition, newly fallen snow will obscure ship tracks. Unsafe ice conditions can persist long after icebreakers have left the area.

## Quick facts from 2018

Coast Guard icebreaking service is an economic enabler. Icebreaking is an important service that helps the Canadian and United States economies. Both CCGS *Griffon* and CCGS *Samuel Risley* received important refit work in 2018 to ensure they can carry out their icebreaking duties. In 2017/2018, south of 60, in central and eastern Canada the Canadian Coast Guard responded to 1,252 requests for icebreaking. The previous winter had been one of the most demanding icebreaking seasons to date on the Great Lakes. Both Coast Guards directly assisted 637 ship transits on the Great Lakes.

From 20 December 2017 and 7 May 2018 (last day of icebreaking) CCGS *Griffon* and CCGS *Samuel Risley* travelled 27,302km escorting commercial ships through the ice, opening shipping routes and breaking out ports throughout the Great Lakes. DCi




*CCGS* Pierre Radisson *icebreaking on the St. Lawrence Seaway.*

*CMM 4500.*

# Breakbulk: the other bulky cargo

# LARGER than bulk

## CJSC SMM satisfying heavy-lift equipment needs

### About CJSC SMM

CJSC SMM, situated in Saint Petersburg, Russia, is a highly efficient and dynamically developing company, which specializes in the production of heavy load-lifting equipment.

Over the past 70 years the company has gained extensive experience in the development, production, installation, servicing, repair and modernization of load-lifting equipment. This has allowed CJSC SMM to master a line of cranes with a loading capacity of up to 500 tonnes. Today, latest-generation universal cranes produced by the company are highly competitive with the best European analogs.

The company accounts for 90% of the Russian Multipurpose Level Luffing Cranes Market and has established itself as a trusted exporter of heavy load-lifting equipment in countries like: Georgia, Uzbekistan, Kazakhstan, DPRK and other EU nations.

### Personnel

CJSC SMM specialists are highly experienced and qualified in heavy load-lifting equipment production.

Based on global experience, the company's specialists strive to stay one step ahead of competitors, which makes constant expansion of the range of load lifting equipment being designed and manufactured a possibility. The company includes research, design, engineering and customer service departments, gauranteeing the entire process life-cycle of the equipment produced.

### Equipment

CJSC SMM produces multiple types of heavy load-lifting equipment for handling cargoes in transport terminals, shipyards, industrial enterprises, ports and industrial enterprises:

**Level luffing portal cranes** (STRIZH, AIST and Vityaz), with maximum load capacities up to 200 tonnes, are designed for the loading and unloading of breakbulk, bulk cargoes and containers. The areas of effective application are loading and unloading operations in sea and river ports, as well as on the premises of industrial enterprises.

**Shipyard double jib level luffing cranes** (Type – SMM), with maximum load capacities of up to 500 tonnes, are designed for lifting and moving large equipment and sections at shipbuilding and industrial enterprises.

**Mobile harbour cranes** (Type – MPK) with a maximum load capacity up to 200 tonnes are designed for loading and unloading breakbulk and bulk cargoes. They are equipped with a rubber-tyred carrier, therefore they are highly manoeuvrable.

**Hydraulic articulated balance cranes** (Type – KMB) with a total load capacity of up to 30 tonnes are designed for loading and unloading breakbulk and bulk cargoes, and have the ability to use hydraulic load-grappling devices.

**Gantry cranes** (BARS, BARS-K and BARS-M) with a total load capacity of up to 2,000 tonnes, are designed for handling containers, breakbulk and bulk cargoes as well as for lifting and moving large objects during installation and repair works at open and closed sites of industrial plants, railway stations and ports.

**Cranes for hydraulic facilities** (Type – SPK), with a total load capacity of up to 30 tonnes, are special-purpose cranes that are designed for manipulating gates and grates, maintenance of mechanical equipment of water intake and discharging parts of dams at hydroelectric power plants.

**Ship articulated cranes,** with maximum load capacity up of to 250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tonnes, are installed on ships for loading and unloading of cargo without the need for shore-based equipment. They are also used to lift and lower special supplies, and to carry out repair works within the ship.

**Electro-hydraulic ship articulated cranes** (Type – SM), with a maximum load capacity of up to 29 tonnes, are designed for installation on unrestricted navigation ships and have the lowest possible weights and dimensions, which allows this type of equipment to be used on ships of relatively small displacement.

**Multiple types of overhead cranes,** with a maximum load capacity of up to 500 tonnes, are intended to carry out loading operations in industrial facilities and warehouses. They can be equipped with cargo gripping devices to carry out special load lifting and technological operations.

**The production of dust-proof and wind-proof fences** — the most common method of combating dust in coal depots and port terminals — uses hard-type dust shield technology, which has already been extended to port terminals for handling open storage bulk cargo in Canada, China, Japan and other countries.

## Major clients

- PJSC (Murmansk Commercial Seaport) – the world's largest port above the Arctic circle: 21 cranes;
- PJSC (Novorossiysk Commercial Seaport) – the third largest port in Europe: 30 cranes;
- JSC (Universal Transshipment Facility) port Ust-Luga: five cranes;
- A/O "KazTransOil" the Port of Batumi (Georgia): three cranes;
- The Riga Central terminal, Riga port, Latvia: five cranes;
- LLC (Sea Fish Port) St. Petersburg: two cranes;
- Radzhin port (North Korea): four cranes;
- JSC (Seaport St. Petersburg): two cranes etc.

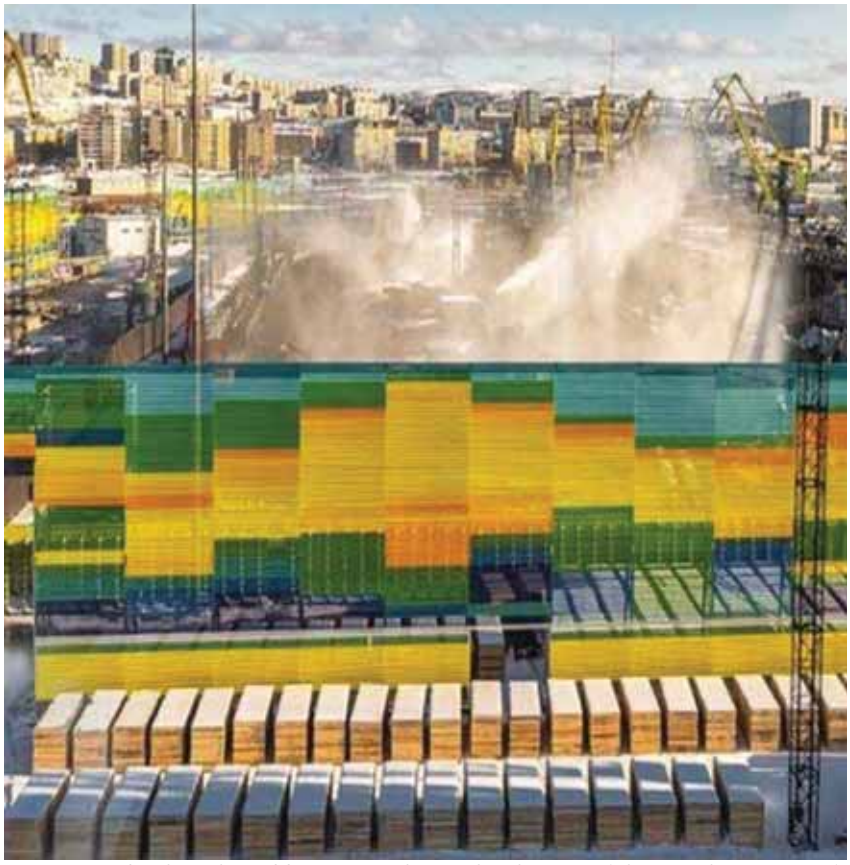
## Recent contracts

CJSC SMM was recently awarded an international contract with COCHIN SHIPYARD LIMITED for the supply of a 10 tonne Level Luffing Single Jib Crane.

## Conclusion

Today, CJSC SMM makes a significant contribution to the development of the Russian market of heavy lifting equipment, by being committed to the main goal – satisfy all needs of ports and transport terminals for modern loading equipment. The company continues to expand its product range, to enlarge the list of partners, and to develop in new directions.

*Vityaz level luffing portal crane.*

*Dust-proof and wind-proof fences are used to combat dust in coal depots and port terminals.*

# The new independence


*Loibl production hall in Straubing, Germany.*

## Former Babcock & Wilcox Loibl GmbH becomes Loibl Förderanlagen GmbH

After several years of membership in the US-based Babcock & Wilcox Enterprises, Inc., B&W Loibl is now operating independently again. At the beginning of July 2019, the change of name was officially announced.

"As Loibl Förderanlagen GmbH, we want to go our own way in the future and seize new opportunities in order to continue to provide our customers with the best possible range of services," says Jules Fricke, long-time managing director of Loibl. After almost eight years of successful collaboration with Babcock & Wilcox Enterprises, Inc., Loibl is now operating under a new face but still standing for the same values.

## Conveying technologies — safety. performance. quality.

Safety. Performance. Quality. These have been the core characteristics of Loibl since the company was founded in 1960. Added to this are customer satisfaction, first-class service, competence and reliability. The company can look back on almost 60 years of expertise in the field of conveyor technologies. "Our systems are particularly robust and come with an above-average lifespan," says Arnd Benninghoff, Sales Manager of Loibl. This goes down well with customers and has made the company known across Europe's borders. That's why the traditional Bavarian company was active on the international market even before the cooperation with Babcock & Wilcox. But belonging to the more than twice-as-old American major corporation has opened further doors. "As B&W Loibl, we were able to establish more and more contacts abroad," confirms the management. But that alone, of course, does not guarantee long-term partnerships. "It is the quality of our services that has convinced our international customers," smiles Fricke, "and not our name."

## Loibl Conveying Technologies — offering solutions to every transport problem

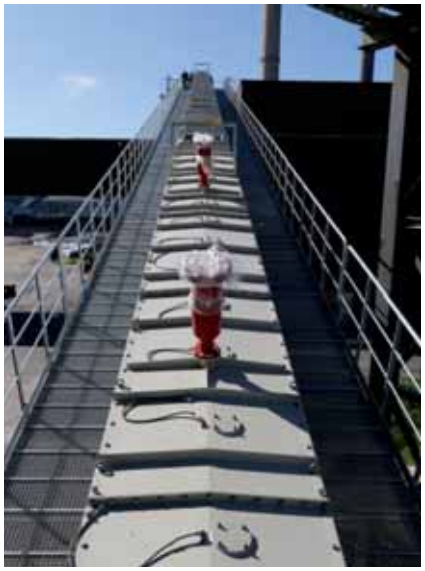
In Straubing, not far from Bavaria's capital city Munich, Loibl's approximately 130 employees develop the most technically demanding solutions for individual bulk material conveying problems. As a plant specialist, the company provides all services that enable successful consulting, planning, construction, commissioning and follow-up. This makes Loibl Förderanalgen GmbH a first-class partner for technically demanding plant constructions in the energy and environmental sectors, as well as for various other industries. No matter what kind of material has to be transported, Loibl develops the right solution for every need.

## Loibl Conveying Technologies — a strong partner in terms of sustainability

"Biomass reduces emissions as a climate-neutral energy source and therefore plays an important role in the energy transition," explains Benninghoff. "Many of our customers in the energy and environmental sectors are gradually rethinking. They set ambitious climate targets which we help to achieve." That's also the case with Loibl's current major project in Geertruidenberg in the Netherlands. Loibl Förderanlagen GmbH has been working successfully with RWE for several years now. In 2017, they realized their so far biggest project with the energy giant: by 2025, the coal-fired Amer power plant located directly on the Amer river will be able to switch completely to $CO_2$-neutral energy generation with the help of a state-of-the-art biomass transport system from Loibl. "The trend is generally more towards sustainability and responsible resource management," concludes Benninghoff. "We are proud to be an important part of these developments."

The developed transport system at the Amer power plant is used to transport wood pellets from an existing ship discharger to several silos in which the pellets are stored. From there, they are conveyed to the mills, in which the pellets are ground and prepared for combustion. After grinding, the resulting wood dust is sprayed into the boilers and burned. That's how sustainable energy production works in times of climate change.

In addition to the conversion of existing steel structures and silos, the range of services offered by Loibl includes the engineering, delivery and assembly of more than 200 metres of encapsulated trough chain conveyors with a capacity of 800 tonnes per hour and a width of 1,600 millimetres. The scope of supply also includes a modern fire-fighting and explosion protection system as well as



*During the installation of an encapsulated through chain conveyor belt system with modern explosion protection.*

*One of Loibl's customized fire extinguishing systems.*

various additional devices such as dust filter systems.

**Loibl range of supplies and services**

- plant engineering;
- trough chain conveyors;
- pneumatically driven sliders;
- filter units and auxillary equipment;
- comprehensive fire and explosion protection;
- steel construction; and
- site installation.

*Aerial view of the company site.*

## Loibl Conveying Technologies — a self-determined future

"It's not like the last few months weren't stressful," Fricke laughs, "but they've definitely been worth it. The whole changeover will only have positive effects for us." With the newly gained independence, the company wants to devote itself more to its own future appearance. Increased attention to the company's own visibility, expansion of production facilities at the Straubing site, creation of additional jobs, as well as more funding for further training and in-house product development, to only name a few emerging projects.

Benninghoff is positive about developments in the company: "Plant engineering serves a very exciting market that will continue to grow in the coming years and will provide many interesting innovations. With the restructuring, we will be prepared for everything."

A collegial working climate and short decision-making paths complete the overall picture of Loibl. With a young team and dedicated employees, the chances of promotion are good. "After successfully completing their apprenticeship, trainees can do it quite quickly here," Fricke confirms.

"We have well educated people in our company, who have made it from trained locksmith to construction manager in a very short time and are sent to jobsites all around the world. Our technical system planners and product designers are also rapidly becoming experienced project managers. As long as there is enough ambition, anything would be possible," he adds with a wink. But Loibl Förderanlagen GmbH is responsible for this anyway. For years, it has been successfully training young apprentices who regularly count among Bavaria's best valedictorians.

*Loibl Conveying Technologies.*

# Breakbulk and other cargoes at Port Milwaukee

Port Milwaukee is located on the shore of Lake Michigan, just south of downtown Milwaukee, and includes immediate access to the interstate highway system via I-794 and I-94.

As a landlord, Port Milwaukee enters into long-term leases with tenants active in the multimodal transportation sector, who operate under the terms and conditions of Port Municipal Tariff No 21.

## Foreign Trade Zone (FTZ) No. 41

As a Grantee, Port Milwaukee assists Wisconsin companies, manufacturers, suppliers, and builders interested in becoming FTZ Operators in order to utilize the benefits of the United States Department of Commerce's FTZ programme to increase their global competitiveness.

## International maritime connectivity

Port Milwaukee receives international, Handysize vessels that enter the Great Lakes from the Atlantic Ocean through the St. Lawrence Seaway between late March and late December each year. Fednav's FALLINE is a scheduled liner service originating from European ports that calls Milwaukee several times each month.

As an Inland River Port, Port Milwaukee has river barge connectivity to transport cargo between Milwaukee and the Gulf of Mexico via the Mississippi River Inland System.

The port's private grain elevator operator, COFCO, exports Wisconsin and regional grain products, including, but not limited, to soy and corn, via vessels through the St. Lawrence Seaway and by river barges via the inland river system.

## Great Lakes maritime connectivity

Port Milwaukee receives self-unloading 'lakers' carrying bulk commodities such as cement, salt, limestone, and slag year round.

Port Milwaukee loads and unloads deck barges carrying breakbulk and steel from other Great Lakes ports. Roll on/roll off, lifting, and/or direct discharge to/from rail are available options at Port Milwaukee.

The port's fully refurbished Liquid Cargo Pier is capable of handling liquid bulk via both barge and tanker movements.

Port Milwaukee's private asphalt dock receives regular shipments.

## Heavy lift capability

Port Milwaukee maintains a 400,000 pound lifting capacity between its multiple port-operated crawler cranes and its 200-tonne stiff leg derrick.

*Photos copyright: Port Milwaukee.*

## Class 1 rail connectivity

Port Milwaukee maintains daily service from both the Canadian Pacific (CP) Railway and the Union Pacific (UP) Railroad on the port's 14 miles of rail track on a daily basis.

Dockside rail is availability at 15 Seaway-max draught vessel berths for international ship-to-rail connectivity.

Rail transload capability is available through Port Milwaukee's bulk stevedore tenant.

The port is currently upgrading its intermodal rail infrastructure while pursuing return of container service by rail at the port.

## Great Lakes cruise facilities

Port Milwaukee operates multiple cruise berths including the Discovery World Dock, the South Shore Cruise Dock, and, opening in 2021, the Walker's Point Cruise Dock.

## Lake Express high speed ferry service

Port Milwaukee maintains daily passenger and vehicular ferry service between Milwaukee and Muskegon, MI from May through October.

# Breakbulk update at the Port of Hamilton

## Providing a gateway for Ontario's wind energy

In recent years the Port of Hamilton has moved towards a more diversified range of cargoes. The port's terminals provide handling, transloading, and storage of a wide range of cargo commodities including dry, bulk, and liquid bulk.

The Port of Hamilton also serves as a strategic location for the import and export of breakbulk and project cargo, such as machinery and components for Ontario's manufacturing and energy sectors.

The port is home to two expert Stevedores, Federal Marine Terminals (FMT) and QSL. Their expertise is combined with facilities and equipment that include substantial lay down area, a 200-tonne+ tandem shore crane lift, and extensive indoor warehousing with heavy crane capabilities. The port is equipped with everything needed for a successful shipment of these heavy-lift cargoes.

Project cargo at the Port of Hamilton is trending much higher for the first six months of this year compared with the same period last year. This is the result of receiving two inbound shipments of wind turbine blades. A transload shipment from overseas, these massive cargoes measured 67m in length. The blades were carried by barge, operated by McKeil Marine Ltd. and discharged at FMT's terminal in a total of 48 pieces.

As the largest wind market in Canada, Ontario has a total of 2,577 wind turbines in operation. Ontario is Canada's leader in clean wind energy with 5,076 megawatts (MW) of installed electricity generating capacity as of December 2018, supplying approximately 8% of the province's electricity demand.

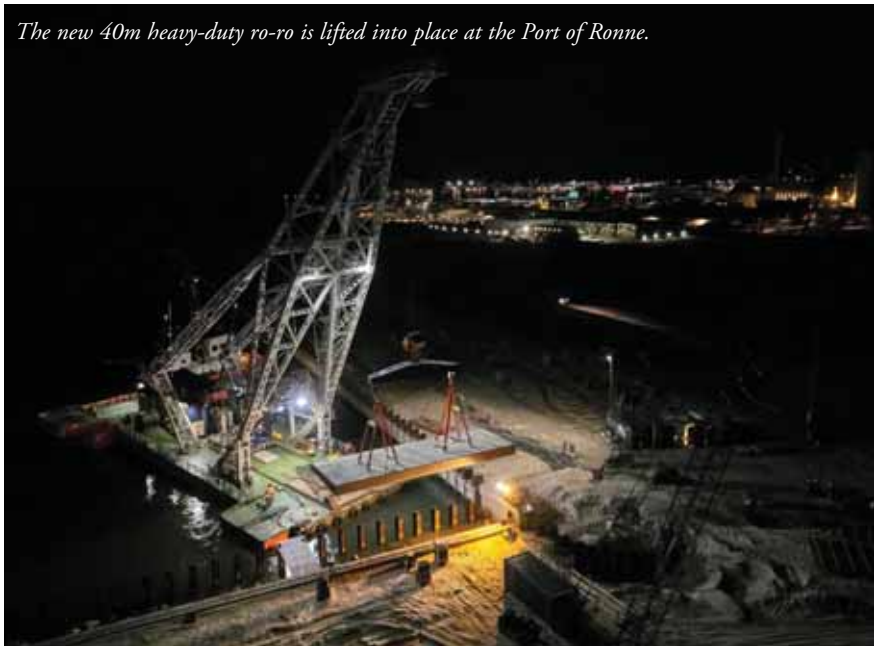
## Shipments of finished steel returning to normal

Shipments of finished steel at the Port of Hamilton are returning to normal after tariffs on steel have stabilized. In May of this year American tariffs on Canadian steel and aluminium that had been in place for almost a year had been lifted.

This season, finished steel imports at Port of Hamilton as of 31 July are sitting at 136,658 metric tonnes. This number is slightly below the same period in 2018, but more on track with the average level. By July 2018, 328,736 metric tonnes of finished steel had already been imported, a historic high at the port.

*Wind turbine blades being discharged at FMT's terminal at the Port of Hamilton.*

# Port of Roenne serving the project cargo and breakbulk sector



*The new 40m heavy-duty ro-ro is lifted into place at the Port of Ronne.*

***On the route between Copenhagen and Saint Petersburg — in the middle of the south Baltic Sea, right between Sweden and Poland — is the island of Bornholm. Bornholm has a modern port, ready to serve customers within the breakbulk and project cargo business***

The Port of Roenne dates back to the 13th century, and has always been the main port on the island of Bornholm. The shipment of goods to and from the island, as well as the sale of fresh supplies for passing ships, have been taking place through the years, though many types of industries have characterized the activities at the port.

Today, approximately 1.5 million tonnes of goods are shipped through the port annually. With more than 1.7 million ferry passengers, routes to four destinations in Denmark, Sweden, Germany and Poland and +50 cruise ships each year, the Port of Roenne is the gateway to Bornholm.

## The right infrastructure

The port has a mission to serve Bornholm society, and this is only possible with the right infrastructure. Therefore, it was decided in 2016 that the Port of Roenne needed to be renewed and expanded to create a modern infrastructure, which is as future-proof as it can be.

Now, in 2019, the first part of the modernization of the port is finished with a new basin with 11m depth, two 300m multipurpose-quays and 150,000m$^2$ heavy-duty storage area. This is added to the existing port with ~2,500m quay split on five basins with depths ranging from 7m to 9m. The port also has one 23m dock ro-ro for general cargo and a 40m ro-ro berth for heavy duty as well as machines to handle most general cargo. Furthermore, the port operates 24/7/365, with no waiting time for berthing, loading and unloading.

## Attracting new business

The rationale behind the expansion is that the new quays and area can be used for multiple activities, by local customers, but also to attract new business to the port. Such business includes the project for Kriegers Flak Offshore Wind Farm (OWF), where Siemens Gamesa has chosen the Port of Roenne as the installation harbour. Project cargo for the 72 wind turbines in the OWF will be transferred to the port, where they will be stored before installation starts.

The project with Siemens Gamesa will not be the first time that the port handles project cargo. In 2018, Boskalis (previously VBMS) choose the Port of Roenne as its base for the Arkona OWF inter-array cable project; the port was chosen because of the geographic proximity to the wind farm as well as the flexibility and additional services available, when using the Port of Roenne.

## A variety of maritime skills

Being an island in the outskirts, the inhabitants on Bornholm have learned from experience that they need to think in solutions when problems arise, and help is far away. Therefore, through experience, local companies have developed skills to solve even quite complex maritime problems both on- and offshore; and customers at Port of Roenne can profit from these skills. To make it easy for customers, local businesses providing these maritime services have formed a network called OCBornholm, which — among other things — have created an app (app name: OCBornholm) with easy information about the services that the companies provides within, for example, engine and machinery, technical systems and bunkering.

"At Port of Roenne we do our best to serve our customers. We believe that we have an attractive location, right in the middle of the Baltic Sea, with short distances to neighbouring countries. And with new and future-proof quays, more storage area, good possibilities for maritime services and a flexible approach, we are ready to do business with more customers in the project cargo business" says Maja Felicia Bendtsen, Chief Business Officer BULK at Port of Roenne.

*Handling project cargo for a local customer.*

*An installation ship is preparing for operation.*

*Bunker service is also available in Port of Roenne.*

*Cruise ship* Braemar *was the first to berth at the new multipurpose-quay in June 2019.*

# Inkoo Shipping Oy Ab as a part of metal scrap recycling chain

*Scrap metal loading at Inkoo Shipping, Finland.*

Inkoo Shipping Ltd, or the port of Inkoo, is a privately owned, public commercial port. The annual turnover of the port is approximately one million tonnes, consisting entirely of tramp shipping. The port is one of the ports in Finland kept trafficable during the winter. The ice conditions in the fairway are usually light, and thus, the channel is mostly free from ice.

The port specializes in the storage and handling of dry goods in bulk. The ports competitiveness is based on long experience, adequate storage facilities, and flexible handling of goods in bulk, together with the geographic location and good connections by sea and road.

Handling metal scrap is one of the increasing business areas for Inkoo Shipping. In June this year, the port has already handled 1.5 times more metal scrap than last year. Recycling metal scrap has long traditions in Finland. The amount of export of metal scrap has been increasing ever since 1970. The recycled scrap consists of materials left over from product manufacturing and consumption, such as parts of vehicles, building supplies, and surplus materials. Scrap is often processed for later melting into new products. A scrap metal shredder is often used to recycle items containing a variety of other materials in combination with steel. Examples are automobiles and white goods such as refrigerators, stoves, clothes washers, etc. By shredding into relatively small pieces, the steel can easily be separated out magnetically. The non-ferrous waste stream requires other techniques to sort.

Loading vessels is when Inkoo Shipping plays it´s part in the recycling chain. The metal scrap is transported to the port with trucks. Scrap is handled with wheel loaders and crane when arriving at the port. "We have developed, in co-operation with our customers, such routines and working habits that insure smooth handling and quick loadings. By investing in a larger mobile crane and using proper scrap handling wheel loaders the port is able to work effectively", says Stevedoring manager Jani Klingberg.

### Investments

To be able to handle the growing amount of metal scrap and other recycling products Inkoo Shipping bought a new Mantsinen 140 Hybrilift this spring and has also invested in a smaller Mantsinen 60. "While loading a vessel it is important to have one machine which feeds scrap closer to bigger machines for them to be able to work effectively", explains Klingberg.

"As the amount of other recycled materials are also increasing Inkoo Shipping is prepared to be a part in this and offer its services and equipment even to new customers," Klingberg continues.

# TMAZ achieves monthly transfer record of 9,132 vehicles in June

Terminal Marítima Mazatlán (TMAZ) moved 9,132 vehicles in June 2019, marking a monthly transfer record for this type of cargo. The SAAM-operated port in the Mexican state of Sinaloa forecasts that it will move 94,000 vehicles this year, doubling its volume from 2016.

"TMAZ has become a key component of the automotive logistics chain in Mexico. As a boutique port, we have found a way to give our customers tailored solutions and comprehensive service," according to the terminal's CEO, Mauricio Ortiz.

The multipurpose port, which launched its automotive operations in October 2015, has a dynamic capacity for 138,771 vehicles per year, which today makes it the port of entry and exit for companies like Nissan, Ford and Mitsubishi. A new automaker will soon join them, bringing the yearly volume to around 120,000 cars in 2020.

In addition to developing operational systems for handling vehicles, TMAZ also services container ships and loose and bulk cargo. "Freight diversification has been fundamental to doubling our throughput since we began operating in 2012. At that time, we practically only moved containers," added Ortiz.

### About SAAM

SAAM is a multinational corporation providing services for international trade through its three divisions: Port Terminals, Towage and Logistics.

With 57 years in business, SAAM has operations in 12 countries in North, Central and South America, creating jobs for more than 7,000 employees.

It is one of the leading operators of port and towage services on the continent.

The company operates ten port terminals in six countries of the Americas, serving differentiated exports in each zone.

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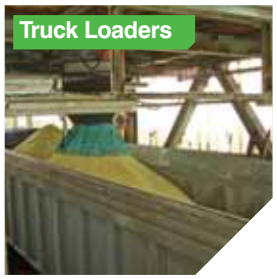
NEUERO Industrietechnik

# 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.

Our worldwide reputation is built on high quality, well-engineered, robust, high performance chutes, backed up by excellent customer service and global lifetime product support.


### Contact Cleveland Cascades Ltd

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