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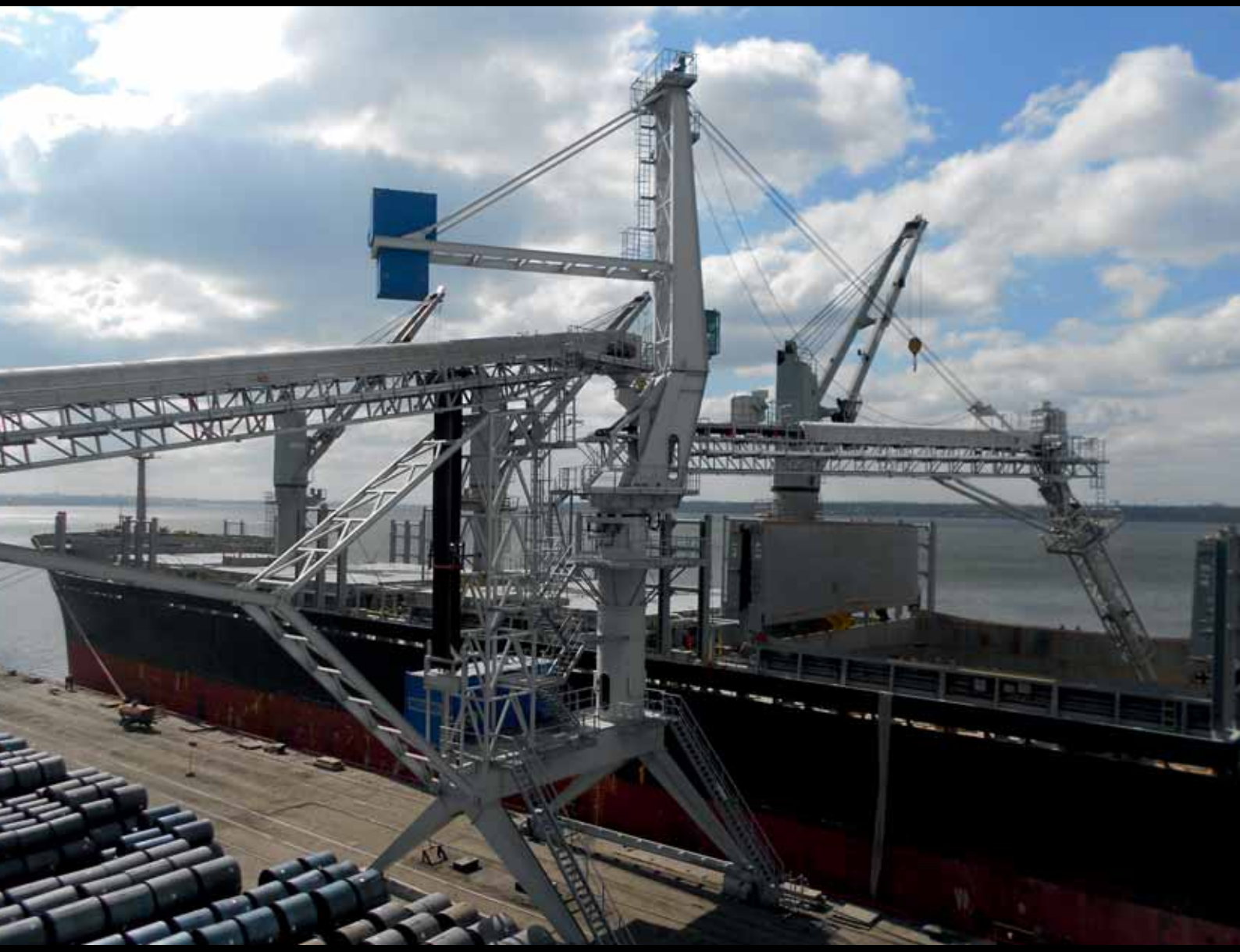

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AUGUST 2015 issue

featuring...

Coal trade growth faltering

Signs pointing to sharply slowing growth of global seaborne dry bulk trade have become more prominent. Although commodity import demand in many countries is still expanding, much of the increased volume is being offset by reductions elsewhere. Weakness in China's imports, particularly coal, is a key negative aspect.

An updated forecast from the IMF in early July provided limited encouragement. A gradual pick up in economic activity among the advanced economies — mainly USA, Europe, Japan and Korea — is expected, to 2.1% GDP growth in 2015 (from 1.8% last year). But emerging economies including China, as a group, are predicted to see a further slowing to 4.2% this year (from 4.6% in the previous twelve months).

Coal

Forecasts for coal trade have been downgraded as the full extent of adverse events has unfolded. However, not all importers are likely to see no growth or lower volumes. India is a focus of attention, reflecting clear indications suggesting a continued strong upwards trend in both steam and coking coal imports.

Recently revised forecasts by the Australian Government Dept of Industry and Science showed global metallurgical coal trade (coking coal plus steam coal used in the steel industry), most of which is seaborne, falling by 3% in 2015. From 310mt (million tonnes) last year, the total is predicted to decline to 301mt this year. A steep 31% fall in China's metcoal imports, to 45mt in 2015, is the main cause envisaged, more than offsetting a robust rise in India.

Iron ore

Steel production evolution in the first half of this year emphasizes slacker support for raw materials import demand in many countries. In China, the world's dominant iron ore importer, an expectation of large additional purchases from foreign suppliers — to replace uncompetitive low-quality ore produced in domestic mines — has not been fulfilled in the past six months.

Crude steel production figures compiled by the World Steel Association show China's total decreasing by a marginal 1% in the first half of 2015, compared with last year's same period, to 410mt. Other reductions included a 5% fall in Japan, to 52.6mt, and similar 5% falls in South Korea and Taiwan, to 34.5mt and 10.6mt respectively. By contrast, EU output was 1% higher at 88.1mt while India saw a 4% increase to 45mt.

Grain

Following a remarkable period of expansion, world trade in wheat plus corn and other coarse grains seems set to decrease slightly over the period ahead. During the past two crop years, 2013/14 and 2014/15 which has just ended, trade grew cumulatively by almost one-fifth. In 2015/16 now beginning, a 3% reduction to 312mt is indicated by updated (at the end of July) International Grains Council estimates.

Growth over the past two years resulted mainly from greatly increased imports into China and advances in some other Asian countries. These rises were accompanied by enlarged purchases by countries in the Middle East and North Africa. Tentative signs of changes in the twelve months ahead point to reduced Middle East volumes, and a number of other smaller reductions around the world.

Minor bulks

Among key minor bulks, global seaborne trade in bauxite/alumina could strengthen in 2015 according to some estimates. After declining steeply last year to around 105mt, positive indications have emerged but there is still uncertainty about China's imports, which totalled almost 42mt in 2014.

Bulk carrier fleet

Additional bulk carrier capacity entering the world fleet this year may exceed the previous annual total, as shown by table 2.

All size groups except Panamax may see larger deadweight volumes added. However, a high proportion of this year's extra new capacity is likely to be offset by scrapping of old tonnage, resulting in a noticeable fleet growth deceleration.

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

	2010	2011	2012	2013	2014	2015*
Japan	76.6	68.7	70.5	77.0	74.1	71.5
South Korea	23.4	25.9	25.7	26.4	29.9	29.0
Taiwan	10.2	10.7	10.5	10.9	10.9	11.0
China	47.3	44.7	53.6	75.4	62.3	45.0
India	35.0	33.0	35.5	39.0	48.0	55.0
Total of above	**192.5**	**183.0**	**195.8**	**228.7**	**225.2**	**211.5**

source: various & BSA 2015 estimates * *estimate*

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

	2010	2011	2012	2013	2014	2015*
Handysize (10-39,999dwt)	8.4	10.2	10.4	6.2	5.3	6.5
Handymax (40-64,999dwt)	19.0	22.0	20.9	14.6	11.1	16.5
Panamax (65-99,999dwt)	14.4	22.2	27.1	20.0	13.2	12.0
Capesize (100,000dwt and over)	38.6	45.6	41.9	22.0	18.5	19.0
Total	**80.4**	**100.0**	**100.3**	**62.8**	**48.1**	**54.0**
% change from previous year		24.4	0.3	-37.4	-23.4	12.3

source: Clarkson Research & BSA 2015 estimates * *estimate*

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Containerized sugar exports up in Brazil

In the first quarter of this year, Williams Brasil reported a rise in sugar being exported via container. The peak came in March, when 185,980 tonnes were shipped.

In total, from January to March this year, Brazil exported 431,910 tonnes of containerized sugar, up nearly 10% over the same period in 2014. Santos, with 377,650 tonnes, remained Brazil's leading sugar port, responsible for 87.43% of the total. Far behind, in second place, Suape accounted for 25,210 tonnes, equivalent to just 5.84%.

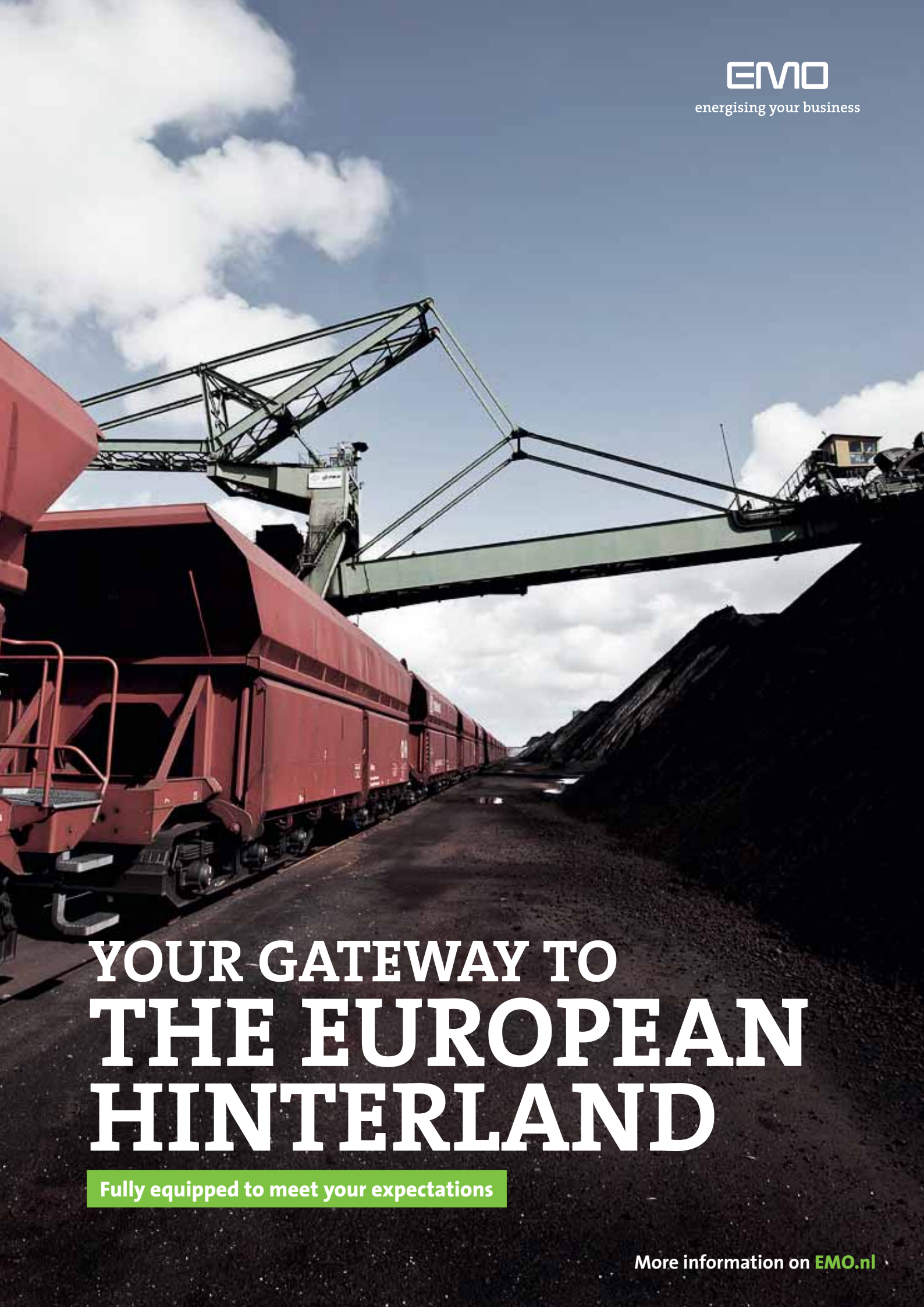
Importers in South Africa were Brazil's main clients, buying 57,210 tonnes, which was 13.25% of the total. They were followed by Sri Lanka, with 52,420 tonnes and Yemen with 43,050 tonnes. *Barry Cross*

Cross-border bulk trade increases between Russia and North Korea

In 2014, cross-border trade between Russia and North Korea, carried by Russian railways via the Khasan for the interchange increased 3.2 times. Coal traffic went up by 24 times in the same period. This trend has continued well into 2015.

In total, in 2014, 280,000 tonnes moved from Russia to North Korea, of which 238,200 tonnes was coal. Significantly, in the first quarter of this year, 408,000 tonnes of coal were shipped to the port of Rajin by Russian railways, which expects to haul 1.5mt (million tonnes) to the port during the course of the present year.

The reinstatement of the line between Khasan and Rajin is a precursor to the reconstruction of the trans-Korean railway, which is planned to link the two Koreas. Since 2014, four trial runs have taken place between the port of Rajin and South Korea. Potentially, the link could handle around 5mt a year. *BC*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Iron ore trades

Tippling facility for rail wagons transporting iron ore.

Chinese production and demand continues to drive the market

Sam Walsh, chief executive officer of Rio Tinto, the world's second-largest supplier of steel-making ingredient iron ore, is an exceptional brave heart, *writes Kunal Bose*. Otherwise, how could he describe a 43% fall in the 2015 first half profit to $2.9bn from $5.1bn a year earlier as "robust?" In justification, Walsh said that the company's working must be seen in the context of the tough operating environment that obtained in the six months to June. As for its all important iron ore division, underlying earnings were down 55% to $2.099bn even while Rio sold 8% more ore on a year-on-year basis at 146.5mt (million tonnes). Robust or not, profit fall of this order was not unanticipated. After all, iron ore prices have been going downhill since the beginning of this year to touch a record low of $44.10 a tonne on 8 July. Plunging profits have squeezed the margins of the company's iron ore business, as is the case with every other miner.

What is, however, to be said in favour of Rio is that by way of economies of scale (over the years it has sold quite a few marginal assets), mining of high-quality deposits largely in Western Australia's Pilbara region and Canada, employment of cost-effective technologies and effective management of logistics chain, its overall ore production cost has remained around $30 a tonne. This is among the lowest in the global iron ore industry. So if an extraordinarily efficient group like Rio experienced meltdown in earnings by more than a half, then the plight of the so-called 'tier two' producers and a very large number still below is understandable.

The world remains oversupplied with iron ore and global steel production in the first half of 2015 was down 2% to 813,045mt from 829,935 tonnes in corresponding six months of 2014. In the same period, China, which makes almost as much steel as the rest of the world combined and consumes close to two-thirds of global seaborne supply of ore, produced 1.3% less metal at 409mt. How then is it that, at the beginning of August, the mineral staged a rally claiming a 28% gain from the low point of $44.10 a tonne? Even then at the rally high point ore prices were still down 20% since year start. And that is after prices fell by half last year.

An intelligent guess for the rally is that some Chinese steelmakers around the capital city Beijing started raising production in the later part of July in anticipation of their being mandated by the government to cut production in order to have a clear blue sky ahead of a military parade on 3 September

Vale Pecém to start operations in September

Vale Pecém, the mining arm of the Brazilian company Vale is to start supplying raw materials to the Pecém Iron and Steel Company (CSP), which is located in the port of Pecém's industrial complex, as of September. It will take ten months for the operation to be fully ramped up, with the iron ore involved used to make 3mt (million tonnes) of steel plates annually.

A second-phase development will see production cranked up to 6mt of plates, although no schedule has yet been published as to when this will take place.

Vale Pecém has been awarded an exclusive contract to supply CSP, a joint venture in which Vale holds a 50% stake. Its other partners — Dongkuk (30%) and Posco (20%) — are both South Korean.

The reception terminal, in which Vale Pecém is investing $96.7 million, will handle and blend iron ore and iron ore pellets.

Barry Cross

commemorating the 70th anniversary of second World War. Before the parade Beijing was hosting the world track and field championship. This has become the practice since China's hosting of the Olympics in Beijing in 2008. Since mills in Hebei province, the country's largest steelmaking centre, Tianjin and Beijing outskirts were to exercise restraint, as much as 6mt of steel production could be lost during restriction period. Will the earlier production gain be higher or less than the loss that will subsequently be known when the World Steel Association publishes production figures for August in the third week of September? Anticipation of capacity use restraint besides, some mills in China lifted production encouraged by unexpected improvement in steel rebar and billet prices.

Director general of Federation of Indian Mineral Industries R.K. Sharma says, "prices of iron ore and steel will continue to be decided very largely by Chinese production and demand for the metal. What does not bode well for the mineral is a statement by China Iron and Steel Association that the country's steel consumption was down 4.7% in the first half on account of a slowing economy and rapidly cooling property market. Then you have more and more iron ore delivered from massive new mines projects in Australia and Brazil." Let the observation by Sharma be read along with views expressed by the World Bank and global investment banking Macquaire.

The Bank foresees 17% fall in metal prices across the board "due to... slowing demand growth in China." The largest decline on minerals front, according to the Bank, is to occur in "iron ore due to significant increases in new capacity from Australia and Brazil." Ore production is also set to increase in India with more and more mines returning to production after production was halted by court order mainly due to violation of environment and forest protection norms. But ore supply in the world market by India, which only a few years ago ranked third as exporter after Australia and Brazil, is condemned to grow slowly because of punitive export duty of 30% both on lump ore and fines. Expect supplies also to rise steadily from a number of African countries where China remains engaged in buying all kinds of resources from oil to iron ore and making commitments to build rail, road and port facilities for egress of mined minerals.

Macquaire believes slowing growth in the global steel industry through the rest of the decade and expanding scrap pool have "obvious implications" for ingredients required for making steel "with required iron ore displacement now larger and more pressure on metallurgical coal supply to exit permanently." It says total iron ore demand in China is likely to fall to 1.13bn tonnes by 2019, down from 1.2bn tonnes in 2014. During this period, global demand for the most traded mineral is projected to be down by 84mt to 1.56bn tonnes. What about the Chinese iron ore industry? The report says, "with Chinese domestic iron ore having already lost 100mt a year over the past two years ... reaching minimum expected volume," any further contraction in the country's steel production will result in falling imports. The fall, says the report, will not amount to a collapse but will be gradual. But a happening like this on the back of nearly two decades of

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continuous growth, even in the worst of times like 2008 and 2009 when the word was battered by memory's worst financial crisis, will "in itself be a significant market event".

In the circumstances, forebodings for non-major producers could only be grave. What also promises to keep them on precipice is resolution of big miners like Vale, Rio, BHP and Fortescue to stick to their ambitious growth plans despite very low prices for the mineral increasingly squeezing their margins. Macquaire says major miners' production growth will likely create condition for yearly displacement of 60mt to 80mt for other producers through 2019. Visibly panicked by the unchecked fall in prices since the beginning of the year, Fortescue chairman Andrew Forrest said in April, "I'm absolutely happy to cap my production right now... In fact, all of us should cap our production now and we'll find iron ore price will go straight back up to $70, $80 and $90." Even while Forrest thought he was not making "attempts to engage in cartel conduct," he got a reprimand from Australian Competition and Consumer Commission. He was also roundly criticized by officials of other large mining groups. Walsh of Rio described the proposal to wind back production to support ore prices at elevated levels as "hair brained".

What, however, came as some consolation for Forrest is the observation by a Morgan Stanley analyst that "he probably does speak the truth. In our view, big miners can influence prices, if they could somehow legally act together to restrict supply growth." The four leading iron ore miners controlling at least 70% global seaborne trade, any moves by them might be perceived as attempts to jack up prices and therefore, to fall foul of regulatory bodies in different countries. Besides regulatory concerns, major producers are not ready to cut production for better unit value realization as that would in the process provide props to high cost mines to stay in business.

According to Goldman Sachs, at least half the world's tier two producers remain at the risk of closure. At what price point will the industry leaders start getting seriously hurt? Certainly not at the current level nor even at $40 a tonne. Mining and logistics efficiency have reached a level that at most of their sites, all costs are more than covered even at $30 a tonne.

Mines in China, which shut operation had their production costs ranging from $75 to over $100 a tonne. BHP CEO Andrew Mackenzie saying, "in iron ore, our focus remains on producing at lowest possible cost with Western Australia iron ore unit cost now below $20 a tonne as we continue to improve productivity" is seen as a commentary on the resilience of top players to ride out the crisis which is not going to go away soon. On this strength, industry leaders' continue to step up production to small groups' disadvantage.

BHP is to lift output by 2% to 250mt in 2015. Rio, which is on the last leg of capacity expansion in Pilbara, is now expected to ship around 340mt in 2015 from its operations in Australia and Canada and not 350mt forecast earlier due to weather disruptions in the first half in Australia. Even at the lower revised level, current year's shipments will compare very favourably with 302.6mt in 2014 when growth on a year-on-year basis was 17% over the previous year. Brazilian Vale, which gets 65 per cent revenue from iron ore, remains aggressive in boosting production as also BHP and Fortescue. According to one estimate, global surplus of seaborne iron ore supply is likely to grow to 300mt in 2017 from an expected surplus of 175mt in 2015.

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The China Syndrome? Vale anticipates tough times ahead

Air pollution in many parts of China has become so acute that numerous coal mines are going to be obliged to shut down. This is likely to mean that the steel mills they supply will cease operations as well.

How much tougher will things get for Vale and the world's other large iron ore mining companies, as prospects for the Chinese economy deteriorate, while the production of ore booms?

For the past 15 years or so, the top priority of the world's leading iron ore mining companies, notably Vale, BHP, and Rio Tinto, has been to keep pace with the frenetic rate of growth in demand from steel mills in China. The response by Vale and companies with mines in Australia has been to seek to open more, bigger, better and lower-cost mines, as well as to invest in infrastructure to get the ore to markets more cheaply, and to push out higher cost competitors by this means.

This was based in the belief that growth in the Asian giant, now the destination of two-thirds of the ore shipped by sea and spurred by numerous major infrastructure works, as well as by fast growth for industry and housing, would continue if perhaps not for ever, at least for several more decades.

But for various reasons, the main one being that massive financial pressures created by the pace of growth have become a threat to the whole edifice, the Chinese government is seeking to switch away from investing in infrastructure, to encouraging the faster growth of consumerism. This means less steel will be needed than hitherto.

There is another important variable as well, which is that far sooner than was anticipated by the planners, large quantities of scrap metal are beginning to become available in China. The country is now the world's leading market for motor vehicles and the first generation of cars made there is now being scrapped. The use of scrap, rather than iron ore to make steel, is a well known phenomena in many countries in the developed world and has resulted in a sharp reduction in the use of ore there.

Keeping pace with the steady increase in the demand for iron ore by China, which grew by more than 20% each year for almost 20 years, has been the main priority of the mining companies, both in Brazil and elsewhere in recent years.

China's burgeoning steel industry, now responsible for about 50% of the total world production of steel, has struggled to keep pace with a rate of growth which often exceeded 10% a year. The country spent huge amounts on constructing a brand new infrastructure, on building up its industry and on building new homes for the tens of millions who migrate from the countryside to towns and cities each year.

Demand for ore frequently exceeded supply, which encouraged prices to rise, which as the numbers in the first table illustrate, quadrupled in less than ten years.

To try to keep pace with demand, all the world's largest mining companies, led by the 'big three' — RTZ, BHP and Vale — as well as second-tier Anglo American and Fortescue, embarked on massive expansions. Ore can be produced at their new mines for considerably less than at most existing ones and it was felt that this would ensure that many competitors in China itself, and in other higher cost producing countries such as India, would close down.

With growth in China now having slowed from 10% a year to an estimated 7–8% in the past few years (some observers think this is an over-estimate) and with the huge rail network virtually complete and a huge stock of unsold housing building up, the government has decided to give more emphasis to consumption, rather than investment from now on. At the same time, the economies of many countries which have bought huge volumes of Chinese-made goods in recent years have been slowing, so China's exports have been falling as well.

The end result is that rather than there being one overriding concern for China, growth, the situation has become far more complex, in some cases, contradictory.

The past couple of years have seen the world price of ore fall steadily, to stand at less than $50 a tonne in recent months, less than half the record $100 per tonne reached two years ago. This is below the cost of production for all but the most efficient mines. Estimates about what will happen to prices from now on and when, vary enormously. It is not entirely clear what the effect a price which is frequently below the cost of producing ore, or equally importantly, transporting it by sea to steel mills in China, might have on mines in different places and with different cost and ownership structures.

Five years ago, mines in China themselves produced more than 300mt (million tonnes) of ore, slightly more than half of all the ore used to make steel. This was despite most of the local ore having substantially less iron content than the 60%+ of the ores coming from mines in Australia and Brazil. Now, less than 200mt are mined in China, after a series of mine closures. The question now is whether the recent falls will continue.

The 'big three' miners, as well as consultants, calculated that most of the high cost mines in China would cease production if prices fell to near $50 a tonne, as this would make them unprofitable. Some mines in China have indeed closed, with the result that about two thirds of all the ore used in China is now being imported. But the fall in local output has not been as fast as many analysts anticipated and it is unlikely to do so any time soon either. As in Brazil, many mines in China are owned by the steel mills which they supply, so may be cross subsidized. Some steel mills are state owned, others are owned by powerful local

authorities which may be prepared to subsidize production to keep people in work, at least for a while.

Another important variable is that the pattern of steel production in China is likely to gradually change in the years ahead. Most steel in China continues to be made in traditional blast furnaces, using mainly low quality and very polluting coal as fuel. But air pollution in many parts of China has become so acute that numerous coal mines are going to be obliged to shut down. This is likely to mean that the steel mills they supply will cease operations as well.

It is expected that mills which now make about 30mt of steel each year, the amount produced by Brazil's entire steel industry, may shut down in the next few years, so substantially less ore will be needed.

Many had predicted that, sooner or later, China would be obliged to switch to start giving priority to consumption, rather than continue to invest in more capital goods. But the 'big three' companies seem to have paid little attention to this, and they have all invested in adding massive new capacity.

They are all relying on being able to cut prices to below those of the competition to allow them to survive and prosper. Rio Tinto and BHP have opened large new mines in Australia, as has Fortescue, while Vale will start producing up to 90mt of extra ore from its new mines in the Carajas complex in a year or two's time. Most of these mines can produce ore for less than $45 per tonne. Vale hopes that the extra ore from Carajas will mean that China gets 15% of all the ore it imports from Brazil in future, rather than the 10% it now does.

To keep the average price down, production in Vale's higher-cost mines in Minas Gerais state is to be reduced by 30mt, while at the same time, Vale is to sell various assets, including coal mines in Mozambique. Last year for the first time, more ore left from the Ponta da Madeira port at Itaqui from which Carajas ore is shipped, than from the Tubarao complex. This trend will continue in the years to come, which will affect the shipping pattern. Investments being made at Itaqui will permit three 400,000-tonne-capacity Valemax ships to be loaded there simultaneously, as new berths are built and latest-generation shiploaders are installed there. Less ore will be shipped from Tubarao on the other hand.

Vale also expects to earn close to $1 billion from the sale of about 30 of its large 400,000-tonne-capacity Valemax vessels to the China Ocean Shipping Company, Cosco. These ships will be allowed to unload them at four ports in China, Qingdao, Dalien, Tungshan and Ningbo. This could reduce the cost of shipping Carajas ore to China by up to $6 per tonne, bringing Vale's costs close to that from Australian mines, which are much closer to China than Carajas is. Vale is also benefiting from the fact that Brazilian currency, the Real, has fallen by 25% against the US$ in which ore prices are set, in the past couple of years. With Brazil's economy struggling, the currency, whose excessive strength penalized Vale and other exporters for several years, is unlikely to rise again any time soon.

Anglo American directors must greatly regret falling for the charms of mega-investor Eike Batista, son of a previous Vale chief executive and paying much more than its Minas-Rio mines were worth. Anglo is looking for a partner to take a share in the project. But dozens of projects, which had they come to fruition, would have added another 250mt to the amount of ore produced worldwide, are now on hold, many of them are up for sale. So Anglo will be lucky to attract a buyer, except at a give away price.

Vale was able to push up the price at which its ore was sold on the domestic market as the world price soared. This encouraged most of Brazil's steel mills, which between them use about 60mt of ore each year, to set about opening, or enlarging mines they themselves owned. Some even began exporting ore, which in some cases earned them more than their exports of steel did. But circumstances have changed once again and although the weaker Real means exporting has become more profitable, it also means that the amount of steel imported by Brazil has fallen sharply.

Fifteen years ago, China was not amongst the top ten importers of Brazilian ore, but it now takes almost two-thirds of it. Japan was the leading customer until the mid 1990s, while several important European steel producing countries, as well as the United States, were also important markets. Virtually no ore was sold to countries in the Middle East at that time. But the amount of ore sold to Japan, Germany, France, Italy, Belgium, the UK and Spain has fallen sharply in the past 15 years, while that going to the US has collapsed. Only some countries in the Middle East are buying more. One of the main causes of the falls has been that the increased availability of scrap steel and the advance of new technology, as well as greater concern with pollution, has encouraged mills to cease making steel in huge blast furnaces. Most have switched to using electric furnaces, which handle scrap instead of ore.

In the past few years, China has become the world's leading market for cars and many consumer durables, which means that the amount of scrap available there is now growing fast as well. How long will it be before China too, starts to cut the amount of ore it needs, with the result that the gleaming new mines, many highly automated, in Australia and Brazil may never fulfill the potential their investors thought was guaranteed! DCi

BRAZIL'S EXPORTS TO CHINA

Year	'000 tonnes	Year	'000 tonnes
2014	171.5	2006	80.2
2013	170.7	2005	58.7
2012	169.9	2004	46.3
2011	164.5	2003	41.0
2010	152.6	2002	27.2
2009	150.2	2001	28.6
2008	96.4	2000	16.8
2007	105.0	1999	14.7

Source: Sinferbase

BRAZIL'S IRON ORE EXPORTS

(tonnes, earnings and $US per tonne)

Year	tonnes '000	US$ '000	US$/tonne
2014	306,536	22,932.5	75.53
2013	329,638	32,491.5	98.63
2012	326,528	30,895.3	94.95
2011	330,989	41,817.3	126.35
2010	310,931	28,911.9	92.98
2009	266,040	13,246.9	49.79
2008	281,682	16,538.4	58.71
2007	258,509	23,887.8	53.73
2006	244,594	11,754.2	48.06
2005	223,378	9,415.1	42.15
2004	200,923	4,992.7	24.85

Source: Sinferbase

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For over 30 years Jacobs Consultancy's Carbon Group has been the world's leading authority on petcoke and other carbon products. With a focus on studies involving fuel-grade and calcined petcoke, coal tar pitch, and other carbon products, Jacobs Consultancy also issues multiple publications, including its flagship subscription service, the Pace Petroleum Coke Quarterly©, which is recognized as the authoritative source of objective analyses for the petcoke industry.

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The petcoke market

tossed on a turbulent sea of change

Ben Ziesmer & Frank Wilson, Jacobs Consultancy

During the last year, the global petroleum coke (petcoke) market was buffeted by declining energy prices, changing ocean freight market, various delays, burgeoning petroleum coke production in the Middle East, and environmental issues.

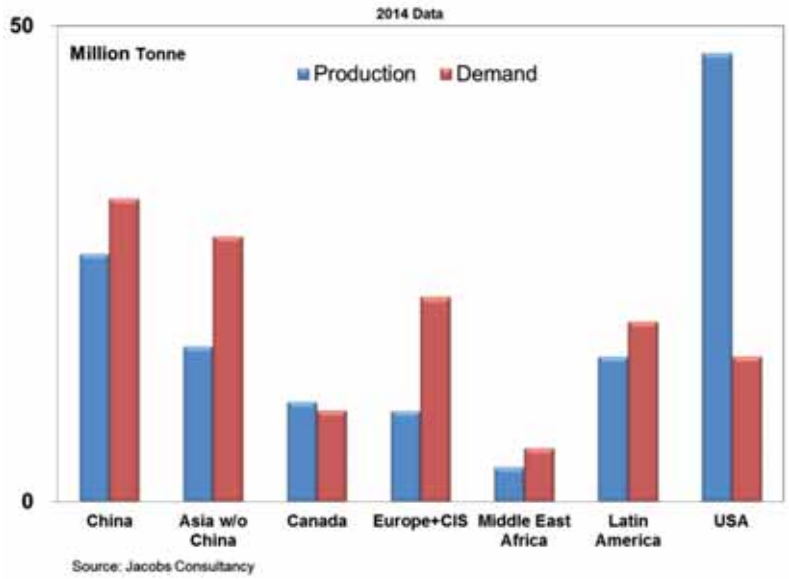
Petcoke — a seaborne market

The United States, the world's largest petcoke producer, exported over 75% of its fuel-grade production in 2014. While petcoke has been exported by many countries[1], the United States is, by far, the world's largest exporter, providing petcoke to Asia, Europe, MENA (Middle East/North Africa), and Latin America.

Furthermore, virtually all of the petcoke produced by Caribbean[2] cokers is exported. The US and Caribbean producers account for 90% of the fuel-grade petcoke that is involved in seaborne trade, because petcoke produced in other parts of the world (e.g., Europe, India) is almost always used domestically. In addition to these fuel-grade petroleum coke exports, about 60% of the US calcined petroleum coke production is typically exported.

Freight costs comprise a higher proportion of delivered petcoke cost versus that for most other traded commodities. The Canadian petcoke market is a good illustration of how cheaper seaborne freight can determine trade flows. Eastern Canada is a net petcoke importer, with the vast majority of this imported petcoke coming from the United States. Meanwhile, western Canada produces enormous quantities of petcoke from the tar sands in Alberta and Saskatchewan. Despite the domestic Canadian demand, it is much less expensive to

Regional petcoke supply & demand



1. Brazil, Canada, China, Egypt, Indonesia, India, Italy, Kuwait, Mexico, Saudi Arabia, Spain, Syria, United States, and Venezuela.

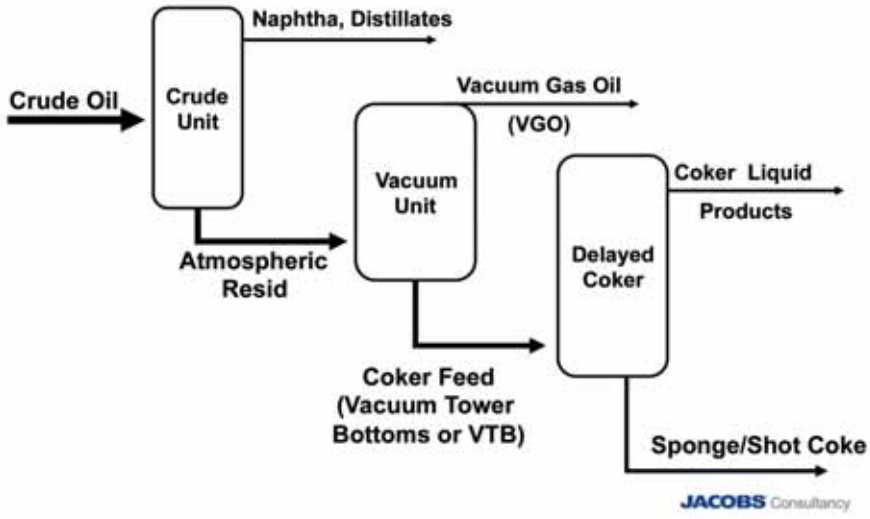
2. Hovensa St. Croix (US Virgin Islands), Valero Aruba, and six coking facilities in Venezuela. With the shutdown of Hovensa St. Croix and Valero Aruba in 2011, all current petcoke production is located in Venezuela.

transport petcoke from Alberta and Saskatchewan to Asian petcoke consumers than to move this petcoke across the North American continent by rail to customers in eastern Canada.

Background

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

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, and diesel fuel). Until recently, a coker almost invariably increased refinery profitability because the yield of high-value transportation fuels is maximized and production of low-value RFO is minimized. While the coking process has been in use since the 1930s, petcoke production has seen its largest growth following 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 that allows the refining industry to reduce its production of RFO per barrel of crude oil processed, and bridge the gap between light product and RFO demand growth.

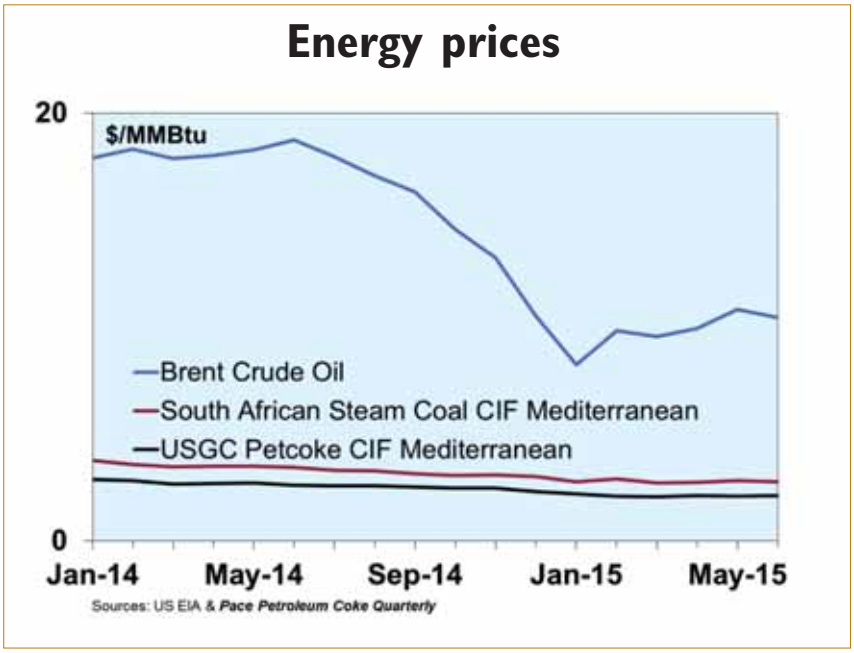
Additionally, beginning in the late 1990s, two new factors have been driving the construction of cokers:

- **Reducing crude oil purchase cost:** coking units allow a refinery to process lower-cost, heavy, sour crude oils. This was the driving force for the nine new or expanded cokers

installed on the US Gulf Coast from 1996–2004 when more heavy crude oil entered the market, and for many other coker projects currently under construction; and

- **Ultra-heavy crude oil production:** cokers are used in upgraders that produce various grades of synthetic crude oil (SCO) from bitumen or ultra-heavy crude oils. This type of upgrader exists in Venezuela where ultra-heavy Orinoco Belt crude oil is upgraded and exported as lighter crude oils, and in Canada where upgraders are used to produce SCO from the bitumen derived from Alberta oil sands.

There are two general applications for petcoke: as a carbon source and as a heat source. The former requires better quality (e.g., low sulphur and metals) and commands higher prices. Green petcoke[3] is usually upgraded by calcination (a process which removes moisture and volatile matter and improves critical physical properties) when it is used as a carbon source. Petcoke that has been calcined is referred to as calcined petcoke (CPC). The largest market for CPC is in the production of anodes for aluminium smelting; other uses for CPC are in the production of carbon electrodes for electric arc furnaces, titanium dioxide (TiO_2) production, and as a recarburizer in the steel industry. About 25% of the petcoke produced is sold into these higher value-added markets for higher-quality petcoke; the remainder of the petcoke is sold into the fuel market, where it almost always competes with coal.



Energy prices

Probably the biggest energy industry event in 2014 was the collapse of oil prices during late 2014/early 2015 (see Energy Prices chart, above). The oil price collapse was preceded by a build-up of crude inventories and the announcement that OPEC (Organization of Petroleum Exporting Countries) was not going to reduce production. Various officials stated that one of OPEC's goals in maintaining production was to protect market share against rising shale oil production.

US crude oil production increased from 5.0 million barrels/day in 2008 to 8.6 million barrels/day in 2014, all of it driven by the increase in shale oil (also known as tight light oil, or TLO) from less than 0.3 million barrels/day in 2008 to 4.2 million barrels/day in 2014. US oil producers reacted quickly to the steep decline in oil prices by cutting capital investment budgets for exploration and production, and the number of operating drill rigs dropped sharply. Going forward, the EIA projects that US TLO production will increase by 14% in 2015 but will then slow to an average annual growth rate of 3% for 2016-2020.

TLO produces very little VTBs, reducing the amount of material to be processed through the coker. Through 2012, as new shale oil production displaced light-sweet crude oil imports, the impact of increased shale oil production on US petcoke production was minimal. This is because the light-sweet crude imports also produced little VTB. However, as TLO production continued to increase, it began to displace imports of heavier crude oils, which in turn reduced the yield of VTB and thus petcoke production at some refineries. While US TLO production increased 37% in 2014, US petroleum coke production only decreased by 1%. A number of factors such as TLO being preferentially used by non-coking refineries, ramping up of production at recently completed coking capacity additions, and increased flow of heavy Alberta crude oil into the US Gulf Coast helped offset the impact of much higher TLO production on petcoke production. Beyond 2015, US petcoke production is unlikely to be affected by increasing TLO production, assuming the EIA's projections of 3% average annual growth rate are correct.

The Energy Prices chart above illustrates that declining crude oil prices had little discernible impact on either international steam (thermal) coal prices or petroleum coke prices. This chart might make one think that coal and petroleum coke prices are closely correlated. While there is an apparent correlation between steam coal cost and the price of petroleum coke, petcoke prices do not move in lockstep with coal prices. Petcoke is not fungible with coal due to its higher sulphur content, inferior combustion characteristics[4], different ash characteristics, and various peculiarities of environmental regulations/permits.

If petcoke prices were entirely determined by coal prices, then the value ($/MMBtu basis) of petcoke compared to coal would be constant (i.e., a straight line); however, this is not the case (see ≥6% Sulphur USGC Petroleum Coke vs. Coal graph).

Ocean Freight Costs

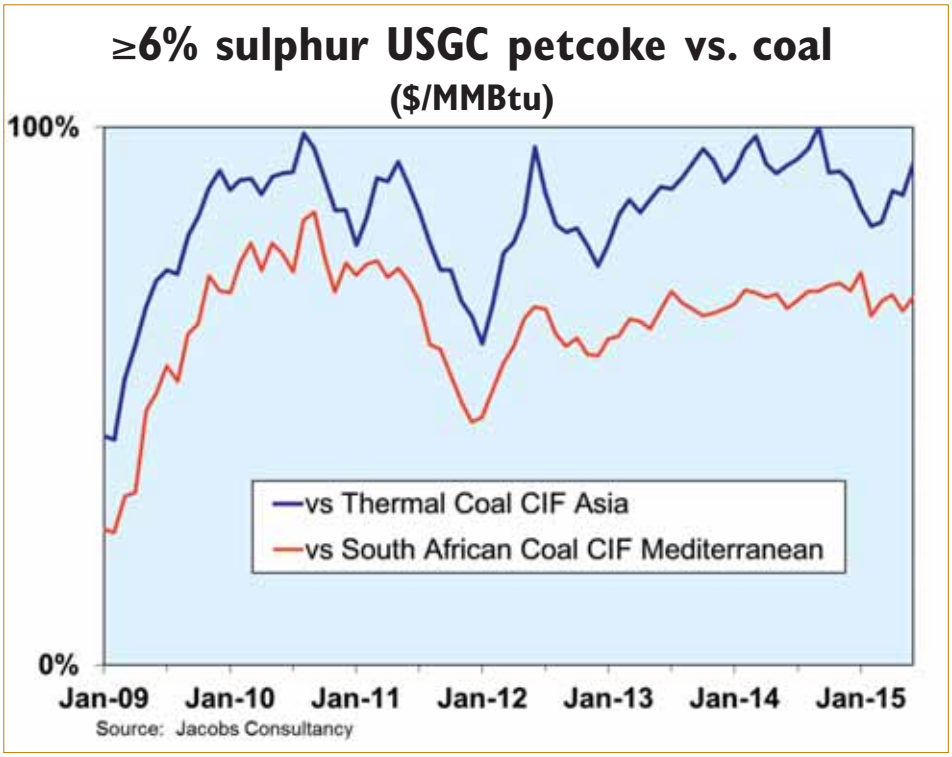
The ≥6% Sulphur USGC Petroleum Coke vs. Coal graph illustrates that freight cost is a critical element in the petroleum coke market. There is insufficient demand in traditional European, Mediterranean, and Latin American markets to utilize all US Gulf Coast (USGC) ≥ 6.0% sulphur petroleum coke, so this petcoke is forced to find outlets in Asia (principally China and/or India). Therefore, ≥6.0% sulphur petcoke pricing FOB (free on board) vessel USGC is determined by the delivered

3. Technically, all petcoke is 'green' when it is produced because all petcoke that has not been calcined is 'green'. However, in the petcoke industry the term green petcoke (GPC) typically refers to higher-quality petcoke used as calciner feedstock.

4. While petroleum coke has higher heating value and lower ash content than coal, it has very low volatile matter content which causes flame stability problems. Additionally, petcoke macerals are much less reactive than coal macerals, so it is much more difficult to completely combust petroleum coke than coal. Petroleum coke is often more difficult to pulverize than coal (i.e. lower HGI).

cost of this petcoke versus coal into Asia.

Freight cost to transport USGC petcoke to Asian markets is much higher than to traditional European, Mediterranean, and Latin American markets because the transport distances are so much greater (see Petroleum Coke Freight Rates Graph). The longer transit distance from the USGC to Asia puts USGC petcoke at a disadvantage versus coal. For instance, the voyage of petcoke from Houston, Texas, to the west coast of India is over 11,000 nautical miles and 28 days. This compares to a 4,400-nautical-mile/11-day voyage for a vessel from Richards Bay Coal Terminal, South Africa, to the same destination. Thus, the delivered cost of USGC ≥ 6.0% sulphur petcoke as percentage of delivered cost of coal is lower into USGC petcoke markets (e.g., Mediterranean) than to Asia.



In general, ocean freight rates during 2014 and 2015 have been relatively low by historical standards (see Petroleum Coke Freight Rates Graph). As discussed above, this is especially important in Asian markets.

Until recently, the predominant petcoke shipment in the market was a 50,000–55,000-tonne cargo carried in Panamax sized vessels. This cargo size was determined by a number of factors including draught at the loading facility, loading terminal storage/segregation capacity, and terminal/facility limitations at the discharge port. For this reason, many USGC petroleum coke loading terminals were designed to accommodate Panamax sized vessels. Recently, the Panamax vessel classification has crept up to include 70,000+ dwt vessels. Shippers, striving to shave their freight costs, are tempted to charter these larger Panamax vessels, but many USGC petcoke terminals cannot fully load these larger Panamax vessels, typically due to draught limitations.

In an effort to further reduce freight costs, during 2014 petcoke marketers sought to capture significant freight savings by shipping petroleum coke to India in 70,000+ dwt Panamax vessels versus smaller Supramax vessels. Since most Texas Gulf Coast petroleum coke terminals are draught-limited to approximately 40ft (12m), shippers found it advantageous to two-port load the Panamax vessels in the Texas Gulf Coast and then 'top-off' these vessels at deeper-draught Mississippi River terminals located near New Orleans, Louisiana. This required careful co-ordination to secure the appropriate cargo from suppliers at the various load ports. This year the savings in the ocean freight rates for Panamax versus Supramax to India decreased to the point that the incremental costs of loading at two ports often outweighed the freight savings.

Under ongoing pressure to reduce freight costs, petcoke marketers have been pursuing loading baby Capesize vessels (i.e.

Green petcoke.

110,000–120,000dwt) at Mississippi River locations for Asian destinations. However, these efforts have been hampered by the fact that most USGC petcoke production is located in western Louisiana and Texas, with draught-limited terminals. Recently, one petcoke reseller loaded a baby Cape vessel with petcoke at a Houston area petroleum coke and coal terminal that had been modified to accept larger vessels.

Delays

Over the past year, several construction projects and other initiatives have not come about as anticipated, contributing to uncertainty in the petcoke market. Among the anticipated changes in the market were the start-ups of new coking units in Brazil and Colombia, the start-up of a huge gasification plant in India, and the shift from fuel oil to petroleum coke to fuel Egypt's cement industry.

On the production side, the new delayed coking units in Brazil and Colombia were delayed in starting up. In Brazil, start-up of Petrobras' new Abreu e Lima (RNEST) refinery located near Pernambuco, Brazil, has been delayed. As of the end of last year, only one-half of the refinery had started up, and the prospects for completing construction of the remaining capacity remain questionable. As a result, only one-half of the expected petroleum coke from this refinery is going to be entering the market. Additionally, ramp up of production of the completed coking unit has been slow, with less than 50% of petcoke production capacity reaching the market this year.

The other delayed coking unit that has been delayed is at REFICAR's expanded Cartagena refinery. This expansion project (which includes a new coking unit, initially scheduled to start up in 2013), was widely expected to begin production this May. However, recent indications are that this coker will start up in the fourth quarter of 2015.

On the demand side, there has been some speculation regarding the start-up of Reliance Industries' huge coal/petcoke gasification project. Initially it was expected to begin operations in 2015. Although Reliance subsequently announced that the first of the five modules would start up in March 2016, indications are that the start-up date will likely slip to late second quarter, with each succeeding module following every three months. When operational, this project will have the capacity to consume 30,000 tonnes per day of coal and/or petcoke.

Lastly, the Egyptian government passed legislation in 2014 allowing certain industries to burn coal and/or petcoke in lieu of more expensive fuel oil. The shift to petroleum coke has been much slower than many in the petroleum coke market had anticipated due to operational and regulatory issues on a plant-by-plant basis. Additionally, since the bulk of fuel savings are achieved by switching from fuel oil to coal, some operators are prioritizing switching to coal as quickly as possible, with possible switching to petroleum coke to follow at some later date.

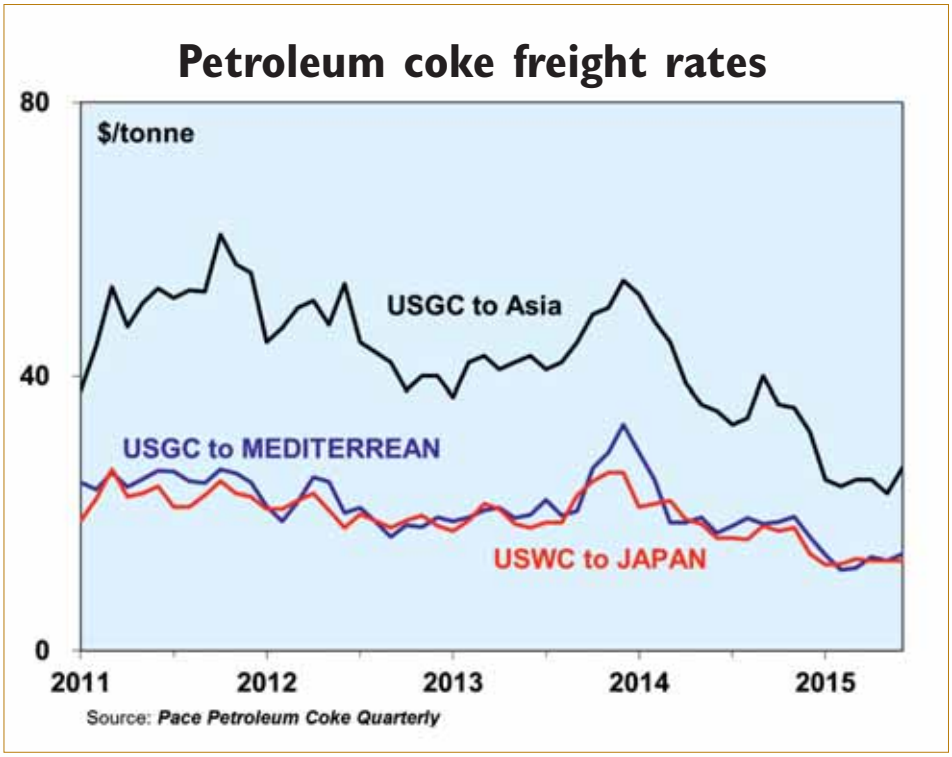
Middle East Rising

The Middle East has historically been an importing region for petcoke, but this traditional role has changed from 2015 onward. The start-up of the SATORP refinery (a joint venture between Saudi Aramco and Total) located in Jubail, Saudi Arabia, initiated a wave of new coker additions that will impact the international petcoke market. In all, five new cokers have begun or will begin producing petroleum coke during 2015/2016, with an estimated total production of 5.4mt per year. Most, if not all, of this new production will enter the seaborne market, feeding burgeoning demand in Asia and Africa, notably India and Egypt. These new cokers are:

- **SATORP and YASREF:** these new refineries are located in Saudi Arabia. SATORP (a joint venture between Saudi Aramco and Total) is located on the eastern coast near the port of Jubail and YASREF (a joint venture between Saudi Aramco and Sinopec) is located at Yanbu on the Red Sea. SATORP began shipping petcoke in late 2014, while YASREF began shipping earlier this year. Each of these refineries is estimated to produce 2.2mt per year of fuel-grade petcoke, and is ideally located to supply the Indian and Egyptian markets.
- **SOHAR:** located in Oman, on the Persian Gulf, this new refinery is scheduled to start up in 2016 and it is estimated that it will produce ~0.5mt per year of fuel-grade petcoke. The Sohar Refinery is also strategically located to supply the Indian and Egyptian markets.
- **RUWAIS:** this new refinery is located in the United Arab Emirates, on the Persian Gulf, and is expected to start up later this year. The coking complex in this new refinery includes a petcoke calciner; it is estimated that the calciner will produce ~0.4mt per year of CPC. This refinery is conveniently located to supply the growing regional CPC market.

Environmental Drivers

Recent environmental issues surrounding transporting petcoke have had a significant impact on the petcoke market. The highest profile of these issues has involved three petroleum coke and/or



General Kinematics petcoke installation

General Kinematics (GK) is well known in the foundry and recycling industries as a major supplier of vibratory equipment that solves the toughest process challenges. But did you know GK has also a proven track record in the Pet Coke industry?

El Dorado, in Kansas, was looking for a solution to handle its shot coke. It needed a dewatering screen solution that would provide zero slide back and that would be capable of handling a steady flow of material as well as large surges. Working with GK's engineering team, two dewatering screens were installed that performed above El Dorado's specifications. Based on field measurements, today feed moistures measure up to 40% while the average discharge moistures are 10.5%. Installed under the drum, the nominal design of these General Kinematics screens is 650tph (tonnes per hour) though capable of occasional surges of 850tph or more.

Lead engineer on this project, GK's Technical Director Oscar Mathis, had this to say about the installation: "GKC's petcoke dewatering conveyor production units, based upon two years of field testing, exceeded everyone's performance expectations. Dewatering occurs to the extent that slide-back on inclined takeaway and stacker belt conveyors has never occurred even when feed surges approach almost twice the original design rate."

About General Kinematics

General Kinematics Corporation, incorporated in 1960, was established to market, design, and custom fabricate innovative vibratory material handling and processing equipment. Today the company is one of the world's largest suppliers of vibratory processing equipment, holding hundreds of worldwide patents, and acknowledged as a major contributor to the technical advancement of vibrating equipment design and application. Over 50,000 General Kinematics units have been installed in virtually all of the world's industrialized countries.

Petcoke stored in southeast Chicago.

coal terminals located in the southeast side of Chicago, Illinois. These terminals received coal and petcoke by barge, rail, or truck; provided storage space; and transloaded material to Great Lakes vessels or barges. Barges loaded at these terminals could access the US Mississippi River system through a series of canals and tributary rivers. Significant quantities of petroleum coke loaded into barges at these terminals moved downriver to the New Orleans area for transloading to oceangoing vessels.

These Chicago area petcoke terminals have been embroiled in controversy regarding fugitive petcoke emissions since the fall of 2013, when the Chicago Tribune and other Chicago media outlets began covering complaints of southeast Chicago residents regarding fugitive petcoke dust emissions from open petcoke piles and during transloading operations. In March 2014, the City of Chicago Health Department issued a series of rules that significantly restricted petcoke and coal terminal operations and required storage areas be enclosed by June 2016.

Much of the controversy focused on petcoke produced by BP's Whiting, Indiana, refinery that was shuttled by mini-unit trains to either of the two Chicago terminals owned by Koch Industries. In February, BP announced that it was going to halt use of Chicago area petcoke terminals by the summer of 2015, and is implementing these plans. As of the end of June, two of the Chicago area coal and petroleum coke terminals, Beemsterboer and KCBX North, are closed; the third terminal, KCBX South, continues to operate.

Due to environmental concerns, the SATORP refinery located near Jubail, Saudi Arabia, was designed to use a conveyor system to move its 4,500 tonnes per day of petcoke production the 26km (16 miles) from the refinery to the petcoke terminal in the marine loading facilities at Jubail rather than moving it by truck. However, when the refinery started up in the fourth quarter of 2013, the conveyor system was plagued with problems, limiting the flow of petcoke from the refinery. It was not until June of this year that, via trucking and restricted conveyor operations, sufficient petcoke could be moved to the terminal to keep up with refinery production (about four vessels of petroleum coke per month). This conveyor/truck operation will likely continue until the conveyor system is fully operational.

In the last year, China's interest in high-sulphur petroleum coke has dramatically declined as Chinese authorities are pushing for petcoke importers to avoid importing high-sulphur petroleum coke.

Perhaps potentially the largest regulatory impact on petroleum coke, MARPOL VI, looms on the horizon. If MARPOL VI is not changed, vessel operators will have to use fuel oil that does not exceed 0.5% sulphur or install SO_2 seawater scrubbers by 2020. If significant numbers of ships are not retrofitted with SO_2 scrubbers, then demand for high-sulphur marine fuel oil will decline significantly. In response to declining high-sulphur fuel oil demand, some refiners will likely choose to install coking units, potentially providing a flood of additional petcoke production for the petcoke market to absorb.

Summary

Petroleum coke has been buffeted by a series of events in the past year. Perhaps the most significant development is increased scrutiny of petcoke terminal and transport operations by environmental activists and regulators. While small compared to many other dry bulk or energy commodities, the petcoke market will continue to provide business opportunities for those that can evolve and change in response to various market and governmental forces. DCi

About the authors

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Contributing editor to Jacobs Consultancy's *Pace Petroleum Coke Quarterly©*. He has an in-depth background in the power sector, including experience in procurement, operations, environmental compliance, and engineering. He leads Jacobs Consultancy's fuel-grade petcoke practices and has been the project manager for numerous studies involving the fuel-grade petcoke market, environmental issues, and power generation.

Frank Wilson (Senior Consultant)

Frank Wilson brings years of experience and an in-depth knowledge of the petroleum, chemicals, and energy industries to the Carbon Group. He is a contributing author for the Pace Petroleum Coke Quarterly and is involved with single-client studies of the global fuel-grade and anode-grade petcoke markets. Prior to joining Jacobs, he was a Petcoke Marketing Manager for ExxonMobil.

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

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Sim4Crew from Hutton's simplifies seafarer internet & phone use

Hutton's Group is now the sole UK distributor of Sim4Crew global sim cards for seafarers.

Sim4crew roams in more than 200 countries at local prices – meaning seafarers never need to buy a local sim card again.

Operational in over 4,500 ports and 120 anchorage areas, the Sim4crew sim card enables users to surf the internet with high speed data and call home with excellent voice quality.

Advanced roaming technology enables calls at superb prices, starting from just five cents a minute and data from nine cents a minute. And receiving sms and calls is free in most countries.

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Sim4crew works in all kinds of mobile phones, tablets, USB modems and hotspots and supports both call through and call back options.

GAC UK appoints Chartering & Project Manager

Martin Kenney joins GAC to extend capabilities in key sector

GAC UK is expanding its services for the heavy lift and project forwarding sector with the appointment of industry specialist Martin Kenney as Chartering & Project Manager.

A ship broker and agent for 27 years working with heavy lift carriers such as BigLift, Rolldock, Jumbo and CPC, Kenney has managed turnkey projects worldwide including multimodal contracts to China, Russia, Argentina, Brazil, Iraq, Saudi Arabia, Pakistan and Algeria. For the last seven years, Kenney has managed his own company, Project Navigation.

He is the latest addition to GAC UK's newly-formed nationwide team of specialist Product Managers dedicated to different sectors. Based in GAC UK's Southampton & London Heathrow offices, Kenney is responsible for the commercial development and expansion of the company's project and chartering operations.

Herman Jorgensen, GAC UK's Managing Director, says: "The addition of Martin to the team further strengthens our project logistics capabilities to better serve our customers. It will enable us to seize opportunities to continue to build our reputation as the leading provider of specialized, integrated shipping and logistics services in the UK."

About GAC Group

GAC is a global provider of integrated shipping, logistics and marine services. Emphasizing world-class performance, a long-term approach, innovation, ethics and a strong human touch, GAC delivers a flexible and value-adding portfolio to help customers achieve their strategic goals.

Established since 1956, GAC employs over 9,000 people in more than 300 offices worldwide.

Ethiopian Maritime Training Institute hosts IMO delegation

Officials from the International Maritime Organization (IMO) recently completed a fact-finding mission to the Ethiopian Maritime Training Institute (EMTI) in Bahir Dar, Ethiopia. Juvenal Shiundu and William Azuh from IMO's Technical Co-operation Division, assisted by officials from the Ethiopian Maritime Affairs Authority and from EMTI, undertook the mission as part of an effort to give effect to this year's World Maritime Day theme of Maritime Education and Training.

EMTI provides specialized training for deck, engineer and electro-technical officers for ships, in compliance with the IMO's STCW Convention, which specifies global standards of training, certification and watchkeeping for seafarers.

A partnership between Bahir Dar University and the US-based investment firm, YCF Group, EMTI currently graduates up to 500 cadets per year, and plans soon to expand its capacity to train over 1,000 seafarers annually. After completing a rigorous training programme at the maritime academy, EMTI cadets begin their careers as junior crew members with leading shipping companies on a global basis.

The demand for Ethiopian seafarers has grown rapidly in recent years, and EMTI is the exclusive marine officer training academy in Ethiopia. During a recent visit to EMTI in Bahir Dar, the Honorable Patricia M Haslach, the US Ambassador to Ethiopia, said, "The US has an old and cherished maritime heritage, and we are pleased and excited to help foster a maritime tradition in Ethiopia as well."

Pini Shwartz, CEO of EMTI, says, "We are greatly encouraged by the interest shown in EMTI by IMO, whose representatives acknowledged during their recent fact-finding mission the progress made by EMTI since it was set up in 2008. They also offered advice on ways to maintain — and, where possible, improve — the effectiveness of the academy, plus assistance with the likes of IMO publications and reference books, which is greatly appreciated.

"EMTI has developed rapidly in a relatively short period of time to become one of the largest quality maritime training institutes in the world, with vast potential for further growth. That growth, of course, will be achieved in line with IMO standards and ideals."

The Ethiopian Maritime Training Institute is a private company established to provide professional maritime training for Ethiopian engineering graduates. Through its elite maritime training programme, EMTI has established superior standards for selecting and training its cadets to become world-class marine engineers.

It is as subsidiary operation of the YCF Group which, through its complementary entities, has developed an exhaustive range of regulatory compliance and training services.

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Coeclerici celebrates landmark year in 2015

Coeclerici Logistics, the logistics division of Coeclerici Group, is one of the world's leading bulk material transshipment companies with a history of more than 40 years in this specific field. The year 2015 will mark an important goal for the whole Coeclerici Group which will celebrate its 120th anniversary — over a century of success in various business industries, from trading to shipping, from mining to logistics.

Even during this tough period for the dry bulk commodities market, Coeclerici has been able to keep its position in the transshipment industry, ensuring a first-class service and reliable performances for its clients, continuously improving its technical and commercial expertise.

Coeclerici has reported on an interesting update to one of its Floating Transfer Stations fleet which operates in East Kalimantan, Indonesia.

The loading system on the *Bulk Celebes* has been improved with additional equipment that allows it to perform blending operations. This means it is now possible to mix homogeneously two different grades of coal. The blending percentage can vary from 20:80% to 50:50%. Once the desired percentage is set, the blend is monitored and automatically adjusted by the PLC unit which can vary the speed and flow rate of the belt extractors.

Flow rate is controlled by three belt scales installed on the conveyor system, one on each extractor belt measuring each grade flow rate and on the transversal conveyor measuring the total flow.

The homogeneous blending of coal is also enhanced by the transfer points of the conveyor system and the revamped system is able to guarantee reliable loading rate from 1,500tph (tonnes per hour) up to 2,000tph. In addition, a sampling unit is installed on the transversal conveyor system: this unit automatically grabs and packs a sample of the material from the conveyor belt in order to check the blended cargo whenever required.

Operations are now running smoothly. Coeclerici's clients have also confirmed the high quality of the blended product.

In fact, blending is becoming more and more important from a strategic point of view. It is highly requested from the main players of the Indonesian coal market, giving to them a price advantage due to the possibility to offer a product more suitable to the final users.

Furthermore, Indonesia is confirmed to be the one of the most important countries for Coeclerici's logistics business, where five Floating Transfer Stations are working in the Kalimantan area, receiving coal from barges and loading OGVs (ocean-going vessels) with best net loading rates over 50,000 metric tonnes a day. In the course of 2014, between them they handled over 17 million tonnes of coal.

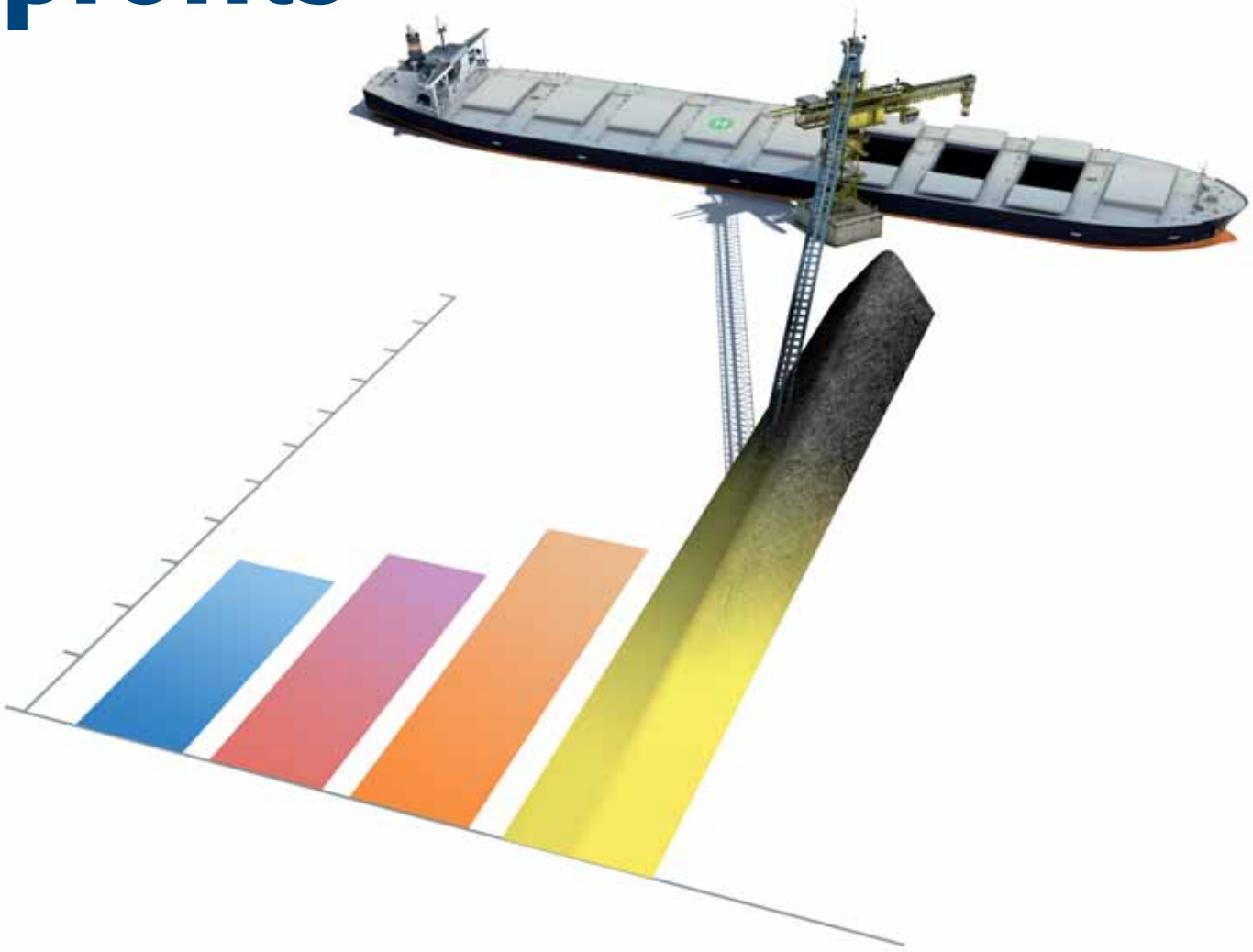
The aim of Coeclerici for the near future is to strengthen its position in the transshipment market continuously creating innovative solution, engineering and promoting the use of 'floating terminals' throughout the world designing and developing different types of floating transshipment stations capable of lighterage /top-off operations, cargo transfer and self-unloading of many different dry bulk materials. These carry out all the same functions as a port terminal but with far smaller investments, lower management costs and less environmental impact.

Regarding CC Transshipment solutions, the key advantages are:

- they eliminate waste and cargo contamination;
- they discharge dry-bulk cargo at an unimproved dock without assistance from any shore-side equipment or shore-side personnel. They do not require any land-based assistance;
- they can provide offshore transshipment operations, topping off or offloading into larger vessels;
- they can reduce a cargo's overall delivered cost per tonne because they are fast, efficient and less capital- and labour-intensive than on-shore based systems; and
- the new generation of self-unloader is equipped with advanced dust suppression systems. Dust suppression units are situated throughout the cargo handling areas, and the discharge booms are enclosed and fitted with water sprayers to further reduce dust during offloading.

The Bulk Celebes *in operation.*

Bulk up your profits



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Class acts

bulker classification

The 27,000dwt open hatch bulk carrier Jules Garnier II *was the world's first vessel built to the Specially Constructed Cargo Ship requirements, constructed and designed by Naikai Shipbuilding Corporation to NK-class and delivered to JX Shipping Co. Ltd on 19 September 2012.*

Michael King

Bulk carrier freight rates may be in a long-term dive, but this is not stopping classification societies from seeking to expand their fleets and pushing forward with new design innovations and safety rules.

The heat may be on bulk shipping margins, but classification societies are continuing to build up service portfolios aimed at the sector in a bid to boost fleet sizes and revenues.

Take Bureau Veritas, one of the market leaders in dry bulk shipping. Konstantinos Chatzitolios, BV's manager for dry cargo, told *DCI* that BV's bulk carrier fleet at the end of 2014 stood at 1,024 vessels aggregating 68.8m dwt, as well as 150 vessels of some 11.7m dwt on order with shipyards.

Konstantinos Chatzitolios, Bureau Veritas' manager for dry cargo.

"BV is amongst the leading classification societies in bulk carriers and has a growing market share due to the inflow of new vessels but also to the decision of many ship owners to change the class of their existing vessels to BV," he said. "We are expecting a stagnating newbuilding market for bulk carriers in 2015 and possibly in 2016, but our focus still remains on providing excellence for services during operation in order to attract the transfer of existing ships to the BV register."

ClassNK is similarly bullish. Yasushi Nakamura, Representative Director and Executive Vice President, ClassNK, said that after a steady year the society had 8,872 vessels totalling over 232.8 million GT on its

DNV GL: new market superpower

The bulk carrier sector is a key target of classification giant DNV GL, the (relatively) new superpower among classification societies which was formed in 2013 by the merger of European stalwarts DNV and GL.

DNV GL's registered fleet amounted to 265 Million GT at the end of 2014. Of this total, bulk carriers accounted for 44.1 Million GT. In terms of vessel numbers this translated into a total fleet of 13,174 ships, 953 of which were bulk carriers.

The society would not comment on its current market share of the bulk carrier sector but Sönke Pohl, Key Account Manager and Ship Type Expert for bulk carriers, said DNV GL was working tirelessly to diversify its dedicated bulk carrier services portfolio as part of a push to draw in more owners and operators.

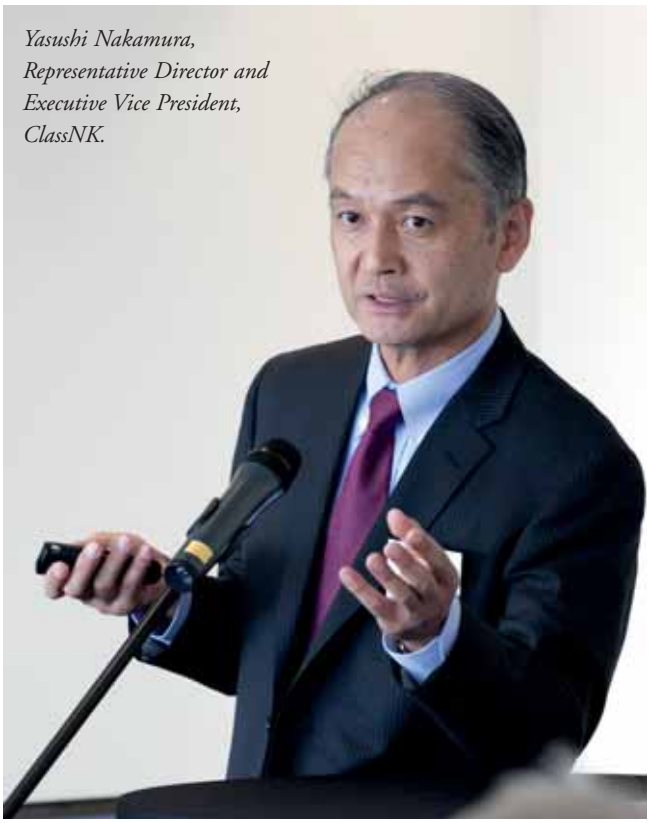
"We are in close dialogue with the industry to discuss their concerns, the services they need and keep customers up to date with the latest developments and upcoming regulations, for example at our regular bulk carrier forum," she said. "The merger between DNV and GL enabled us to combine both company's longstanding expertise in the bulk carrier segment and increase our global reach. With 1,300 surveyors based in more than 100 countries around the globe, DNV GL can offer customers a broad set of expertise and local support."

DNV GL has now issued its plans for new rules to more than 800 customers and stakeholders, part of an extensive external hearing process before their publication and entry into force. The rules being developed — which the society said would become its 'signature' and would be practical, clear, consistent and easy to use from the design stage onwards — will essentially form the basis of the organizational strategy of the classification behemoth as it attempts to position itself as the global maritime safety leader.

"From the beginning of this project, we wanted these rules to be unique in the way they reflected industry experience and input," said the COO of DNV GL – Maritime, Knut Ørbeck-Nilssen, who will take on the role of CEO in August. "So our objective has been to have our customers and stakeholders deeply involved throughout the development and implementation process. Already, at the recent Nor-Shipping trade fair we signed several joint development projects with leading yards to work together with us to ensure the rules deliver the quality, safety and process efficiency our customers expect."

Once DNV GL has received feedback from its customers and stakeholders, this input will be processed and incorporated into the rules which will be launched and published in October and will then enter into force on 1 January 2016.

One of the areas the rules will set new standards for the industry is on hull structure, according to Geir Dugstad, Head of Division Classification in DNV GL – Maritime. "The new advanced load concept is a major step towards a more realistic representation of the environmental loads," he said. "Along with our state-of-the-art capacity models, this concept will increase the consistency in the safety level applied for the complete hull structure. In addition, this approach will also accommodate the challenges related to development of novel and unusual designs. They could be a real game changer for our customers."



Yasushi Nakamura, Representative Director and Executive Vice President, ClassNK.

register at the end of 2014, with bulk carriers representing the largest portion.

"At ClassNK, we provide a wide range of technical surveys and service and are world renowned for our high quality services, which is why we have the world's largest share of the bulk carrier market on our register," he said. "In fact, over the past three years alone ClassNK has had the top share of bulk carriers in the IACS fleet, with our share growing from 32% at the end of 2012, to 33% at the end of 2013, and 34% by the end of 2014 in terms of gross tonnage. Given these figures, we feel that 2015 will be another strong year for us."

Dino Cervetto, Director of Technical Services at RINA Services, is also looking to the bulk sector for growth. At the end of 2014, RINA's classed fleet reached 34 million GT, totalling 5,166 ships of which bulk carriers represented 29% (9.85 million GT). He said the Italy-based society was enhancing its position in the bulk carrier market, both by strengthening its relationship with Greek and Chinese bulk carrier owners and managers, and supporting designers and shipyards in the development of new projects for eco ship new building programmes in Asia. "Our bulk carrier market share is quite stable — the new tonnage delivered last year was balanced by the scrapping rate, he said. "In 2015 we expect growth in our bulk tonnage as the forecast of vessels to be sold for scrap is lower and over 500,000 GT is going to be delivered under RINA class."

DNV GL, meanwhile, has also been pushing forward with

design advances for the sector as part of its push to secure more market share (see box 'DNV GL: new market superpower'). As regulations on harmful ship emissions such as sulphur become stricter, reducing SO_x, NO_x, CO_2 and particulate matter will be at the top of the agenda for many players in the maritime industry. DNV GL believes this will encourage owners and operators to explore fuels that ensure compliance and maximize fleet and vessel efficiency.

The society presented Oshima Shipbuilding Company with an Approval in Principle (AiP) certificate for a LNG-fuelled Kamsarmax bulk carrier at the Nor-Shipping exhibition in June. The new *Oshima Kamsarmax* is designed for dual fuel operation, using both LNG and HFO to power the main engine, the generators and the boiler. This allows fuel usage to be adapted depending on when the vessel enters or leaves an Emission Control Area to reduce LNG usage.

The new design complies with DNV GL class rules and all current and upcoming regulations, including the new emission control regulations and the draft IGF Code for fuel with a low flashpoint, according to the society.

Moreover, because space on bulk carrier decks is limited, the *Oshima Kamsarmax* design also features an innovative U-Shape superstructure to accommodate the LNG tank in its centre. This approach allows the accommodation deck house to be completely separated from the LNG storage tank as well as scalability in terms of the amount of LNG storage available onboard.

"LNG is emerging in a number of ship sectors and has great potential. We were very pleased to work on this innovative

RINA revises offshore crane rules

RINA has reaffirmed its long-standing commitment to safe transshipment standards in the bulk sector by revising its rules for offshore cranes used in construction, service and demolition.

The Italy-based classification society has been a forerunner in the auditing of transhipment standards, not least through its work with designers including Logmarin. Previously this has seen the development of service notations for transshipping units and floating terminals which have been assigned to non-propelled and assisted propulsion units designed for the transhipment of dry bulks.

Building on previous rules and notations, the society has now re-based its rules for offshore cranes, splitting the requirements for specific crane types (ship, offshore and transhipping) into free-standing sections to make the rules more user-friendly.

For example, the new RINA rules for transhipment cranes provide a specific notation — CARGO HANDLING — which has already been assigned to the floating crane transshipment unit *FC ASIA BELLA*, built by China's Chengxi Shipyard for the Indonesian owner Pt. Pelayaran Mitra Kaltim Samudera.

The service notation of units operating permanently anchored or moored in a fixed location is competed by the additional class notation MOORING, to attest that the mooring system is certified by RINA.

The new transhipment rules take into account both static and dynamic loads on cranes used on vessels transhipping bulk cargoes in open waters, and also detail how these are related to structural requirements for the vessel and crane.

The revised rules for offshore cranes have been based on European Standard EN 13852, which RINA said takes a different and more modern approach to commonly used offshore crane standards.

"There is a gap in the market for standards for transhipment cranes," said Dino Cervetto, Director of Technical Services, RINA Services.

RINA's new rules contain an operational chart which Cervetto said would allow operators of floating transhipment terminals to widen the weather window in which they can work, and also takes into account the specific wave height and orientation of the terminal.

"The new rules for transhipment cranes cover certification of cranes engaged in open sea operational use including cranes installed on storage bulk/ore carrier for transshipping operations or cranes installed on transhipment units," he said. "The crane working envelope is defined with a matrix that correlates the wave height with the operational criteria. A table correlating maximum operational wave height and characteristics of the vessels involved in the operation will be annexed to the certification.

"The intention is to provide a structure which ensures that the cranes chosen for open sea transhipment are fit for purpose and can withstand the stresses caused by movement in multiple dimensions which are typical of open sea transshipment.

"Cranes certified under this new notation will be able to operate safely for longer and give more operational time to terminal operators without fear of breakdowns or overload conditions.

"RINA believes that there is a need in the offshore industry for a clear standard for floating cranes and cranes built onto OSVs which is based on European requirements."

design with Oshima," said Morten Løvstad, DNV GL Bulk Carrier Business Director. "It offers customers a flexible, safe, future-proof solution and the opportunity to almost eliminate SOx emissions and particulate matter, cut NO_x by 80% with EGR (Exhaust Gas Recirculating) and reduce CO_2."

ClassNK's global push for market share saw it establish two new Survey Operations Headquarters in Germany and North America last year which, together with its head office in Tokyo, offer 24-hour coverage of survey enquiries on a global basis, as well as rapid responses when dealing directly with clients and flag state administrations.

The 27,000dwt open hatch bulk carrier Jules Garnier II.

"We also operate five Plan Approval Centres in the world's major shipbuilding regions - Korea, China, Turkey, India and Singapore — in addition to our head office," said Nakamura. "This means that we can cooperate directly, greatly improving the efficiency of ClassNK-registered projects throughout the world for the benefit of shipyards and designers, and ultimately the owners themselves."

Class NK has been to the fore in the reduction of risk when it comes to the liquefaction of nickel ore, a major cause of deaths at sea and loss of bulkers over the last decade. First the society produced its *Guidelines for Safe Carriage of Nickel Ore* which compiled the loading requirements and transport procedures of the IMSBC code, with best practices, precautionary measures, and recommendations for safely loading and transporting nickel ore gleaned from onboard operators.

But ClassNK did not stop there in its bid to tackle the dangers of liquefaction. "We began further examining the effects on vessels, in terms of structure and stability, when loaded with nickel ore with moisture content in excess of the transportable moisture limit, employing extensive testing and numerical simulations on cargo properties and the behaviour of nickel ore with the advice and support of an independent panel of experts over a six-month period," explained Nakamura. "Based on this research, we established the world's first standards for stability, hull strength, and other requirements necessary for vessels to safely carry nickel ore cargos in any condition regardless of moisture content. The results of these efforts were published in the Second Edition of the *Guidelines for the Safe Carriage of Nickel Ore* in February 2012."

These standards were first approved by the Panama Maritime Administration and later by a string of other flags. "The 27,000dwt open hatch bulk carrier *Jules Garnier II* was the world's first vessel built to the Specially Constructed Cargo Ship requirements, constructed and designed by Naikai Shipbuilding Corporation to NK-class and delivered to JX Shipping Co. Ltd on 19 September 2012," added Nakamura.

ClassNK has also been involved in a European Joint R&D project called LiquefAction which it joined in September 2014. The project aims to better understand the physical properties of cargo liquefaction in order to prevent bulk carrier casualties and is being carried out by a consortium of Europe's top research institutions with support from German shipowner Oldendorff Carriers.

"Building on knowledge gained from the Guidelines for the Safe Carriage of Nickel Ore, the LiquefAction project will look at various other cargoes covered under the IMSBC Code," he said. "Ship motions and the frequency range and amplitude that cause liquefaction of a given cargo with given moisture content over specific time periods are central areas of study within LiquefAction, as well as modelling the phenomenon's effect on stability by taking into account dynamic behaviour. By conducting further study into these factors we hope to contribute to qualifying and quantifying preventive and mitigating measures in ship design and operation."

Nakamura also said owners should be aware that the *IACS Common Structural Rules for Bulk Carriers and Oil Tankers* (CSR BC & OT) had entered force on 1 July 2015 and applied to all bulk carriers over 90m and oil tankers over 150m in length. "These new rules bring new requirements for more comprehensive structural analysis at the design stage, including FEM analyses covering the entire range of cargo hold structures, as well as new formulae for buckling, fatigue, and residual strength criteria to enhance safety and reliability," he said. "However, these new requirements also greatly increase the overall time needed for vessel design.

"In order to help lessen the burden of these news rules on ship designers, and as part of our total ship care system aimed at ensuring the comprehensive safety of ships throughout their operating lives, we developed PrimeShip-HULL(HCSR), a design support tool that makes it easy for shipyards and ship designers to carry out rule calculations and optimize their designs."

BV certainly has no intention of being left behind by its ambitious class rivals, not least when it comes to helping its partners meet the demands of the latest regulations. "Bulk carriers represent the strongest market segment for BV's marine business, accounting for almost 25% of total revenues," said Chatzitolios. "We continue to invest in this market in order to maintain our strong position.

"In previous years we have engaged in a major campaign to train shipyards and designers in the new Harmonized CSR and relevant BV software tools. We have also worked with them to examine their existing CSR designs against the new rules and to be able to produce even more optimized designs.

"We believe that the introduction of the new CSR could influence future demand."

Adani Ports builds on success of port acquisitions and expansions

Adani Ports & Special Economic Zone last year bought Dhamra Port in the state of Orissa.

Adani Ports & Special Economic Zone, the flagship company of India's fast ascending businessman Gautam Adani, has advanced the target of handling cargoes of 200mt (million tonnes) by three years to 2017 buoyed by its success in acquiring ports and terminals and then rapidly expanding their capacity. The company which last year bought Dhamra Port, a deep draught all season port in eastern state Orissa, from equal joint venture partners Larsen & Toubro and Tata Steel, is now eyeing Gangavaram Port, further down the east coast in Andhra Pradesh. Reports are doing rounds that Adani Ports are in talks with private equity firm Warburg Pincus to buy its 31.50% ownership of Gangavaram, a dry bulk all weather port with water depth of up to 21 metres and equipped to handle cargoes from coal to iron ore to fertilizers and alumina. The deep draught allows Gangavaram to accept fully laden super Capesize vessels of up to 200,000dwt.

Expectedly, none of the parties involved in reported talks is ready to share information with the media at this early stage. But India's leading business newspaper *The Economic Times* has quoted a source familiar with the likely deal saying "the handshake is over. Due diligence and paper work are on." Macquarie Capital, according to the newspaper, has been retained as adviser by Adani Ports. Once the Warburg Pincus holding is hopefully bought, Adani Ports will seek to increase its holding in Gangavaram to over 50%. About 15km from Visakhapatnam Port, which urgently requires capacity expansion, Gangavaram is in the news for Adani's reported attempts to acquire a major stake. At the same time Adani's buying interest coincides with steps taken by Gangavaram to double its annual cargo handling capacity to 42m tonnes.

Based on example of Dhamra, where immediately on a nearly $1bn takeover Adani made a bold declaration of raising the port capacity fourfold to 100mt in phases, experts foresee similar 'fireworks' at Gangavaram if he manages to move into the driver's seat. In India's pursuit for steel capacity of 300mt, Orissa being exceptionally rich in such steel making ingredients from iron ore to non-coking coal to chromite and manganese is having a big role. This will, however, require of the coastal state to beef up its port capacity to handle increasingly large quantities of coking coal to be imported for blast furnace use and finished steel products for export. Cargo handling capacity at Orissa's leading government owned Paradip Port and Dhamra in the private sector will too require enhancement to handle other cargoes like thermal coal (India's imports of this commodity is steadily rising), bauxite, alumina and aluminium of which exports are rising and fertilizers for which the country is import-dependent.

A shipping ministry official says notwithstanding a coastline 7,516.6km, challenges for opening new ports have become acutely difficult. Forest and environment clearances and big land acquisitions to host greenfield ports are challenges which test the patience of investors. Appreciating the problem and requirements of expanded port capacity, governments of coastal states from Orissa and Andhra Pradesh in the east, Gujarat and Maharashtra in the West to Tamil Nadu and Kerala in the south are coming to the aid of operating ports to acquire extra land. For example, the Orissa government has sanctioned allotment of an additional 700 acres to Dhamra Port, though some hitches remain to be sorted.

According to India's twelfth five-year plan covering the period 2012–17, the country should ideally have 2,302mt port capacity by terminal plan year to handle export-import cargo traffic of 1,759mt. The new right wing Bharatiya Janata Party government dispensed with the six-decade-old Planning Commission for a think tank called Niti Aayog with a more restricted agenda. So expect rework on future port capacity building along with review of production and capacity targets for different sectors and industries.

Kunal Bose

Cold water poured on São Sebastião expansion

The expansion of the Brazilian port of São Sebastião would have "catastrophic" and "irreversible" effects on the Bay of Araçá claims a group of scientists contracted by the State Prosecutor who is trying to overturn permission for the work to go-ahead. The existing project would see the current area of the port doubled, with the construction of a 500,000m² piled working area covering 75% of the Bay.

The project has been divided into four phases. In December 2013, the environmental agency gave the go-ahead for phases 1 and 2, which included construction of three berths and a multipurpose terminal. However, environmental groups subsequently undertook action to prevent work from going ahead, resulting in an injunction placed in July 2014 by the federal judge.

Barry Cross

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Paranaguá improves fertilizer handling

Paranaguá and Antonina Port Authority (APPA) in Brazil recently met with operators and importers of fertilizer to discuss ways to speed up the discharge of consignments and their movement to warehouses.

In the first four months of this year, 2.7mt (million tonnes) of fertilizer was imported and, for the whole of 2014, Brazil acquired 9.2mt, up 5% on the previous year. Paranaguá remains Brazil's leading handler of this commodity.

One of the proposals at Paranaguá is that berth 208 should be used exclusively for fertilizer handling once reinforcement work is completed. At present, two berths at the port are wholly given over to fertilizer handling, while a further six act as alternative outlets.

In recent times, operators have been able to benefit from an area set aside in the port for trucks to be cleaned and prepared for fertilizer loading, which has helped reduce the amount of pollution generated when they pass through the city. Indeed, around 20,000 tonnes of residue is now routinely collected each month in this truck holding area. *BC*

Itaguaí to get dry bulk investment

The FI-FGTS investment fund has approved financing of $385 million for the national steel company CSN. The loan will be used to expand the port of Itaguaí, in Rio de Janeiro state in Brazil, which is used to handle iron ore and coal.

In addition to the investment from FI-FGTS, CSN is committed to spending $169 million of its own money.

The project involves boosting discharge capacity, warehousing and iron ore loading by 34%, with capacity rising from 45mt (million tonnes) per annum to 60mt. Work should take two years to complete. *BC*

Açu port hits 1.5 million tonne mark

Terminal 1 at the Brazilian port of Açu, which opened for business in October 2014, has already handled 1.5mt (million tonnes) of iron ore at its facility in São João da Barra. 20 vessels have so far docked at the port, taking on consignments for countries in Asia and the Middle East.

Work on the port continues, with infrastructure due for completion in December. The loading area is fully operational, while the multipurpose terminal has almost been completed and is slated to commence operations in the second half of this year. *BC*

Tarragona aims for 33mt in 2015

Tarragona port authority is aiming to handle a combined 33mt (million tonnes) in 2015, an increase of 3.5% over 2014. For the first four months, overall tonnage was up by 10%, following an 8% first-quarter increase, when 8.25mt passed through the port.

In terms of growth, Tarragona is therefore Spain's leading Mediterranean port, although is the fifth most important in Spain overall.

In 2014, dry bulk traffic amounted to 9.7mt, up 31.6% on the year.

BC

Japan continuing to bankroll Nacala

An agreement has been signed between Japan and Mozambique, which will see a further Japanese loan of $280 million made available to partially fund phase 2 of the expansion of the port of Nacala.

In 2012, Japan made available $30 million, followed by $70 million in 2013, both for the same project. The combined $380 million loan is the largest ever made available by Japan as part of its development programme. Repayment will be over 30 years at an annual interest rate of 0.01%, including a ten-year grace period.

Phase 1 construction began in March 2013 and phase 2 in May 2015. Work has involved dredging of the North quay and the preparation and paving of the terminal area. Once fully operational, these areas will increase capacity from 2mt (million tonnes) per annum to 5.5mt by 2020. *BC*

Thumbs up for Coquimbo expansion

In Chile, the environmental agency has given the go-ahead for construction of a third berth at the port of Coquimbo. Once in place, the new facility will allow the port to handle additional cargo, including fruit, offshore wind farm equipment, dry bulk and general cargo. Construction will consist of one esplanade of 2.5ha and a 6,000m² warehouse, which will be climate-controlled to allow for the handling of specific dry bulk commodities.

Loading capacity for dry bulk will be in the region of 1,800 tonnes per hour.

Construction will cost around $86 million and work will take 22 months to complete. *BC*

New hopper for Avilés

CHIA Espirales y Maquinaria de Transporte has delivered a new mobile hopper to the Northern Spanish port of Avilés for the discharge of dry bulk commodities. The hopper, which has a 95m³ capacity, is equipped with its own generator and also hydraulic motors to enable it to be moved autonomously. *BC*

Dry bulk investment in Piombino

The Italian business Aldo Spinelli is to invest in the port of Piombino, where it intends to handle cellulose and aluminium. It will do this in partnership with an unnamed Anglo–Dutch company that already operates in this sector in Northern Europe. A meeting will be held at the port in September to thrash out details.

Piombino is well placed to serve numerous paper mills located in Tuscany. *BC*

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Essar acquires Vizag concession

The government-owned iron ore handling complex project at Vizag port in India has been acquired by Essar Ports Ltd, which will operate it as a concession for 30 years.

The new operating subsidiary, Essar Vizag Terminals, will build three berths: two in the outer harbour and one in the inner harbour. These will be built in two phases and add a combined 23,000,000 tonnes to the port's capacity. Once operational, they should reduce overall turnaround time by a minimum of 50%.

The project, which has been costed at $187 million over three years, will see the two outer berths upgraded as part of an initial phase, while the mechanization of the inner harbour berth will form phase 2. The facility will send consignments to China, Japan and South Korea, as well is to other ports across India. It will be linked by rail to the surrounding iron ore mining areas. *BC*

Containerized soya booming at Rio Grande

Rio Grande container terminal agreed to export its largest-ever consignment of containerized soya. This took place in the second quarter of this year, with 7,700 tonnes of this commodity involved, being loaded into 275 containers.

Dispatch of boxed soya began at the end of April and continued throughout June, the end user shipping consignments to Shanghai in China.

Significantly, and for the very first time, 3,000 tonnes of containerized wheat was also handled by the terminal en route to Vietnam in April. *BC*

Bolivia seeking sovereign outlet in Chile

Bolivia has taken Chile to the International Court of Justice in The Hague in respect of its demand to be allowed a sovereign outlet to the sea for its products. Chile, for its part, stresses that Bolivia already has relatively open access to its ports.

In 2014, for example, 7,000 Bolivian companies made use of the Chilean ports of Arica, Iquique, Mejillones and Antofagasta to move their cargo, in accordance with the 1904 treaty signed between the two countries. In 2014, this cargo amounted to 3.5 million tonnes, up 3.4% on 2013, with Arica accounting for 71% of total cargo. *BC*

Port of Iquique.

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- Floating crane (50 tons)
- Coal storage capacity 3mio tons on 700,000m²
- Railcar loading facility; 25,000 tpd
- Two large ship (spout)loaders: 60,000 tpd at the Sonthaven for (push)barge combinations and seagoing vessels.
- Grab loading into barge/seagoing vessel at Main Terminal and Terminal North
- In ttl 10 heavy duty magnetic separators installed in all inward and outward bound conveyor belt routes, including the railcar loader. Board/board into barge barge/coaster also possible via the magnetic separators.
- Homogenising of various grades of coal whilst loading via the conveyor belt incl. weight assessment per quality
- Screening/crushing/mixing
- Covered storage capacity at Main Terminal in 5 sheds directly under reach of the grabs; ttl. 25,000m² for biomass, agribulk and minerals.

OBA Bulk Terminal Amsterdam

Westhavenweg 70, 1042 AL Amsterdam,
Managing Director: Harm Winkeler (harm.winkeler@oba-bulk.nl) +31 20 5873701
Commercial Director: Hans Mattheyer; (hans.mattheyer@oba-bulk.nl) +31 20 5873750
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Arica free to handle mineral concentrates

The Court of Appeal of the Chilean city of Arica has rejected two requests to ban the storage of mineral concentrates from the Sierra Gorda mining area at Terminal Puerto Arica (TPA). The ruling confirmed that TPA has the legally required environmental conditions on site to undertake this type of operation.

Local residents became alarmed when road haulage companies conveying copper concentrates from Antofagasta began arriving at the port, convinced that these would prove toxic. However, copper, under Chilean legislation, is not regarded as being toxic. *BC*

ATI undertakes final copper concentrates warehouses tests

In Chile, Antofagasta Terminal Internacional is undertaking final tests prior to commencing the handling of copper concentrates at its new hermetically sealed warehouse, which was due to begin operations in early July.

These installations have been built for the exclusive use of Sierra Gorda SCM, which will use them to warehouse its production of copper and molybdenum concentrates. Rail company FCAB will transport the concentrates to the port in hermetically sealed wagons. *BC*

Urabá Port construction to start next year

In Colombia, construction is due to begin in March 2016 of Urabá Port, which is known locally as Antioquia port. Phase 1 opening is mooted for 2018, with the project being bankrolled by Puertos, Inversiones y Obras SAS at a cost of $400 million.

Initially conceived of as a dry bulk port, it will now be developed as a multipurpose facility. The port, which covers an area of 130ha, will have 1,600 metres of quayside and four berths, with alongside water depth of 14 metres. *BC*

Antaq and Bunge reach agreement

Antaq has signed a contract with Bunge Alimentos, covering the Terminal Portuario Graneleiro facility in Barcarena. Authorization granted by Antaq will allow dry bulk commodities to be handled and warehoused there at a 1.17 million m² site for a period of 25 years. *BC*

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Inspection, Analysis & Sampling

Jay Venter

Leaving no cargo unturned

Whether performed automatically or manually, sampling occurs through extracting a quantity of commodity smaller than the original quantity, and sending it for laboratory analysis or screening purposes. However, the quality control of dry bulk commodities in general, is more than just filling a number of sample bags and can only be accurately performed by experienced and highly-educated surveyors. RC Inspection considers the sampling and sample preparation procedures to be of extreme importance and always sets its goal to obtain the desired end result with the first consideration being the accuracy of the sampling procedures.

Each commodity has its own individual characteristics based on the different possible global origins or composition. Due to this, each commodity has to be sampled, inspected and prepared in its own specific way in order to obtain the most reliable end results. A good example can be given when looking at biomass commodities. In order to be of any value, biomass samples need to be unbiased, accurate, precise and representative of the main lot or consignment of the biomass. Since biomass is highly variable in size, configurations and moisture content is prone to fractionation and stratification, which can complicate the sampling procedure.

These services are all performed according to the international ISO Standards for sampling and sample preparation. Sampling and the visual inspection of the cargo are complicated processes and will become more complicated and important in the near future, due to the heterogeneity of the cargoes based on the origin of the commodities and their characteristics. The surveyors need to know the visual characteristics of each different commodity to be able to perform accurate inspection, sampling and sample preparation. Throughout the visual inspection, the condition and the appearance of the cargo is important as it may have an impact on the quality, due to possible contamination and/or free water.

When samples are taken from a stationary source, such as a stockpile, it may be impossible to obtain an accurate sample due to the fact that the material in the center of the stockpile may be inaccessible when conventional sampling techniques are used. When samples are taken from a moving stream, such as a conveyor belt, the requested increments have to be collected at the place of the stockpile. The sampling must be performed where the cargo is leaving the conveyor belt system in order to

obtain the most representative increment-samples. Sampling from a moving conveyor belt, is banned at all European terminals due to safety reasons.

Poor sampling and sample preparation will lead to non-representative analytical results. This is best disregarded because the obtained samples will have no reliable value at all.

The used sampling equipment is evaluated according to its effectiveness in obtaining a representative sample according to the accepted standard. To ensure quality sampling, RC Inspection uses ISO-approved shovels.

When a cargo is reloaded from the stockpile, the vessel, river barges, containers and/or trains, have to be visually inspected before loading operations start, in empty condition to protect the quality of the cargo. The surveyors have to inspect for the presence of traces of previous cargoes, contamination, free water and possible damages.

Umpire analyses

Sampling and analytical results do not always guarantee 100% accurate results, as these depend heavily on human input and this may introduce human error inaccuracies. Sampling from a single spot is generally less likely to be representative of the main body of the dry bulk than a gross sample, which is a mixture of multiple spot samples.

When errors like these occur during sampling and analysis performed by other parties, RC Inspection is nominated to perform umpire analysis. For these samples also count that the analytical results will be unreliable when sampling and/or sample preparation has not been performed accurately at load-port and/or at disport. All requested analysis are carried out in the laboratory according to the relevant ISO and/or ASTM standards under full accreditation according to the ISO 17025 norm.

As a result of the management's longstanding personal experience, RC Inspection recognizes the importance of extensive knowledge and experience, as well as the ISO standards in order to perform highly representative inspection and sampling services, including the sample preparation of the obtained bulk samples.

This has led to the managing experts of RC Inspection developing special internal procedures for sampling, inspection and sample preparation for all kinds of dry bulk commodities.

The surveyors are all well informed and instructed according to these internal procedures, which is necessary to guarantee high quality services.

These procedures are recognized by the fact that RC Inspection recently obtained accreditation according to the ISO 17020, accredited by the RvA, under registration number I 308.

This accreditation has been valued upon the following services:

- Visual cargo inspection, sampling, sample preparation, barge gauging/draught survey for loading and discharging operations for hard coal, pet coke, ferro alloys and ores.
- Storage facilities and transshipment equipment for solid fuels and metals/minerals
- Loading Compartment Inspection (LCI) for feed transport

This accreditation guarantees the clients that the policies, practices and procedures of the company can be ensured with consistent high quality and expertise in the knowledge of the commodities and the provided services worldwide.

SGS Australia continues coal sampling and analysis at Origin Energy

Origin Energy operates Eraring Power Station, Australia's largest power station. It is located on the shores of Lake Macquarie near Newcastle, NSW. It is one of the most efficient and lowest carbon-intensity black coal-fired power stations in Australia with a capacity of 2,880MW. The station was initially put into operation in 1983. Several upgrades have been carried out, with the most recent being in 2012.

Coal is delivered to the power station by overland conveyor, trucks and rail. Commercial sampling is carried out using a number of mechanical sampling systems. SGS Australia was contracted in 2009 to conduct technical audit inspections and bias tests on the existing mechanical sampling systems.

What is a technical audit of a mechanical sampling system?

- Critical review by qualified and experienced sampling engineer/inspector
- Compliance check against relevant sampling standards
- Comparison against best sampling practices
- Reporting including recommendations for improvements
- Should be done before any bias test
- Should be done periodically

What are the benefits of a technical audit?

- Assurance that sampling is compliant for both internal and external purposes
- Minimizes risk of biased sampling
- Increased confidence in lab results
- Improved reliability/availability of systems
- Regular, scheduled audits allows system to be monitored for changes in operation or performance

Following those inspections and bias tests, SGS Australia was awarded contracts to design, supply and install two mechanical sampling systems to replace existing in-coming systems and a new plant feed sampling system. The total value of this work was in excess of A$5 million.

Each in-coming sampling system is based on cross belt primary sampler, double roll sample crushers and cross belt secondary samplers. Final samples are collected and stored in a rotary sample collector with six sealed sample canisters. A facility is also provided to take uncrushed sizing samples using a cross belt sampler. Manual and automatic operation of the sampling systems is available using a HMI Touch Screen.

The installation of the plant feed sampling system was partly prompted by the need to meet the requirements of the National Greenhouse and Energy Reporting (NGER) Regulations and better monitoring of coal usage. That system samples coal from two parallel plant feed conveyors. The sampling system is similar to those installed for the in-coming coal stream but includes two cross belt primary samplers feeding to a common crushing and secondary sampling system.

All installed sampling systems were successfully bias tested after commissioning.

SGS continues its involvement with the power station through the daily collection and analysis of the sampled coal using its state-of-the-art coal testing laboratory located at Newcastle.

With more than 80,000 employees, SGS operates a network of over 1,650 offices and laboratories around the world. SGS offers a full range of coal testing services including exploration, laboratory and production services, as well, as inspection and sampling. With core services and industrial expertise to help you improve your operational efficiencies, SGS' global technical leadership helps minimize operational and financial risk.

Crusher and secondary sampler.

Plant feed sampling system.

Plant feed sampling system.

SGS has a coordinated Global Mechanical Sampling Capability with centres of MSS excellence in Australia (covering Australia, Southern Africa, and Asia), Italy (covering Greater Europe, Russia and Northern Africa), India, China and USA (covering Canada, the USA, Mexico and South America). These centres of excellence are all ready and able to meet the local needs of our customers who require mechanical sampling systems for any bulk material. The systems are designed and supplied at mine, port, or delivery sites as required.

SGS co-ordinates this capability from the SGS Australia office.

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Alex Stewart Agriculture Ltd. – serving the grain trade market

Grain and oilseed inspection and analysis are core businesses of Alex Stewart Agriculture Ltd. Alex Stewart is a superintendent and analyst member of the Grain and Feed Trade Association (GAFTA).

Alex Stewart works with many leading grain traders by providing trustworthy professional inspection and laboratory services globally. In addition, ASA can arrange fumigation services in most areas of the world to ensure that its customers' cargoes are treated as with the greatest care. Upon nomination, Alex Stewart's mission is to protect customers' interests at loading and/or discharge ports worldwide. ASA is also able to provide collateral management services such as supervision of long term storage of grain or control of transportation between storage facilities.

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

Sample preparation.

Agricultural laboratories

Huson & Hardwick and A. Norman Tate Laboratories are GAFTA/FOSFA (Federation of Oils, Seeds and Fats Associations) registered analytical laboratories that specialize in the analysis of oilseed and edible oil, grain, barley, rye and wheat, animal feed, sugar and food products operate from Alex Stewart's head office in England. They are able to perform a full range of commercial and shipping sample including protein, fat, fibre, ash, moisture analysis via classical wet chemistry and hi-tech instrumentation including NIR (near infrared), ICP (inductively coupled plasma) and HPLC (high performance liquid chromatography); also infestation, foreign matter and admixture, hazardous contents, fuzarious grains, nutritional values, toxic contents (eg. arsenic, mercury & lead) mycotoxins and pesticides.

Dry bulk commodities certified by Alex Stewart

Fertilizer

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

Animal feed

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

Grain and wheat

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

Quality inspection services

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

- **pre-shipment inspection and analysis:** the Alex Stewart inspection team will check that the customer's product is within specification and fit for the intended use.
- **quality control:** checking that cargo conforms to contractual specifications, checking cargo for signs of contamination, odour, colour change, moisture levels, friability, protesting/rejecting inferior cargo on sight, granule sizing, radioactivity testing and laboratory analysis.
- **vessel hatch inspection:** service includes checking hatch condition ensuring that they are free from loose rust and paint flake, free from previous cargo, checking that hatches are tight fitting, checking hatch open and closing operation is functional and timely, inspecting hatch rubber condition, hatch hose water testing, checking that holds are water-tight.
- **vessel hold cleanliness:** detailed inspection ensures that holds are clean, dry, free of loose rust and paint flake, free from previous cargo, free from infestation and odour and in every respect fit to receive the designated cargo.
- **continuous supervision:** ASA guarantees continuous supervision of customers' cargo loading and/or discharge (24 hours), representative sampling/sealing as per contract.
- **quality control inspection:** packaging reporting when applicable.

- **weight verification:** gross, tare & net weighing.
- **weighbridge control:** test weight checking, scale calibration and certification check, recording truck movements across scale ensuring that all cargo is weighed.
- **bagging supervision and tallying:** full tally and checking for bag strength and durability (laboratory testing is available) and verifying markings.
- **continuous information updates:** ASA's busy administration centre is in contact with all of its inspectors operating in the field and provides its customers with up-to-date, hour-by-hour detail of all loading and discharging operations.
- **documentation:** Alex Stewart Agriculture uses state-of-the-art technology to supply standardized reports and certificates; certification and reporting can be tailored to suit customer requirements. Photographic reports by conventional and digital camera can also be supplied for evidence purposes.
- **damaged cargo assessment:** establishing possible source, cause, and severity.
- **loss prevention:** supervision of reconstitution of acceptable cargo.
- **container services:** supervision of stuffing and unstuffing, container sealing, container condition surveying (on/off hire, damage assessment).
- **transportation services:** whether the commodity is manufactured, stored, shipped, railed, trucked or containerized, ASA can assist customers in their trading activities.
- **consultancy:** ASA offers consultancy services to assist customers on methods concerning material handling, weighing, transportation, sampling and analysis. Local knowledge and years of experience are primary assets of its business.

KEY AGRICULTURAL GAFTA/FOSFA SUPERINTENDENT OPERATIONS WITHIN ALEX STEWART AGRICULTURE

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Exposing the risks of sampling, inspection and analysis for mineral ore cargoes

How much can you determine about a cargo on the basis of the test certificates issued at the time of loading? How accurate are the test certificates? Are the cargo characteristics and properties reported in the shipping documentation believable?

These are the questions that Masters ask themselves when reviewing cargo documents prior to loading their ships with mineral ore cargo. If the test certificates are accurate, all of the following applies:

- the cargo must have been properly sampled to obtain test samples that are truly representative of the entire cargo;
- the cargo must have been visually inspected for irregularities with respect to moisture content and/or other potential contamination at the port prior to loading; and
- the samples must have been tested in a Competent Authority laboratory, within the appropriate time intervals to be considered valid, and analysed using appropriate test standards.

Samples in laboratory.

The International Maritime Solid Bulk Cargoes (IMSBC) Code regulates the safe transportation of these mineral ore cargoes. The IMSBC Code details the sample preparation methods to be employed, all the necessary test equipment, and how to analyse results for compliance with internationally and nationally accepted standard procedures. Yet despite the provisions of the Code, there are many non-compliant laboratories issuing invalid cargo certificates and many non-representative samples sent for testing.

Section 4 of the IMSBC Code describes the assessment of consignments for safe shipment. The 'provision of information' (Section 4.2 of the Code) states the cargo must be tested and certified by a Competent Authority in order to demonstrate its safety to the Master at the loading port. However, the laboratory technicians who test the samples in order to certify the safety of a consignment are not the ones who supervise the collection of test samples. The laboratories work independently of the parties that collect the samples for the testing and analysis, therefore it is imperative that shippers (and their representatives) give clear instructions to obtain suitable samples.

Barge transfer of covered cargo to bulk carrier with free water visible in the hold.

Section 4.4 of the Code describes the cargo sampling procedures. The opening statement in this section stresses the importance of samples being representative of the entire consignment: *"Physical property tests on the consignment are meaningless unless they are conducted prior to loading on truly representative samples."* This point is emphasized because the material characteristics of a cargo can be tested accurately in a lab, but the condition of the cargo to be shipped is likely to be affected by outside conditions such

as weather, handling and storage prior to loading. The Code also advises on carriage precautions such as hold cleanliness and weather precautions, loading rates, ventilation, trimming and carriage as all these aspects can adversely affect the cargo's mechanical behaviour during a sea voyage.

Test certificates are only valid for a relatively short time. What is often the case at the port quaysides is that cargoes are standing by waiting to be loaded in all weather conditions without adequate protection from the elements. Often the sampling is carried out well in advance of loading (such as at the mine prior to a long road, rail or barge journey to the port that can take days) so that aside from the changes that the material characteristics undergo due to exposure, the test certificate has expired by the time it is loaded on board a vessel.

Guidance is provided on the sampling procedures and the number of sub-samples to be obtained according to the total consignment size. It has often been the case in cargo disputes that there are more samples taken from some stockpiles and not enough from others. How is the Master or the laboratory technician to know how representative the samples are if the sub-sets are biased towards one stockpile over another?

When there are disputes regarding the moisture content of a cargo, for example, is it extremely important to draw samples at varying depths of the stockpile to gain representative samples that override any variations in moisture distribution throughout the consignment. Section 7 of the Code describes the risks associated with liquefaction and the precautions to take to minimize this risk. When a Group A cargo (defined as likely to liquefy in the IMSBC Code) has a moisture content greater than the certified Transportable Moisture Limit (TML) value, the cargo is not suitable for transport by sea. Historically many Group A cargoes have been wrongly declared; either by the shipping documents wrongly declaring the cargo as Group C (not likely to liquefy) in the absence of proper test certification, or by improper sampling and testing procedures leading to invalid certificates.

The laboratory test procedures undertaken for bulk cargoes that may liquefy are described in Appendix 2 of the Code. These tests originate from the soil mechanics laboratories of geotechnical engineers. All laboratory analysis starts with visual inspection of the samples to determine their appearance with respect to moisture condition, particle size distribution and variability. The next steps in the analysis are sample preparation, TML testing and analysis of the test results. Soil mechanics is a complex science requiring a sound understanding of the cargo's behaviour and the test methods at each stage of the laboratory analysis, yet many certificates are produced by inexperienced or uninformed organizations. It is often the case that the best test method for a particular cargo is not the test carried out by the laboratory for the production of the test certificate. This can alter the test conclusion.

The IMSBC Code advises on carriage precautions such as hold cleanliness.

Stockpiles are to be levelled prior to sampling

There are cases where the general description of the cargo on the shipping documentation is questioned. To resolve a cargo dispute, sampling and testing must be undertaken to support the veracity of the shipping documents (as it is the mechanical properties that determine the appropriate description and Group for the cargo). Many misunderstandings regarding the Code continue today, despite the on-going efforts at the IMO to regularly update and amend the provisions within the IMSBC Code.

Cargo sampling and testing procedures require experienced operators that understand the importance of employing the utmost care to prevent changes in cargo quality and characteristics. Cargoes will remain potentially hazardous until shippers and receivers alike demand the best sampling, storage and handling procedures are employed. Only high quality analysis on representative samples will result in test certificates from Competent Authorities that Masters, shippers and receivers can trust.

Author: Dr Aime Harrison, a Geotechnical Civil Engineer at London Offshore Consultants. She has been a Technical Expert on the subject of mineral ore cargo liquefaction at the IMO and the amendments to the IMSBC Code since 2011.

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Mechanical Part-stream Sampling – new bulk material sampling device from SAI and PSI

Installed MPS with small footprint.

Sampling Associates International (SAI), in partnership with Precision Samplers, Inc. (PSI), has developed a new device to sample bulk materials from moving conveyors. This device is called a Mechanical Part-stream Sampler (MPS) and has already been installed at multiple export terminals in the United States. While the initial installations have been to sample coal, the MPS can be customized to sample any bulk material.

The genesis of the MPS came from the need to sample bulk materials from a moving conveyor when a traditional mechanical sampling system is offline. In most cases when a mechanical sampling system is unavailable, the 'back-up' method is to collect sample increments manually by inserting a sampling device by hand into the material on a moving conveyor. However, as loading efficiencies are achieved by greatly increasing the speed of modern conveyor belts, the historical 'back-up' method is no longer safe. The MPS design, which has a patent pending, solves this problem by eliminating the need for sampling technicians to be exposed to moving conveyors.

The MPS can also be a safe and effective method to sample bulk materials on conveyors where a full mechanical sampling system is not available at all because it is not economically justifiable.

The main features of the MPS (see photographs) are:

- It has all stainless steel construction for long-term corrosion prevention
- There are two alternating sample scoops to reach both sides of the conveyor
- The scoops are designed to reach deeper than a human with a shovel can
- The scoops operate in the same direction of the material flow
- The frequency of sampling is programmable based on the lot size and flow rate calculations; and
- It has a very small footprint on the conveyor belts.

In the sampling world, those samples that are collected by a device that takes a full cross section increment from either a conveyor belt, or a falling stream at a transfer point, are called Probability Samples. This is because every particle in the consignment has a non-zero chance of being selected for the sample. This is the best sampling method for any bulk material and known as Full-stream Cut Sampling.

The MPS does not collect a Full-stream cut, it collects a Part-stream cut (hence its name). Because there are particles in the consignment that have a zero chance of being


Double sample scoops which alternate during operation.

selected for the final sample, it is called a Judgment Sample. There are many types of Judgment samples such as sampling from the tops of barges, or rail wagons, but the MPS provides the best possible Judgment sample.

The main benefits are as follows. First, Mechanical Part-stream sampling is much safer than manual belt sampling. No human is exposed to the moving conveyor parts or harsh weather. Secondly, it removes the human element in the timing of the sample increments and the selection of material into the sample. By customizing the scoops to reach deep into the material, the particles with a non-zero chance of being selected for the sample are minimized.

When an MPS is paired with a full mechanical sampling system, an important benefit is that the terminal can keep loading when the sampling system is offline for any reason. In addition, the MPS frees the sampling technicians from collecting the samples so that they can concentrate on repairing the sampling system and getting it back on line.

Bulk materials with wide variation in the particles of different sizes may not be suited for sampling with an MPS. However, the initial installations in the USA show excellent comparative results.

CKIC – More than the right results

CKIC'S new product – 5E-FT2300 Automatic Fluorine Analyzer, is used to determine the fluorine in coal or other combustibles by hydrolysis method & ion selective electrode method, which is widely applied in coal-fired plant, coal mine, steel plant, petrochemical industry, etc.

General company background

Changsha Kaiyuan Instruments Co., Ltd (CKIC) is a global manufacturer specialized in researching, developing, manufacturing and the marketing of coal sampling, sample preparation and sample analysis, as well as in providing complete fuel quality control solutions for global users.

CKIC star product – Proximate analyzer

CKIC products include:

Stockpile Inventory Instrument: To measure and quantify dry bulk inventory stockpiles

Calorimeter: To determine the calorific value of solid and liquid combustibles

Elemental Analyzer: To determine carbon, hydrogen, nitrogen, sulfur, fluorine, chlorine and mercury content

Proximate Analyzer: To determine the moisture, ash, volatile matter and fixed carbon in coal and coke

Sample preparation equipment

Mechanical Sampler: For random sampling of bulk materials from wagon and cross belt

CKIC has been providing products and solutions for over 40 countries and 1,000 laboratories in power plants, coal mines, metallurgy, chemical industry, commercial inspection, scientific research, etc.

CKIC has 23+ years' experience in coal quality analysis.

Recent technological developments;

Fuel Intelligent Control System: to monitor all systems from receiving sample to consumption, including coal truck, coal yard and equipment of sampling, sample preparation and analysis for fuel.

Fully Automatic Sample Preparation System: An intelligent system without human participation, with strong adaptability of coal types and stable performance.

Trace Elements Analyzer: to analyze the fluorine, chlorine and mercury content in coal in order to conform to China New Regulation on coal import.

CKIC new plant Launched

CKIC's new plant has been launched successfully in February 2015. The factory area is now doubled together with the previous one.

New product lines have been settled down in the new plant, which would highly improve the production efficiency.

Automatic operation is widely applied in CKIC plants production. With 6 brand new CNC lathes from Hardinge USA, and sets of laser cutting machine from TRUMPF Germany, CKIC's annual production capacity now reach to 5,400 units including mechanical sampler, full automatic sample preparation system, sample preparation equipment & tools, laboratory analyzers etc.

9.76 million new order from Ministry of Environmental Protection

In the first quarter of 2015, CKIC was awarded an EPC contract of the Pollution Sources Monitoring Project from Ministry of environmental Protection of China, the total contract amount reached 9.76 million RMB.

The good news strengthens CKIC's presence in the coal instrument industry of Asia area.

In recent years, environmental problems have become the focus of attention of the public. Fired coal is a major source of atmospheric pollution, determination of coal quality is vital for monitoring of pollution sources. CKIC recommendS using clean coal by improvement of washing rate, effective washing and blending combustion of coal. Instruments and equipment are designed and produced based on this concept.

Customized turnkey solutions from CKIC help customers increase efficiency on fuel control and reduce fuel cost. In particular, CKIC 5E series Fuel Intelligent Control System, as the highlight of CKIC Management System, has been proved by professional users and some coal-fired power plants in China.

PT Carsurin – testing and inspecting services throughout Indonesian archipelago

Established in 1968, PT Carsurin is well-known to the mining, oil and gas, shipping and manufacturing industry players. The company is recognized as an independent service provider of inspection, testing and certification services, which have witnessed uninterrupted growth over the past ten years.

Founded by the late Capt. Hein Christopher Tiwan in Jakarta 47 years ago, Carsurin had its origins in the marine sector. Over the past nearly five decades, the company has evolved from a survey company into a technical solutions provider, delivering inspection, certification, consulting, lab testing and analysis, and technical due diligence to a broad range of industries including coal, minerals and metals, oil and gas, petroleum and petrochemicals, marine cargo and offshore, food and agri commodities, industrial equipment and consumer goods.

Coal chain and quality control process.

Having developed a culture and reputation for delivering 'quality with integrity', Carsurin is acknowledged as the largest independent player in the Indonesian testing and inspection industry with 750 professionals in 20 branch offices and 11 multi-purpose laboratories throughout the Indonesian archipelago, which have been accredited to both national (KAN, Komite Akreditasi Nasional) and international standards.

As such, Carsurin has secured and continues to maintain its ISO 9001:2008, 14001:2004, 17020 and OHSAS 18001:2007 certifications and its laboratories are accredited by International Accreditation Cooperation ("ILAC")/ISO 17025:2005).

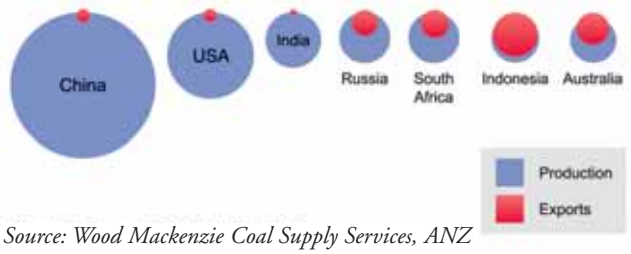
Operations excellence is the vision when delivering services. It is achieved with standardized end-to-end system and process flow - from job order, operations and laboratory analysis, to reporting. Transparent and performance-driven execution is the ethos of Carsurin, implementing measurable and clear objectives in every aspect of the business.

Coal quality export challenges in Indonesia

Indonesian coal overview

Indonesia is one of the world's largest producers and exporters of coal. According to information presented by the Indonesian Ministry of Energy, Indonesian coal reserves are estimated to last around 83 years if the current rate of production were to be continued. Around 60% of Indonesia's total coal reserves consist of the sub-bituminous coal that contains less than 6,100 cal/gram.

In the distribution of world coal reserves, Indonesia has circa 3% of the coal reserves worldwide, yet remains one of the largest exporters. Indonesia's coal exports rose significantly between 2012–2014, with an increase in annual exports of about 150mt (million tonnes) — exceeding the export outlook forecast by the government.



Source: Wood Mackenzie Coal Supply Services, ANZ

Coal resources in Indonesia have been identified to be as much as 160 billion tonnes (120 billion tonnes open pit and 40 billion tonnes underground) with 31.30 billion tonnes coal reserves, with the largest quantities in South Sumatra and East and South Kalimantan.

Coal quality challenges in Indonesia

Heterogeneity of coal quality in Indonesia certainly raises a challenge for global coal users. For instance, the use of coal in accordance with design specifications is critical for coal-fired power plants at the risk of decreased efficiency and much increased wear and tear.

There are a number of quality and quantity issues that the end buyer and/or shipper may encounter with coal shipments from Indonesia, for example:

1. Quality discrepancy between loading and discharging
2. Coal contamination
3. The difference in quality between the plans with the mined goods result
4. Coal handling issues (high ash cargo).
5. Spontaneous combustion
6. Sampling accuracy

Poor maintenance stockpile vs good maintenance stockpile.

With the challenges of heterogeneous coal quality in Indonesia, as well as issues such as differences in quality of loading and discharging, the correct quality control process is the solution to cover the issue.

Spontaneous combustion

Choosing the right surveyor company with competency, services and professional integrity that can be relied upon is the solution to handle these challenges.

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Going Great Guns

bulk handling on the Great Lakes/ St Lawrence Seaway System

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

To realize the magnitude of this commerce, consider the impact of some typical cargoes:

- one 1,000-foot-long Great Lakes vessel carries enough iron ore to operate a giant steel mill for more than four days;
- a similar 'super laker' carries enough coal to power Greater Detroit for one day; and
- a Seaway-size vessel moves enough wheat to make bread for every resident of New York City for nearly a month.

For every tonne of cargo, there are scores — often hundreds — of human faces behind the scenes. On board, there are the mariners themselves, while shore side there are lock operators and longshoremen, vessel agents and freight forwarders, ship chandlers and shipyard workers, stevedores and terminal operators, Coast Guard personnel and port officials, railroad workers and truck drivers — a wide web of service providers.

Opened to navigation in 1959, the St. Lawrence Seaway part

of the system has moved more than 2.5 billion metric tonnes of cargo in 50 years, with an estimated value of more than $375 billion. Almost 25 percent of this cargo travels to and from overseas ports, especially Europe, South America, the Middle East, and Africa.

From Great Lakes/Seaway ports, a multi-modal transportation network fans out across the continent. More than 40 provincial and interstate highways and nearly 30 rail lines link the 15 major ports of the system and 50 regional ports with consumers, products and industries all over North America.

Ports

As hubs of commerce, Great Lakes ports are economic drivers in their communities.

Commercial shipping serves more than 100 individual ports in the eight Great Lakes states and the provinces of Ontario and Quebec. These ports range in size and configuration. The most simple ports feature a single dock where ships tie-up to load or unload cargo for a single facility. Other ports are complex with multiple docks serving a variety of industries. In each case, a port serves as an interface between land-based modes of transportation (highway and rail) and waterborne transportation.

Private ports

Throughout the Great Lakes-Seaway region, many ports have been constructed and are owned by a single company. At these locations, the facility serves the host industry and no others. For example, large mining companies, power plants, and steel mills have constructed their own port facilities.

Public ports

At larger ports it is typical that local government has established a public port agency to manage and develop port facilities with the goal of stimulating marine-related economic development and trade. These public port authorities do not exist to serve a single industry, but rather, to facilitate commerce on behalf of businesses throughout the community.

In the Great Lakes-Seaway region, public port agencies are governed according to several models. Some are divisions of municipal government, others are a division of county government, yet others are a division of state or provincial government. On the US side of the Great Lakes, most port agencies were created by state statute and are governed by a board appointed by local and state officials. In Canada, smaller ports are under local government control, while larger ports are designated 'Canada Port Authorities' by the federal government. These federally designated port agencies are governed by a seven person board, appointed by local and federal officials.

Public/private ports

Most major Great Lakes-Seaway ports typically feature of a mix of publicly controlled and privately controlled facilities.

Ships

More than 25 companies operate commercial vessels in the Great Lakes-Seaway System. The largest Great Lakes freighters are massive and can carry more than 70,000 tonnes of cargo in a single voyage. Stood on end, these ships would be as tall as a 100-storey building. Ships offer the most efficient means of transporting large quantities of cargo. For example, the largest Great Lakes vessels can transport the same amount of cargo as 700 rail cars or 2,800 trucks.

Lakers/Salties

Lake Vessels

Most Great Lakes-Seaway commercial cargo ships are specially designed and constructed for use in the system. Known as 'lakers', these vessels carry bulk cargo and have a unique configuration that enable them to fit through the navigation locks and operate under the weather and fresh-water hydrologic conditions in the Great Lakes.

Ocean-going vessels

The waterway is also served by ocean-going vessels designed to operate not only in the Great Lakes, but also in the harsh conditions of the world's salt-water oceans. For this reason, these vessels are known as 'salties'. Most salties are multipurpose in their design, able to carry bulk cargo, breakbulk cargo and project cargo.

Vessel flag

The Great Lakes-Seaway system is served by three distinct vessel operator communities:

- US-flag operators are those companies whose vessels are documented under the laws of the United States. Generally these carriers operate between US ports within the Great Lakes.
- Canadian-flag operators are those companies whose vessels are documented under Canadian law. These carriers generally operate between lower St. Lawrence River ports and Great Lakes ports, carrying both domestic and bi-national commerce.
- Foreign-flag operators are those carriers whose vessels are documented under the laws of a country other than the United States or Canada. These vessels operate between system ports and overseas destinations.

Cargoes

While all types of cargo are transported on the Great Lakes-Seaway system, bulk cargo dominates commercial shipping in the region. Transportation of these cargoes serve the region's farmers and manufacturers. Other cargoes include breakbulk, containerized and project cargo.

- Bulk cargo includes products that are loose and unpackaged, such as grain, sand, or coal. These cargoes are typically loaded and unloaded via conveyer systems.

- Containerized cargo includes products transported in standardized steel boxes. Because these containers can be easily interchanged between ship, rail, and truck, they offer a flexible and efficient means of goods movement.
- Breakbulk cargo includes products that are not able to be containerized, but are also not loose. Such cargo may be in bags, drums or bales, or bundled and strapped such as lumber or steel.
- Project cargo includes products that are unusually heavy, oversized or of an awkward shape and would have difficulty moving by rail or highway. Such cargo includes wind turbine components, large machinery and industrial equipment.

Primary Great Lakes/Seaway cargoes include:

- Iron ore: the primary ingredient in steel making, iron ore is mined in northern Minnesota, the Upper Peninsula of Michigan and in eastern Quebec. From the mine, ore is transported by rail to nearby ports and shipped to steel mills in Northwest Indiana, Detroit, Cleveland, and Hamilton.
- Coal: a key fuel for power generation, coal is mined in the Powder River Basin of Wyoming and Montana. From these mines, it is railed to Superior, Wisconsin and Chicago, Illinois, where it is transferred to ship for final delivery to shore-side electric generating facilities throughout the Great Lakes region. Similarly, coal from Ohio, Pennsylvania and West Virginia is railed to Lake Erie ports for delivery by ship.
- Limestone: used in steel production, cement production, and road construction, limestone is one of the top commercial cargoes moved on the Great Lakes-Seaway system. Michigan is the dominant producer of limestone aggregate which is transported by vessel to ports throughout the region.
- Farm products: – grown by farmers throughout the upper Midwest, wheat, sorghum, corn and soybeans are key cargoes being exported in bulk from Great Lakes-Seaway ports. Major grain export facilities are located in the ports of Thunder Bay, Ontario; Duluth, Minnesota; Superior, Wisconsin; Toledo, Ohio; and Hamilton, Ontario.
- Steel: semi-finished steel products such as slabs, plates, bars, and coils are imported into the Great Lakes-Seaway system typically from Europe or South America. Local steel processing companies take delivery of these cargoes and perform additional value-added processing such as rolling, stamping, or pickling. Finished steel products are used in construction, automobiles, machinery, and appliances.
- Project cargo: unique shipments by vessel of unusually heavy, large or awkwardly shaped products. For example, industrial equipment for mining, refining or steel making are often transported by ship when highway and rail transport are disruptive to communities, or simply not viable. Typical project cargo moved on the Great Lakes/Seaway system would include large turbine blades for wind energy projects, giant steel pressure vessels for oil refining, and railroad locomotives for export.

New voice for Great Lakes Seaway shipping

The Great Lakes Seaway Partnership was launched on 9 June, and brings together leading US and Canadian maritime organizations working to enhance public understanding of the benefits of commercial shipping in the Great Lakes Seaway region of North America.

The organization manages an education-focused communications programme, sponsors research, and works closely with media, policy makers, community groups, allied industries, environmental stakeholders, and the general public to highlight the positive attributes of marine transportation. The programme does not have an advocacy agenda, and as such, it does not develop or promote issue-based messaging, policy or legislative matters, or lobbying of any kind.

INITIAL MEMBERS OF THE PARTNERSHIP INCLUDE

Lake Carriers' Association (LCA)

Founded in 1880, LCA is one of the oldest active trade associations in the United States. Headquartered in Rocky River, Ohio, LCA represents 16 member companies operating 56 commercial cargo vessels on the Great Lakes.

Fednav Limited

Fednav is the largest international bulk carrier on the Great Lakes-Seaway system. Headquartered in Montreal, Quebec, the 70 year old company has offices on four continents, as well as regional offices in Canada and the United States. Its principal activities include the transport of bulk and general cargo worldwide.

American Great Lakes Ports Association (AGLPA)

AGLPA represents the interests of commercial ports and port users on the United States side of the Great Lakes. The Association works to inform and influence public policy with the goal of fostering maritime commerce and related employment in the Great Lakes region.

Saint Lawrence Seaway Development Corporation (SLSDC)

SLSDC is a wholly owned federal government corporation created by statute in 1954 to construct, operate, and maintain that part of the St. Lawrence Seaway between the Port of Montreal and Lake Erie, within the territorial limits of the United States, which also performs environmental management activities and promotes Great Lakes regional trade and economic development.

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Lake Carriers' Association sees major progress on top issues

photo: Great Lakes Fleet.

Prospects for ending the dredging crisis and resolving other pressing issues on the Great Lakes are the best in 12 years according to Lake Carriers' Association (LCA), the trade association representing US-flag vessel operators on the inland seas, in its State of the Lakes report issued at the end of June. Only uniform, Federal regulation of ballast water remains elusive, particularly since Canada has yet to issue its ballast water regulations.

The greatest progress has been made on the dredging crisis. Just a few years ago more than 18 million cubic yards of sediment clogged ports and waterways and the backlog was projected to grow. Now, the backlog is down to approximately 17 million cubic yards and shrinking.

LCA credits passage of the Water Resources Reform and Development Act (WRRDA) of 2014 for turning the tide. The legislation designated the Lakes a system in terms of dredging and directed that expenditures from the Harbor Maintenance Trust Fund be incrementally increased until they reach 100% of receipts (in 2025). "Treating the Lakes as a system rather than pitting the 60 Federally maintained deep draught ports against one another for dredging dollars and increased funding should allow the US Army Corps of Engineers to reduce the dredging backlog every year going forward," declares LCA.

However, the report stresses that the rise in Great Lakes water levels has not restored full loads. The largest single iron ore cargo carried in 2014 totalled 69,859 tonnes. "The record for the Head-of-the-Lakes trade (Lake Superior to lower Lakes ports) is 72,300 tonnes, so even the best load of 2014 was still 2,400 tonnes short of the trade's benchmark."

The report repeats LCA's call for more icebreaking resources on the Great Lakes. "The launch of the new *MACKINAW* in 2006 ensured we maintained the status quo in terms of a heavy icebreaker, but the following nine years have put a lot of wear-and-tear on the other icebreakers that have been in service since the late 1970s and early 1980s. Simply put, despite the best efforts of their outstanding crews, the US Coast Guard's icebreaking assets are now overmatched when nature sends us winters as challenging as the past two."

Thanks to Great Lakes legislators, Congress has got the message. The Coast Guard Authorization Act of 2014 passed by the House of Representatives includes provision authored by Congresswoman Candice Miller (R-MI) that authorizes the Commandant to design and build a new icebreaker for its Great

Lakes Fleet. The Senate FY16 Homeland Security Appropriations bill directs the Coast Guard to conduct a Great Lakes mission analysis within 180 days after its enactment to determine whether another *MACKINAW*-class icebreaker is required.

LCA then urges the Coast Guard to move quickly once the legislation has been enacted. "The new icebreaker will probably take two years or more to build. Time is of the essence."

Another project that is time-critical is a second Poe-sized lock at Sault Ste. Marie, Michigan. Eight out of every 10 tonnes of cargo moving through the Soo Locks transit the Poe Lock, and that chamber is now nearly 50 years old. The project remains stalled by a flawed benefit/cost ratio that mistakenly assumes the railroads could move the cargo if the Poe Lock went down for a lengthy period of time. Thanks to Senator Debbie Stabenow (D-MI) and Rep. Dan Benishek (R-MI), the Corps is re-evaluating the cost:benefit ratio and prospects for twinning the Poe Lock are the best they have been in years.

The report cautions that lack of a Federal standard on ballast water that pre-empts state regulations and the threat of Canada imposing a transit standard when its ballast water regulations are implemented following ratification of the International Maritime Organization's ballast water convention 'casts a pall' over all the positive news. State regulation of ballast water has created a patchwork of differing requirements.

Most troubling are the yet-to-be-released Canadian ballast water regulations. There is no treatment system that can work on lakers, so a transit standard, which has been endorsed by some in Canada as an option, would ban US-flag lakers from Canadian waters. The problem is US-flag lakers must transit Canadian waters, not only when loading or discharging in Canada, but when trading between US ports. If Canada imposes a transit standard, the US-flag Lakes fleet could be put out of business.

"The State regulation problem could be solved if the Vessel Incidental Discharge Act (VIDA) was enacted. S. 373 sets a uniform and achievable Federal standard. States can suggest more stringent requirements, but they must prove the need and that systems exist that can meet the requirements. The bill also recognizes that vessels that operate within a limited geographic area, such as lakers, do not have the potential to introduce aquatic nuisance species, so requires best management practices rather than treatment."

The VIDA is still moving through the Senate, both as a stand-alone bill and in the Senate Coast Guard Authorization Act of 2015. The House does not have companion bill right now, but has passed similar legislation in the past.

The ballast water issue notwithstanding, the report concludes that "Great Lakes shipping is on the verge of solving some of its most pressing problems. Challenges will remain, and new ones will appear, but the State of the Lakes in 2015 is proof positive that our efforts, some of which have required years and years of engagement, are paying off, and the future is brighter because of that."

Lake Carriers' Association represents 16 American companies that operate 56 US-flag vessels on the Great Lakes and carry the raw materials that drive the nation's economy: iron ore and fluxstone for the steel industry, aggregate and cement for the construction industry, coal for power generation, as well as salt, sand and grain. Collectively, these vessels can transport more than 115 million tonnes of cargo per year.

The Interlake Steamship Company gears up for final phase of $100 million fleet upgrade and modernization plan

The Interlake Steamship Company announced in early June that it will repower its last steamship — the *Herbert C. Jackson* — with a highly automated diesel propulsion system in the final phase of a ten-year, $100 million modernization effort to create the most efficient, reliable and environmentally friendly fleet on the Great Lakes.

The six-month diesel conversion, which is slated to begin in mid-December, is the fifth major overhaul to Interlake's fleet and its fourth steam-to-diesel conversion since 2006.

"This repowering illustrates Interlake's continuing commitment to shrink its environmental footprint by reducing emissions throughout our fleet," says Interlake President Mark W. Barker. "We have a long-term vision for our industry and we are investing in our equipment and our ships to offer the most reliable, efficient delivery within an industry that is the greenest form of transportation available."

The Lee A. Tregurtha *was the first ship to be repowered with a highly automated Bergen diesel engine power plant in 2006.*

Since 2007, Interlake has reduced its emissions dramatically. For example, through 2014, the company estimates it has lowered its particulate matter by 30%, sulphur oxides by 54% and carbon dioxide by 47%. In April 2015, Interlake debuted the installation of exhaust gas scrubbers on the bulk carrier *Hon. James L. Oberstar*, becoming the first US-flag fleet to test the emission reduction technology on the Great Lakes.

Built in 1959, the *Jackson*'s vintage steam turbines and automation would require costly upgrades for the ship to remain a reliable workhorse in the fleet.

"It's a sad day leaving the era of steamships behind but it's a good day as we move forward," says Barker about the last steamship being repowered. "We only have nine months a year to carry close to 20 million tonnes of cargo for our customers. It's critical for us to be able to do that without any delays. To meet that goal, we have to invest and keep our ships outfitted with the best equipment in the industry."

The Herbert C. Jackson *is the last of Interlake Steamship Company's fleet to be repowered.*

The company is in discussions with potential shipyards to do the repowering work. The 6,250-BHP propulsion package will include a pair of MaK – six-cylinder M32E engines which will give the ship enhanced propulsion capabilities and reliability. In addition, the repowered *Jackson* will receive a twin-input, single-output Lufkin gear box with twin PTO shaft generators, a Schottel controllable-pitch propeller system and Gesab exhaust gas economizers along with an auxiliary boiler. The economizers allow the ship to harness the waste heat and energy from the main engine exhaust and produce 'free steam' to heat the accommodations and for heating various auxiliary systems and fuel oil services. These installations will net the company even greater emission reductions.

"The Engineering Team at Interlake is excited to be working with the professionals at Toromont Cat, a division of Toromont Industries Ltd., on another project," says Phil Moore, Fleet Superintendent at Interlake. "The Toromont group provided engineering services, the MaK equipment and auxiliary propulsion systems on the successful diesel engine replacement of the *Paul R. Tregurtha*. Toromont made it an easy choice to work with them again on the *Herbert C. Jackson* repowering."

The *Lee A. Tregurtha* was the first ship to be repowered with a highly automated Bergen diesel engine power plant in 2006. Similar engines were installed in the *Hon. James L. Oberstar* (then the *Charles M. Beeghly*) in 2009. In 2010, the *Paul R. Tregurtha*, Interlake's largest freighter at 1,013-feet long, underwent a diesel engine replacement using MAK engines. The *Kaye E. Barker* was the last steamer to be repowered with Bergen diesels in 2012. The design and engineering of the power plants have been led by Ian Sharp, Director of Engineering for Fleet Projects. Sharp is currently completing the design of the *Herbert C. Jackson*'s new propulsion plant. Headquartered in Middleburg Heights, Ohio, the Interlake Steamship Company was launched in 1913. For more than a century, the company has led the Great Lakes shipping industry through its commitment to flawless service, environmental stewardship and continuous innovation. ISO 9002 certified, Interlake's fleet of nine vessels deliver raw materials to ports throughout the Great Lakes region.

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Fednav breaks new ground: landmark year for Canadian shipowner

Fednav's icebreaking bulker the Nunavik *steaming through the Northwest passage (photo: Tim Keane).*

Fednav has been associated with shipping in Canada for over 70 years and in the Great Lakes since the opening of the St. Lawrence Seaway in 1959. Today, the Montreal-based company operates a fleet of about 85 bulk carriers, most of which are built to offer year-round service to the St. Lawrence, Saguenay River, the Hudson Bay, and even the Arctic. In fact, over a span of five decades, Fednav has made Arctic shipping a specialty. Three of Fednav's vessels, custom-designed to service mines in Canada's most remote regions, are ice-breaking bulk carriers capable of travelling unescorted year-round in the Arctic.

Fednav operates the largest fleet of Great Lakes-suitable, ocean-going bulk carriers that ship to and from the Great Lakes — its main niche market. In fact, the company is this year taking delivery from Oshima Shipyard of Japan six of a series of 16 box-hold oceangoing Handysize Lakers designed to transport steel or bulk to St. Lawrence River ports and into the Great Lakes and carry grains and other bulks outbound. These additions to the fleet demonstrate the company's confidence in the future of shipping in the St. Lawrence Seaway and the Great Lakes.

These new-generation 34,000dwt ice-class vessels represent a major step forward in terms of environmental benefits. With their advanced design and more efficient engines, they will produce 20% less emissions than vessels of the same dimension built by Oshima Shipyard 15 years ago and, therefore, contribute significantly to Fednav's objectives of reducing GHG emissions in its fleet on a continuous basis. All of the vessels will receive the CLEAN DESIGN notation from the DNV classification society. Deliveries are scheduled to take place from 2015 to 2018.

The Great Lakes, in the heartland of North America, are also at the heart of Fednav's environmental strategy. As a founding member of Green Marine, a voluntary, bi-national environmental programme, and with the recent order of 12 BallastAce water-treatment systems, Fednav demonstrates its commitment to stimulating trade and enhancing Canada's economy, while preventing the introduction and spread of aquatic invasive

The Nunavik *alongside.*

species in the Great Lakes.

For the St. Lawrence River, Hudson Bay, and West Coast bulk trade, comprised mainly of imported alumina, sugar, fertilizer, and coal products, and exported grains, industrial minerals, wood pellets, the company employs a growing fleet of Supramax and Handymax vessels as well as its Handysize lakers, a fleet that remains among the newest, most energy-efficient, and best managed operating internationally.

The Federal Baltic.

Transportation of breakbulk from Europe, including steels and other general cargoes such as heavy and/or bulky industrial or agricultural equipment, yachts, beer vats, and windmills, is undertaken by a Fednav Atlantic Lakes Line, or FALLine. With roughly 60 sailing per year, FALLine is the premiere transatlantic breakbulk transportation service that has offered uninterrupted liner operations to shippers since the opening of the Seaway in 1959.

Shipping in the Great Lakes is also synonymous with Federal Marine Terminals (FMT), Fednav's cargo-handling division, which celebrates its 50th anniversary this year. Six of FMT's twelve dry bulk and/or general cargo operations are in the Great Lakes at the ports of Burns Harbor, Cleveland, Hamilton, Milwaukee, Thorold, and Toronto. Together with Fednav Direct, the company's logistics service, Fednav is able to offer a complete through service to its large international customer base. Conscious of the importance of giving back to the community — local and maritime — the company not only contributes actively to many associations and organizations and offer a number of fellowships, but has also given employees stewardship in funding community causes close to their hearts and homes.

The most significant characteristic that sets Fednav apart is the company's unwavering commitment to delivering a higher standard in everything it does.

Fednav celebrates 70th anniversary

Fednav recently celebrated its 70th anniversary. Established in 1944, it is the largest dry bulk Shipowning and chartering group in Canada as well as the biggest ocean-going user of the Great Lakes/Seaway System and leader in the Canadian Arctic.

According to Mark Pathy, President and Co-CEO, "sticking to the fundamentals has been key to our continued success — a prudent approach, measured growth, and, more importantly—a focus on relationships with our customers and quality and reliability in our service and fleet."

The Federal Leda *in port.*

Ballast treatment system gets green light

On 15 April this year, Fednav announced an order for 12 ballast water treatment systems (BallastAce) developed by JFE Engineering Corporation in Japan, to equip its vessels currently under construction.

The Federal Yukina.

This places Fednav as the first shipping company in Canada and the Great Lakes to announce the installation of a ballast water treatment system, well before the regulatory requirement. This news thereby highlights the company's commitment to stimulating trade and enhancing Canada's economy while protecting the Great Lakes against the introduction and spread of aquatic invasive species.

'Nunavik' first to carry Arctic cargo through the Northwest Passage

Late last summer, the Fednav's *Nunavik* was one of the first commercial vessels to transit the Northwest Passage completely, and the first to do so unescorted with an Arctic cargo. The 31,700dwt icebreaking bulk carrier sailed from Deception Bay in Northern Quebec carrying a full cargo of nickel concentrate bound for the port of Bayuquan, Liaoning Province, China.

By favouring the Northwest Passage over the conventional Panama Canal route, the *Nunavik* saved roughly 5,000 nautical miles (9,400km) or 20 days of sailing and therefore, more than 1,300 tonnes of greenhouse gas emissions.

The vessel was supported by shore-based team of experienced Arctic operators and ice navigation specialists from its subsidiary, Enfotec. The vessel received regular ice charts including real-time satellite imagery in order to operate Enfotec's proprietary onboard ice-navigation system, Icenav™, further enabling safe and efficient transit. "Fednav is proud to have designed this remarkable ship and to have planned the first independent commercial voyage through the Northwest Passage," said Paul Pathy, President and co-CEO of Fednav Limited. "It is through the extraordinary capabilities of the Fednav team, the ship's crew, and its world-leading technology that we can undertake this journey with confidence."

Fednav Hamburg marks 50 years of operations

Fifty years ago this past March, Fednav opened its first foreign office in Hamburg, Germany. When it was founded, Fednav Hamburg acted as both an extension of the company's chartering team and for many years, as a liner agent for the company's regularly scheduled Transatlantic general cargo service. Today, this office plays a key role representing Fednav in Europe, including in the Baltic and Black Sea regions.

FMT celebrates 50 years

Incorporated in 1965 in Chicago, Federal Marine Terminals, Inc. (FMT) celebrated its 50th anniversary on 23 April. FMT today has operations in 12 ports along the US East Coast, in the Gulf of Mexico, and on the Great Lakes. Leveraging its experience in stevedoring, terminal handling, and logistics services for all types of dry cargo, FMT offers a seamless supply chain in the markets it serves.

Fednav tops in annual employer competitions

In 2015, Fednav was, for the fourth consecutive year, recognized by *The Gazette* as one of Montreal's Top Employers and by *The Globe and Mail* as one of Canada's Top Employers for Young People for the second year running, acknowledgements that illustrate the company's commitment to the employment and development of its employees.

'Federal Tyne' awarded five stars with RightShip

At the end of October 2014, the *Federal Tyne* earned a perfect RightShip rating on all three vetting parameters: a five-star risk rating, a five-star environmental rating, and a greenhouse gas (GHG) emissions rating of A+. Out of about 18,000 bulk carriers currently in service, only 26 vessels have a five-star rating on both the risk and environmental side — and six of those vessels are owned by Fednav. The *Federal Tyne* distinguishes itself by having a perfect GHG emissions score of A+, and is one of only two bulk carriers that hold this distinction in the world.

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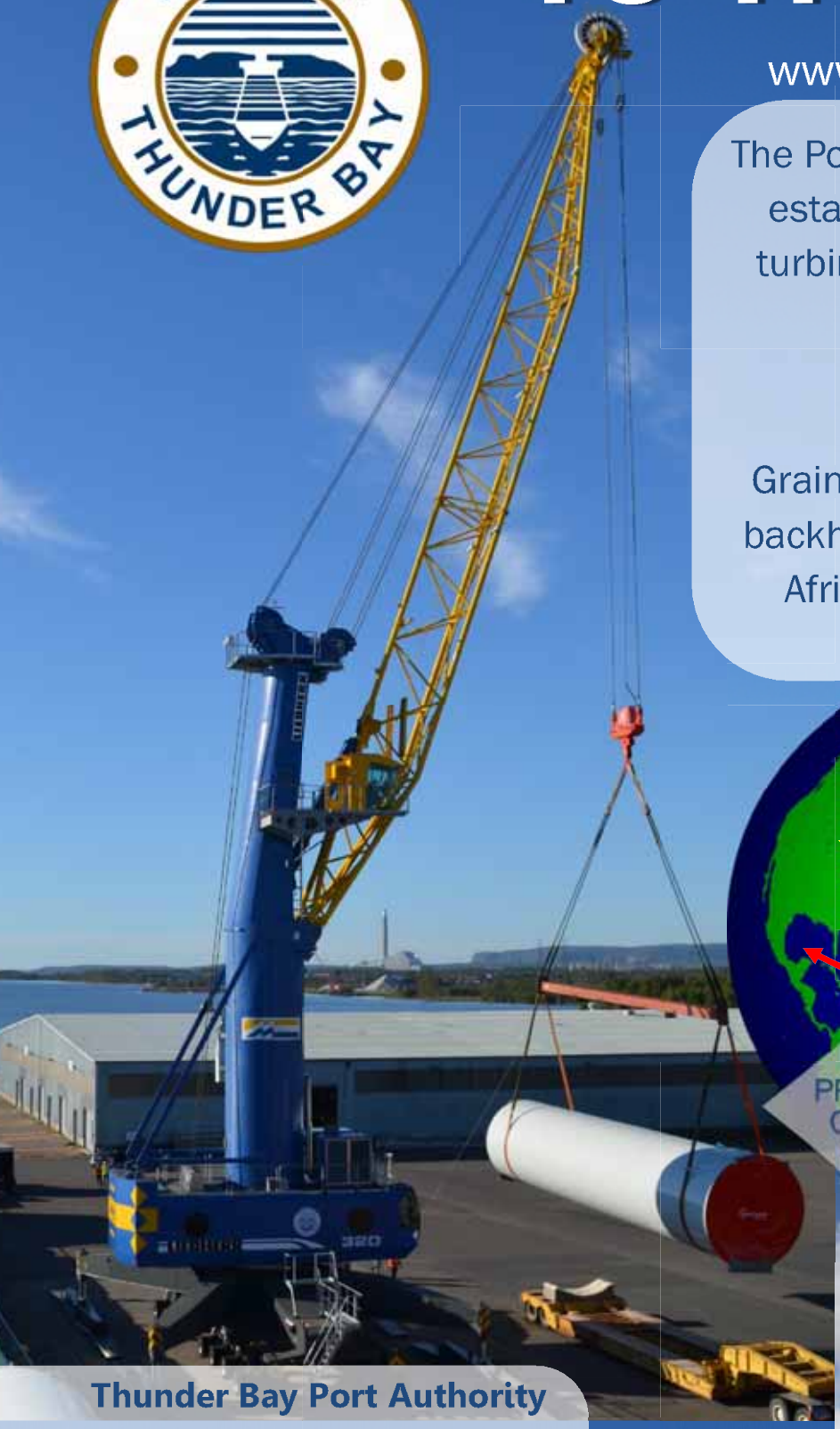

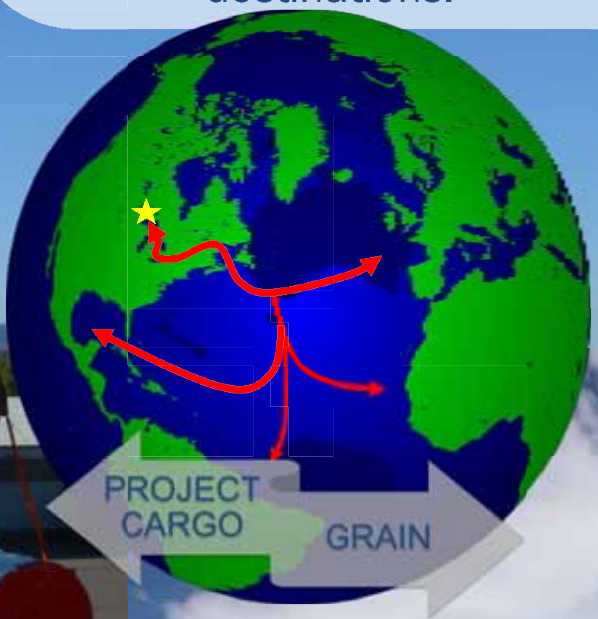

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Recently, RAD-CON (B.C.O.) engaged the services of global 3PL and licensed NVOCC & freight forwarding company UWL. RAD-CON was in need of a solution to complete an oversized move. This particular move posed the potential to be complicated and costly due to the extremely heavy weight and large size of the product being transported. UWL was able to streamline this process and complete the process — from quote to load — in 12 days. Cargo was transported successfully from Cleveland to Antwerp, where it will make its way to its final destination in Turkey.

In working with UWL, RAD-CON felt confident knowing that they had the strength of an asset-based forwarder on their side throughout the project. Advantages such as 650 trucks, 55 offices worldwide, 15 container depots and 20 warehouses/distribution centres throughout the United States. Most of all, they were able to take advantage of the relationships that UWL could bring to bear on the St. Lawrence Seaway & Port of Cleveland — opening up transatlantic routes without the need for fighting the congestion on either coast. UWL effectively opens up efficient service routes to Europe and beyond.

Customers depend on UWL to anticipate challenges and find solutions to complex supply chain needs. The difference that UWL's world-class team brings to the customer is a dedication to innovation, client-centred service and a world-class, team approach. By leveraging 50+ years of industry experience on the part of parent company World Shipping, Inc. (WSI), UWL has helped clients to realize success in the Great Lakes as well as markets around the globe. Areas of expertise include: Custom House brokerage, ocean freight, air freight, chemical logistics, project cargo logistics, warehousing, transload and distribution, road and rail, bulk liquid logistics and customs compliance consulting.

The Great Lakes Towing Company expands fleet with four new tugs

The Great Lakes Towing Company, which operates the largest fleet of shipdocking tugboats on the US Great Lakes-Saint Lawrence Seaway, has announced the addition of four more tugboats to its fleet.

The four newly purchased tugs will be named after four of the Great Lakes; Tug *MICHIGAN,* Tug *HURON*, Tug *ONTARIO* and Tug *ERIE*. The company's Tug *SUPERIOR* has been in service for years, operating in the Port of Detroit.

"These four tugs will be immediately added to the fleet, and provide some new life and operational stability to our day-to-day business," says Gregg Thauvette, Vice President – Operations, The Great Lakes Towing Company. Thauvette continues, "The equipment and machinery onboard, including the towing gear and firefighting equipment, are ideal for our operations across the Great Lakes, and will help us to continue to provide harbour towing services to our customers in more than 35 US ports, in all eight US Great Lakes' states."

Major Fleet Overhaul Program

In addition to the four newly purchased tugs, Great Lakes Shipyard is in the process of reactivating the Tugs *LOUISIANA* and *PENNSYLVANIA* from its existing fleet, both of which have been out of service for several years. Once completed and back in service, the company plans to also reactivate the Tugs *IDAHO* and *CALIFORNIA*, which were taken out of service over the last two seasons. The company is also in the process of drydocking, refurbishment and major maintenance on 15 tugs from fleet as part of the company's ongoing Major Fleet Overhaul Program. The schedule for this program includes:

"As The Towing Company continues to maintain and upgrade the tugs in its fleet, the Shipyard will also continue to expand and grow," says Joe Starck, President of the Towing Company and Great Lakes Shipyard. Starck further explains that, "We are currently in progress of building one of two new tugboats for New York Power Authority (NYPA) Niagara Power Plant's operations in Buffalo, NY and we are also building two small work barges for the United States Army Corps of Engineers (USACE) Rock Island District. We also have many other very interesting new construction projects on the table. This new vessel construction business is in addition to our ongoing regular, in-house, commercial and government repair and modification work, where we regularly perform routine drydocking, maintenance, emergency repairs and custom fabrication services."

About The Great Lakes Towing Company

The Great Lakes Towing Company (or the 'Towing Company') owns and operates the largest fleet of shipdocking tugboats on the US Great Lakes-Saint Lawrence River Seaway.

GLT is the principle provider of commercial tugboat services in more than 35 US ports, in all eight US Great Lakes' states and the St. Lawrence River, and maintains nearly 99% market share of the harbour towing business in US Great Lakes ports. No other towing company in the US matches this range of service. Services include harbour towing, docking and undocking assistance, ice breaking, rescue and assistance to grounded or damaged ships, and interport towing of vessels and barges.



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Port of Thunder Bay off to strong start

Grain shipments through the Port of Thunder Bay are off to their strongest start since 1997. As of 31 May, more than 1.8mt (million metric tonnes) of grain have been loaded at the port's elevators. The 31 May five-year average for grain is 1.4mt.

Grain, the port's mainstay cargo, continues to surge following dramatic volume increases last year. In 2014, the port recorded its highest cargo volumes in 16 years due to the swell in shipments of Western Canadian grain. There is no sign of slowing down as prairie farmers experienced their second-highest grain production in history in 2014, following the record production set in 2013.

The Port of Thunder Bay handled nearly 1.3mt of cargo during May — 37% more than the five-year average for the month. A wide variety of cargoes passed through the port during May including coal, potash, liquid petroleum, wood pellets, road salt, windmill components and steel. Potash shipments were particularly strong. At 72,000 metric tonnes, potash volumes were 50% higher than the five-year average for the month.

Top Hat Ceremony for first ocean-going vessel

The Cyprus-registered vessel *Tundra* became the first ocean-going 'saltie' vessel to enter the Port of Thunder Bay during the 2015 navigation season, berthing at Richardson's Main elevator on the morning of 17 April. The vessel loaded 15,100 metric tonnes of Western Canadian Wheat destined for San Juan, Puerto Rico.

Tundra is owned and operated by Montreal-based ship company Canfornav. Canfornav is one of the largest ocean-going carriers calling the Great Lakes – St. Lawrence Seaway on a regular basis, transporting cargoes to and from worldwide destinations. The agent for the vessel is Lake Superior Shipping Ltd., ocean ship agents in Thunder Bay since 1959.

Tundra Captain Volodymyr Ovdiyenko and Chief Engineer Igor Galkin was welcomed to the Port in an on-board 'Top-Hat' ceremony.

New CWB vessel loads first grain shipment in Thunder Bay

On 13 April, the Port of Thunder Bay welcomed a new Canadian Laker built specifically for transporting grain from Thunder Bay to the St. Lawrence River. *CWB Marquis* arrived in port the previous evening and took on its first ever load of grain on 13 April at Mission Terminal.

CWB Marquis *is the first vessel to be owned by CWB.*

CWB Marquis is the first vessel to be owned by CWB, formerly known as the Canadian Wheat Board. The vessel is named after the historic 'Marquis' wheat variety, the first wheat variety bred specifically for the short Canadian growing season. "Marquis wheat has a long and distinguished history on the Prairies and we are proud to name CWB's first laker vessel in honour of its legacy," said CWB president and CEO Ian White. "Almost every variety of wheat grown on the Prairies since the beginning of the 20th century can be traced back to Marquis wheat."

The ship is the third *Equinox*-class vessel to enter service on the Seaway, joining Algoma Central Corporation's *Algoma Equinox* and *Algoma Harvester*. Algoma Central Corporation will operate and manage CWB Marquis, along with a second CWB fleet-mate to be delivered later in 2015.

Equinox class vessels are touted as the next generation of Great Lakes bulk carriers with the ability to carry more cargo, sail faster and consume less fuel than their predecessors. The ships are also more environmentally friendly with exhaust scrubbing systems designed to remove 97% of sulphur oxide emissions generated by the vessel engines.

Winnipeg-based CWB is an experienced wheat and barley marketer, having sold grain to over 70 countries. Since the elimination of its monopoly on wheat and barley grown in Western Canada in 2012, the organization has been transitioning toward a private operating model that includes a network of strategic grain-handling assets and farmer ownership. CWB has initiated a series of elevator construction projects and acquisitions across the prairies and in port, including the acquisition of Mission Terminal in the Port of Thunder Bay last year.

April's load of 30,000 metric tonnes of wheat and durum, destined for Trois Rivières and then to Cuba, will be the first of many. *CWB Marquis* will be used extensively to carry grain eastward out of Thunder Bay, and iron ore on the return trip from seaports back into other Great Lakes ports.

The Algoma Equinox *is another of the* Equinox-*class vessels operating on the Great Lakes/ St Lawrence Seaway System.*

Toledo-Lucas County Port Authority celebrates 60th anniversary

Charts a course for the future

Transportation has always played a vital role in the development of the Toledo Region and has a significant annual impact on the region's economy. In 1833, when Toledo was founded through the merger of the villages of Port Lawrence and Vistula (both villages were already active ports on the Maumee River at the western end of Lake Erie), Toledo quickly became one of the great transshipping ports on the Great Lakes handling grain, flour, butter, pork and lumber. The first railroad in Ohio, the Erie & Kalamazoo, began service from Toledo in 1836. Additional growth was fostered by the construction of the canals, which linked the Maumee River with Central Indiana's Wabash River and the Ohio River.

The new Ironville Terminal opened in March 2014. It is owned by the Port Authority, which has entered into a long-term agreement with Midwest Terminals to manage the port operation.

Toledo was a place where all modes of transportation came together to serve the region's agricultural and manufacturing-based economy. Toledo's rich history in shipbuilding began as early as 1828, starting with schooners and side-wheel

steamboats and quickly evolving into constructing steel freighters. For the next 100 years the port continued to expand and in 1955 construction commenced on the St. Lawrence Seaway, a bi-national waterway connecting world markets to the Great Lakes Region. In June of that year, the Ohio Port Authority Act was adopted and Toledo became the first port authority in the state of Ohio. Under the direction of the Port Authority, many accomplishments were achieved including establishing the eighth Foreign-Trade Zone in the nation in 1961 and becoming the largest coal port in the world handling over 30 million tonnes annually from 1963 to 1966.

Over the years, the Port Authority dramatically expanded its role in the Toledo Region, taking on the management of additional transportation assets including two airports, a passenger rail station and three downtown parking garages. At the same time, new services and programmes were offered by the Port Authority to promote economic development in the Toledo Region such as brownfield redevelopment, innovative financing, energy efficiency improvement, a community economic development grant programme, and a programme to offer assistance to minority and women-owned contractors. The combination of assets, programmes and services makes the Toledo-Lucas County Port Authority one of the most diverse and sophisticated port authorities in the nation.

General Cargo Dock at the Port of Toledo.

This August marks the 60th anniversary of the Toledo-Lucas County Port Authority. While much has changed over the past 60 years, the Port Authority continues to hold the same fundamental vision as its founders in 1955. Site development, job creation, port expansion and efficiency in moving people and goods through the region remain top priorities. Maritime activities at the Port of Toledo alone employ over 7,000 people and have an annual economic contribution of over $1 billion to the region.

The Port Authority is continuously investing in the modernization of port facilities. At the Toledo Shipyard, operated by Ironhead Marine, topside and dry dock work is routinely performed on freighters, ferry boats and other vessels. Ironhead's modern high bay facility was constructed in 2008, along with many other recent improvements, which have allowed the company to provide excellent service to the maritime industry. In 2010, the Port Authority invested over $10 million in new cargo handling equipment at its general cargo facility operated by Midwest Terminals, which included the acquisition of two Liebherr mobile harbour cranes and a Mantsinen material handler. An additional $15 million was invested in a new entrance gate complex, new roadways and improved on-dock rail infrastructure at the facility.

Perhaps the most ambitious and significant development at the Port of Toledo in recent years was the opening of the new Ironville Terminal in March 2014. This 180-acre site, previously used as an oil refinery, was purchased in 2008 and was transformed into a fully operational marine terminal financed with public and private investments. The site is owned by the Port Authority, which has entered into a long-term agreement with Midwest Terminals to manage the port operation. The total project cost was $23 million and provided up to 100,000 man hours of skilled construction labour for the community. Development of the site included the installation of 20,000 linear feet of rail connecting the terminal to Norfolk Southern's network, dredging and dock wall improvements, and the construction of a multimodal material transfer system and warehouse. The terminal handled over 277,000 tonnes of material in its inaugural season and is expected to play a key role in the development of new cargo handling opportunities by providing additional capacity and capability.

For 60 years, dedicated staff and board members have worked together with community and government leaders to make the Toledo-Lucas County Port Authority the organization it is today. The Port Authority salutes the thousands of customers and stakeholders around the world who have utilized the Port of Toledo's facilities and services, all of which helps move the Port Authority and its community forward.

Duluth Seaway Port Authority names Director of Business Development

The Duluth Seaway Port Authority has named Kathryn 'Kate' Ferguson as Director of Business Development, effective 13 July 2015. She will be the first point of contact with the Port Authority for companies pursuing domestic and international trade opportunities. Additionally, Ferguson will work to develop, attract and retain business for the Port Authority and its properties — co-ordinating business expansion prospects with industrial development organizations throughout the region.

Kate Ferguson.

Ferguson brings a decade of professional experience and academic credentials to this position, primarily in the arena of business development, account management and supply chain logistics. Her expertise crosses a wide range of industries and encompasses materials moved by water, road and rail here in the Twin Ports and across the Upper Midwest.

Prior to her most recent position as supply chain informatics senior specialist for Essentia Health, Ferguson spent nine years working in transportation logistics based here in Duluth — first with Great Lakes Fleet (GLF) and later with Canadian National Railway. She has spent the majority of her career analysing and improving efficiencies in cargo movement between ports and facilities along the Great Lakes-Seaway. From her role as sales, marketing and traffic analyst for GLF to her position as transload solutions manager for CN Supply Chain Solutions, Ferguson has focused on business development, project management, contract administration and the improvement of operational efficiencies for customers at dozens of multi-modal facilities.

Business management and transportation logistics have dominated Ferguson's educational pursuits, as well. She graduated *magna cum laude* with bachelor's degrees in transportation & logistics management and computer information systems from the University of Wisconsin-Superior, then earned an MBA at the University of Minnesota Duluth. She currently is pursuing a doctorate in transportation & logistics through North Dakota State University and is certified by the American Society of Transportation & Logistics.

"The port remains an economic driver for this community, the region and our state," said Vanta Coda, Duluth Seaway Port Authority executive director. "Kate is unique in the world of logistics in many ways: accomplished academically in the discipline, experienced in multiple modes with supply chain execution responsibilities and connected to the Great Lakes maritime life. We have great expectations that her skill sets can leverage our mission of business and economic development to greater heights."

A native of Alpena, Mich., Ferguson has spent her entire life along the shores of one or another Great Lake. "I rely on that knowledge almost every day in understanding the people and products that move across and within this region. Having that Great Lakes base really helps in building strong relationships with customers and networks with business and industry," said Ferguson. "I can't wait to get back to the working waterfront and am looking forward to working with the amazing team at the Port Authority."

Ferguson's maritime interests extend beyond the job, as well. She currently is serving as president of the Propeller Club of Duluth-Superior, spent three years on the board of the Lake Superior Marine Museum Association, has volunteered on the *S.S. Meteor* Preservation Project in Superior for five years, and has been a guest lecturer in the transportation & logistics management department at UWS since 2006.

After hours, you'll likely find Ferguson on some type of playing field, in the woods or on the water as she is an avid outdoor fitness enthusiast — participating in everything from soccer, hockey, running, hiking, and biking to kayaking, wakeboarding, snowboarding, cross country skiing and 4×4 off-roading.

The Port of Duluth-Superior sees nearly 1,000 vessel visits each year, moving an average of 38 million tonnes of cargo including iron ore, coal, grain, limestone, cement and salt plus a variety of heavy-lift and project cargo. As the largest tonnage port on the Great Lakes St. Lawrence Seaway, cargo movements through the Port of Duluth-Superior support 11,500 jobs and contribute over $1.5 billion to the local/regional economy.

The Port of Duluth-Superior moves an average of 38 million tonnes of cargo a year.

The Duluth Seaway Port Authority is an independent, public agency created by the Minnesota Legislature to foster regional maritime commerce, promote trade development, facilitate industrial development and serve as an advocate for port interests.

Port Corpus Christi Commissioner Barbara Canales: 'Y Women in Careers' Honoree

The YWCA of Corpus Christi has named Port Corpus Christi Commissioner Barbara Canales as one of 2015's 'Y Women in Careers Honoree's, reflecting her professional accomplishments and outstanding community leadership. Along with fellow recipients, Canales was honoured during a banquet on 5 March.

"I am honoured to be included in such a distinguished group of women who have been recognized in the career fields throughout the years by the YWCA. The YWCA believes in empowering women so that they can achieve the success they desire in their respective arenas. I feel so fortunate to have been empowered by strong women my whole life and I attribute this honour to that mentorship," says Commissioner Canales."

Canales is a distinguished professional and active member of the South Texas community. She currently is a practising attorney and partner of Mother Ocean, LLC, and has been serving as a Commissioner of Port Corpus Christi since 2014. In addition, she currently sits on several boards and committees throughout the region, including the University of Texas at Austin College of Engineering Advisory Board; Ready or Not Foundation, President; Canales Foundation, President; Education is our Freedom Scholarship Foundation; Eagle Ford Shale Consortium Committee; and the South Texas Institute of the Arts Development Committee. She is also a member of the State Bar of Texas and the Corpus Christi Bar Association. Canales has had numerous past appointments.

"Since 1979, the YWCA Corpus Christi has honoured the remarkable, professional women of the coastal bend…By recognizing these amazing women, we can create positive role models for young girls in our community," says, Nancy Wesson-Dodd, YWCA President/CEO.

About Port Corpus Christi

As the primary economic engine of the Coastal Bend, Port Corpus Christi is the fifth-largest port in the United States in total tonnage. The port's mission statement is to "serve as a regional economic development catalyst while protecting and enhancing its existing industrial base and simultaneously working to diversify its international maritime cargo business." Strategically located on the western Gulf of Mexico, with a straight, 45' deep channel, the port provides quick access to the Gulf and the entire United States inland waterway system. The port delivers outstanding access to overland transportation with on-site and direct connections to three Class-1 railroads and uncongested interstate and state highways. The port is protected by a state-of-the-art security department and an award-winning Environmental Management System. With outstanding management and operations staff, Port Corpus Christi is clearly "The Port of the Lone Star State."

Port Corpus Christi is a member of START (South Texas Alliance for Regional Trade), a collaborative effort that highlights business opportunities in South Texas in the manufacturing, energy, aerospace, international trade, military and other sectors and the related strategic support provided by Port San Antonio, Port Corpus Christi and Port Laredo.

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First ocean vessel of 2015 arrives at Port of Indiana

Northwest Indiana celebrates opening of gateway to global markets

The arrival of the 655-foot bulk carrier *Irma* at the Port of Indiana-Burns Harbor signals the official opening of the international shipping season. Port officials welcomed 2015's first ocean vessel in April, with a ceremony presenting the Ports of Indiana 'Steel Stein' to the ship's captain.

"Our port is open year-round handling Great Lakes ships and river barges, but the first ocean vessel of the year signifies the opening of Northwest Indiana's gateway to the world," said Port Director Rick Heimann. "These ships bring raw materials for local companies and transport finished goods from the Midwest to global markets. The shipping season also provides an important economic impact to the region for the skilled workers involved in the supply chain as well as many other related jobs and businesses that depend on these cargoes."

Maritime operations at the port generate $4.3 billion per year in economic activity and support 33,000 total jobs. Overall in 2014, the Port of Indiana handled more shipments than any year since opening in 1970. Total volume was up nearly 30% over 2013 driven by strong shipments of steel, grain, limestone and salt.

Manned by Captain Piotr Szczesniak and a crew of 21 from Poland, the Cypress-flagged Irma picked up its steel cargo in Ijmuiden, Holland, and stopped in Cleveland and Milwaukee before coming to the Port of Indiana. Built in 2000, the vessel is owned and operated by the Polsteam Shipping Co.

The steel was unloaded by port stevedore Federal Marine Terminals with local workers from the International Longshoremen's Assoc. and International Union of Operating Engineers.

"We had a great year in 2014 with record tonnage and activities at the Port of Indiana-Burns Harbor," said Michel Tosini, executive vice president, Federal Marine Terminals. "We are very encouraged by the prospect of another busy year in 2015 and through our long-term partnerships with the port and our customers, such as Tata Steel, we look forward to tackling the challenge."

Over 50 workers unloaded 9,400 tonnes of steel coils from the *Irma* which are destined for Tata Steel in Chicago.

"We are always pleased with the arrival of the first vessel to the port each year as it symbolizes Tata's continued commitment to our Midwest customers," said Simon Golding, general manager for Tata Steel's Shipping and Logistics Operations. "The Port of Indiana-Burns Harbor plays a key role in our supply chain as the predominant gateway into this market region. We are looking forward to another safe and successful season."

Port Director Heimann presented Captain Szczesniak with the 'Steel Stein', which commemorates Northwest Indiana's identity as the "steel capital of North America," producing more steel than any other region on the continent. The Port of Indiana is recognized as one of the top steel ports in the country for inbound and outbound shipments of steel and metal-related products.

On 2 April, the St. Lawrence Seaway opened for its 57th navigation season, providing the connection between the Great Lakes and Atlantic Ocean. Betty Sutton, administrator for the St. Lawrence Seaway Development Corp., noted the Seaway realized a nearly 8% tonnage increase from 2013 to 2014, reflecting the increasing strength of the economy.

About the Port of Indiana-Burns Harbor

The Port of Indiana-Burns Harbor opened in 1970 and is operated by Ports of Indiana, a statewide port authority operating three ports on the Ohio River and Lake Michigan. Established in 1961, the Ports of Indiana is a self-funded enterprise dedicated to growing Indiana's economy by developing and maintaining a world-class port system. DCi


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Malcolm Youll takes over at SAMSON Materials Handling

On 1 June, SAMSON Materials Handling, formerly B&W Mechanical Handling Ltd., appointed Malcolm Youll as new Managing Director. He will be based at the SAMSON Office in Ely, Cambridgeshire, UK.

Youll brings vast international experience of the capital equipment industry and complex engineered solutions having worked for CNH, CAT, and Cargotec. His wide range of experience in the field of mining and ports & terminals will expand the SAMSON Materials Handling activities in the various markets worldwide. Youll holds degrees in Manufacturing, Management and Technology.

From left to right: Andreas Klottka (AUMUND Holding, Managing Director), Malcolm Youll (SAMSON Materials Handling, Managing Director), and Franz-W. Aumund (President of AUMUND Group).

"SAMSON Materials Handling, which is under the roof of the AUMUND Group of companies, is a world-renowned engineering company in the markets it serves. To be joining such a well-respected company who focuses endlessly on reliability and durability of its products is inspiring. The Material Handling business has fantastic products, an impressive customer base and very knowledgeable and talented people. I'm looking forward to leading this business and delivering the products, innovation and support that our customers need," says Youll.

Material handlers for steel mill

IS VINA IN VIETNAM IS EQUIPPED FOR COMMISSIONING NEW STEEL MILL

The Korean logistics provider Il Shin Marine Transport Co., Ltd. is responsible for supplying the largest steel producer in Korea — POSCO Specialty Steel. Its newest steel mill is in Vietnam, near the capital of Ho Chi Minh City, and will be fed by four SENNEBOGEN material handlers in the future.

At the beginning of 2015, SENNEBOGEN Asia Pacific and its sales and service partner Kilwoo Corporation was able to deliver four new SENNEBOGEN 830 material handlers to Ho Chi Minh City. With operating weights of 38.5 tonnes and ranges of 15 metres, the material handlers were specially equipped for demanding applications in scrap handling. When the machines were handed over by Green Line Sales Manager Dennis Hasenkopf, the responsible people could be sure that they were well prepared for the start of production in June.

Why SENNEBOGEN? From a long-term point of view, the 830 material handler convinced the customers with the best total cost of ownership. The responsible people plan to save up to 40% of operating costs. Supplemented by a SENNEBOGEN multi-shell grab with an 800 l capacity, which was adapted to the material handlers at the factory, scrap feeding cycle times of less than 30 seconds are possible. For the drivers, it quickly became clear that the highlight of the machines is the highly mobile 2.7m Maxcab comfort cab, which provides them with a perfect view and a pleasant working environment in daily operation.

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New Cat® 16M3 motor grader delivers greater

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The new Cat® 16M3 motor grader features engineering enhancements that boost fuel economy, increase structural durability, simplify maintenance, add operator convenience and promote the safety of both the operator and those around the machine. The 16M3 is available in configurations to meet engine emissions standards worldwide.

The 16M3 motor grader is an essential machine for building and maintaining mine haulage roads to keep trucks running most efficiently and at the lowest cost per tonne of material moved. The 16M3 has a 16ft (4.9m) mouldboard and an average operating weight of 71,454 pounds (32,411kg). The motor grader is optimally sized for operations using 150-tonne (136-tonne) or smaller trucks.

The 16M3 features a Cat C13 ACERT™ engine with the Cat Optimized Variable-Horsepower system, which provides net power ratings from 290–348 horsepower (216–259kW). The engine is available in three configurations to satisfy global emissions standards: US EPA Tier 4 Final/EU Stage IV/Japan 2014 (Tier 4 Final); Tier 3/Stage IIIA /Japan 2006 (Tier 3) equivalent; and Tier 2/Stage II/Japan 2001 (Tier 2) equivalent.

A new ECO mode, standard for Tier 2 equivalent and Tier 4 engines, is designed to improve fuel economy by optimizing engine speed to 1,900rpm in working gears when possible with no compromise in performance. This operator-selected feature delivers fuel savings estimated at up to 4% to 5%, compared with working in comparable light- to moderate-load applications with the system deactivated. An additional engine control system feature provides consistent power to the ground by continually adjusting the engine to compensate for power losses to the cooling fan.

Also new for the 16M3 is the 'OK-to-Start' system, which automatically checks the engine coolant, engine oil, and hydraulic oil levels when the key is turned to the on position. The system also monitors these levels and the trans-axle oil level during operation, and it alerts the operator if levels drop too low.

Drive train and structures

The Cat direct-drive, power-shift transmission, with eight forward and six reverse gears, incorporates the Cat Advanced Productivity Electronic Control Strategy (APECS) system, designed to smooth gear changes and promote productivity. The modular trans-axle now has a standard automatic differential lock, which ensures appropriate locking/unlocking for optimum traction and manoeuvring, thus averting possible damage from ill-timed manual control.

The 16M3 also features nearly 15% greater dynamic braking torque at the rear tandems, achieved by enlarging both the brake disc diameter and the piston area. A new manual brake wear indicator simplifies disc wear measurement, eliminating having to remove the brake pods to check wear.

The 16M3 front frame, hitch area, and rear frame have been specifically designed to ensure long-term durability with the added weight and power of the new model. The centre-shift section is now a heavy-duty steel casting designed to effectively distribute stress and enhance durability in this highly loaded area of the mainframe. The rear frame is lengthened, incorporating two bumper castings for added counterweight, and the hitch plates (at the articulation joint) are 50% thicker than those of the 16M. The longer frame improves machine balance and steering control and provides easier access for routine maintenance.

In the cab

The new full-colour touch-screen display, with an intuitive menu structure, allows the operator to monitor machine performance, set parameters to suit operating situations, and access service information for initial troubleshooting. The new display also shows Cat Grade Control Cross Slope readings and DEF (diesel exhaust fluid) level.

In addition, a new keypad with lighted, one-touch buttons replaces most of the three-position switches used previously, further easing the operator's job. Advanced Control joysticks (a retrofit option) enhance control of the Cat Grade Control Cross Slope or AccuGrade™ systems and also have provision for auxiliary-hydraulic control.

Also standard for the 16M3 is the Caterpillar Vital Information Management System (VIMS™), which provides real-time information about machine health and surroundings, trends, events, and other vital machine information to support production and planning.

Safety and service

The standard rearview camera system presents crisp images on the new information display or on an optional LCD screen above the rearview mirror. Also standard is a seat belt indicator, which alerts the operator that the belt is not fastened and records the incident as a fault code.

The optional enhanced-access platform provides ladders, walkways and handrails that allow access to the cab or engine

fuel efficiency and power

compartment from either side of the machine. An available service access configuration has ladders, walkways and handrails for convenient access to the engine compartment from either side. Double doors provide open access to the engine and use stainless steel barrel hinges for easy removal. An available fire-suppression-ready package facilitates installation of most recommended fire-suppression systems suitable for the 16M3.

Key service intervals have been extended for the 16M3: engine air filter and pre-cleaners have twice the life, compared with the 16M, and service intervals for the main hydraulic, pilot and transmission filters have doubled from 500 hours to 1,000 hours when S•O•SSM sampling and Cat filters are used. In addition, transmission/rear-axle fluid-change intervals are extended from 1,000 hours to 2,000 hours with S•O•S sampling.

In the engine enclosure, clearance above the valve cover allows injectors, compression brakes and valves to be serviced without removing any major components. The modular design of the rear axle allows removing the final drives in-chassis, significantly decreasing service time.

The 16M3 also uses a new modular cooling package, which facilitates removal and installation of components in the cooling system, providing an estimated time saving of 20%, compared with the 16M. Clean-out doors provide easy access to the cooling cores.

A durable metallic fuel tank is modular in design and can be serviced with fast-fill fuel systems delivering up to 150gpm (567.8 litres). The new radiator shunt tank is fabricated of metal. On models equipped with a DEF tank it has been strategically positioned at ground level for easy filling when the fuel tank is being filled.

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Biomass handling facility relies on Talentum flame detectors

FLAME DETECTORS WORK IN TANDEM WITH WATERMIST SYSTEM TO PROTECT OVER 700 METRES OF CONVEYORS

The conveyor with the docks in the background.

Problem

As part of the conversion of Ironbridge power station in Shropshire, UK, from coal to biomass, E.ON Energy has constructed a biomass handling depot at Gladstone Docks in Liverpool. This allows the delivery and transfer of biomass (in the form of wood pellets) from anywhere in the world to Ironbridge via train.

The Liverpool depot consists of three conveyors totalling over 700 metres in length, taking the biomass direct from ship to train or from ship to a large storage building. Due to the highly flammable nature of biomass, the fire and safety plan required an extensive fire detection and suppression system on all three main conveyors.

Solution

The solution was based on FFE's Talentum flame detectors and a high-pressure watermist system from Hydramist©. The complete system was designed and installed by FFE contractor Fireworks.

Each conveyor was divided up into fire zones, with each zone having a dedicated Talentum flame detector, zone valve, fire control panel and set of water pipes and spray nozzles. The flame detectors and nozzles were installed inside the conveyor covers to provide optimum protection of the biomass. The watermist system operates from a central high pressure pump set with 100% redundancy.

The entire system was then linked to a side-wide addressable fire panel which allows further automatic controls to be programmed, ensuring the desired number of zones will automatically operate when required and that the conveyors will stop as soon as the fire system operates.

Fireworks trained E.ON staff to operate the system and carry out fault-finding and remedial actions if required. The entire system requires minimal maintenance and is on constant standby 24 hours a day when the biomass handling depot is in operation.

"FFE's Talentum optical flame detectors are ideal for this type of application. By utilizing infra-red (IR) sensing technology, they detect flames within seconds, irrespective of any dust, steam or smoke present. With the addition of an ultraviolet (UV) sensor the detector also becomes immune to false signals such as sunlight," commented Dr Daniel Waldron, a research scientist at FFE.

Talentum flame detector within the enclosed conveyor.

About FFE

FFE is a UK-based, global design and manufacturing business, dedicated to supplying specialist detection products to the fire industry. The company's two leading brands are the Fireray optical beam smoke detector, with over half a million units installed worldwide, and the Talentum flame detector, one of the world's most respected flame detector brands. FFE also leads the global market in providing fire extinguishers for aviation use and produces a range of vibration switches for industrial applications. It is a Halma Company.

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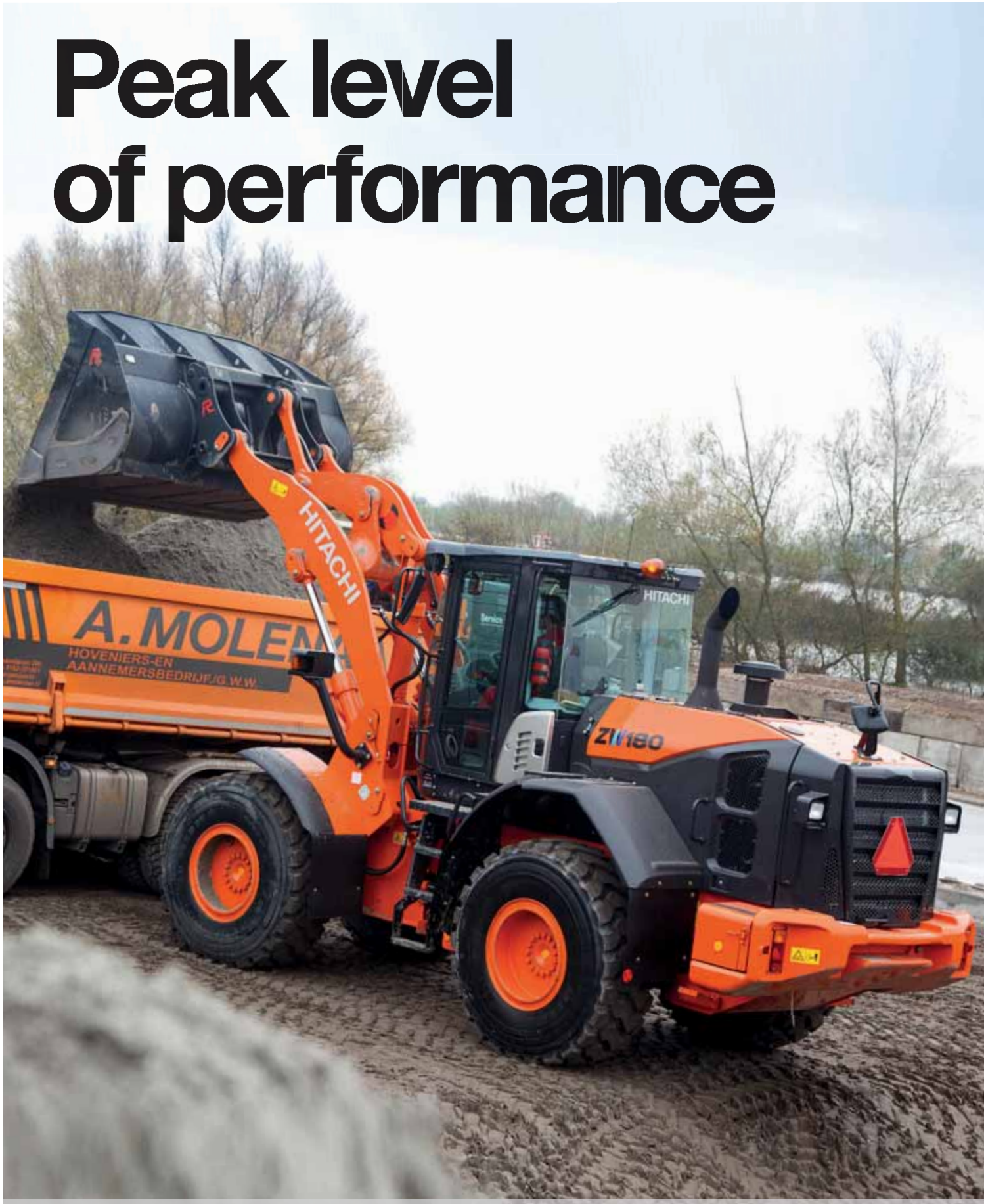

The power of advanced technology has developed a new high-quality range of Hitachi construction machinery. ZW-5 wheel loaders offer a peak level of performance, reinforcing their leading reputation for reliability and durability. Designed for the most challenging material handling environments in ports and harbours, the Hitachi ZW180-5 delivers increased productivity at a lower cost of ownership.

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Swiss civil engineering company invests in large ZX470LCH-5 excavator

A Swiss civil engineering company has made a successful investment in a Hitachi ZX470LCH-5 excavator as the main production machine for its sand and gravel pit. The large Zaxis-5 excavator was delivered to Scrasa's Satigny site on the outskirts of Geneva in October 2012 by the country's Hitachi dealer, Probst Maveg.

Formed in 1962, Scrasa was formerly a French company that helped to build Geneva airport on its first Swiss project in the same year. Scrasa became an independent company in 2007 and its 200 employees work across a wide range of projects, including the pit and its production facilities, as well as road construction, electrical utility, paving and microtunnelling projects.

The ZX470LCH-5 is part of a fleet of construction machinery that includes two ZX225USLC-5s, a ZX135US-5 and a ZX85USBLC-5, but it is the only machine based at Satigny. It plays a key role in the excavation of up to 1,500 tonnes of mixed materials per day, loading two trucks for the maximum 2km haul to the yard.

This helps Scrasa to produce 200,000 tonnes of washed materials for general building construction and a further 200,000 tonnes of recycled materials for road construction and concrete production per year. The four sizes of aggregates are 0.4, 4/8, 8/16 and 16/32mm, and they also mix products according to the needs of their customers and projects.

Excellent after-sales support from Hitachi

After testing the ZX470LCH-5 against three other brands, Scrasa opted to add to its Hitachi line-up for three main reasons. "We continue to buy Hitachi excavators that offer value for money and top quality, supported by excellent after-sales support," says Scrasa's Jean Marc Zuccalli, who is responsible for managing the operations on the site.

"Quality is always important, because one day lost in the pit would cost us a lot of money and so it's important that the machine is reliable. Of course we have to consider the cost, but after-sales is also very important, and Probst Maveg is highly responsive and provides an excellent level of service. In addition, the opinion of the operator is vital, as he will not be productive if he's unhappy with his machine."

A fast and economic excavator

Experienced operator Pascal Notelle says that the machine is well suited to the work in the sand and gravel pit. "There are many different layers – including compact and hard soil — but the ZX470LCH-5 is able to dig into all of the materials easily. I also have to mix the different grades by dragging the bucket down the face of the pit and the machine has more than enough power to complete this task.

"The ZX470LCH-5 is strong, fast and smooth, especially for loading the trucks and for a machine of its size. The cab is comfortable and spacious, and I really like the adjustable air-suspension seat. I also find that the monitor is easy to use and understand for technical information, and the camera is also left switched on for safety purposes. As well as being a stunning machine to look at, it's also very economical for fuel consumption."

Jean Marc adds, "The ZX470LCH-5 helps us to ensure that the layered materials are mixed and therefore the aggregates of high quality when they are produced. The operator has time between loading trucks to sort the materials in this way. It is also very important that this machine has an integrated DPF, so that we comply with the environmental standards. We are very conscious of our responsibilities for sustainability, which is why we clean the materials and recycle using the best possible methods, so that future generations will still benefit from our natural resources."

BRUKS Rockwood shiploader serves Port Sulphur

BRUKS Rockwood was selected to provide complete engineering and equipment for the shiploader at the IMT terminal facility in Port Sulphur, LA, USA. This travelling, slewing, luffing shiploader is designed to load coal (petroleum coke optional) at a rate of 5,000tph (tonnes per hour). With its 150ft boom, this machine accommodates Panamax and river barge vessels that hold up to 74,000 tonnes. The telescopic chute at the end of the boom contains a trimming spoon which helps with filling the four corners of the ship hold.

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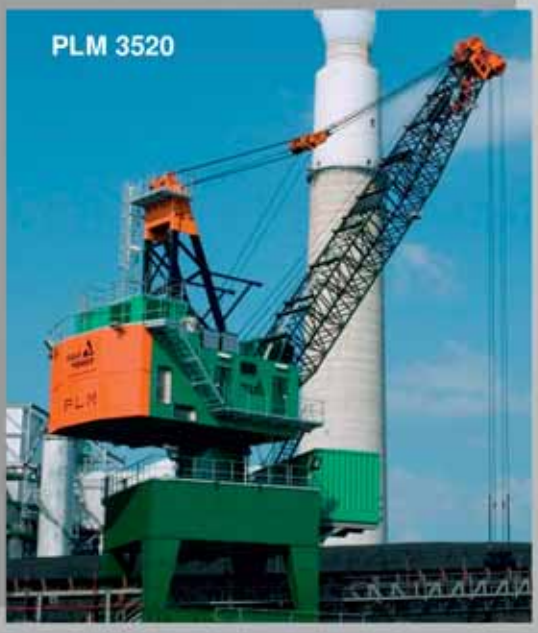

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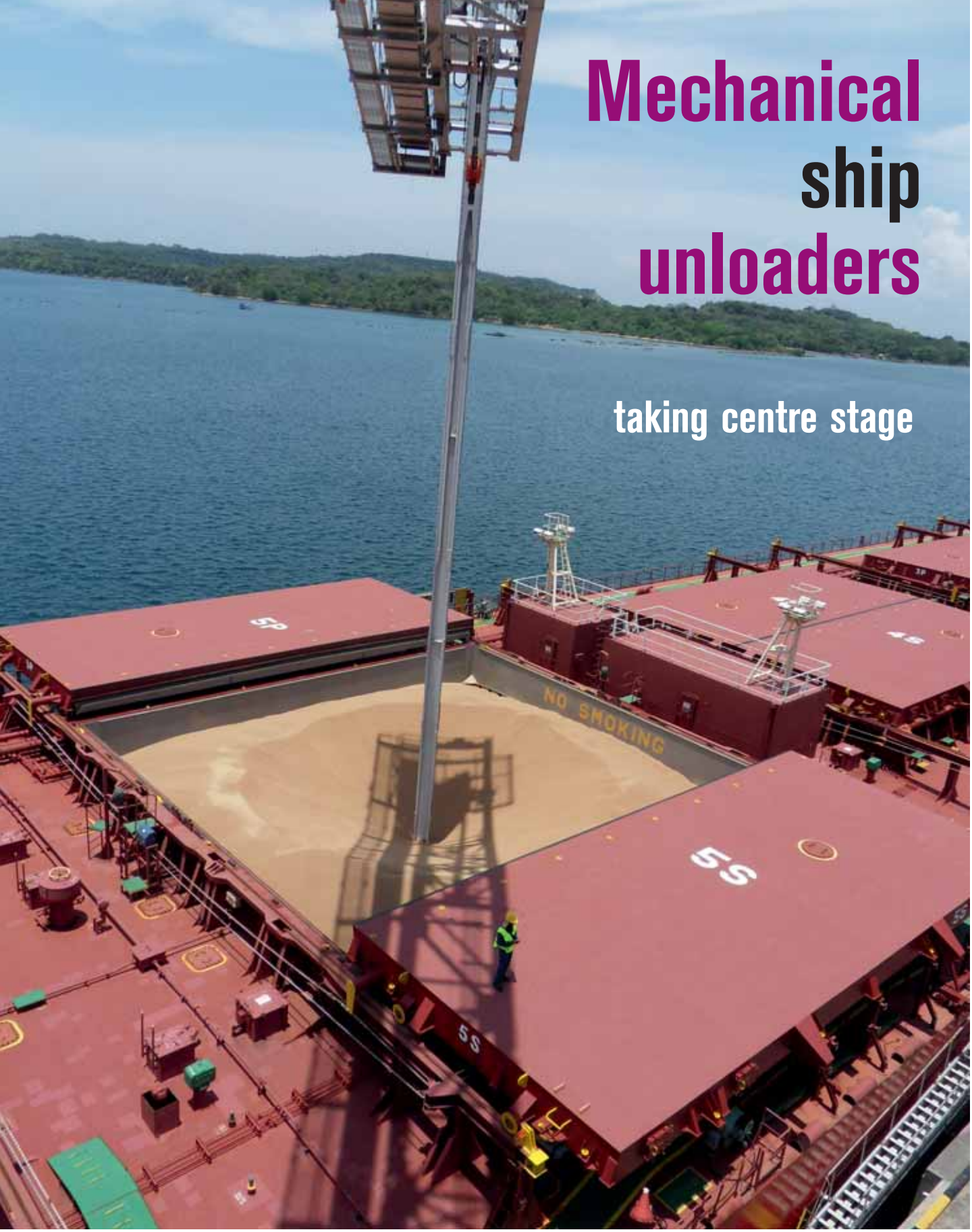

Mechanical ship unloaders

taking centre stage

Bühler – saving time, money and the environment

Bühler is a specialist and technology partner for plant, equipment, and services for processing basic foods and for manufacturing advanced materials. The group holds leading market positions worldwide in technologies and processes for transforming grain into flour and feeds, making pasta and chocolate, as well as in the field of aluminium die casting.

The core technologies of the group are in the field of mechanical and thermal process engineering. With its expertise and over 150 years of experience, Bühler time and again rolls out unique and innovative solutions for its customers, helping them achieve success in the marketplace.

Mechanical ship unloaders are an important part of Bühler's

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San Miguel's Portalink 600, with barge loading facility, was completed in 2013.

product range. Bühler has long and intensive market experience, and has developed a broad and extensive product portfolio. Within that portfolio, the Bargolink and Portalink models offer a versatile solution for its customers who need fast, optimal and efficient ship unloading.

The Portalink, for example, is a mechanical unloader for seagoing vessels of up to 125,000dwt, at capacities ranging from 300tph (tonnes per hour) to 1,500tph. The Bargolink, also a mechanical unloader, has been specially developed for use with river barges, and has an unloading capacity of 300tph.

Commodities handled

Due to the low conveying speed of the vertical chain conveyor, Bühler's mechanical unloaders are excellent for unloading free-flowing products such as wheat, corn, soyabeans, wood pellets, etc. But they also excel in the unloading of mealy products such as soyameal. With the use of specially designed equipment such as the proven loosening screws, not only is unloading efficiency increased, but also the uniformity of the size of the unloaded product increases, reducing the risk of blockages further in the system.

Major clients

Major clients for Bühler's mechanical unloaders are grain terminals, and larger end users. For example, San Miguel has invested in a Portalink 600, with barge loading facility, completed in 2013. The Portalink has a nominal capacity of 600tph for wheat and can handle vessels up to 65,000dwt. Prima Flour Mills in Sri Lanka has installed a Portalino Combi on its multipurpose jetty and has installed a Portalink 800tph on its main jetty.

Portalink.

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Keeping competitive

Mechanical unloaders in particular — such as the Portalink range — are setting market standards in terms of low energy consumption, high operating efficiency due to easy handling for operators, high availability due to reduced maintenance time and low wear-and-tear. This all means that buyers can expect a short return on investment (ROI), making them an excellent choice economically.

In the last year, Bühler has focused on a new operating and control system for its loading and unloading portfolio. This new operating system has been developed as a response to direct customer feedback, and simplifies multiple functions. It also increases functionality for maintenance and traceability. This results in a reduction in the time needed to search for errors or train new staff to understand the equipment, greatly improving ROI.

Recent contracts

Contracts that have recently been received by Buhler include:

- two large Portalinks with a capacity of 1,200tph;
- a second order for a midsize 800tph Portalink ; and
- a midsize 600tph Portalink in Asia.

Technological expert

With more than 100 years of experience building mechanical unloaders, Buhler has a large and global base of installations. With their high and reliable quality, many of the older mechanical unloaders are still in use even after 50 years, and form the backbone of many companies. To even further extend the operating life of its equipment, Bühler has developed several service packages. One of the new service packages is a complete or part retrofit of the marine leg, the heart of the mechanical unloaders. With a less-than-optimal functioning marine leg, not only is performance reduced, but also unexpected breakdowns result in unscheduled and expensive repairs. With the retrofit offered, Bühler diagnoses and intervenes ideally before or when interruptions happen, thus reducing risk and or costs.

Another service package which Bühler provides to its customers is an upgrade of the operating system of its unloaders. With an upgrade of the operating system to the latest Bühler standard, not only is the outdated and defective hardware replaced, but also a complete new revised operating system is installed. The latest operating system has increasing functionalities such as a touch panel directly presenting error messages, individual selection of each motor and sensor saving precious time during unloading "

Bühler — committed to sustainability,

Every day, billions of people use Bühler technologies to satisfy their basic needs for food, mobility, or communication. With its industrial process technologies and solutions, Bühler makes a significant contribution to feeding the world's population while focusing on food safety and security. Around 65% of the wheat harvested worldwide is processed into flour on Bühler mills. The company's contribution to the global production and processing of rice, pasta, chocolate, and breakfast cereals is equally substantial. Furthermore, Bühler is a leading solution provider of die casting, wet grinding, and surface coating technologies, with a focus on applications in the automotive, optics, electronics, printing, packaging, and glass technologies. The solutions provided to these industries are characterized by high energy efficiency and sustainable mobility. As a leading technology group, Bühler invests up to 5% of its turnover in research and development every year. Bühler is proud of its Swiss roots, with 10,600 employees at some 140 sites generating sales of CHF 2.3 billion. As a family-owned company, Bühler is particularly committed to sustainability.

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Bedeschi guarantees efficency and a eco-friendly solution with the bucket chain continuous ship-unloader

The environment is constantly changing and there is a need to become increasingly aware of the problems that surround it. This is why Bedeschi always pay attention to environmental issues, basing its projects on the stability and sustainability of the surroundings. Nowadays there is often a need to transport raw materials and combustible solid material from one continent to another by sea. The ships that do this are becoming bigger, so the modern port has to be equipped with all kinds of machines like shiploaders, ship-unloaders, cranes, conveyors, etc. to be able to complete the vessel's loading/unloading process in the minimum time.

To guarantee efficiency in the ports it is necessary to optimize the position and the volume of the material that is stored and in transit, waiting to be shipped, to have adequate machinery to reduce the time of loading and unloading of the ships, and the delivery of the raw material. It is also necessary to organize the layout of the terminal in the most functional way and to reduce the number of operators needed through automation of the process, creating eco-friendly terminals by using dedusting equipment.

Thanks to its wide experience and knowledge in material handling, Bedeschi is successful in all of the above mentioned aspects. For example, when considering the bucket chain continuous ship unloader (CSU), all the solutions that Bedeschi proposes, and the executive design, are developed with the utmost care to dust control. The CSU will travel on rails and will be travelling and luffing boom type, it will be equipped with a bucketwheel elevator with continuous rotation for digging, with belt on the boom and central hopper to unload on a feeder that will load the pier conveyor.

When unloading, the material reclaimed by buckets will be luffed to the unload point, on the top of the elevator, and unloaded on a rotating plate which, independently from the rotation position of the elevator, will convey the flow on the boom belt. From the boom belt, through the central hopper, the material will be unloaded on the belt feeder under the hopper that will convey onto pier conveyor.

The proposed design with fixed foot will allows to extend the elevator enclosure, leaving the foot only on open air. While in operation, even at the real beginning of the unloading, the elevator foot is almost entirely inside the hold avoiding any possible dispersion. Once the material is inside the buckets, the entire stroke is protected.

Drive sprockets of the elevators will be equipped with a suitable device to avoid any possible egress of material inside the elevator enclosure.

CSUs are normally compared with a traditional grab type ship unloader. While the grab type ship unloader, even if equipped with ecological grabs, does not make it possible to completely eliminate dust dispersion during the transfer from the hold to the hopper — especially in windy conditions — with the CSU the route of the material is completely enclosed and the transfer points are equipped with dedusting systems.

This means that, once reclaimed by the buckets, the material can be fully enclosed without any possible dust dispersion.

Particular care will be taken to avoid any material accumulation inside the elevator in order to avoid any possible material falling during machine transfer operations. The unloading chute will be closed, with sealed inspection doors.

This is why the CSU ensures a homogenous material flow, with dust kept to an absolute minimum.

Going green and sustainable practice is now seen as an essential part of any business in the bulk industry.

Considering the fact that port's infrastructures which consists of the land and space necessary for operations is expensive, Bedeschi is able to help the client by providing compact, functional, and eco-friendly machines that are able to adapt to a smaller space but are still able to offer the high volumes requested by the client.

Bedeschi is also able to minimize environmental problems due to dust emission by stacking material in an enclosed warehouse. In addition, all of the machines have dust filters created by the Bedeschi affiliate company CTP, therefore Bedeschi Group is able to offer totally dust free environmental friendly solutions.

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Sensors deliver commercial information for ship unloaders

Ship unloaders are a well-developed technology that work continuously and reliably. While there are different types suited to different materials, a common factor is the need for effective control and monitoring to be maintained at all times to both ensure trouble-free operation and to calculate the weight of cargo being unloaded.

Real-time monitoring data from unloading systems is key for safety, operational and commercial reasons. When it comes to safety, an overloaded machine can be dangerous to personnel, or could break down and bring operations to a costly halt.

In operational terms, unloaders need to run at optimum speed to minimize ship turnaround times, while also controlling the rate of delivery of materials to the dockside facilities. Live load data can allow operators to calculate the amount of cargo moved, the time to completion of each operation, the number of trucks required for onward shipment, etc.

There is also a distinct commercial requirement for effective monitoring, as the value of many dry bulk cargoes is calculated from its weight.

Real-time data from the unloaders is collected by having sensors monitoring the critical variables — in this case the torque on the drive shafts, the speed of the motors and the drive power. All of this data fed back to the control system can help in deriving load values on conveyors, stress and potential overload in unloading systems, and weight of bulk product moved.

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

An emerging technology that is increasingly being integrated into unloaders is wireless, non-contact digital torque monitoring, an area of specialism for Sensor Technology. These sensors measure the work being done by the motors and drive shafts of the unloaders and the data is automatically and instantly converted into cargo weight figures.

With over 20 years of research and development into digital non-contact torque monitoring, Sensor Technology is at the forefront of this technology. Operating out of the heart of Oxfordshire, Sensor Technology is an acknowledged leader in the manufacture of quality torque measurement solutions and wireless load sensors. It has a global network of distributors assisting sales, and a network of world-renowned technical experts assisting in the development of technology.

Sensor Technology's non-contact torque monitoring transducer, TorqSense, is based on the patented technology of measuring the resonant frequency change of surface acoustic waves (SAWs) generated by rotating shafts. It's a proven technology that has solved torque measuring challenges in a host of industries.

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

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

Applied to mechanical ship unloaders, the technology is

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bringing distinct advantages. A process that was once regarded as very difficult to monitor can now be optimized for the highest levels of productivity with the lowest cost. Not only does it offer many benefits for conveyor dry bulk unloading, it has also been adapted by Sensor Technology recently — in the form of the wireless LoadSense transducer — for use with straight-line load monitoring, such as is required by cranes and hoists as they lift cargo to and from ships. This means that all cargo handling techniques used in any given situation can be monitored by the same system, which will lead to significant savings in management time and costs as two or more reports do not have to be integrated.

To date the technology has been successfully applied to all forms of unloader — bucket wheels, flighted vertical conveyors, augers, horizontal belt conveyors and pneumatic systems, and Sensor Technology has seen its torque monitoring technology used in the transfer of grains, minerals and other dry bulk materials from ship to shore.

The unique principle of operation, being non-contact and maintenance free, has seen a rapid adoption in a host of dockside unloading applications around the world, as more and more operators see the commercial advantages of improved quality of information to their control systems. It is helping to minimize the amount of time ships are in dock — and therefore not earning — by optimizing the speed and reliability of unloading processes, while also helping companies to maximize profitability by delivering more accurate weight information on bulk goods.

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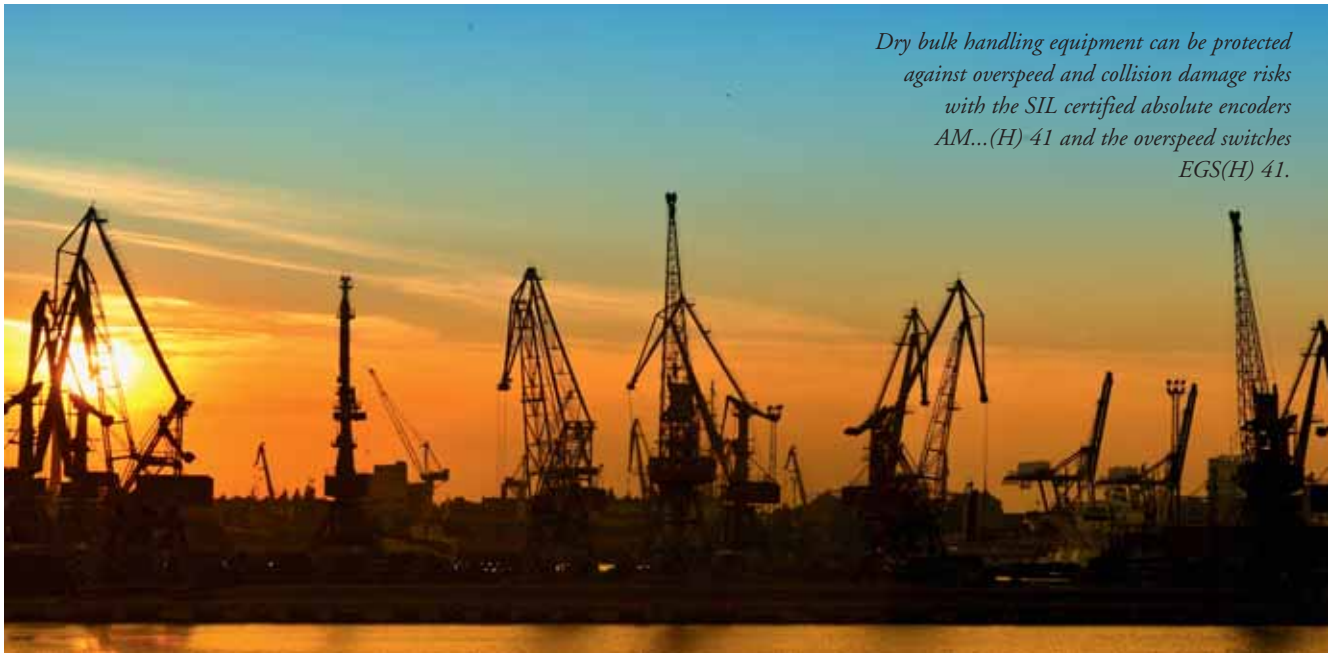

Dry bulk handling equipment can be protected against overspeed and collision damage risks with the SIL certified absolute encoders AM...(H) 41 and the overspeed switches EGS(H) 41.

The extreme conditions in the heavy industry require reliable and safe industrial applications. Individual customer solutions and all-round service also play an important role in this context. As a renowned supplier, Johannes Hübner Fabrik elektrischer Maschinen GmbH offers encoder systems for heavy duty applications, including ship unloaders.

The company is also widely recognized as an industry leader in the fields of measurement, encoder and drive technologies. In more than 80 years Johannes Huebner Giessen has installed several thousand applications in the mining and dry bulk industry. For example the company's products in great demand for use in stackers, reclaimers, shovels, belt conveyors, shiploaders and unloaders, cranes and hoist systems. Reference projects worldwide in countries such as Canada, China, Russia or the USA demonstrate the comprehensive track record of Johannes Huebner Giessen. The company's scope of supply includes incremental and absolute encoders, universal encoder systems, overspeed and position switches, SIL certified systems, magnetic encoder systems, fibre-optic components, output multipliers and pulse converters, tacho generators as well as mechanical accessories like couplings, adapter shafts and torque brackets. The specialist from Giessen offers an all-round complete service from determining on-site installation conditions through to installing the complete encoder systems.

Guaranteeing the safety of both humans and machines is an extremely important factor in heavy duty applications. And it is not only the environmental conditions that can cause dangerous situations. The equipment needs to be protected in some applications should dangerous situations arise, for example as a result of overspeed or collision damages.

Absolute encoder with SIL CL3 certificate

Johannes Huebner Giessen presents the new series of absolute encoders with SIL CL3 certificate for deployment in applications requiring certified compliance with functional safety requirements. Specifically developed for heavy industry the AMP(H) 41 (PROFIsafe via PROFIBUS DP) and AMPN(H) 41 (PROFIsafe via PROFINET IO) are certified to DIN EN 61508 up to Safety Integrity Level (SIL) CL3 and to EN ISO 13849 up to Performance Level (PL) e. Utilizing these functionally safe encoders exempts the user from having to provide separate verification of the functional safety of the position sensors.

Different versions of the encoders are available: AMP 41 and AMPN 41 with solid shaft (14mm diameter) as a flange (B5) and

The SIL CL3 certified multiturn encoders from Johannes Huebner Giessen are available with solid shaft as type AM…41 or with hollow shaft as AM…H 41.

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Johannes Huebner Giessen developed the SIL 2 certified overspeed switch EGS(H) 41 specifically to meet the challenges and safety requirements of heavy industry.

flange-foot version (B35) to mount the encoder using a coupling as well as the AMPH 41 and AMPNH 41 with a continuous hollow shaft (20mm diameter) to mount the encoder directly onto the drive shaft. The devices with a PROFIBUS interface and those with a PROFINET interface use the PROFIsafe protocol for data transmissions. The total resolution is 28 bit, 13 bit singleturn resolution (8192 steps/revolution) as well as 15 bit multiturn resolution (32,768 rotations). An additional incremental output offers 4,096 pulses.

Featuring extensive diagnostics functions for error detection the certified functionally safe encoders are manufactured in an audited development and manufacturing process. That guarantees maximum safety!

Robust and reliable: Ideal for heavy industry

"In heavy industry it is imperative that high-performance and robust construction are not mutually exclusive," explains Thomas Brandenburger, head of the Product Management department. The new encoders were specifically developed for deployment in SIL 3 applications in heavy industry such as in dry bulk and container handling equipment, in steel and rolling mills, in mining industry as well as for general deployment in applications in extremely harsh operating and environmental conditions. Features such as a thick-walled aluminium casing, large ball bearings with high dynamic load rating and corrosion-resistant material with an additional protective coating ensure the encoders are ideal measuring devices for heavy duty applications in operating temperatures from –25°C to +70 °C. Furthermore, all devices are equipped with secure bolted connections to prevent them working loose under vibration loads as well as feather keys for form-fit shaft connections. For hollow-shaft assemblies the robust, long torque bracket arm ensures a higher signal quality. The available degree of protection up to IP66 and the quality of the materials used mean the new absolute encoders are also suitable for deployment in salt-laden environments.

SIL 2 certified overspeed switch

Due to the extreme conditions faced by humans and machines alike, particularly stringent safety regulations apply to plants and systems operated in heavy industry. To fulfill these requirements the specialist from Giessen offers the electronic overspeed switch EGS(H) 41 that operates independently from the closed-loop speed control system. The EGS(H) 41 is certified up to Safety Integrity Level (SIL) 2 in accordance with the international standard IEC 61508 as well as up to Performance Level (PL) d to DIN EN ISO 13849. It is also the only overspeed switch worldwide certified to this standard. Consequently, it guarantees the operator the highest level of plant safety and serves to protect personnel.

Monitoring speed and safety functions

With an integrated sensor, logic circuitry and an actuator the EGS(H) 41 functions as a complete system. The speed is sensed, evaluated and switched in sequence. The safety device is equipped with two separate, electrically isolated and, as a consequence, complete switches to monitor speed that can be programmed independently from one another to monitor overspeed and underspeed from 0.5 rpm. In this instance the electrical insulation generates a huge advantage in comparison with mechanical centrifugal switches, which would need a second device for the same function. A further switch automatically monitors safety functions relevant to the hardware and software modules (diagnostics). The EGS(H) 41 also features integrated overcurrent detection and monitors the status of the wear-free, electronic switching contacts as well as optional standstill and slip monitoring.

Individual customer solutions and all-round service

Encoder concepts from Johannes Huebner Giessen are customized to meet individual customer requirements. Design engineers determine the installation conditions on-site and support the customer throughout the calculation and design phases, during production and delivery through to final assembly and installing the encoders. High resistance to external loads such as vibration, shock and dust as well as robust, fully encapsulated electronics mean the encoders are predestined for deployment in heavy industrial applications such as rolling mills, in the mining industry and harbour cranes. Their high degree of protection from IP66 to IP69 is a further distinguishing feature that also underlines their suitability for applications in heavy industry. DCi

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Bedeschi works with Yara

Screw-type shiploader in operation.

successful co-operation in the fertilizer sector

Bedeschi Spa, a long-time supplier of crushing and handling machines for the cement mining industry, steel factories, coal and others industrial processes, has in the latest 15 years added a new string to its bow, *writes Eng. Pietro de Michieli - Chief Operating Officer Bedeschi Spa*. It now also produces a wide range of shiploaders for on-shore installations. Major Bedeschi bulk cement and clinker shiploaders are already in operation, while others are in the assembly phase.

Thanks to its wide experience, Bedeschi is able to offer shiploading technology even in a different kind of sector. Close to the classic technology of using a loading boom, rubber belt conveyor and telescopic chute, Bedeschi's design uses a chain conveyor and telescopic chute to ensure a closed, sealed system that is dust-proof. Below is a case study that details shiploaders using chain conveyors and rubber belt conveyors in the fertilizer industry.

Case study 1: Yara — Germany

In May 2012, Bedeschi was awarded a contract to supply a shiploader to Yara's Brunsbuttel facility in Germany. The contract included turnkey delivery, including engineering, construction, erection, commissioning and start-up of a shiploader to replace the one that was already in place.

PROJECT DATA	
Material	Urea
Size	1–3mm
Design capacity	500tph

Description of the loading process

The shiploader moves along the quay on a portal travelling device and receives the bulk material (urea) from the tripper car on the fixed quay gallery belt conveyor. The portal travelling device has two groups of twin wheels located on its corners and runs on rails. The upper part of the portal is equipped with one transfer chain-conveyor, receiving the material from the tripper car installed on the gallery quay conveyor, and delivering the same to the main chain conveyor installed on the boom of shiploader. The portal screw conveyor is also equipped with a cartridge filter suitable both for the ducting of transition point between tripper and the portal chain-conveyor, and to create vacuum atmosphere into the same screw conveyor. The slewing part of the shiploader consists of a rotating frame superstructure, a supporting luffing boom equipped with the

Slewing luffing and travelling shiploader.

main chain-conveyor and a telescopic and tilting loading chute.

The telescopic and tilting chute can be equipped alternatively with a launching belt or with a loading spoon. These two accessories allow for an easy and optimal loading efficiency of both big vessels up to 20,000dwt and barges.

On the top part of the slewable boom is installed another filter dedicated to the ducting of the telescopic loading chute, through two connections, functioning as and extraction system to create a vacuum atmosphere into the holds of ocean vessel.

The telescopic chute is operated by a cable winch for vertical movement. The internal part of chute is equipped with dedicated lined guide cones. The totally enclosed chain-conveyor frames also help to meet the aim of environmental friendliness, as they enable significant noise reductions.

Shiploading is carried out by a combination of slewing, luffing-lowering and telescoping movements. All movements are controlled from the same control cabin by means of PLC automation.

The advantages of using a telescopic chute with an extraction system

The telescopic chute is an ideal solution to prevent the problem of breaking particles and to minimize dust generation when loading bulk material. The design of the telescopic chute ensures that material particles are kept in mass flow form and at low velocity. In fact the internal lining of the module cones minimize the escape of dust particles without affecting loading rates. The extraction system, represented by the top boom filters, guarantees a perfect vacuum atmosphere into the vessel hold, preventing any dust emission.

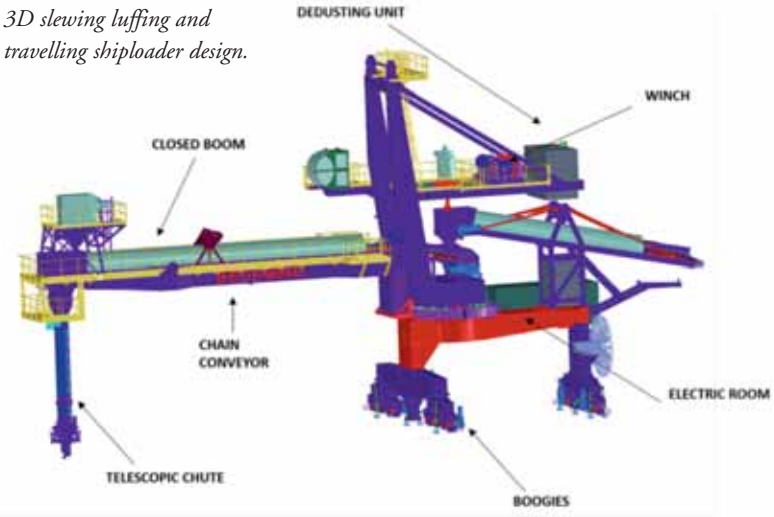
Due to the minimal free-fall and the low velocity that the material experiences, greatly reduced material degradation is evident when loading sized product.

Case study 2: Le Havre Port, France — Yara

Bedeschi is in the process of manufacturing a shiploader to handle urea for the Yara France operations at the Port of Le Havre. The contract is EPC-based, including commissioning and startup activities. The shiploader is designed for loading at a rate up to 250tph and for vessels with a capacity up to 20,000dwt. The shiploader is a luffing and travelling type and it is equipped with the traditional belt conveyor boom. The machine will replace the current shiploader at the harbour terminal, a few kilometres away from the Le Havre Yara plant. It will become the connection point for final product export operations. Commissioning of the machine is expected to take place in the middle of 2016. This project is the third to be awarded by Yara to Bedeschi, confirming the reliability of Bedeschi machines in this field.

PROJECT DATA	
Material	Urea
Size	1÷3mm
Design capacity	250tph

3D slewing luffing and travelling shiploader design.



Conclusion

In an ever-more globalized and competitive world, port infrastructures are rapidly changing. It is often necessary to handle bulk material far from the quarries, by sea, with ships that are becoming bigger. It looks clear that to guarantee efficiency in the ports in this changed scenario it is necessary to optimize the position and the volume of the stored material, reduce the loading/unloading times and create functional and eco-friendly terminals. This is why the modern port has to be equipped with all kinds of machines like shiploaders, conveyors, etc. to be able to complete the vessel's loading process in the minimum time considering also dust-free solutions.

Bedeschi, with its wide range of machines is able to satisfy the modern need for solutions that are flexible, efficient, eco-friendly and, last but not least, cost-effective.

Bedeschi has many years of experience in supplying on-shore and off-shore material handling systems and extensive experience in the design of bulk material handling plants for continuous loading of dry bulk cargo onto ocean vessels up to Capesize in deep water anchorage. Each new project incorporates feedback received from the on-going systems to continually improve the design of the machines. DCi

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Innovative dust control solutions

to meet new petcoke regulations

The devices can be tower-mounted for precise aiming and longer range.

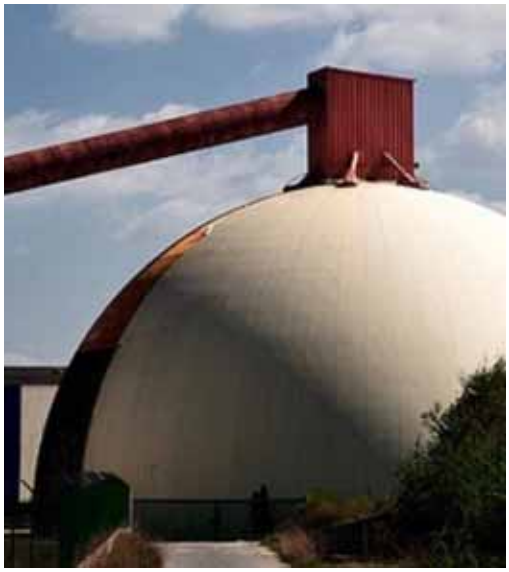
Recent environmental regulations have presented a difficult challenge to petroleum coke (petcoke) storage operations and transfer stations by establishing tight restrictions on dust emissions and in some areas mandating that storage piles be housed in full enclosures, *writes Mike Lewis, Dust Management Specialist at Dust Control Technology*. A byproduct of the oil refining process used for various applications from cement additive to affordable carbon fuel source, the US and other nations have deemed petcoke dust to be hazardous when inhaled.

The most common way to control dust from outdoor storage piles is through the use of water, but moisture content above 8% and an increased net weight can have a severe impact on the price per tonne. Smaller companies with tight profit margins are finding that proposed regulations could significantly raise operation costs and affect prices. Regardless of the standards enacted by regulators in each municipality, measurable dust emissions are required by federal law to be controlled, causing many firms to turn to antiquated solutions that have actually exacerbated the problem.

In an attempt to mitigate dust, many operations have installed high-pressure sprinkler systems that use hundreds of gallons of water per minute, resulting in high water costs, material saturation and runoff. This leaves organizations facing further regulations regarding wastewater and introduces an undesirable increase in moisture content. Moreover, operators have discovered that sprinkler systems do not control airborne dust.

Irrespective of the industry's good-faith efforts, concerned municipalities and local governments have begun to consider ordinances similar to one imposed by the city of Chicago, mandating that petcoke handlers move operations into sealed, emission-free enclosures. This has caused the shutdown of small facilities in the city, since indoor storage is only economically viable for companies financially prepared to incur the high cost.

Under these circumstances, operations of all sizes have taken notice of a dust suppression technology embraced by the coal industry. Addressing similar regulations, atomized mist has been found to mitigate dust emissions both in the air and on the surface of coal storage piles, with only trace amounts of runoff. Using far less water than large sprinkler systems, airborne mist helps processing operations and transfer stations stay compliant with current standards and potentially avoid further regulations regarding their wastewater. Additionally, the technology drastically reduces the moisture content of the saleable product.



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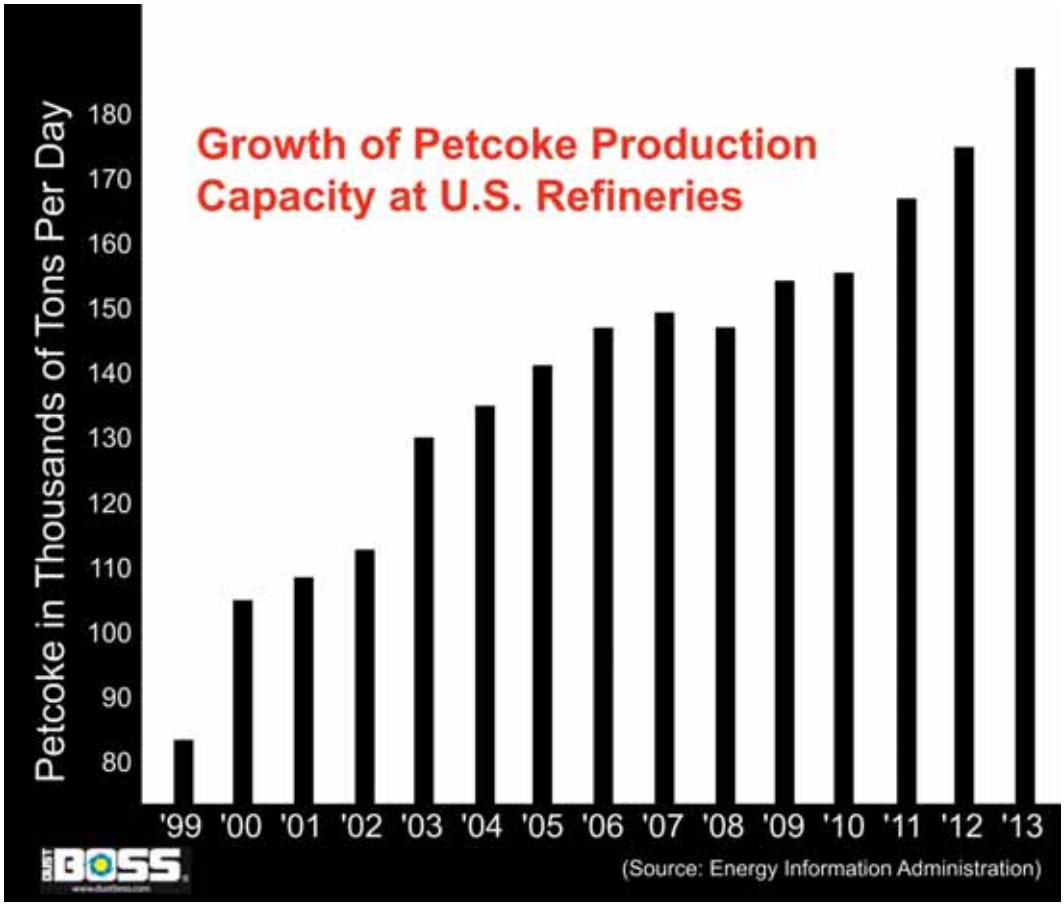
Bellwether Legislation in Chicago

According to the Energy Information Administration (EIA)[1], since 1999, the amount of petcoke exported from the US has doubled to hundreds of tonnes per day, increasing the amount of dust produced from outdoor storage facilities. This prompted South Chicago residents who live near the Koch Industries KCBX facility to file a lawsuit in 2014, accusing the terminal of polluting the local air and water.



Prior to the filing, in response to years of complaints from residents, KCBX spent $10 million to install 42 rotating water cannons mounted on 60ft poles. Unfortunately, the approach had limited success in controlling the dust, and in fact the lawsuit suggests the equipment may have made things worse, alleging that, "Periodic overwatering of these surfaces can contribute to conditions that allow petroleum coke, coal, and/or dusts of these materials to enter local storm drains and waterways."

The lawsuit characterizes petcoke as a toxic pollutant, but industry representatives have pointed out that the substance doesn't fit the EPA's definition of a pollutant[2]. Consisting almost completely of carbon, the commodity is traded on the futures exchange alongside crops, minerals and dried bulk goods (such as coffee). Proponents reason that a tradable and transportable inert, non-toxic substance should not be considered a hazardous waste product or a pollutant.

Without awaiting resolution of the lawsuit, the Chicago City Council passed regulations in December 2014 that require petcoke and coal storage companies within the Chicago city limits to completely enclose operations. This forced the closure of a mid-sized Chicago area petcoke storage facility owned by Beemsterboer Slag Corp. However, KCBX submitted plans to build a $120 million enclosure on its existing site, measuring 1,000ft long x 200ft wide x 100ft high (304.8m x 71m x 30.5m), that would contain the entire operation by 2017.

KCBX's agreement to these demands has caught the attention of stakeholders in the petcoke and coal industries, which are monitoring the issue closely. Concerned that this may set off a trend in other US municipalities, resulting in the closure of dozens of smaller facilities across the country, petcoke facility operators are seeking alternatives to current marginally effective dust suppression methods.

The science of dust suppression

One of the reasons why industrial sprinkler systems like those used by KCBX are unsuccessful at managing airborne dust is because of the 'slipstream effect', which prevents large droplets of water from effectively capturing small airborne dust particles. When droplets fall, they cause air molecules to move around them in a current called a slipstream. The force of this effect is relative to the size and speed of the droplet. When small airborne particles encounter a large droplet such as those from a sprinkler, they can get caught in this current, causing them to deflect away from the droplet rather than colliding with it and being absorbed.

To improve the effectiveness of trapping airborne dust with water, a technology called 'variable particle sizing' (VPS) is used to adjust the droplet size to match the size of the dust particles. According to the US National Institutes of Environmental Health Sciences[3], a cross section of the average human hair is about 100 microns in diameter, the same threshold at which the US Environmental Protection Agency (EPA) considers dust to be inhalable through the nose and mouth. Dust particles that are 200 microns or smaller are able to linger in the air and travel on naturally occurring atmospheric currents. This is also true for water droplets. These particles and droplets are no longer visible to the naked eye below 50 microns.

In comparison, industrial sprinkler systems create droplets between 200 and 10,000 microns in size[3], and atomized mist uses VPS to produce droplets between 50 and 200 microns. While sprinkler droplets quickly fall to the ground without encountering

1. Chart, "Petroleum and Other Liquids: Subcategory: Petroleum Coke," U.S. Energy Information Administration, U.S. Department of Energy. Washington, D.C., July, 31, 2015.

2 Staff. "What is Nonpoint Source Pollution?", Environmental Protection Agency. Washington, D.C., August, 27, 2012

3 Staff, "Particles: Size Makes All The Difference", National Institute of Environmental Health Services. Research Triangle Park, NC, 2006.

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A single atomized misting unit can cover as much as 280,000ft² with a powerful dust-trapping plume.

a high number of airborne dust particles, millions of atomized droplets are introduced into the atmosphere surrounding petcoke storage piles, travelling with the dust and colliding with the particles, absorbing them and using the collective mass to drive both to the ground.

Product Loss & Water Usage

Rainfall, snow and ice runoff can be predicted through rainfall averages and accurate modern weather modelling to engineer a site's water drainage. Industrial sprinklers, on the other hand, can erode an unreasonable amount of product, strain containment systems and consume massive amounts of water, often exceeding even the hardest downpour.

For example, a hard three-inch-per-hour rainfall on a 10,000ft² area will produce 18,700 gallons (70,787 litres) an hour at the rate of 312 GPM (1,181 LPM). For many facilities, that's enough to flood catch basins and stress drainage systems. Large industrial sprinkler systems commonly used for dust suppression propel a long stream of water over storage piles, saturating the surface with a volume of 500 GPM (1,893 LPM) within a typical coverage area of 91,476–396,396ft² (8,498–36,826m²).[4]

By using high-powered industrial sprinklers, the cost of water can become a major expenditure and require more extensive runoff control systems, as well as increased man hours devoted to management.

Even a large atomized misting machine, such as the DustBoss® – 60 (DB-60) manufactured by Dust Control Technology averages a fraction of the water usage at just 23 GPM (88 LPM), requiring a minimum inlet pressure of only 10PSI (.7 BAR). Using a 359° oscillator, a single unit can cover as much as 125,000ft² (11,612m²) of area by throwing an engineered mist in a 200ft-long (60m) cone using a powerful 25HP industrial fan.

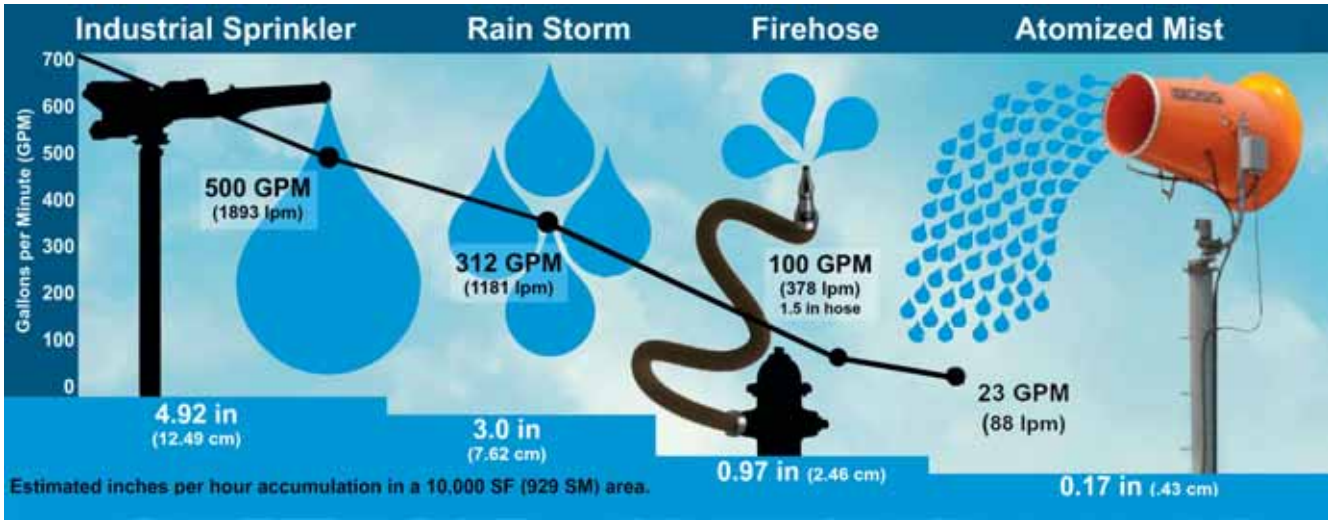
Atomized mist settles gently on the surface of material without saturation, controlling the moisture content and weight of the product. Lower water usage means less runoff and pooling, reducing product loss and overall operating costs.

The Logistics of Dust Control

Though wind is a concern when storing any bulk material outdoors, the offloading, disruption and loading of material into trucks, trains, barges and containers is the primary cause of petcoke dust. This makes identifying problem areas and employing the correct dust suppression technology very important around these operations.

To address dust from surface material caused by wind, coal storage facilities have successfully employed surfactants and

4 Harrison, Kerry, "Factors to Consider in Selecting a Farm Irrigation System: Table 1", University of Georgia, College of Agricultural and Environmental Sciences. Athens, GA, 2012.



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utilized atomized mist, both for dust control and as a chemical delivery method. Surfactants are compounds that mitigate the hydrophobic qualities of substances like petcoke and coal, allowing droplets to spread more effectively and prevent dust from escaping. When equipped with a dosing pump, atomized mist can distribute water and dissolved chemicals evenly across the surface of the pile. The angle of the misting machine can be adjusted so that it provides control of both surface dust and airborne particles.

To combat dust emissions caused by offloading and disruption, atomized mist units employ a specialized barrel design with an industrial fan on one end and a misting ring on the other. The machines can either be tower mounted or placed on moveable trailers for additional versatility. Units can be aimed and adjusted by remote control to address a specific location, and can be equipped with adjustable oscillation to cover a wide area. Trailer mounted units are easily relocated to provide coverage at problem areas across the entire worksite or in response to changing wind patterns.

Loading onto barges, ships and containers from a conveyor can cause dust to travel longer distances. As an additional option for dust management, a ring mounted at the discharge point can create a curtain of atomized mist around the falling cargo, preventing dust from escaping and directing it back into the main material flow.

Economical solutions to environmental problems

Operators of petcoke storage facilities, local residents, environmental groups, and state and federal officials need to agree on a list of best-practice solutions that will keep jobs in the area with as little environmental impact as possible. Given that the current approaches to petcoke dust management have not resolved all of the issues, alternatives to extreme solutions like enclosures should be thoroughly reviewed and considered before making them universally required.

Atomized misting systems have allowed coal companies to engage in environmentally responsible dust control with considerably less product loss and water usage than large-scale sprinkling systems. It could very well be the solution that makes the most economic and ecological sense for the petcoke industry, as well. DCi

Atomized mist is one of the few suppression technologies capable of controlling both ground-level and airborne dust.

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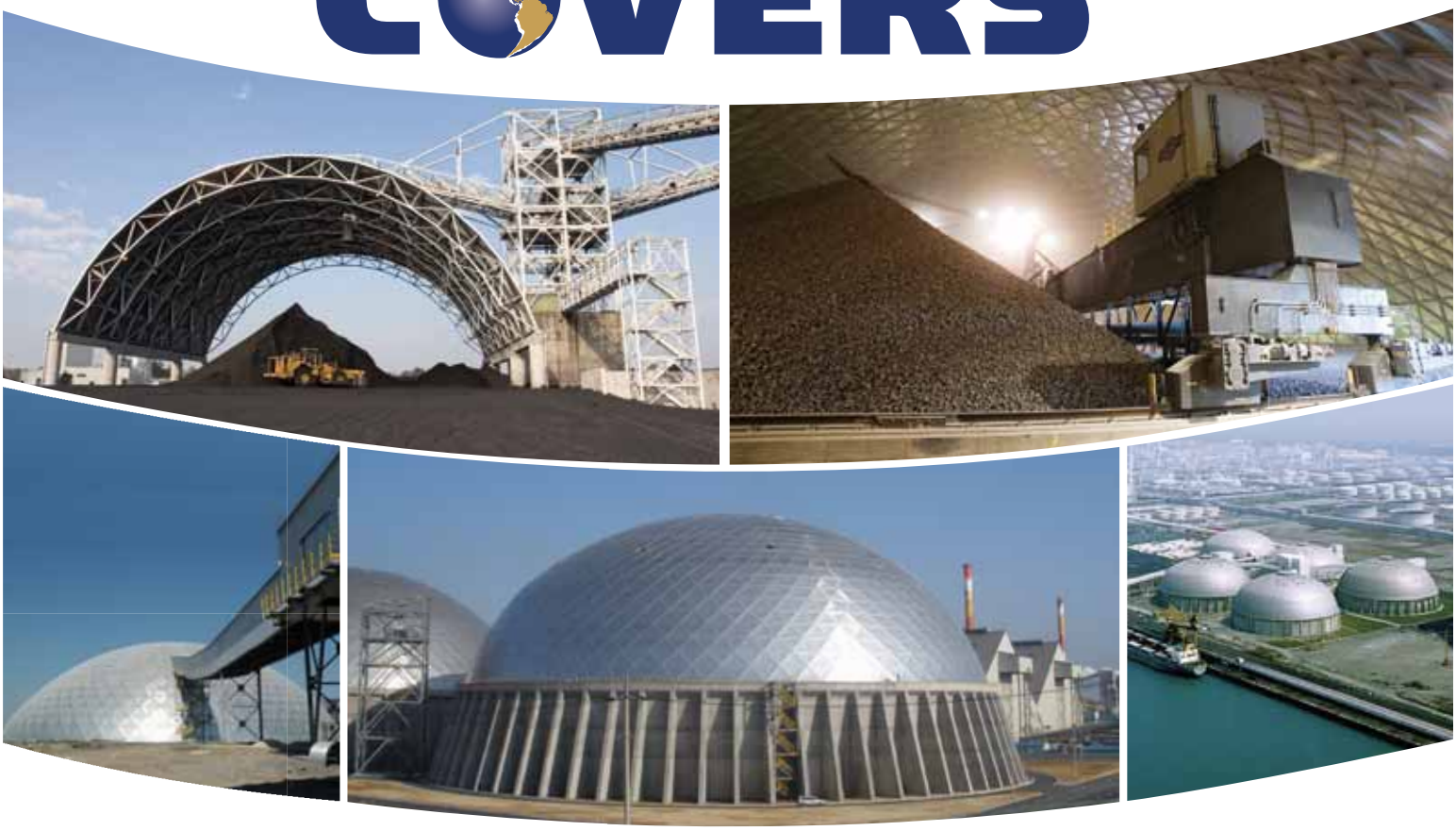

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RTU220 loading directly from trucks to a barge in the United States.

About EDGE Innovate

The EDGE brand stems from a long tradition in the engineering industry in Ireland. With over 25 years' experience designing and manufacturing machinery for a range of industries globally; the EDGE team is made up of 'old school' traditional quality engineering and innovative thinking alike.

All EDGE products are designed, manufactured and built in a new state of the art manufacturing plant based in Ireland, with a strong focus on quality assurance. As a result of decades of experience, EDGE Innovate is leading the way in the materials handling and recycling equipment sectors. The company's material handling portfolio boasts a wide range of mobile conveying systems that includes; the MS-Series (mobile stockpilers), the TS-Series (track conveyors), the RTS series (Radial Track Stockpilers), the FS-Series (Mobile/Track Feeder Stockpilers) and our new LTS-Series (low-level track stockpiler) launched in 2013 along with the added option of our 360° Unlimited Range. This growing range of equipment caters for the various needs of a rapidly growing customer base with a wide range of applications including rail loading/unloading, construction and demolition waste (C+D), sand and gravel, compost, topsoil, wood waste, mulch, scrap metal, aggregates and coal.

Introducing the EDGE RTU220 Radial Truck Unloader

The newly designed RTU220 is a new concept to the bulk materials handling sector. Designed to allow operators to continuously load directly from articulated road lorries and dump trucks into train wagons, barges, ships, and hoppers it is as comfortable on the port as it is in the harsh environment of the quarry or indeed the mine-site. The massive 23m³ (30yd³) hopper capacity increases cycle times and on-site production.

With access from three sides and with the added feature of hydraulic flared sides, the RTU220 hopper can also be fed directly by wheel loaders, excavators and grab cranes.

The high torque capacity of the RTU220 coupled with its adjustable belt speed allows the machine to be used to regulate the flow of material onto screens and crushers. Unlike feeder belt systems driven via a drum roller, the RTU220s' sprocket and chain design, ensure against belt slippage or stalling. With the capacity to convey 1,000 tonnes per hour (1102UST) with a maximum feed size of 600mm (23") and boasting a 140° radial conveyor the RTU220 is the number one choice across a range of applications.

Powered by a Cat4.4 96KW (129BHP) diesel engine, the RTU220 offers huge torque whilst only consuming 12–15 litres per hour (3–4USG). A further cost saving option of a dual power source is available to customers allowing the RTU to be tracked into position and then connected to an on-site three-phase electrical supply to power conveyors for a higher level of efficiency.

EDGE Supplies Fullen Docks & Warehouse with RTU220 and RTS80

Fullen Docks & Warehouse Incorporated is a full-service

EDGE's newly designed concept for the unloading of train wagons for a project in France: The TOL-TS80 (Train Off-Loader) has allowed the customer to rapidly increase the operator's production rate by allowing material to be directly offloaded from the train wagon into awaiting trucks.

intermodal river terminal and warehousing facility located on the lower Mississippi River, immediately north of Downtown Memphis.

After successfully tendering to provide expanded clay, shale, and slate to a light weight concrete block manufacturer, Fullen Docks had to come up a solution of moving and storing this fragile, lightweight material. Expanded clay, shale, and slate are produced by crushing the raw materials and heating them to 2,000°F (1,093°C). At this temperature the material bloats, or puffs up, because of the rapid generation of gases caused by the combustion of small quantities of organic material trapped inside. The problem with such a material is that it cannot be stockpiled via wheeled loaders as the material is

very fragile and breaks down under the weight of the shovel. Uniformed aggregate is vital in the production of light weight concrete so cross contamination caused wheel loaders was another major concern.

To overcome this challenge Fullen Docks decided to invest in two EDGE products; an RTS80 radial track stockpiler and a RTU220 radial truck unloader.

Prior to purchasing the RTU, Fullen Docks off-loaded barges using an excavator. From there it was transported to the storage area and stockpiled using wheeled loaders. By enabling Fullen Docks operators to continuously load directly from trucks into the RTU220's large 23m³ (30 cubic yards) hopper and into train wagons or barges, the Radial Truck Unloader removed the need to double handle the material and drastically improved cycle times and overall productivity.

For Fullen Docks to maintain a high quality product as specified by its customer, no cross contamination from Fullen Dock's other aggregate products could occur. To prevents this; a second smaller holding yard was employed for holding the lightweight aggregate. The issue facing Fullen Docks was the limited space provided by this yard to stockpile the vast amount of material required to fulfil their customer requirements. To overcome this shortcoming, Fullen Docks invested in an RTS80 radial track stockpiler to stockpile material directly from the RTU220. The RTS80 purchased by Fullen docks is a unique concept in that it is essentially a radial wheeled stockpiler and a track stockpiler all in one. It provides all the benefits found in two model types — the manoeuvrability found with a track stacker over rough terrain and the 360° radial stockpiling ability of a radial mobile stacker. The radial track stockpiler supplied to Fullen Docks was installed with EDGE's automatic stockpiling programme option. By combining automatic radial drive functions and self-angle adjustment, the RTS80 has the ability to create huge radial stockpiles with minimal supervision. Trucks at Fullen Docks were now able to offload directly in the RTU220 which in turn transferred the material into the RTS80 which has the ability to create radial stockpiles with a volume of up to 13,328.8m³ (17,433 yards³).

This flexibility of the RTU220 is highlighted by Fullen Docks future plans of deploying the RTU220 and its 140° 50FT Radial Conveyor to load directly into barges with materials from their Fullen Stone Department. The RTU220 has dramatically expanded Fullen Docks material handling options and has eliminated the need to double handle material, reduced their dependency on wheeled loaders and vastly reduced cycle times from the barge to the storage facility. Ultimately in the case of Fullen Docks; EDGE has been able to reduce its cost-per-tonne handled.

EDGE Innovate is exhibiting its wares at a number of up-coming exhibitions including;

- Matexpo – Belgium — 2–6 September
- Expobiomasa – Valladolid, Spain — 22–24 September
- Dry Cargo Conference and Exhibition — Rotterdam 30 September to 1 October
- Philconstruct – Pasay City, Philippines — 8–11 October
- CONEXPO Latin America – Santiago, Chile — 21–24 October
- Waste Management and Recycling Summit – Doha, Qatar — 4–5 November

Readers are encouraged to visit EDGE's stand at any of the exhibitions listed above to speak to a member of the company's team about the latest offerings, including the EDGE RTU220 radial truck unloader.

Serving the marine industry

TTS offers wide range of equipment for the cargo market

The TTS Group is a global enterprise that designs, develops and supplies equipment and services for the marine and offshore industries. TTS is a renowned supplier in its specialized market segments, with headquarters in Bergen, Norway and listing on the Oslo Stock Exchange.

TTS' workforce of approximately 1,000 people offers over 50 years of experience in the maritime industries. The group has subsidiaries in the United States, Brazil, China, Finland, Germany, Greece, Italy, Korea, Norway, Poland, Singapore, Sweden, and Vietnam. Through impeccable aftercare, it helps its customers get the best possible return on their equipment investment. It prioritizes development and improvement of its support network and service hubs around the world, increasing its ability to serve customers quickly and efficiently with minimal disruption to their operating schedules.

TTS' core business value is to ensure that customers operate TTS-supplied equipment efficiently and safely. To this end, it offers service agreements and training packages tailored specifically to its customers' requirements. A long history of delivering reliable hydraulic, mechanical and electrical systems provides the core of its service personnel expertise. With these qualified, experienced engineers stationed in key locations worldwide, TTS provides support at short notice, wherever the equipment happens to be. TTS also offers conversion programmes which are designed to benefit shipyards, operators, and owners in preparing their existing equipment for a viable and competitive future. This includes the adaptation of equipment for use in new ways and for compliance with new rules and regulations.

TTS Training offers the opportunity for operators and maintenance personnel to become familiar with TTS systems. The Training can be customized according to the customer's requirements and can cover operations and maintenance. TTS is committed to delivering cost-effective, safe and reliable systems

backed up by comprehensive and global service hubs. One of these service hubs is located in Houston-Texas-USA.

This facility in Houston provides local time zone availability in the Americas for new equipment sales, spare parts delivery and warehousing, urgent and *ad-hoc* equipment service, scheduled inspections, and surveys in support of all TTS brands and some third party equipment. The complete TTS product line is covered including, cargo cranes, anchor and mooring winches, hatch covers, cargo ramps, offshore cranes, rescue boat davits, ship lifts, heavy load transport systems, hydraulic lifting trailers and cargo cassettes, shell doors, and side loading systems.

This Houston facility houses a parts warehouse and service shop with capability to handle service for machinery systems and complete crane jibs in a clean, controlled indoors facility. The shop and staff are fully capable of handling mechanical and hydraulic repairs, light fabrication, and electric work in house, with partner organizations throughout the Houston area to assist with more intense fabrication and service.

The Houston facility handles TTS Products covered under previous brand names including Syncrolift, Kvaerner Ships Equipment, Kvaerner Brug, Hamworthy KSE, Hydralift, Norlift, O&K, Krupp Foerdertechnik, LMG, NMF, Friedrich Kocks, Kocks, Mongstad Engineering, Velle Systemer and Von Tell.

The TTS equipment portfolio includes cargo cranes and hatch covers specifically designed for the bulk cargo market. This machinery takes into account the hazardous nature of some bulk cargoes and the wide variety of port facilities which handle the cargo. The equipment is designed and built to maximize capacity, efficiency, and safety.

TTS cranes can handle a variety of self-discharge cargoes, and can help streamline bulk operations. The equipment designed for robust duty cycles and high load cycle times, which results is faster cargo loading and unloading, shorter port stays, and increased ships' revenue. TTS cranes come with an unlimited slewing range of 360°, machinery protected against maritime weather conditions by mounting inside the crane housing. Three main crane types are offered:

- **TLB:** electro-hydraulically driven up to 45 metric tonne capacity;
- **TLB–e:** electrically driven up to 45 metric tonne capacity; and
- **TLB-V:** four-rope cranes up to 40 metric tonne capacity for heavy duty, higher volume operation

TTS Hatch Covers undergo continuous product development resulting in high quality, strong, low-weight covers with reasonable manufacturing times. Four main hatch cover types are offered for bulk operations:

- **folding hatch covers:** the covers have a special design allowing them to be nested when the covers are stowed, keeping space requirements to a minimum. These covers can also be delivered with an insulated solution for reefer cargo.
- **lift-on hatch covers:** the covers can be lifted in non-sequential order, giving full operating flexibility, which is made possible by using different sealing arrangements.
- **piggy back hatch cover:** the covers originated for a new generation of bulk carrier whose design requires the hatch opening to be up to 80% of its width, without stowing space. These highly-automated hatch covers meet the needs of this vessel type.
- **side rolling hatch covers:** these covers use a simple, cost-effective construction and make use of a patented Auto Roll* mechanism, with the hydraulic cylinder, wheels, wheel recess, and auto-cleat device at the ship's centre line.

New developments at TTS include the production of heavy cargo deck cranes. A significant achievement was the delivery of the first two-piece cranes with SWL capacity of 1,000 metric tonnes, and 2,000 metric tonnes in tandem operation. TTS has since brought expertise in the design and manufacture of heavy cargo marine cranes to the growing offshore market in 2012, fulfilling an order for the first offshore crane with an SWL capacity of 900 metric tonnes for a jack-up offshore vessel. DCi

AUMUND equipment for RWE Power Plant

AUMUND arched plate conveyors replace coal feeders at RWE Power Plant (photo AUMUND).

AUMUND replaces 16 coal feeders with arched plate conveyors

With the conversion of 16 arched plate conveyors, AUMUND Fördertechnik GmbH contributed to the improvement of the operating procedures at the RWE power plant in Neurath, Germany. The conveyors, with a length between 12m and 32m, are used as coal feeders in the block units F and G. In August 2012 after investing €2.6 billion, RWE Power AG put the two additional lignite power block units F and G into operation with a performance of 1,100 MW each and improved systems technology BoA.

In Grevenbroich-Neurath, the first power plant block unit was put into operation in 1972. Until 1976 three 300-megawatt-block units and two 600-megawatt-block units were put into operation in total. The power plant uses lignite from the open pit mines at Garzweiler and Hambach (both in Germany) to produce the electricity base load demanded by private households and industry. With more than 4,200 megawatt, the seven block units cover more than ten percent of the installed output by RWE Power AG owned power plants.

The coal feeders for the coal mills of the block units F and G delivered by a competitor in 2012 did not work satisfactorily and caused high costs for downtime and maintenance. The two boilers each are fed by eight coal feeders.

Due to the structural situation and the high costs for new machines, AUMUND was contracted to improve the existing pan conveyors that were only two years old. The casings of the machines were conserved as far as possible and received additional reinforcements. On the outside sections of the machines gear unit, engine and bearings were re-used. On the inside however, all components including the drive shafts were replaced by AUMUND-machine parts of the BPB 250 line. In carrying out the contract, AUMUND undertook construction, production and installation supervision. The existing cleaning conveyors were converted from three strand- to two strand conveyors. The drive units remained, but their positions were optimized during the retrofit, while the drive- and tensioning stations were renewed.

In 2012 — two years after the initial start of operation — the AUMUND engineers conducted an inspection together with the customer. In doing so they noticed, that the existing pan conveyors based on round link chains of a third-party

manufacturer were heavily worn after only a rather short life span. Besides, they displayed substantial mechanical defects and did not fulfill the customer's demands concerning pressure tightness. During a rotational downtime of the plant, the existing conveyors were retrofitted by AUMUND specialists partially while the furnace kept working. Thus, a general overhaul could be executed with the heavily worn conveyors while avoiding a simultaneous boiler downtime, which would have been necessary under the given circumstances in the medium term.

For the retrofit, RWE selected light pan conveyors with an average performance of 150tph (tonnes per hour). During peak times, the conveyors can transport 200tph since one pan conveyor loads one megawatt. While designing the new machines within the existing casings, some constructive tricks became necessary to achieve the conveying performance needed. AUMUND decided upon welded pan conveyors, which had to be adapted very individually for the connection to the hopper.

The AUMUND conveyors with a standard width of 200 to 300 millimeters had to be built into the extremely cramped constructive space. Simultaneously with an adaption and a complete exchange of the former material feed, the conveyors were equipped with a new surface. Due to the limited space available between material feed, side plate and rollers on one side and the outer edge of the casing - pressure tight up to one bar - on the other side, a special construction had to be realized. Because of the negative pressure loading of the coal mills, special attention was given to a better sealing of the entire casing to avoid leaking air.

The arising material loads underneath the bunker chutes were brought under control by installing a baffle beam. With an increased board height, the feedback conveyor had to be lowered. Besides, a smaller sprocket wheel was used.

While equipping the pan conveyors, the designing engineers selected the AUMUND chain AU6052 .With a significantly higher safety than normally chosen for comparable uses, notably higher service life can be achieved. The use of new flights between the chain strands, the lowering of the tensioning axis and the installation of a new sprocket wheel completed the retrofit.

About the AUMUND Group

The AUMUND Group is active worldwide. The conveying and storage specialist has special expertise at its disposal when dealing with bulk materials. With their high degree of individuality, both its technically sophisticated as well as innovative products have contributed to the AUMUND Group today being a market leader in many areas of conveying and storage technology. The manufacturing companies AUMUND Fördertechnik GmbH (Rheinberg, Germany), SCHADE Lagertechnik GmbH (Gelsenkirchen, Germany), SAMSON Materials Handling Ltd. (Ely, England), as well as AUMUND Logistic GmbH (Rheinberg, Germany) are consolidated under the umbrella of the AUMUND Group. In conjunction with the headquarters of the manufacturing companies, the global conveying and storage technology business is spearheaded through a total of eight locations in Asia, Europe, North and South America.

DCi





www.orts-grabs.de

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Shipboard cranes and grabs

simplifying bulk cargo transfers

On-board grabs and an ideal link from ship to shore: ORTS Maschinenfabrik

Made in Germany

The company dates back to 1972 when it was founded as an engineer office and consulting company, specializing in the construction of grabs (main business) and many other kinds of bulk handling equipment.

To start with, the company only dealt directly with construction and sales. All manufacturing took place at well-known companies in Northern Germany.

In 1985, the company founded its own workshop; at that time, it was also renamed ORTS GmbH Maschinenfabrik.

ORTS offers a wide range of grabs and lifting beams, many of which are in use on-board bulk vessels to load/unload cargoes. They are particularly useful at ports that do not have the infrastructure to offer their own loading/unloading equipment. This means that the self-loading/unloading vessel can call at a wider variety of bulk ports, without restriction.

Among the equipment offered by ORTS are electro-hydraulic grabs; diesel hydraulic grabs; rope-grabs; lifting beams and special constructions.

Electro-hydraulic grabs

The clamshells of electro-hydraulic grabs are opened and closed using hydraulic cylinders. The drive unit for this is an electro-motor with hydraulic pump. The drive unit of the grab

needs an electrical power supply from the crane via a cable. The grab also receives its commands through this cable. It is necessary to fit a cable guide to the crane jib to carry the cable.

Diesel-hydraulic grabs

The clamshells of radio controlled diesel-hydraulic grabs become are opened and closed using hydraulic cylinders. The drive unit for this is a diesel motor with hydraulic pump. The commands are given by the crane driver over a radio control to the grab. The crane does not need any additional equipment to operate these grabs. The grabs can be operated on every kind of crane at once. The effectiveness is similar to electro-hydraulic grabs, and in special cases even better.

The advantage of the diesel-hydraulic grab is that there is no need for crane accessories, and no limitation in the working height by discharge into hoppers

Rope-grabs

Mechanical rope grabs are opened and closed using ropes direct from the crane. The system is like a block and tackle. Depending on the crane type, there are different types of mechanical rope grabs. Options include: single rope grabs, two-rope grabs (one holding rope, one closing rope), three-rope grabs and four-rope grabs (two holding ropes, two closing ropes).

Customized and special construction grabs

ORTS can also supply customized grabs, as well as unique special constructions such as swimming oil-salvage grabs for recovering oil from the water surface (following ship accidents, for example). This grab can still operate when other oil-removing equipment has to give up: stronger weather with waves and waste swims between the oil.

In the early 1980s, ORTS started offering its first grabs with 100% enclosed buckets for protecting the environment.

The biggest-ever grab made by the company was a 115-tonne dead weight salvage grabs for destroying and removing shipwrecks. This grab is considered to be the biggest functioning grab in the world.

The biggest dredging grabs were constructed for Russia with 60t and 80t dead weight each.

ORTS's main customers are shipping companies, where the grabs has to withstand the rough conditions on sea-going vessels, loading and unloading vessels in every corner of the world.

ORTS is also able to repair grabs made by other manufacturers.










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Quality is key for Negrini grabs

It is well known that any good machine — whether it is a cable crane or a hydraulic excavator — will only perform at its best if the attachment used to work with it is well engineered and manufactured. In fact, a high-quality attachment not only does a good job, but it also reduces machine stress, allowing for safer working and helping to save energy. This is true for bulk handling grabs, whether used onshore on on-board self-handling vessels.

That's why choosing the right attachment is one of the main concerns for any wise contractor and a very important factor in guaranteeing the successful outcome of any job.

Over the last 48 years, the Negrini company has engineered and manufactured attachments of the highest quality. These include: mechanical and hydraulic clamshell buckets; cable clamshell buckets with radio-controlled release; orange peel buckets both mechanical and hydraulic; two- or four-rope scoop grabs; dragline grabs; trenching mechanical clamshell buckets; and buckets with special designs for controlled digging depth and special valves that are widely used to collect polluted mud from the sea or river bed.

Since 1967, the Negrini company has engineered, manufactured and supplied contractors and port authorities with buckets for all those jobs and every bucket has been a success. That's why Negrini has gained a very good reputation in this field.

Buckets like those that Negrini delivers worldwide are often engineered by some manufacturers in such a way that the end product is heavy and clumsy. Negrini's engineering concept is different because its engineers believe — and decades of practice show they're right — that heavier buckets are not always stronger; in fact they prefer to combine a large use of high tensile steel like Hardox with very accurate engineering. In this way Negrini buckets are more resilient and yet lightweight, thus enhancing performance whilst granting significant energy savings.

All this is the result of Negrini's long experience built up by case-by-case studies.

Negrini's attachments are at work in many different parts of the world: from Italy to the United States, and from the Gulf countries to Australia, Negrini is the brand of choice for many contractors.

One source of satisfaction for Negrini is the recent sale of ten units, in co-operation with the company Lameter srl of Genova, destined for the Asian market and more specifically, Qatar.

This is one of the most important business deals ever made by the company, not only in Italy, but worldwide.

The contract includes hydraulic grabs for excavators for the handling of heavy material (heavy duty).

In recent years, the company has expanded its client base, including a number of important foreign companies operating in the port sector and construction equipment. Over the last few years, the equipment has been in operation in the most important ports and quarries in the world.

The success of Negrini's products has increased dramatically in recent years, confirming that performance and quality are decisive factors for contractors that want attachments for their most demanding jobs.

BECO | GRABS

Technology that grabs you!

Our program of Grabs:
- Mechanical clamshell buckets
- Hydraulic clamshell buckets
- Electro-hydraulic clamshell buckets
- Orange Peel grabs
- Specials (tailor made)

Electro hydraulic clamshell bucket

Mechanical one rope clamshell bucket with remote control

Mechanical four rope clamshell bucket

Mechanical one rope clamshell bucket

Electro hydraulic clamshell bucket

Hydraulic clamshell bucket

Hydraulic clamshell bucket with connection piece

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Major expansion increases Blug market share

Credeblug is heavily involved in the dry cargo handling equipment industry; examples of its grabs are working successfully in over 52 countries, where the Blug name has become synonymous with quality.

Over the last few years, the company has completed an international expansion, achieving a staggering 80% increase in international turnover in 2014. Blug's products range in capacity from 50 litres to 150 tonnes, and the company is one of the few manufacturers in the world that offers a quality rope-operated, hydraulic and electro-hydraulic or motor grab catalogue. The year 2015 year will be an important one for the company due to its 50th anniversary celebration.

The company's history dates back to 1965, when its main focus was on special products for the steel industry. From the very beginning, Blug's equipment has been highly specialized and manufactured to a high quality, and focused on the handling industry, which is today a core business for Credeblug.

With a strong position in the port handling sector, Blug's equipment is used increasingly often in bulk handling applications where reliability is a key factor, helping Blug to maintain its strong market reputation.

Coal handling applications

Coal represents major volumes in bulk port applications. Historically, it has been one of the 'star commodities' often handled by grabs. Therefore, grab solutions have continuously evolved and specialized to improve loading cycles for this material.

Based on a 0.8–0.9t/m^3 average density, Blug's range for coal handling offers a wide variety of options depending on the crane and capacity requirements. The key factor to obtain a fast return on investment for this kind of application is to optimize a grab's capacity/self weight ratio and offer the highest lifetime versus purchase, start-up and maintenance costs.

Credeblug has been continuously adapting and developing its rope-operated product range to progress on loading capacities and environmental impact. One of the aspects that has been specially developed during the last years has been the ecologically friendly grab range. Due to pollution that bulk material loading can produce in the environment, Blug products include dust-proof closed valves structure.

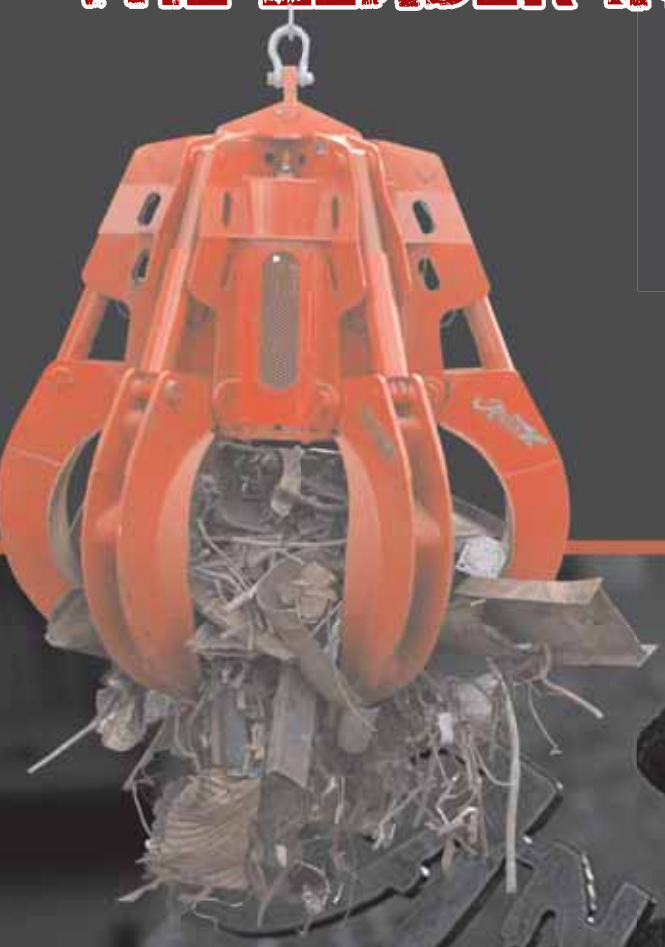
The C4, CV2 and CM4 grabs are the most representative models of Blug clamshell grabs for coal and bulk handling applications.

ANVIL ATTACHMENTS

Hawco • Pro-Line • Owen • Yaun • Williams • Drott

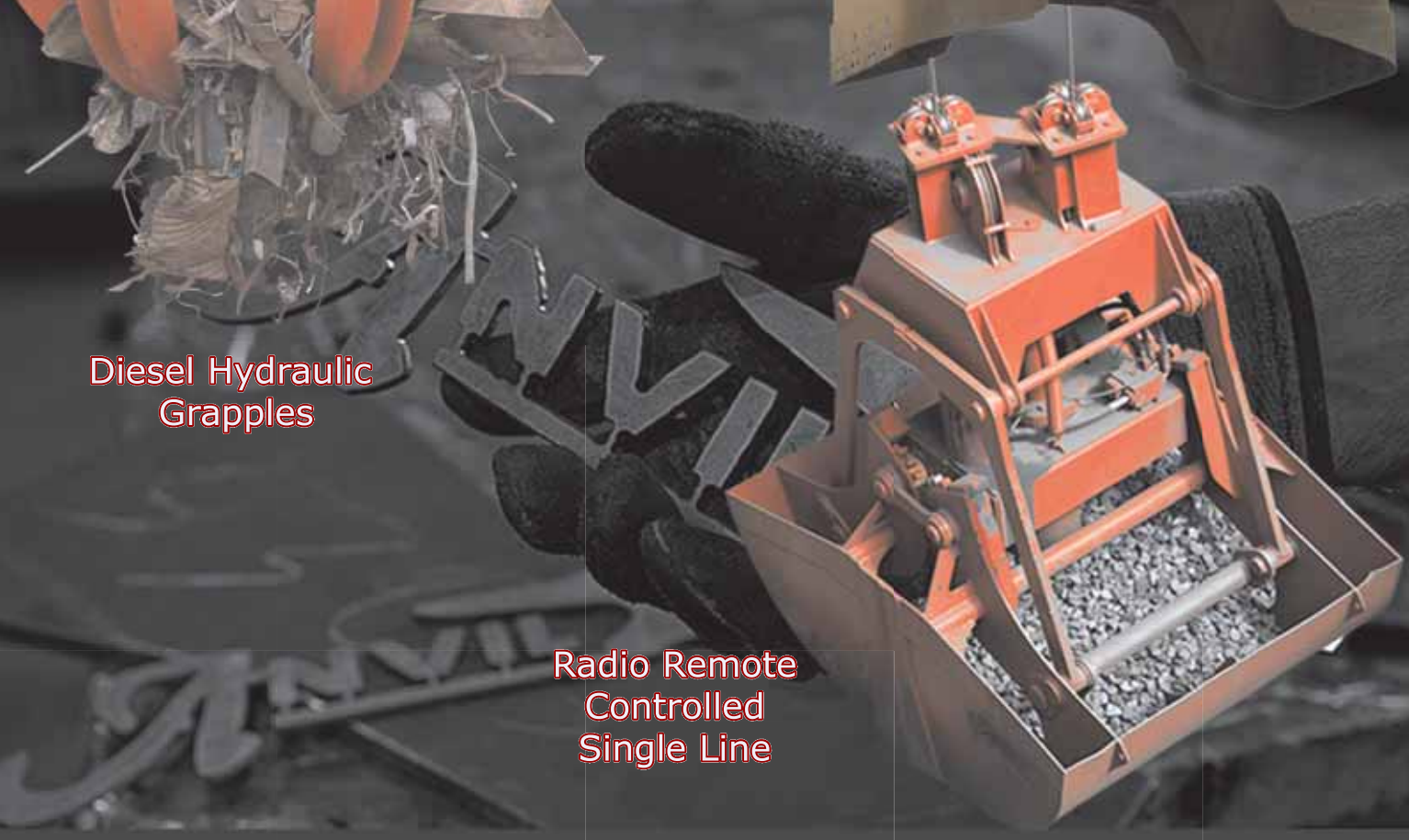
Rope Grabs

THE LEADER IN DRY CARGO GRABS



Diesel Hydraulic Grapples

Diesel Hydraulic Buckets



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Company expansion

Following the expansion and product developments of the Credeblug company, its customer portfolio has included during 2014 some of the principal European crane manufacturers as crane/grab perfect combination is one of the key aspects to be considered for the profitability of any shipping contract. In 2014, the port cargo handling business has represented the biggest income within company's portfolio and the incoming deliveries for the first quarter of this year represent the best figures in the company's history so far.

These orders' figures show the market tendency and Blug products' market reference position for the biggest lifecycle value solutions. Fifty years of experience, in addition to continuous product development, makes Blug a very competitive option that offers a step forward in the grab business

NEMAG fully prepared for market upturn

NEMAG clamshell grab handling ilmenite.

Ninety-year-young NEMAG celebrated its anniversary last year and the company is running at full speed.

The orderbook for NEMAG is well filled and prospects are looking very good for the next half year and next year

The sentiment in the market has changed and demand is increasing at a fast rate.

To deal with the increase in activities, during the last three years NEMAG has invested in design software, new manufacturing tools and technology as well as adopting lean manufacturing.

Currently NEMAG holds the IBJ Award for the most innovative company in the dry bulk industry.

This award , heavily competed for by a large number of leading companies in the industry, was the combined result of ground-breaking research projects as well as the introduction of a new generation of environmentally friendly clamshell grabs.

Unloading alumina from the hold.

Scissors grab for unloading coal en route to the customer.

- the research project with TU Delft has led to the development of Rapid Prototyping Simulation software for designing and testing grabs/new grab types in a virtual EDEM/ADAMS environment; and
- the newly developed environmentally friendly clamshell grab offers improved eco friendly bulk handling as well as reduced risk of damage to ships's holds as there are no sharp corners at all in the grab design

These achievements are the result of continuous search for innovation.

NEMAG historically focuses on medium to very large bulk handling companies with a high to very high berth occupancy; this means terminals handling high volumes of cargo, high crane speeds and the need for high reliability.

Examples of such companies are: VALE Brazil – Oman – Malaysia; EMO and EECV Rotterdam; EBS Rotterdam; OBA Amsterdam; Nippon Steel Japan; JFE steel Japan; SSAB Sweden and many others in more than 60 countries worldwide

This market requires tailored solutions, because each grab unloader is of a different configuration and each application requires specific solutions.

In recent years, NEMAG has also focused on design and manufacture of standardized grabs which are used with mobile harbour cranes (MHCs).

This has resulted in a number of eye catching supplies for MHCs such as supplies for LIEBHERR LPS 600s in Poland, LIEBHERR LHM 400 and 550s in France, as well as TEREX 6, 7 and 8 series cranes in the United Kingdom, Belgium, France, India and South America.

For this specific market segment, clamshell grabs of up to 46m³ (coal) are available and have been supplied for various MHCs.

30m³ clamshell grab unloading coal.

A recent delivery by NEMAG, and one of its most impressive, has been to France: two mega-sized cactus grabs for handling wood chips with a volumetric capacity of 50m³ for a Liebherr LHM 550.

The grabs were commissioned successfully last month and

Experience the progress.

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LIEBHERR
The Group

NEMAG has delivered two 50m³ mega-sized cactus grabs for handling wood chips to France.

highlight a new product in the NEMAG product range; still based, however, on a long tradition of experience and expertise in grab designing and manufacturing.

Apart from grabs, NEMAG is known for its NEMAG Quick Release Link and Rope Pear Sockets; product which are literally linked to the grab and make a safe and fast change over of grabs possible within minutes.

NEMAG looks ahead with great optimism and determination to maintain and extend its position as a leading quality player in the market.

J&B GRABS

With more than 60 years' experience, J&B Grabs is the name you can rely on


Hydraulic High Volume Grabs


45 m³ Hydraulic Grab


High Volume Rope Grabs 31.5m³


Hydraulic Rehandling Grab


Hydraulic Cactus Grab (1.6m³)

Rope Cactus Grab (10m³)

J&B GRABS FOR ALL KINDS OF BULK HANDLING

Products:

- Cactus Rope Grabs
- Rehandling Rope Grabs
- Hydraulic Cactus Grabs
- Hydraulic Rehandling Grabs
- Hydraulic Wood Grabs
- Hydraulic Demolition & Sorting Grabs
- Quick Change System
- Multipurpose Spreader

New Products:

- Big Bag Frame
- Cellulose Frame

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Family values at the root of Mack Manufacturing's success

US company Mack Manufacturing originated as a welding shop in 1942, and every family member since has come into the business with a personal appreciation of the craft. While the company has evolved into the required knowledge and skills to support the thriving, multifaceted enterprise, Mack's family values remain firmly rooted in pride of workmanship.

The Mack facility in Theodore, AL, USA, is fully equipped to complete the company's full range of manufacturing and remanufacturing tasks under one roof. Mack maintains its own onsite engineering staff and technology, supporting its professional staff in customer service and quality assurance. Mack's production services are built on a highly experienced manufacturing team providing the trade skills to operate and maintain its comprehensive fabrication machinery, from plasma burning to precision machining to final finish.

The shared insights and experience of the team help Mack to maintain high-quality support capabilities. Sales, service and engineering staff are fully initiated into Mack's inside procedures and processes before they are assigned to represent the company in the field. Personal experience is the key to delivering the expert onsite training that helps customers to maximize the service life and productivity of their equipment.

Mack's grabs and grapples are used in a wide range of industries, including: pulp and paper; logging and sawmills; steel mills and smelting; recycling and salvage; waste handling; stevedoring and port facilities; dredging operations; cement processing; aggregate and ore processing; utilities and power generation.

Grapples & grabs

Mack's grapples are custom-designed to suit customer requirements. Backed first by more than 73 years of experience in the industry, the range includes: log grapples; scrap grapples;

waste grapples; rock grapples; single-line buckets; two- and three-line buckets; four-line buckets; hydraulic buckets; and diesel powered buckets.

Mack grapples are designed to be durable and long lasting. Some of the advantages include:

- wear points are hardened to extend service;
- moving parts are supplied with protective grease fittings to prevent accidental damage and ensure proper lubrication;
- built with heat-treated alloy steel that combines light weight with rugged strength; and
- furnished with replaceable bushings at hinge points for ease of maintenance.

Custom engineered for the customer's crane and power supply

Wire rope

- two- and four-line configurations with wedge type open sockets for easy rope connection;
- sheave grooves cut to customer specifications to ensure long rope life;
- each sheave has grease point to ensure long bearing life; and
- hardened guide rollers are supplied at strategic points to prevent cable wear

Hydraulic

- optional cold weather packages, cable reels, and 360° rotation;
- explosion-proof configurations;
- furnished with Mack heavy-duty cylinders to ensure long life.

Single line

- convenient, completely self-contained, requiring only a hoist hook-up;
- diesel-hydraulic, touch and go, and hydraulic configurations;
- operated by mechanical trip, pull cord, or radio remote control.

Mack 'thinks big' to keep pace with new ship's gear

Mack Manufacturing has been building on its range of single-line clamshell buckets to offer larger equipment for the higher-capacity cranes appearing on some of today's newer ships.

"We have been receiving orders recently for ship-mounted cranes rated up to as much as 30 and 35 tonnes," says Matt Davidson, Vice President of Sales & Marketing at Mack. "25-yard buckets used to be the largest size we ever produced for these applications, but we'll build them as big as our customers need."

Mack is a leading manufacturer of crane attachments for a full range of stevedoring applications. While smaller 'touch & go' buckets were previously more common in use with the ship's cranes, Mack has found that most ship builders and stevedoring firms have adopted their radio controlled, single-line buckets over recent years. One innovation that is gaining in popularity is Mack's self-contained diesel-powered grapples and buckets with remote controls. This model allows customers to handle materials with higher densities such as pig iron and HBI. "Our single-line buckets can be designed to meet the larger sized requirements than the old 'touch & go models'," says Davidson, "but they still offer the simplicity and versatility you want on a ship's crane, compared to the electrically powered units used by port facilities."

Mack offers a full range of medium-duty buckets recommended for off-loading bulk materials up to 100 lbs./cu.ft., as well as light-duty buckets that offer weight-savings and lower costs for moving grains and similar materials weighing under 60 lbs./cu.ft. Mack radio-controlled models allow operators to actuate the bucket hydraulics from onboard the ship or from the dock, anywhere within a 500ft. radius. The solenoid control valve on the bucket is powered by a basic 12 V marine battery. Standard models include a second valve which can be attached to a ¼" line as a backup to the radio control.

With more than 30 years experience supplying equipment for ships and ports, Mack works with its customers to help them assess the optimum bucket size and type to match the equipment and cargoes they require. "Our goal is to move the maximum amount of material over the longest possible lifecycle," says Davidson. "That's how our customers get the best value from our products."

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Verstegen: dedicated to grabs

Verstegen is a leading manufacturer of rope operated mechanical grabs for the dry bulk industry. Stevedoring companies, port authorities as well as steel works and power plants use the company's grabs to handle all kinds of bulk materials. There are more than 10,000 Verstegen grabs operating in more than 100 countries worldwide; many of these are in use on board ships.

Verstegen is specialized in the design and construction of grabs. Its people are continuously working to develop and build efficient and cost-effective grabs. Besides its standardized product range, Verstegen also develops unique solutions for specific situations and customer needs.

For fast and efficient unloading, a grab is one of the most important tools. In order to get high unloading rates, the grab must be extremely reliable with a high productive capacity. Furthermore each grab should be custom-built for the material it has to handle and the unloading situation in which it has to operate.

In order to obtain the highest productive capacity, a grab should have the highest possible volume without unnecessary dead weight. This is only possible with a good and well proven design and the use of the best possible materials. To increase strength and minimize wear, each Verstegen grab is provided with shells completely made of high tensile wear resistant steel. The friction in the articulation points is absolute minimal because of an excellent bearing system.

A different grab for each bulk material

Each material has its own specific properties and a grab must be adjusted to these properties. A grab that will work perfectly handling coal can have great difficulties whilst handling iron ore. Through wide experience and extensive expertise, Verstegen has developed a number of grab models, especially designed for common bulk materials (coal, iron ore, agribulk, fertilizer, phosphates, and so on). As well as grabs for these materials, Verstegen also offers special solutions for other bulk materials with specific properties.

In order to improve the strength and extend the lifetime of the shells, all Verstegen grabs are made of high-tensile wear resistant steel, Hardox 450.

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Pulp bucks the trend

Patrick Knight

In contrast to most commodities, the prices of which have tumbled in the past few years due mainly to oversupply, the price of market pulp has continued strong enough to encourage companies in Brazil to make a start on four new pulp lines.

With the world price of most of the commodities exported by Brazil far below their highs of recent year, with the country's economy teetering on the verge of recession and likely to shrink by up to 2% this year, there is little favourable news at the moment.

One exception to the gloom, however, is market pulp. The four leading companies in Brazil, Fibria, Suzano, Klabin and Eldorado, whose mills already make about 15mt (million tonnes) of pulp each year, have made a start on building new lines which will add an additional 6.5mt to total output by about 2020.

Pulp exports will increase from the 10mt of 2014, to 15mt by 2020. Little of the extra will be needed in Brazil, where demand for most grades of paper grows only slowly.

Hundreds of thousands of the farmers who grow soya responded to several years of high prices by planting more, while the record price of iron ore attracted numerous new mining companies.

Things are very different in the pulp industry, which is dominated by a small number of large companies. Even though they are nominally competitors, the firms all work together to ensure that only one new mill starts up each year, so no excess of pulp causes prices to plummet.

The latest generation of mills are each able to make close to 2mt a year and cost about $2 billion to build. A similar amount is needed to plant the thousands of hectares of forest needed to supply the mills. A go-ahead to build a new mill is only given once the company concerned is confident that a market for the new output will be there.

World demand for pulp continues to grow slightly faster than the global population. This is mainly because the tens of millions of people who migrate each year from the countryside to cities in numerous countries around the world, notably in China, other countries in Asia, in Africa and other developing countries use far more paper than those in living the countryside.

In addition, several high cost mills mainly in Europe or the United States close down each year, leaving space for the lower-cost pulp made at Brazilian mills. Fibria claims it will cost less than $160 to make each tonne of pulp at its new mill, the lowest price in the world. This is because of economies of scale and also because far less manpower, getting more expensive year by year, is needed to run the latest mills.

The adoption of new cloned varieties of eucalyptus and pine means that productivity in forests has been growing fast as well in recent years. Less land is needed to produce each tonne of wood than before, so less capital is needed to buy or rent land. In the past, the full cycle of a plantation of eucalyptus lasted about 24 years, and trees were allowed to sprout twice after the first cut. But the latest varieties are cut after just six years, with

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the new trees producing much more than their predecessors,

The giant Klabin company is the leader in packaging materials in Brazil, notably of the packaging first used to package drinks such as orange juice and soft drinks, but which is now used to hold fruit and vegetables, notably tomato products. This has replaced glass and cans.

Klabin was the first to start work on its 1.5mt-capacity mill, which will make two types of pulp. Long fibre pulp is more suitable for making the robust type of corrugated paper used to make packaging, as well as for various types of board, so Klabin has always used a blend of both long and short fibre pulp to make its paper. A hundred per cent of short fibre eucalyptus pulp is by the other companies, being used to make printing and writing, tissue, and most other types.

Brazil's pulp industry was hit hard by problems caused by poor investment decisions made prior to the 2008 financial crisis. The crisis bankrupted Aracruz, forcing it to merge with VCP. VCP was the pulp arm of commodity giant Votorantim, also strong in cement, and in aluminium and other metals. Fibria was the result.

With its debts now manageable, Fibria is soon to start work on a new line at the company's 1.7mt-capacity Tres Lagoas plant, located alongside the Parana river in Mato Grosso do Sul state. This mill, together with a newer one close by owned by the Eldorado company, is much further from most of Brazil's large cities or from ports, than the earlier generation of mills belonging to Aracruz, Votorantim, Klabin, Suzano and numerous smaller companies. All of these were built close to the coast, to be within easy reach of ports such as Portocel, Santos and in Klabin's case, Paranagua. Rail links allow the companies to transport the pulp to their own terminals at port in specially built rail wagons.

A 1,000km rail line also links both Fibria's mill, as well as that of more recently built Eldorado company, to Santos. Eldorado is controlled, and mainly owned by the world's largest meat producing company, JBS.

Eldorado's mill, started up in late 2013, is now the largest in Brazil, and made close to 2mt in 2014. The company will soon make a start on a new line at its Mato Grosso do Sul mill. So far, Eldorado has been far less cautious than its longer-established peers as far as building new mills is concerned. Eldorado also seems to be more confident than the giant Suzano company, which has recently started up the first very large mill in Brazil's the north east. Suzano's new mill is also located alongside a railway which links with the line which takes Vale's ore from its Carajas mine to the port of Itaqui. The mill was planned to be the first of two, but Suzano has now decided to delay making a start on second plant in Maranhao state for the time being. In addition to the new mills to be built by Klabin, Fibria and Eldorado, CMPC is also pushing up production at its mill in Rio Grande do Sul state.

Brazil's National Development Bank, the BNDES, has always provided much of the finance needed to build virtually all the new mills, as well as for planting the forests needed to provide the wood needed. Soon after it was formed in the 1960s, the BNDES set about identifying industries which experts considered could be competitive on a world scale. One of the first to be pin-pointed was pulp and paper, as well as steel. More recently the meat industry followed suit.

While Brazil has long been a world leader in pulp, until recently the country's very fragmented beef industry lagged behind that in neighbouring Argentina as well as much smaller Uruguay on the world stage.

This all changed a decade ago, when the aggressive Batista brothers formed the JBS company. With Development Bank help, JBS set about buying up numerous other beef processors facing financial difficulties. The first of these was in Brazil, but soon after JBS began buying meat packers in Brazil's two southern cone neighbours, Argentina and Uruguay, both which had traditionally exported far more beef exporters than Brazil itself. Taking advantage of the fact that the Brazilian currency, the real, was relatively strong at the time. JBS bought numerous large and well known firms which were in difficulties further afield, first in the United States, to be followed by companies in Australia, Asian countries, and even some in Europe. Low-cost BNDES funding has been instrumental in allowing JBS to emerge as the world's leading meat processor, as it now handles pork and poultry, as well as beef. Partly because it was able to take advantage of exchange rate fluctuations, JBS became very profitable in the process.

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Looking for new fields in which to operate, and encouraged by the BNDES to join the ranks of the then troubled pulp industry, JBS turned to pulp. Even though it had no previous experience in the industry, JBS's Eldorado 2mt giant, is the largest mill in Brazil.

Fibria sells much of the pulp it makes at Tres Lagoas, to the neighbouring International Paper company, which bought a paper mill which VCP had built before the newly formed Fibria company decided cease making less profitable paper and concentrate on pulp. Unlike its more cautious peers in the pulp industry, JBS has never been worried about borrowing huge amounts, both to finance its take overs of meat packers, and to build the Eldorado mill. But in the present rather delicate financial climate, private investors, which are quite happy to lend large amounts to Fibria, Klabin and Suzano, have steered clear of the more brash, although apparently equally successful, Eldorado. This company sometimes cuts corners and has rather blotted its copybook by planting cloned stock developed by and patented by Fibria for planting in its own forests. Eldorado was obliged to pay large fines to Fibria following legal action.

Aracruz, VCP and Suzano were all originally family owned companies and although the BNDES often pushed them to merge in order to achieve economies of scale, their founders refused to accept the idea.

But the financial crisis of 2008 which rocked Aracruz and forced its merger with VCP, together with the disappearance of their original founders, has made the idea of their mergers more acceptable to the industry's current present professional managers. Executives at Fibria have made no secret of favouring a merger with Suzano, perhaps subsequently one with Eldorado as well.

Basking in the apparent strength of their meat trading business, which is spread across five continents, and seemingly little affected by the prolonged financial crisis in many markets Eldorado, has so far turned up nose at such a plan. But with a downturn in the price of the beef and now chicken and pork which are still responsible for the lions share of the company's profits, and with the Development Bank under pressure to be more transparent in its operations, who can be certain of what the future may hold? The emergence of one huge pulp producing company in Brazil is quite likely in the medium term. On its own, Fibria will soon be making almost 8mt of pulp.

The short fibre pulp which forms the majority of what is made in Brazil, is particularly suitable for making tissue, used both to make sanitary and also paper towels. But until now, only small quantities of 'fluff' pulp, used to make nappies, as well as items for women's sanitary needs and the incontinent has been made in Brazil, so most of the 400,000 tonnes used each year, has been imported.

As part of their expansion plans, both Klabin and also Suzano are in the process of installing equipment able to make 500,000 tonnes of fluff pulp at their mills. Within a short time, Brazil will switch from being a leading importer of this product, to have up to 100,000 tonnes for export. As befits its long experience with long fibre, Klabin will use this type of pulp exclusively to make fluff. Suzano, on the other hand, which many years ago, pioneered the use of eucalyptus wood surplus to the needs of the railways, which had planted it for fuel in locomotives, to make short fibre pulp, will use that type to make the product. Some long fibre pulp will be incorporated in Suzano's fluff product as well

After a year when it was halted, and when the Orsa packaging materials company was taken over by International Paper, the pioneering Jari mill deep in the Amazon jungle, was re-started early this year. Jari is scheduled to make some 220,000 tonnes of soluble pulp in a full year, rather than the 400,000 tonnes of market pulp made from a variety of woods, which it did previously. After experimenting with several exotic types of wood, notably the African Gmelina, Jari has now settled for eucalyptus as the most appropriate one.

With the economy in the US on the mend, but more importantly, with domestic consumption of all types of timber, and wood products growing fast, the owners of the majority of planted forests in Brazil, the Association of Pulp and Paper Producers, Bracelpa, in the lead, but also including the makers of MDF, and particle board, have merged to form one large forestry entity. Brazil now boasts about 14 million hectares of planted forest, and with demand booming in all sectors, the industry anticipates the area increasing to 20 million hectares in the next few years. By then twice as much MDF and Particle board, as well as other panel products, is expected to be needed. Most will be used by the booming furniture industry for sale in Brazil.

Compact material handler for timber handling

SENNEBOGEN has brought the latest generation of the 723 to market with compact dimensions, a sophisticated machine concept and numerous equipment variants. The mobile timber handling machine offers a tailor-made solution above all for smaller saw mills and timber processing companies for efficient timber handling.

For decades, the reliable timber handling machines of the Bavarian manufacturer SENNEBOGEN have proven themselves to be ideal in demanding practical use. With the new edition of the 723 of the current E-Series, SENNEBOGEN brings a machine with 27-tonne deadweight to market, with especially impressive compact dimensions and maximum stability in demanding timber handling. Equipped with a diesel engine complying with the Tier 4f emissions standard, a newly designed robust mobile undercarriage, and particularly low consumption values, the new material handler is made to impress.

As a mobile timber handling machine, the SENNEBOGEN 723 is at home in the saw mill and in the log sorting yard. The drive is provided by a 119kW strong diesel engine. With a two-stage all-wheel travel drive and 11m equipment length, the machine also offers smaller companies the best possibilities for optimizing their timber handling processes. After the successful market launch of the larger SENNEBOGEN 735 in 2014, the second type of this machine generation will be available via the worldwide network of SENNEBOGEN sales partners starting in autumn 2015.

Compact dimensions: manoeuvrable and safe even in narrow alleys

Special attention was paid to the safety features of the machine during design and development. A newly designed access ladder, in combination with the peripheral uppercarriage railing and the extensive step grids, ensures maximum work safety. A massive, full protective grating is installed on the cab as a standard feature and can be supplemented with an armoured glass pane. An extensive travel drive protection on the undercarriage is optionally available.

Thanks to compact dimensions of 3m in width and a rear radius of 2.52m, the machine can even move safely into narrow alleys. Thus logs can be conveniently manipulated to a height of approximately 10m. Thanks to the 360° infinitely rotating uppercarriage, the machine can always be moved out forwards again, eliminating the need for complex manoeuvring. This also makes it significantly easier to unload trucks.

The new SENNEBOGEN 723 is optimally equipped for use on demanding terrain, inclines and difficult substrates. The two powerful travel drives with two speed levels accelerate the machine up to 20km/h. With wide twin tyres and a supplemental support plate, the machine is stable in every position.

Ergonomic work environment with optimum overview from the cab

The proven, roomy Maxcab comfort cab is used in this machine class for the first time. For the operator, the 1m rigidly elevated cab offers an ideal overview of the equipment and work area. An extensive lighting package and peripheral cameras offer the operator additional support during work. Equipment features, such as the standard direction of travel reversal and the SENCON control system with intuitive operation, ensure fatigue-free and comfortable working. A well-though-out maintenance concept offers optimum access to the components and simplifies daily maintenance.

Beumer fillpac® for the building industry?

bag after bag – continuous and exact filling process

BEUMER Group has added the rotating filling machine, BEUMER fillpac®, to its product portfolio and equipped it with extensive features. (Photos: BEUMER Group GmbH & Co.)

Cement, mortar or gypsum — the bulk density, flow characteristics and grain distribution of these products, which are filled in bags and packed for delivery to the customer, may vary significantly. BEUMER Group, a single-source provider of filling, palletizing and packaging systems offers the BEUMER fillpac®, which can be flexibly integrated and adapted with existing packaging lines by the user. Depending on project requirements, BEUMER Group offers varying designs. Specific weighing electronics are utilized to ensure weight accuracy of the bags. Operators can nearly eliminate rejects caused by too high or too low filling weights.

Building materials have their own specific characteristics, such as high product temperatures or different volumes and weights — they may show an unusual flow behaviour and may be dimensionally unstable. As a partner to this industry, BEUMER Group successfully enable material manufacturers to fill bags without any product loss with the BEUMER fillpac®, an efficient filling machine. The systems of this construction series fill reliably, carefully and sustainably while meeting the required throughput.

Precision filling

The BEUMER fillpac® is equipped with a weighing unit, which communicates permanently with the filler neck via a dedicated software.

The automatic bag weight control determines the exact filling weight while filling. This way the system always achieves accurate degrees of filling. Thus the packaging line works more efficiently as it is no longer necessary to remove under or overweight bags from the material flow. In addition, the quantity indicated on the bag always corresponds to the real volume.

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The BEUMER fillpac®, equipped with the BEUMER bag discharge line SA 4000.

Air filling machines for pourable and coarse-grained products

Depending on the requirements and on the material characteristics such as bulk density, flow behaviour or grain distribution, BEUMER Group can offer both air and turbine filling machines from the construction series. The air filling machines are suitable for bagging pourable and coarse-grained products with particle sizes up to ten millimetres. The systems use a blower to fluidize the materials in a pressure chamber. The products can then be filled into bags gently and precisely. Depending on the throughput, the user may opt for a rotary or an inline filling machine. The air rotary filling machines have four to twelve filling modules which are arranged in a circular pattern. Depending on the number of filling spouts, the systems reach a maximum capacity of 1,200 to 3,600 bags per hour for 25kg bags.

The air inline filling machines are generally equipped with one to four filling modules. Depending on the number of filling spouts positioned next to each other, the system achieves a capacity reaching between 300 and 1,200 25kg bags per hour. Regardless of whether the system is arranged in a circular pattern or in a line, capacity and utilization can be improved by installing an optional automatic bag placer. The filling process is carried out either automatically or at the push of a button. Two configurations are available for removing the bag at the end of the filling process: either manually or automatically with vertical bag discharge on a belt conveyor.

Turbine filling machine for free flowing and fine-grain products

The turbine process is the appropriate solution for companies which predominantly fill free flowing and fine-grained materials, such as cement or gypsum. The turbine filling machines use motor-driven impellers. They can be arranged either horizontally or vertically, ensuring a particularly high filling pressure and thus a very good compaction of the fine-grained materials to be bagged. The result is filled bags which are compact and dimensionally stable so that the user is no longer required to vent them.

With up to 20 filling modules, the BEUMER fillpac® R for example can fill up to 300 tonnes of fine-grain materials per hour into diverse bag types. The HDPE bag placer, an exclusive offering of BEUMER Group, enables dependable filling of HDPE bags. The filling impeller is characterized by its speed and the maximum material throughput. The bag weight adjustment, which automatically adjusts the weight of the next bag, always ensures precise results.

Opening and closing of the vertically mounted filling spout is carried out outside of the dirty area — this way the three-position cylinder which regulates the coarse and fine flow is protected from dust. The cylinder for bag discharging is also located in the dust-free zone above the filling spout. This solution minimizes wear and tear on both cylinders and, therefore, ensures longer service life.

BEUMER Group also offers the turbine filling machines with inline design. The filling modules are placed next to each other for ready access, which makes them extremely easy to maintain. The inline filling machines are best suited for production environments with low throughput rates.

Individual customization

The BEUMER construction series is equipped with an ergonomic control terminal. The improved Human–Machine Interface concept allows operators to work in a simple and intuitive way. Almost all built-in components of the BEUMER fillpac® are freely available commercially. This reduces delivery times for spare parts and lowers capital costs for the user. Furthermore, the intralogistics supplier has designed the system in a way that individual customer requirements or special operational requests can be implemented flexibly and cost-effectively. DCi

Handling rebar at Port Everglades.

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Port Everglades: South Florida's 'powerhouse port'

Port Everglades is one of the most diverse seaports in the United States. Located on the southeast coast of the Florida peninsula, Port Everglades is one of the top three cruise ports in the world, is among the most active containerized cargo ports in the United States and South Florida's main seaport for petroleum products such as gasoline and jet fuel.

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

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

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

Bulk cargo mainly consists of:

- cement;
- aggregate;
- tallow; and
- gypsum.

Breakbulk products are mainly steel, lumber and wood. Port Everglades is in the process of demolishing ten old molasses tanks to make way for a 13.79-acre breakbulk storage yard.

Most people associate South Florida with sunshine. There's a select group, however, that identifies it with speed. That group consists of more than 30 shipping lines. For them, the fastest and most strategic course for their cargo is Port Everglades.

Port Everglades has rapidly established itself as Florida leading seaport for containerized cargo. As it is at the epicentre of a region that thrives on trade and tourism, it's the perfect hub and point of entry for companies that conduct business in Central America and South America, the Caribbean, Europe and the Far East.

Nearly 24mt (million tonnes) of cargo, including bulk, breakbulk, petroleum and containerized, moved through Port Everglades in Fiscal Year 2014. Port Everglades also broke the one million TEU mark ranking it as the 11th leading container port in the United States and the top port in Florida, serving more than 150 ports and 70 countries.

Fewer waves, more speed

Nobody moves cargo in and out faster than Port Everglades. The port is part of a thriving global transportation network that counts among its attributes:

- a favourable location less than one mile from the Atlantic Shipping Lane;
- direct access to multi-modal inland links through Florida's interstate and highway systems;
- on-port Florida East Coast Railways Intermodal Container Transfer Facility (ICTF); and
- just across the street from Fort Lauderdale-Hollywood International Airport (FLL), one of the fastest growing airports in the nation.

Key to recent growth has been an aggressive expansion of Port facilities (Northport, Midport and Southport) through a multi-million-dollar capital improvements programme that has resulted in:

- new and expanded marine cargo terminals;
- the first port in the nation to have the ELMO system installed as well as the US Customs & Border Protection radiation portal monitors to inspect all containers leaving the Port via truck;
- 99% uptime on gantry cranes; and
- expansion of Southport container yards.

Booming import/export trade

The port's location at this global crossroads for trade also makes it extremely attractive for imports and exports — more than $18 billion worth . One key draw is Florida's first and largest Foreign-Trade Zone, conveniently situated in the heart of Port Everglades.

A master port with a master plan

Port Everglades updates its 20-year Master/Vision Plan every two years. The port's 20-year Master/Vision Plan includes expansions to support future growth in containerized global trade, and the deepening and widening of the port's channnels and the expansion of the Southport Turning Notch.

Port Everglades is moving forward with a plan to widen and deepen its channels, but there are still several steps to go before construction begins, the port's Chief Executive Steven Cernak told elected officials and business leaders during an event in July to celebrate the project's long-awaited approval from the US Army Corps of Engineers. In addition, Cernak announced that the Corps has committed $1.2 million for the immediate next step, which is the pre-construction engineering and design phase, estimated to cost a total of $5.6 million.

"Our Congressional Delegation has taken our message to Capitol Hill with determination and perseverance, so that we can begin the design phase this fall and be ready for construction before receiving Congressional authorization," Cernak said. "It has been a long and winding road. But we are much closer to the finish line."

Cernak and members of the local Congressional Delegation addressed the need for continued bipartisan support to receive Congressional authorization and funding to move the project forward.

Members of Congress who spoke at the event included Debbie Wasserman Schultz (FL-23), Frederica Wilson (FL-24), and Lois Frankel (FL-22).

"Today is a day to celebrate at Port Everglades. We know Florida is part of the increasingly interconnected global economy, one that requires us to act with one eye on South Florida, and one eye on the rest of the world, to stay ahead of the curve and ensure we are not falling behind. The port's dredging project is vital to making South Florida a better place to work and raise our families," said Congresswoman Wasserman Schultz.

"I am glad to see that Port Everglades and the Corps of Engineers have accepted the challenge to stay at the forefront of port development and work with environmentalists to continue our struggle to create Jobs! Jobs! Jobs!" said Congresswoman Frederica S. Wilson, founder of the Florida Ports Caucus, a bipartisan Congressional taskforce that co-ordinates federal action in support of Florida's harbours and waterways.

Congresswoman Frankel said: "From every level of

Host Terminals: South Florida's largest bulk stevedore

Host Terminal's South Florida operations at Port Everglades and at the Port of Palm Beach were established in 2012 by acquiring two stevedoring companies and merging them into one. It is the largest dry bulk stevedoring operation in South Florida. Since July 2012, Host has handled the majority of dry bulk raw material imports into the area, including coal, flyash, gypsum, bauxite and slag. In addition to dry bulk, Host handles breakbulk cargoes and containers in South Florida.

When handling dry bulk cargoes, dust suppression is very important to Host Terminals. Wet mist suppression techniques prevent dust when discharging bulk cargoes into the shore hoppers. Misting machines spray microscopic water beads, creating a moisture wall to which flying dust particles instantly bond. Once they bond, the particles drop to the ground, where industrial street sweepers constantly comb back and forth to gather all dust.

Additionally, Scott Graves, Host Terminal's Vice President of Special Projects, designed special spill plates that are placed from shore and rest against the side of ships so that any spillage from the side of the ship will deflect onto the docks instead of into the water.

The systems work so well that Host is discharging cargoes like bauxite and coal in the vicinity of cruise ships without any issues. "This is quite a testament to our dust control methods," says Scott Graves.

Host Terminals

Host Terminals, Inc. operates ten terminals, handling approximately nine million tons of dry bulk commodities annually such as wood pellets, aggregates, minerals, and grains. Host has an impeccable safety record, which is the top priority at all the operations. In addition to terminal operations, the company is consulting in the development of import and export terminals.

government and across the private sector — this has been a bipartisan, public-private effort to bring more good paying jobs to South Florida."

Broward County Mayor Tim Ryan credited the grassroots efforts of the Port Everglades Association, the Greater Fort Lauderdale Alliance, Broward Workshop, the Greater Fort Lauderdale Chamber of Commerce, the Hollywood Chamber of Commerce and numerous other organizations for moving this project forward.

"Port Everglades is an economic powerhouse for Broward County, generating over $28 billion in economic activity and nearly $810 million in state and local taxes," Mayor Ryan said. "But what many people may not realize is that the port is a self-funded enterprise that is supported by user fees as opposed to local taxes. It is, however, governed by the Broward County Board of County Commissioners. We are proud to serve the people and businesses who make the port a success for our community."

James A. Walters re-elected chairman of Georgia Ports Authority

On 29 June this year, the Board of Directors of the Georgia Ports Authority re-elected James A. Walters of Gainesville to serve as chairman.

Appointed to the GPA board by Georgia Gov. Nathan Deal in 2012, Walters just completed his first one-year term as chairman, having previously served as vice chairman.

"At a time of unprecedented growth and the start of construction for the deepening project, Jim's continued, steady leadership sends a strong message to those who choose Georgia as their gateway to global commerce," said Governor Deal. "Business leaders can be comfortable with Jim's background in economic development, coupled with a strong vision for the future of Georgia's ports."

Continuing in the role of vice chairman will be James L. "Jimmy" Allgood, while A.J. "Joe" Hopkins III will also maintain his post as secretary/treasurer.

"I am honoured by the board's vote of confidence," Walters said. "I am also excited by the opportunities before us as this body prepares our port facilities to handle the new demands of an evolving logistics industry."

Walters noted the Port of Savannah's unmatched ability to handle cargo influxes related to diversions of freight from the West Coast, and the megaships now favored by shipping lines for their increased efficiency.

"The Savannah model, of a large, single-operator container terminal supported by an array of near-port distribution centers, direct interstate access and on-terminal rail has proven to be the right model to meet today's container trade demands," Walters said. "Beyond containerized goods, GPA's diversified terminals, focused on bulk, breakbulk and automotive cargo, provide the right solutions to serve all segments of the logistics industry."

Handling grain at the Colonel Island Terminal at the Port of Brunswick.

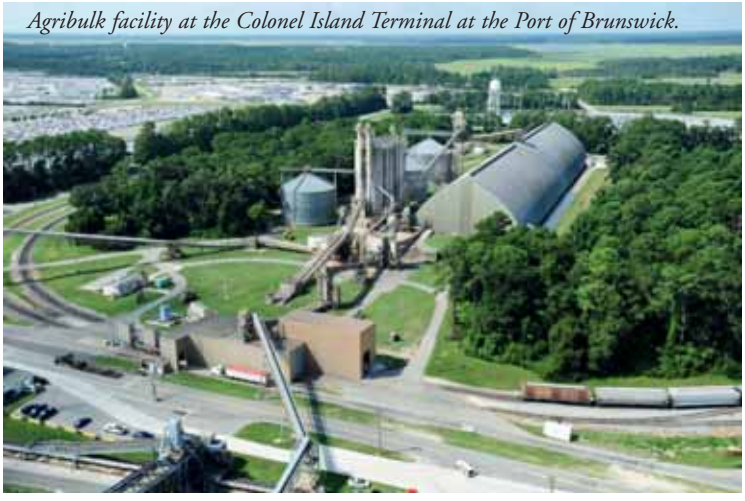
GPA BOARD OFFICERS

Chairman James A. Walters. Walters is the president of Walters Management Co., a financial services company which operates in Georgia, Tennessee and Texas. He is a former director of First National Bank of Gainesville and its holding company, First National Bancorp. After the sale of First National to Regions Bank, Walters continued to serve as an advisory board member of Regions Bank of Gainesville. He currently serves as chairman of the board of Chattahoochee Bank of Georgia, a Gainesville, Ga.-based bank he helped found. Walters sits on the boards of Northeast Georgia Medical Center Foundation, James A. Walters YMCA, Elachee Nature Center, and the Texas Consumer Finance Association, and is a past president and current director of the Georgia Industrial Loan Association. He is secretary to the Board of Trustees of Brenau University and is on the President's Advisory Committee of Gainesville State College. Walters attended North Carolina State University. He and his wife, Peggy, have two daughters, five granddaughters, and one great grandson. They reside in Gainesville.

Vice Chairman James L. "Jimmy" Allgood. Allgood is chairman of the Board of Allgood Pest Solutions, a company he started in 1974. He was chairman of the Structural Pest Control Commission for 20 years and is past president of the Georgia Pest Control Association. He has served as chairman of the Dublin-Laurens County Development Authority, the Dublin Rotary Club, and the First United Methodist Church board. Allgood earned a bachelor's degree from the University of Georgia, was a member of the Leadership Georgia Class of 1993, and was president of Leadership Georgia in 1996. He and his wife, Kathy, have three children and two grandchildren. They reside in Dublin.

Secretary/Treasurer A.J. "Joe" Hopkins. Hopkins serves as director of Hopkins-Gowen Oil Company, president of Toledo Manufacturing Company, director of Southeastern Bank, and as a partner in Gowen Timber Company. He earned a law degree from Mercer University before going into private practice from 1977–1988. He is a former president of the Georgia Forestry Association, and current president of the Forest Landowners Association. Hopkins has served as a member of the Joint Georgia House and Senate Future of Forest Study Committee; as a member of the Coastal Georgia Comprehensive Development Plan; and the First Congressional District Representative to the state Department of Community Affairs Board. He currently serves on the Suwanee-Satilla Regional Water Council.

Georgia's deepwater ports and inland barge terminals support more than 369,000 jobs throughout the state annually and contribute $20.4 billion in income, $84.1 billion in revenue and $2.3 billion in state and local taxes to Georgia's economy. The Port of Savannah handled 8% of the U.S. containerized cargo volume and 11% of all US containerized exports in CY2014.



Agribulk facility at the Colonel Island Terminal at the Port of Brunswick.

Full-service cargo handling from JAXPORT

Liquid bulk at Talleyrand Marine Terminal.

Located in Northeast Florida, in the heart of the South Atlantic, JAXPORT is a full-service, international trade seaport situated at the crossroads of the nation's rail and highway network. The port handles a wide variety of cargoes, including: autos; breakbulk; bulk; containers; forest products; heavy lift; reefer; and ro/ro.

In FY2014, JAXPORT handled a total of 797,917 short tonnes of dry bulk and 380,312 short tonnes of liquid bulk.

Dedicated dry bulk berth

Dry bulk materials such as limestone and gravel have dedicated berth space and are poured onto 41 acres at JAXPORT's Dames Point Marine Terminal.

Expansive liquid bulk storage

JAXPORT's Talleyrand Marine Terminal has more than 324,000 barrels of capacity for cooking oil, corn syrup, molasses and other bulk liquids.

Room to grow

JAXPORT boasts more than 1 million square feet of on-dock warehousing storage and more than 3 million cubic feet of on-dock refrigerated space.

Millions of square feet of additional space are located within minutes of port terminals. DCi

Dry bulk at Dames Point Marine Terminal.

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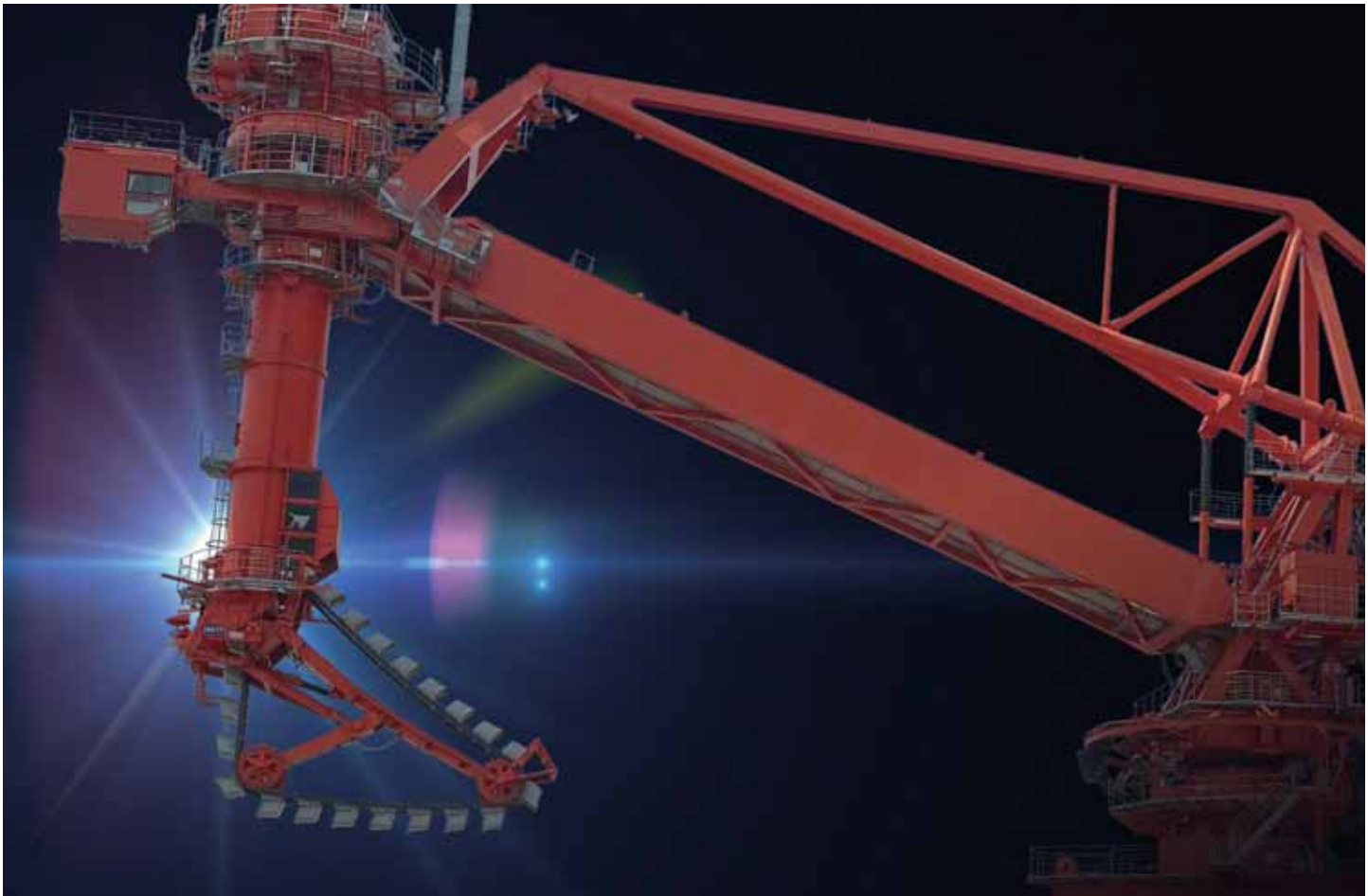

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