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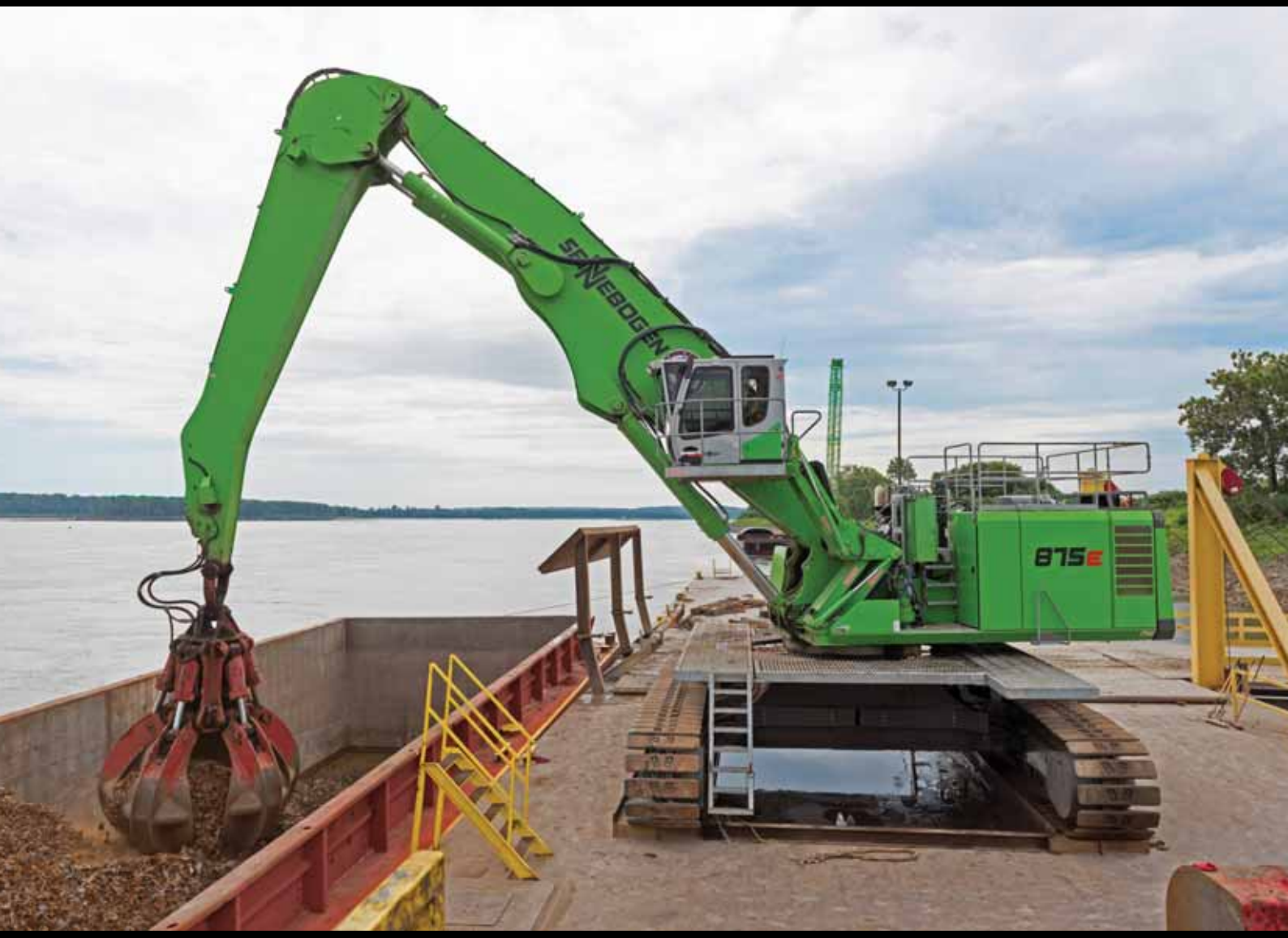

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- Asian Coal Trades
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Soya trade uptrend continues

Although the view is still broadly positive, prospects for global commodity movements in the period ahead have been overshadowed by the imposition of additional tariffs on some US imports. A widening international trade dispute could have adverse effects on world seaborne dry bulk trade, which currently is expected to see further solid growth during 2018 and into next year.

Forecasts of economic output (goods and services) published in mid March by the OECD organization were generally upbeat, with the proviso that an escalation of trade tensions could have a negative impact. Currently, GDP in the G20 group of countries is estimated to reach 4.1% in 2018 and a similar rate next year, after the improved 3.8% achieved last year, despite the slowing envisaged in China.

Grain & soya

Recent signs point to a continued robust upwards trend in soya movements. World imports of soyabeans and meal could total 214mt (million tonnes) in the present 2017/18 marketing year ending September, based on US Department of Agriculture estimates, as shown in table 1. This volume is 5% above the previous annual figure.

Increased imports into China are a large contributor, but many other countries are expanding their purchases. Robust consumption trends, coupled with insufficient or lack of domestic soya production underpins this strength. While China's imports, which comprise over two-fifths of the total, are predicted to increase by 4% to 97mt in 2017/18, other countries together including Asian and European importers could raise their volume by 6%, to 117.5mt.

Iron ore

Analysis of key influences affecting the global steel industry suggest that production changes in 2018 will not be as favourable for raw materials trade as seen last year. An expectation of limited or no growth in China's steel output, or possibly even a decrease, may not necessarily have a corresponding effect on the country's iron ore imports, however. Increasing emphasis on higher-quality foreign ore supplies may provide extra support.

Elsewhere around the world there are prospects for some growth in steel production this year, although at a slower rate. A recent calculation by consultants MEPS indicated a 2.6% increase in the world (excluding China) total, about half of last year's rise. Positive results were foreseen in many countries including the European Union.

Coal

Restraints on coal consumption, resulting from environmental policies and increasing emphasis on alternative energy sources in many countries, are clearly visible. But, despite this background, global seaborne coal trade strengthened last year and a further increase in 2018 is seen as a possibility.

Statistics contained in a recent IEA report provide a useful perspective. During 2017, a good year for the world economy, global energy demand rose by 2.1%. Oil demand grew at a similar 1.6% rate, while natural gas saw a 3% rise and renewables (wind, solar and hydropower) expansion satisfied a quarter of all incremental world energy demand. Yet global coal demand still rose, albeit at a marginal 1% rate, mainly due to extra power generating, especially in Asia.

Minor bulks

Global trade in steel products (coil, sheet, plate and other items) seems likely to be disrupted by the new US tariffs on imports from some countries. How much patterns of movements will change is not yet clear.

World seaborne cargoes amount to a huge volume of around 400mt annually and a large part is not directly affected by controls on US imports, which totalled 30mt in 2017.

Bulk carrier fleet

Last year growth in the world fleet of Panamax size (65–99,999dwt) bulk carriers accelerated to almost 3%, as shown in table 2. But expansion probably will be much reduced in 2018 amid lower newbuilding deliveries, possibly accompanied by lower scrapping. This size group comprises about one-quarter of the entire world bulk carrier fleet.

TABLE 1: WORLD SOYABEANS AND SOYAMEAL IMPORTS (MILLION TONNES)

	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18*
European Union	29.5	31.4	33.5	34.3	32.4	33.2
China	59.9	70.4	78.4	83.3	93.6	97.0
Other Asia	27.8	30.3	32.3	34.3	34.5	36.3
Others	33.8	38.9	41.0	43.2	44.0	48.0
World total	**151.0**	**171.0**	**185.2**	**195.1**	**204.5**	**214.5**
% change from previous year	–0.3	+13.2	+8.3	+5.4	+4.8	+4.9

source: US Dept of Agriculture, 08 March 2018 *October/September marketing years* * *forecast*

TABLE 2: PANAMAX (65–99,999DWT) BULK CARRIER FLEET (MILLION DEADWEIGHT TONNES)

	2013	2014	2015	2016	2017	2018*
Newbuilding deliveries	19.9	12.8	9.9	9.4	8.9	5.0
Scrapping	5.0	4.8	6.8	8.3	3.6	2.5
Losses	0.0	0.0	0.1	0.0	0.0	0.0
Plus/minus adjustments	0.1	0.1	–0.2	–0.1	0.0	0.0
World fleet at end of year	**184.3**	**192.4**	**195.2**	**196.2**	**201.5**	**204.0**
% change from previous year-end	+8.8	+4.4	+1.5	+0.5	+2.7	+1.2

source: Clarksons (historical data) & BSA 2018 forecasts **forecast*

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Asia's coal trade inspires cautious optimism

Richard Scott, Bulk Shipping Analysis

Continuing uncertainty prevails about how the trend of coal imports into Asia will evolve over the next few years. Longer term restraints on growth are prominent and potential for a downwards trend to resume and intensify is widely recognized. Yet recent developments have encouraged a more positive view of prospects, at least in the short term. Some countries' import reductions have been more than offset by recoveries elsewhere, resulting in regional expansion.

Uncertainty, often implying pessimism, about the future trend reflects the obvious effects of environmental influences. Governments in a number of Asian countries, especially the larger economies, are taking steps to reduce pollution by switching progressively towards cleaner energy sources. While further economic progress is envisaged, together with rising energy usage, support for coal consumption and imports probably will be limited.

Asia is by far the biggest regional buyer of coal, comprising more than three-quarters of the global seaborne total. The largest individual importing countries are China, Japan and India with broadly similar annual volumes, accompanied by South Korea, Taiwan and several smaller importers. Hence this region is closely watched for any changes. Remarkably, over the past two years a recovery was seen, reversing the preceding sharp downturn which had been expected to persist. In 2018 there is a possibility that Asian imports may see an extended upturn.

Supporting economic drivers

Vigorous economic growth among Asian countries recently has underpinned rising energy use, especially for electricity generation. Japan and South Korea have reached mature stages of development where energy demand has stabilized. By contrast in China, India and numerous smaller economies energy demand is still growing rapidly amid relatively fast expansion of economic output.

An update by the International Monetary Fund, published in January, estimated that a group of emerging and developing economies in Asia had grown by 6.5% in 2017, a similar GDP growth rate to the 6.4% seen in the previous year. This group includes China and India and a sub-group comprising five members of Asean (Association of Southeast Asian Nations) - Indonesia, Malaysia, Philippines, Thailand and Vietnam.

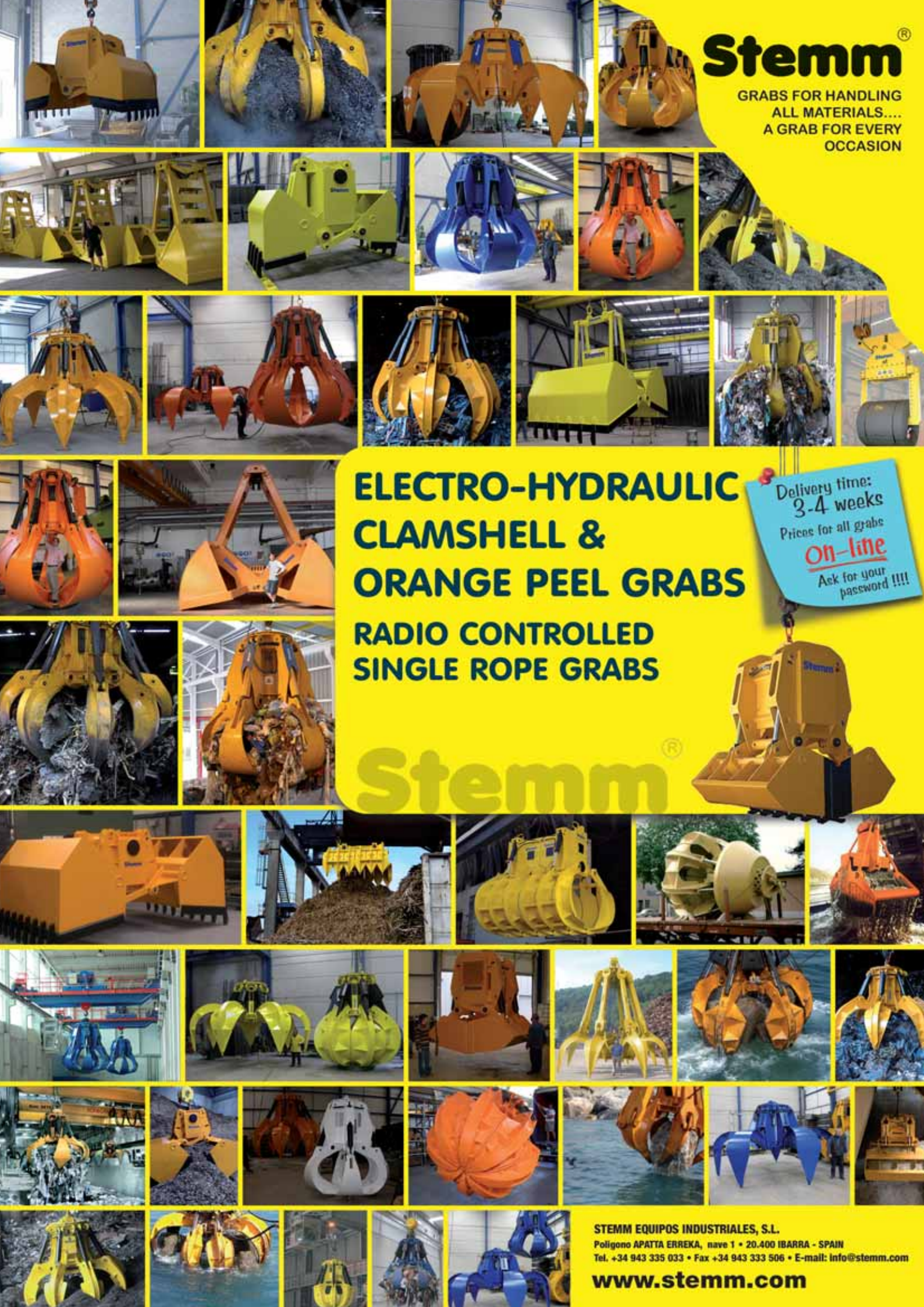
While China's growth improved last year, there was a slowdown in India, limiting the entire group's performance. The Asean five together achieved a slight acceleration. Elsewhere, Japan in 2017 saw an almost doubling of its sluggish advance in the previous twelve months, and South Korea's economy saw a modest pickup.

During the current 2018 year, according to the IMF estimates, emerging and developing Asia could experience an unchanged 6.5% average growth. Despite an expected slight slowing in China, India's economy is predicted to accelerate. A stable rate of increase within the Asean sub-group is envisaged. In Japan, last year's upsurge seems unlikely to be fully maintained, but in South Korea momentum may not change much.

These changes have varying implications for coal. Favourable economic growth trends have positive effects on coal consumption, although other drivers are very influential, modifying the impact. One country, Indonesia, is a major coal exporter, so its trade involvement is dependent on the import demand evolution in Asian and other buying countries, and on the strength of competition from alternative suppliers.

Regional imports recovery

Over the past two years annual seaborne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coal imports into Asia have fully reversed the sharp downturn seen previously, as shown by the table. After reaching a peak 923mt (million tonnes) total in 2014, based on calculations by Clarksons Research, the regional volume fell steeply by 67mt or more than 7% in the following year, to 856mt. In that 2015 year, China's imports saw the second consecutive large annual reduction. Optimism about Asian coal buying faded.

In the next year, pessimism was confounded when China's coal imports increased strongly and, despite a downturn in India, the Asian total saw a partial recovery of 3% to 883mt. Doubts about prospects for extending the rebound proved misplaced in 2017, which saw a further but stronger advance of 49mt (6%) to a new record high volume estimated at 932mt. India's purchases continued to decline last year, but in other countries the picture was very positive.

Four-fifths of Asia's seaborne coal imports consist of steam (or thermal) coal grades, chiefly destined for use in the electricity generating industry. Cement production and other manufacturing processes are also sizeable consumers. The remaining one-fifth is comprised of coking coal used in the steel industry by blast furnace mills making pig iron.

The largest coal buyers in Asia — China, Japan, India, Korea and Taiwan — need imports of both types, reflecting either an absence of domestic supplies or insufficient quantities available. In India and China indigenous coal from domestic mines is produced in enormous quantities and satisfies a large part of the market. Other countries, such as Japan and Korea rely wholly or almost wholly on imported supplies.

Coal imports into Asia benefit from progress in economic activity across the region, and broadly positive effects on energy demand. Strengthening electricity generation and steel production are features.

However the impact can be diluted or masked by other changes. Large increases or decreases in domestic coal supplies, and domestic price variations, is one prominent aspect. Changes in alternative energy supplies — hydro-power, natural gas, renewable energy from wind or solar sources, and nuclear — also are increasingly visible in the power generation market.

A recent report by the International Energy Agency estimated that in 2017 over two-thirds of the global 3% rise in electricity generation occurred in China and India. The same report also commented that global coal demand increased marginally by 1% after two annual declines, driven by stronger coal-fired power generation, mostly in Asia.

Variations among importers

China's seaborne coal imports (thus excluding overland volumes mostly from Mongolia) are again the biggest among individual Asian importing countries. At an estimated 217mt in 2017, up by 9% from the previous year, these are still well below the peak seen five years ago before the steep fall, however.

Several influences are relevant. Coal consumption in China last year picked up for the first time since 2013, increasing marginally by 0.4%. Production from domestic mines also rose, by 3% to 3,520mt. The coal market was restrained by anti-pollution measures designed to improve air quality in cities, placing more emphasis on cleaner energy sources. As a proportion of total energy consumption, coal usage reportedly declined by 1.6 percentage points to 60.4%, while clean energy including gas and renewables rose by 1.3 percentage points to 20.8%.

In India seaborne coal imports seem to have continued on a downwards trend since the peak four years ago. The 2017 total, which one estimate puts at 191mt, was 4% lower compared with the previous twelve months. But definitive figures are not yet available and another estimate suggests a much smaller 1% decrease. Weakness has mainly reflected a better performance from the domestic mining industry, and success in boosting coal output sufficiently to keep pace with or exceed consumption trends.

Japan's continuing high but quite stable imports, which were up by 2% to 187mt in 2017, have been greatly influenced by heavier reliance on coal as a power station fuel in recent years. Since the severe earthquake and tsunami in 2011 and the associated Fukushima nuclear power station disaster, most nuclear plants have remained closed. Political opposition has resulted in only a few reopening, although more are scheduled to resume operating.

Seaborne coal imports into South Korea last year expanded strongly after flatlining for several years. The 2017 total rose by 13%, reaching 141mt. Higher steam coal purchases apparently comprised all the incremental volume. Coal-fired power station usage was boosted by shortfalls in electricity supplies from nuclear plants. In Taiwan, imports rose by 8% last year reaching 70mt.

A group of smaller importers has been contributing an expanding proportion of the Asian regional total. From around 80mt annually, during the past three years annual coal imports by this group have risen cumulatively by over 50%, including an estimated 15% increase in 2017, to 126mt. Within this category Malaysia, Philippines, Thailand and Vietnam have seen especially notable growth, but Hong Kong's volume has declined.

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ASIA COAL TRADE — MAIN IMPORTERS (MILLION TONNES)

	2014	2015	2016	2017	2018*	2018 % change**
China	239	164	200	217	225	+4
Japan	186	185	184	187	185	-1
India	225	222	199	191	195	+2
South Korea	123	126	125	141	140	-1
Taiwan	67	67	65	70	70	n/c
other importers	83	92	110	126	135	+7
total	923	856	883	932	950	+2

** forecast ** 2018 forecast compared with previous year*

source: Clarksons Research, Bulk Shipping Analysis forecasts and calculations

More growth ahead?

Forecasts of longer term growth in Asia's coal imports arguably are difficult to justify, given the prominence of downwards pressures. It is not even clear whether a flat trend can be achieved. Nevertheless for the immediate future, this year and into 2019, prospects are more finely balanced. A downturn does not seem inevitable and it is at least conceivable that further growth, albeit probably modest, will occur.

One aspect complicating the forecasting process is political influences in several coal consuming and importing countries. Some changes in government policies affecting imports are foreseeable as possibilities, but the probability of introduction, the magnitude of changes, the precise timing, and their effectiveness are almost unpredictable. Other policy changes may be unforeseen.

In recent years and probably in the future as well, this aspect has been especially evident in China and India, although is not exclusively limited to these countries. Together, the two major importers receive over 400mt annually, comprising about 44% of Asia's seaborne coal imports and more than one-third of the global volume. Consequently any large change in their purchases has a wide impact.

Particular uncertainty about government policy relates partly to environmental measures directly targeting coal imports. Other policy changes indirectly influencing imports are often more prominent. These affect market drivers such as coal consumption, which can be determined by added emphasis on alternative energy sources, and by limiting or promoting domestic coal production where this resource is available.

Given the wide potential for unpredictable policies to affect coal trade, in addition to the normal commercial imponderables relevant to all seaborne commodity movements, the usefulness of firm forecasts may appear questionable. Much guesswork is inescapable, and the end result is perhaps more a statement of a viewpoint than a reliable prediction.

Tentative forecasts

The Bulk Shipping Analysis calculations for 2018 Asian coal imports shown in the table were prepared against this background. Although the direction of change could be up or down, a moderate 2% increase raising the regional total to about 950mt seems quite realistic. Whether some individual components, especially China and India, will see upwards changes and whether these are as little as 2-4%, is unclear. Marginal or no change in Japan, Korea and Taiwan is also a debatable outcome.

Elsewhere, prospects for some smaller importers are more solidly positive, perhaps over a number of years ahead. A large part of Asia's incremental coal imports expected in the current year is concentrated within this group, which is predicted to see an 11mt or 7% rise, to 135mt.

One relatively minor importer with potential for becoming more significant is Vietnam. Seaborne steam coal imports into this country are estimated to have grown over the past few years, from a minimal 1–2mt annually to reach about 10mt in 2017. Expanding coal-fired power station capacity could greatly boost volumes during the decade ahead. Port facilities are under development and last September *DCI* magazine reported a new floating transfer terminal being positioned in South Vietnam to receive coal imports arriving in large bulk carriers.

In a detailed study published a few months ago, the International Energy Agency focused on energy demand in the ten Asean countries of southeast Asia. Energy consumption in this group seems set to grow strongly over many years, and coal is expected to have a major and expanding role in the trend. Foreseeable electricity demand expansion, with coal-fired power stations contributing a large part of the extra power generation, is a feature and a number of countries will become increasingly reliant on coal bought from foreign suppliers.

Advantages derived by the shipping industry from participation in Asian coal import trades are restricted by the large part comprising short-haul movements from major supplier Indonesia within the region, in close proximity to the importing countries. Last year Indonesia reportedly exported steam coal totalling 319mt, up by about 2%, much of which was purchased by neighbouring buyers. Additionally a large volume of low-grade lignite exported was mainly bought by China. Some forecasts suggest that the export total could increase again in 2018.

A proposal by the Indonesian Government has complicated the outlook for the country's coal exports. It has been proposed that transportation of several key export commodities should be handled by domestic shipping companies. Plans for implementation of the regulation in late April this year appear to have been postponed. But opponents argue that, if introduced eventually, it has the potential to raise transport costs substantially and adversely affect the competitiveness of Indonesian coal in the world market.

Bettercoal welcomes JERA Trading as its first Member in Asia

Bettercoal has announced that JERA Trading has joined the initiative and is its first Member in Asia.

JERA Trading demonstrates leadership by joining the only global coal supply chain initiative with the aim to promote the continuous improvement of corporate responsibility in the coal supply chain. Until now, Bettercoal Regular Members were major European utilities. JERA Trading is the first Japanese-controlled company to join Bettercoal, allowing the initiative to expand its membership to the Asian market.

Anne-Claire Howard, Executive Director of Bettercoal said: "Bettercoal's aim is to build a more responsible coal supply chain globally. We believe that welcoming a company with such a strong presence in Asia and in coal markets will enable us to further broaden the global reach of Bettercoal and ensure we grow our footprint in markets where coal still plays a significant role in energy production.

JERA Trading joining Bettercoal will lead to more coal producers going through our Assessment Process leading to a more responsible production of coal."

Ronan Lory, Managing Director JERA Trading said: "JERA Trading is committed to being a responsible coal supplier and operator and is delighted to join the Bettercoal initiative to contribute to and gain from exchanges on best practices in this field. We look forward to a mutually beneficial experience."

The initiative is open for membership to major coal users from anywhere in the world, including energy utilities and industrial players such as cement manufacturers and steel makers.

Bettercoal

Bettercoal is a global not-for-profit membership-based organization set up to advance continuous improvement of corporate social responsibility, including social, environmental and ethical practices, in the coal supply chain. Its vision is a coal supply chain that protects the environment, respects the rights of the people and contributes to the livelihoods of workers and communities.

JERA Trading

JERA Trading (JERAT) is a jointly owned company: two thirds by JERA Trading International Pte. Ltd., a wholly owned subsidiary of JERA Co. Inc. which is an equal joint venture between two major Japanese electric power companies, TEPCO Fuel & Power (TEPCO) and Chubu Electric Power Company (Chubu); and one third by EDF Trading. JERAT is responsible for the global coal procurement of Chubu, TEPCO and EDF. It operates an integrated coal and freight supply chain and has benefited from EDF Trading's expertise in energy commodity trading and risk management to minimize the costs and optimize revenues associated with the delivery of coal requirements of its shareholders and third party customers. JERAT is one of the leading utility-backed coal traders globally with a presence in the Atlantic and Pacific basins. JERAT operates in all major coal and freight markets (Europe, Asia, North and South America) and trades both physical and financial products. It is headquartered in Singapore with offices in London and in Maryland.

Responsible business is good business: Bettercoal explains why

Photo credit: Richards Bay Coal Terminal.

Global coal demand is set to stagnate through to 2022 according to the IEA (International Energy Agency). Despite the growth of renewables and lower gas prices, additional demand for power will have to be met by coal. The need for coal cannot be ignored and therefore, it is imperative that buyers of coal in the Asian region start paying attention to where their coal comes from.

Mining and the use of minerals in any production process is coming under growing scrutiny from civil society organizations, governments and consumers. Companies need to demonstrate that they identify and monitor their supply chains fully understanding and accepting the provenance of the products they use. Coal as a resource for power generation, steel or cement manufacturing is under even more scrutiny because of its direct link to climate change. However, we need to look beyond that aspect of the debate, and producers and buyers alike need to focus their attention on the way coal is mined and transported to its end users. Identifying and managing social and environmental risks in the supply chain is a business imperative.

Bettercoal was created to deal with just that concern: ensuring that the coal purchased by its members comes from mines committed to a continuous improvement process in their operations. Bettercoal assesses performance of coal suppliers against the ten principles of its code and jointly develops a Continuous Improvement Plan, the summary results of which are shared with its members. The members take into account the results of the assessments in their purchasing decisions and due diligence processes. The outcome is a re-enforcing loop of improvement and recognition in the coal supply chain.

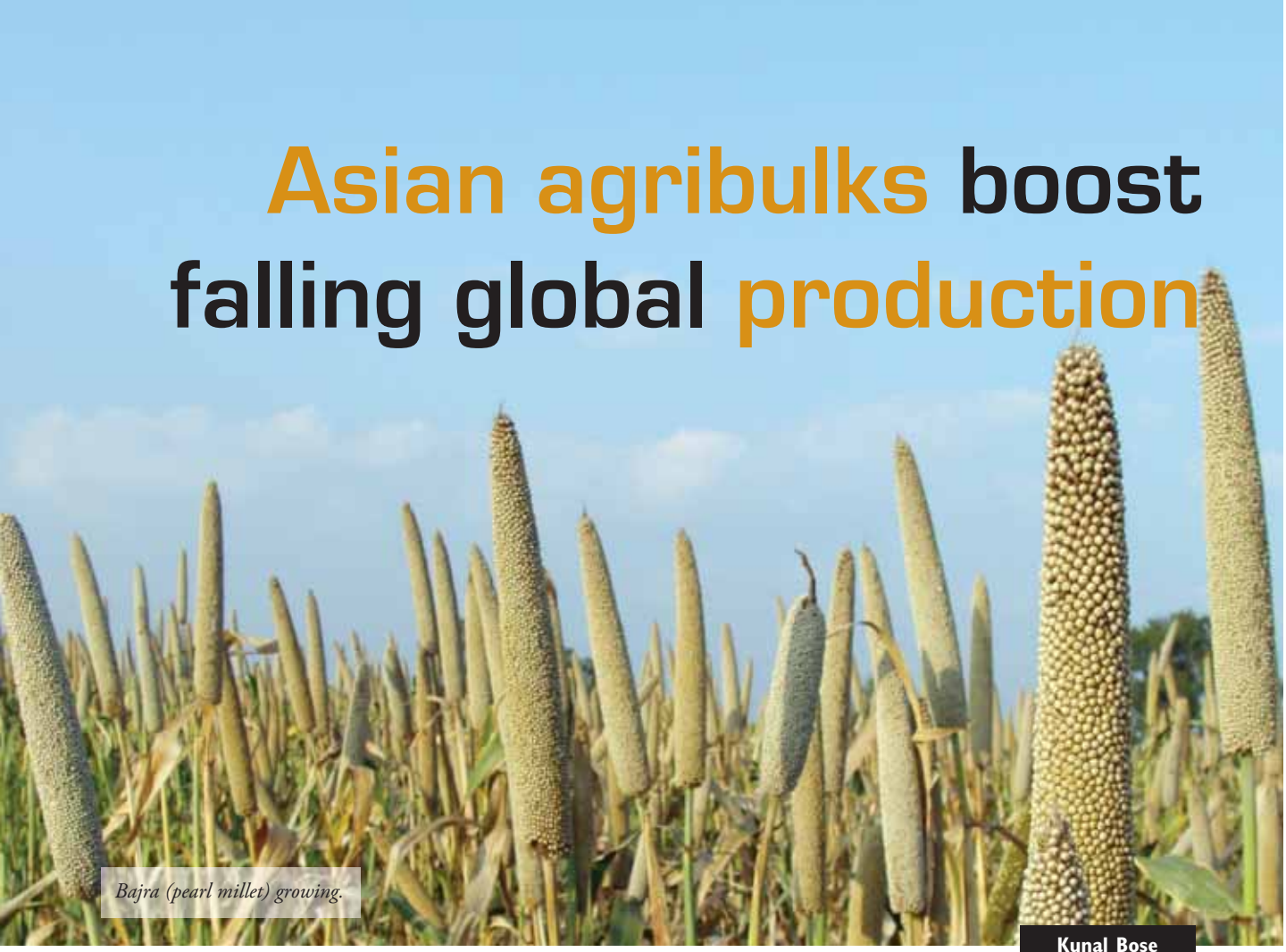
Bettercoal recognizes that Asia remains the hub of coal consumption moving forward as Europe implements policies aimed at ending coal fuelled power generation. To ensure that coal producers keep improving their operations, Asian buyers need to demonstrate the same commitment as the European utilities have to a responsible coal supply chain. As it happened in Europe, civil society organizations and consumers will start asking questions about the conditions under which the coal they burn is being produced. Therefore, utilities will have to demonstrate that they understand and acknowledge the risks in their supply chains linked to social and environmental pressures.

Through its actions over the last couple of years, Bettercoal has engaged with mines in Colombia, Russia, the US, South Africa, Poland, Germany, Indonesia, Australia, Norway, Kazakhstan and the UK. Bettercoal members purchase coal from across the globe and therefore connect with mine operators in many different countries. Many of the suppliers currently engaged in the Bettercoal Assessment Process also supply the Asian market, therefore Asian utilities could benefit from joining Bettercoal.

Coal will continue to be challenged as the world transitions to low-carbon sources of energy. Producers and buyers should continue to work closer together to develop a shared understanding of the risks and build a system where demonstrating continuous improvement in practices will become a key purchasing decision factor, as important as price. Responsible business is good business and joining Bettercoal is one way in which both Asian coal producers and Asian coal buyers can demonstrate their commitment to a responsible coal supply chain. *Anne-Claire Howard, Bettercoal Executive Director*

Photo credit: Canyon Coal.

Asian agribulks boost falling global production



Bajra (pearl millet) growing.

Kunal Bose

The UN Food & Agriculture Organization (FAO), which month on month tracks the global cereal supply and demand situation, says in its March report that global trade in all cereals in 2017/18 will be close to 405mt (million tonnes). This, while it stands slightly better than the earlier forecast, is nearly 1mt or 0.2% below the 2016/17 level. It attributes the revision mostly to an increase in global maize trade, which more than offsets lower wheat shipments to India, Japan and Vietnam. As for wheat, the US Department of Agriculture (USDA) says, global wheat exports in 2017/18 are to advance to 184.41mt from 182.24mt in 2016/17. This is mainly on account of Russia whose exports are now seen to be up 35% at 37.5mt from last year's record 27.81mt.

Surge in Russian exports more than makes good the shortfall in global wheat supply from Australia and the European Union amounting to 4.561mt and 1mt, respectively. While shipments from Argentina and Canada are up, the US wheat exports are set to fall to 24.50mt from 29.49mt in 2016/17 on "reduced price competitiveness in some international markets," says USDA. As a result of export contraction, the US end season stock of wheat will be up by an identical amount.

For the second year in a row, world wheat production at 744mt in 2018 will experience a fall, according to FAO's first forecast for the cereal. Whatever happens, the global output is still expected to remain above average. The projected decline in world production will be mostly on account of the EU and the Russian Federation both standing to suffer fall in yields from 2017 highs. FAO further says an anticipated recovery in Australian wheat production will be check on a larger output decline at the global level. Chinese wheat output is estimated 1% higher at 129.774mt against 128.845mt in the previous year. India is likely to see a minor fall in wheat production at 97.11mt from last year's 98.51mt due to diversion of land to pulses.

In the meantime, the world is closing on a fractionally higher 2017/18 rice production at 486.3mt, thanks largely to India benefiting from a normal monsoon and improved availability of inputs such as seeds and fertilizers stepping up output to 111.01mt from the previous year's record 110.15mt. According to the Indian government's second advance estimate of farm production the summer-monsoon rice crop in 2017/18 agricultural year (July to June) is taken at 96.48mt and the winter crop at 14.53mt. China is seeing a 1% growth in rice output to 208.560mt. The upsurge in fair weather-driven Indian production will more than offset the setback in Sri Lankan output where worryingly the rice crop has remained below average for the second consecutive year.

The global trade in the commodity will be 47.3mt higher than earlier forecast of 46mt aided by bigger exports from India with its great surplus to go by. Expectations remain that smaller purchases by Bangladesh, Senegal and Sri Lanka would more than offset larger deliveries to Indonesia, Nigeria and the Philippines. Expect world-ending rice stocks to become the second highest on record at 143.1mt with majority of that held in China. International trade in all cereals in 2017/18 is forecast to approach 405mt, marginally up on the earlier estimate but still almost below the earlier year's level. The revision upward is mostly due to an increase in global maize trade, more than offsetting lower wheat shipments to India, Japan and Vietnam.

China's likely total cereal imports in 2017/18 at 24.1mt will mark a third decline since the record achieved in 2014/15. Even then, imports will remain close to five-year average. Chinese wheat imports are forecast to fall by close to 20% from last year's high level to 3.5mt. This happened

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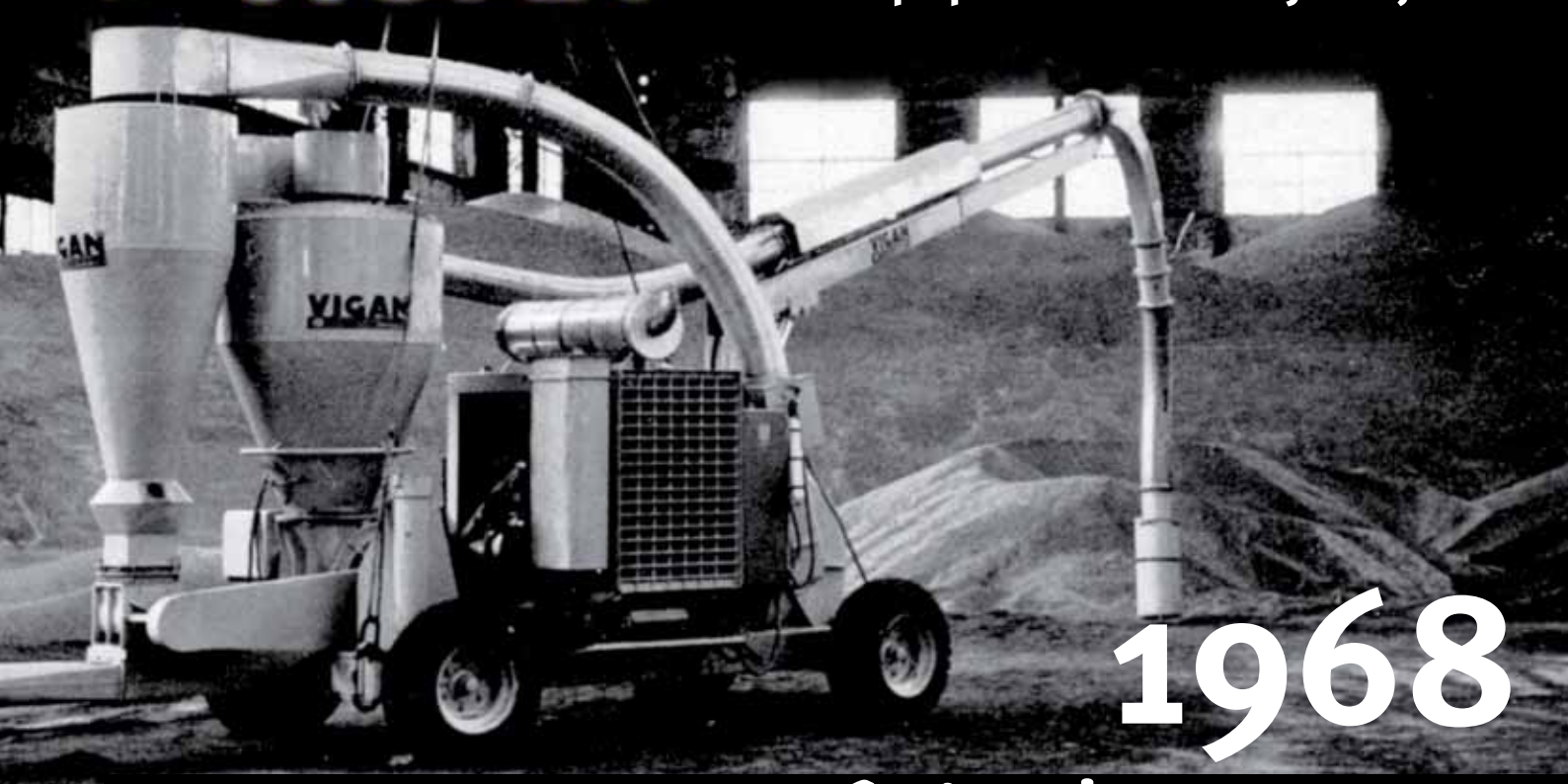

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because the country was sitting on high stocks built from successive bumper harvests. Imports of feed cereals are expected to return to average, after the exceptional high levels in 2014/15 and 2015/16, due to expectations of the much larger use of domestic maize for feed and industrial processing, says FAO. This is being occasioned by Beijing's decision to pare domestic inventories. Rice imports by China are expected to remain close to the five-year average of 5.8mt, given persistently more profitable prices in other major origins in Asia compared with local quotations.

According to USDA, the global coarse grain production forecast for 2017/18 remains virtually unchanged at 1.322bn tonnes. It further says coarse grain outlook relates to "nearly unchanged production, increased use, lower trade and greater stocks relative to last month." Production outlook for coarse grain in the southern hemisphere points to a likely decrease mostly due to contraction in plantings and unfavourable weather in South America and southern Africa. Brazilian corn production is down. For Argentina it is a double whammy — its late planted corn stands to suffer yield loss due to heat and dryness during February and March while the early planted corn yield was lower than expected.

The US corn is positioned for larger exports and increased crushing to make ethanol, a non-fossil energy source. The country's corn exports are raised 175m bushels to 2.225bn bushels. This shows global price competitiveness of US corn and reduced exports by Argentina. China, which suffered a 2% fall in maize production in 2017 at 216mt from 219.554mt in 2016 will see its imports climb, including from the US with which it is now engaged in trade skirmishes. Maize production fell two years in a row and the 2017 output sank below the 2012/16 average of 217mt. Reuters reported quoting an analyst that China could end up importing 20mt of corn a year, more than six times the current level to meet a switch to greater use of ethanol as energy source. USDA estimates China will end up importing 3mt of corn during 2017/18 crop year, up from 2.4mt in 2016/17.

The Indian Agriculture Ministry says the country's production of coarse cereals, including maize, jowar (sorghum), bajra (pearl millet) and barley will be a record 45.42mt against last year's 43.77mt. Maize output is an all-time high at 27.14mt. In order to have a greater degree of self-reliance in pulses, a major source of protein for the common Indian, New Delhi is using all the tools at its disposal, particularly attractive minimum support prices and improved supply of high quality seeds to incentivize farming of the crop on an increasingly bigger scale. The results are already there. The country is harvesting a record 23.95mt of pulses in 2017/18, up from 23.13mt in the previous year.

However, the country's concern point remains oilseeds where production is forecast to fall to 29.88mt from 31.28mt. India's big worry this sugar season (October to September) is now to protect the interest of farmers and save industry sickness in the face of record production of around 30mt against 20.3mt in 2016/17. As major falls in sugar prices, which for the last couple of months and a half do not even cover the cost of sugarcane, are inflicting big losses on crushing factories instances of their failing to pay for the cane bills are growing fast. Farmers are seething in anger. But factories just don't have the money to clear cane bills.

India needs 25mt of sugar for domestic use. That leaves it with seasonal surplus of 5mt plus the current season opened with stocks of a nearly similar amount. Export India must despite the low world prices. Success in selling sugar in the world market will, however, depend on what kind of financial help New Delhi will be ready to provide to enable factories to participate in exports. Sugar industry official and farm expert Om Prakash Dhanuka says "crisis of the present kind will continue to recur at regular interval till the government ordains linkage of sugarcane and sugar prices. What I'm saying has been recommended by the Rangaraj committee."

Talking about outlook for the farm sector in general Dhanuka says: "We have to wait till the fourth and final estimate is out in August to know precisely the year's production of each major crop. The fact remains whether it is rice, wheat or oilseeds, India has much catch up to do to raise productivity by way of reforming farm practices, expanding irrigation command area, creating condition for extensive use of tractors and harvesters through consolidation of land holdings and introducing a robust farm extension programme." UN and FAO statistics show that against the cereal yield of over 7,000kg a hectare in the US and 5,800kg a hectare in China, Indian productivity is around 3,000kg a hectare. Incidentally, Bangladesh, which at the time of declaration of its Independence in March 1971 was seen as a basket case, has a cereal productivity of over 4,100kg a hectare.


Sugar cane.

Giving a few examples to illustrate the point of the country being a laggard in making better use of land resource, Dhanuka says referring to the US Geological Survey 2017 that India has 179.8m hectares of cropland area, which is 9.6% of the global total. "With such a big share of global cropland, India has tremendous potential to make farming a profitable and sustainable economic activity. Unfortunately, even after 71 years of Independence, the percentage of irrigated land to total cropland is still 34.5. The country remaining heavily dependent on rains for growing crops, it is no surprise that annual farm growth rate in recent times fluctuated between 5.6% in 2013-14 and minus 0.2% in the following year. The irrigation command area needs expansion at a rapid rate," says Dhanuka.

Citing a United Nations report, Dhanuka says the planet could have as many as 9.7bn mouths to feed by 2050. "You factor in changing diets in the two most populous countries on earth with the per capita income rising and that will require of us to lift global food output by 70 per cent from 2009 levels. This is what FAO observes," according to Dhanuka. Besides raising farm efficiency by deploying technology on a much bigger scale, countries such as China and India will have to see that instead of further land loss because of degradation by way of pollution, serious attempts are made to restore heath to land.

Whether it is India or China, the farm sector remains vulnerable to production disturbances due to climate change in the form of increased variability in temperature and occurrences of extreme weather events such as heavy rains, floods and drought all leading to crop damages. Disturbances to agro-ecosystems resulting from climate change have led scientists and agronomists to turn ambitious in developing climate smart agriculture (CSA). Still evolving, CSA has three defined objectives: First, sustainably increase agricultural productivity and incomes. Second, make crop resilient to climate change. Third, tighten greenhouse gas emissions. Dhanuka sees in CSA a right way forward. DCi

Prudent ship agency procurement will support long-term stability in the dry bulk sector

The dry bulk sector is on the road to recovery thanks to a strong performance in Q4 2017. However, the industry must target improvements in profitability to ensure that it remains financially buoyant in 2018. Neil Godfrey, Group Sales Director at GAC, explores the role ship agents can play in supporting the overall recovery of the dry bulk market.

There is a new air of optimism in the dry bulk sector. Exponential growth in demand for imports from China fostered an overall dry bulk demand growth rate of 5% — a three-year high, according to BIMCO. Major contributors to this growth included a new world record in steel production of 74.6mt (million tonnes) set by China in August 2017, as well as iron imports in the same country that exceeded 100mt for the first time in September 2017. These are just some of the key factors that led to several ship owners and operators reporting a profitable Q3 and Q4 2017. There is a tangible sense of guarded relief at change of fortune, as 2016 was seen by many as one of the worst years in the history of dry bulk. If the 2017 performance trend continues, ship owners could be looking at profitable business throughout 2018.

Despite the positive signs, many ship owners and operators remain justifiably cautious in Q1 2018. They are mindful that the financial success of the sector is heavily dependent on China's continued strong appetite for dry bulk commodities — something which will be largely dictated by momentum of the nation's ambitious Belt and Road Initiative driving infrastructure development across Asian trade routes. Other regions of influence, according to BIMCO's chief shipping analyst Peter Sand, include India, South Korea and Malaysia, where coal demand will have an impact on the dry bulk market.

Sailing speeds is another factor that will influence the success of the dry bulk market in 2018.

The benefits of slow speeds to control fuel consumption and costs will be weighed against the imperative to get commodities to and from their markets within short time scales.

Neil Godfrey, Group Sales Director at GAC.

With the market dynamics surrounding the dry bulk industry remaining uncertain, many ship owners and operators are looking to control and limit OPEX costs including repairs and maintenance, crew costs, insurance and ship agency. And yet, the latest figures from GAC suggest that ship owners and operators are not willing to compromise on quality to secure the lowest OPEX costs. This is evidenced through GAC's ship agency business, which has achieved a 5% growth in dry bulk port calls in the last year.

Trust

Ship agency success in dry bulk shipping depends on the agent getting the vessel into port, loaded, discharged, serviced and on its way again in the quickest, safest and most economically efficient way possible. It's a major operation which relies on a trusted and experienced agent with local presence, trained staff, financial stability, international resources and a robust safety and compliance culture. GAC's global ship agency network offers a range of services including full agency and cargo operations, protective agency, husbandry, hub agency and disbursement account management, ship supplies and launch services, as well as complementary support like bunker fuel supplies, hull cleaning, weather routing, maritime training, terminal services and ship spares logistics.

In 2017, GAC handled 10,500 dry bulk port calls involving a range of clients including international and local commodity traders, national and international utility companies, owners and operators across sectors that include coal and coke, ores and concentrates, fertilizers, grains, sugar, and biomass. Services were delivered from key dry bulk hubs in Brazil, Australia, India, Indonesia, South Africa, USA, Russia, Turkey and — critically — China.

GAC's strong performance in dry bulk — amid tough market conditions — is a testament to the prudent procurement strategies of ship owners and operators, who recognize the role of an agent's experience, global resources, quality of service and certification in obtaining value for money. The group's policy of rigorous adherence to the evolving spectrum of compliance policies and procedures in play within the industry make it the agent of choice for many owners and operators. Dry bulk shippers want to know they can depend on compliance and quality from their agent — after all, costs quickly mount up when mistakes are made. If an agent fails to comply with health and safety regulations and an incident occurs, the financial and legal implications for the ship owner are substantial.

Stability

As the green shoots of recovery continue to emerge in the dry bulk sector, dry bulk owners and operators are looking to make informed ship agency procurement decisions with the long-term sustainability of their businesses in mind.

It's a given that ship agents must keep in mind the ever-changing needs and expectations of owners and operators. But in a sector where uncertainty still lurks beneath the surface, they must keep a close eye on their competitors and key trends like the fluctuations in demand from China, slow steaming, changes in cargo flows within different commodity sectors and the ever-growing range of compliance policies and procedures in play. Ultimately, reliable and competent ship agents will be key partners in helping owners and operators to sustain improving fortunes in the dry bulk sector.

Five facts about coatings that should not be ignored

The conversation about the importance of antifouling measures is growing. Here are five reasons why shipowners and operators should not ignore the debate and should opt for quality marine coatings.

It's a tried and true business cliché: the market is getting tougher, more competitive. In the global supply and demand game, marine coatings companies are competing intensely to capture more market shares. Shipowners and operators want their vessels to operate faster, cheaper and greener. In addition, the companies that supply the raw materials to the coatings market are pushing for higher prices to meet their own increasing costs.

The driving force behind this market pressure is, in part, the regulations that dictate an increasing level of environmental performance from the coatings themselves and the vessels that use them. For the major coating companies, like Jotun, it is about responding to customer and market needs in a professional and responsible manner that benefits all stakeholders.

Currently, boicide-based self-polishing coatings are widely applied as standard defence against fouling. Performance and price of these antifouling coatings varies largely depending on base matrix and antifoulings used.

So, what can shipowners and operators achieve by using advanced antifoulings?

Five reasons to opt for antifouling coatings

According to Stein Kjølberg, Global Concept Director at Jotun Hull Performance Solutions, there are "five smart reasons" for them to opt for high quality antifouling coatings:

- **Comply with environmental regulations:** ship operators must comply with the accumulating environmental legislation and regulations. For instance, IMO has agreed to maintain the implementation of the 0.5% global sulphur cap by 1 January 2020. Also, EU MRV (Monitoring, Reporting and Verification) comes into force 1 January 2018.
- **Reduce speed loss:** deterioration of the ships hull by biofouling can lead to significant speed loss and efficiency loss over time
- **Reduce time lost at sea:** given the fact that not all ships compensate fully for the effect of a deteriorated hull, they will spend more time at sea consuming more fuel than necessary
- **reduce performance claims:** better antifouling systems and better overall performance will contribute to drastically reducing the number of performance claims
- **improve commercial performance when trading in pools or under charter contracts:** better antifouling systems and better overall performance will ensure that the distribution of pool points and the share of the profit will be more beneficial for stakeholders. Also, better control on the underwater hull and the actual operational parameters, will ensure that tonnage providers will comply better with the contractual terms of a charter contract

Measuring antifouling efficiency

"Clearly, hull and propeller are essential with regards to fuel consumption and systematic recording of sailing efficiency is essential to detect the antifouling efficiency," points out Kjølberg. He continues, "Certainly there are effective solutions for improving performance but the industry has lacked a globally recognized and standardized way for measuring this and providing return on investment for shipowners and operators. Also, there's a multitude of measurement methods being introduced in the market; some quite good, some fairly accurate, several of them proprietary (black box) and many using their own yardsticks. It is becoming challenging, even for the most resourceful, to determine which methods can be relied upon and which cannot."

ISO 19030 helps to quantify impact of antifouling coatings

Kjølberg welcomes the long-awaited ISO 19030 standard, recently published by the International Organization for Standardization. "With this standard we can finally quantify how solutions, such as advanced antifouling coatings, can contribute hugely to reducing losses caused by poor hull and propulsion performance. This is a huge leap forward for shipping and the environment."

Jotun has invested heavily in research and development to create reliable high-performance products to meet the increased focus on this segment. This is backed up by tighter control of all of the supporting roles including global production, service and technical advice.

Will the implementation of the Sulphur Cap 2020 be delayed?

Two of the most discussed issues in the international maritime industry in recent years have been the implementation of Ballast Water Management Convention (BWMC) and the approaching Sulphur Cap 2020, *writes Kim Yeon-tae, Executive Director, Korean Register.*

Kim Yeon-tae, Executive Director, Korean Register.

The prolonged maritime downturn of the last decade, combined with the substantial capital expenses required to meet the requirements of both conventions, have raised serious concerns among maritime stakeholders and have led to heated debates at IMO meetings, with many calling for the postponement of their implementation.

The first convention to allow postponement was the BWMC. The two-year postponement of the installation of the Ballast Water Management System (BWMS) was agreed at the 71st Marine Environment Protection Committee (MEPC 71) which took place in London in July 2017. As a result of the many obstacles to the effective implementation of the BWMC, such as the lack of facilities to install BWMS onboard, the application of NEW G8 and USCG Type Approval, the decision was made to postpone its implementation.

However, this decision means that the early movers — i.e., those shipping companies which had already installed BWMS on board their ships in accordance with the convention — are having to face many more hurdles such as non-compliance with the requirements of USCG type-approval, etc., whereas those who decided to wait and see — can now benefit from installing a more reliable system with a proven track record.

Now the eyes of the maritime industry are turning to the global Sulphur Cap which will come into effect in 2020. But, there is a significant doubt across the industry that the convention will actually come into effect in 2020, as currently scheduled.

With less than two years left before the sulphur convention comes into force, it is evident that the relevant parties are far from being fully prepared. For example, the IMO regulations, which are relevant to the convention, in terms of how to apply and implement the convention, have still not been finalized.

The majority of shipping companies have still not made up their minds on what measures they will be taking, to comply with the convention. The refineries, on the other hand, are not expected to be able to produce a sufficient amount of low sulphur fuel oil (LSFO) for ships, in time. These factors are similar to those faced by the industry when it came to complying with the BWMC, and so many in the industry have voiced a need to postpone the implementation of Sulphur Cap 2020.

However, I think there is very little chance that the implementation of the global Sulphur Cap 2020 will be postponed, for the following reasons.

It is anticipated that there will be a regional shortage of LSFO after 2020. However, if LSFO is not available at the place of bunkering, under MARPOL Annex IV/18.2, the ship is simply allowed to be exempt from compliance with the Sulphur Cap 2020 regulation. Therefore, a shortage of LSFO will not be a legitimate excuse for postponement.

Some ships will be fitted with Exhaust Gas Cleaning System (EGCS) to comply with the Sulphur Cap 2020. The availability of EGCS may not fully meet the demand before the year 2020. In such cases, a ship will be allowed to use LSFO until it is equipped with an EGCS.

In the last two IMO meetings, the 4th Pollution Prevention Response (PPR) held in February 2017 and the 71st MEPC, several member states highlighted their concerns regarding the difficulty of implementing the global Sulphur Cap, but they were excluded from discussions. It's likely to be difficult for IMO member states to re-submit the same proposal in future committee meetings.

Furthermore, to amend the conventions, the proposal must not attract objections from more than one-third of the contracting governments. At the moment the number of member States that have ratified MARPOL Annex IV is 89, and the number of states objecting the postponement of implementation is likely to be more than 30. With the EU member states objecting, the likelihood of postponing the implementation of the Sulphur Cap 2020 convention seems very low.

Above all, if the implementation of Sulphur Cap 2020 is postponed once again after the BWMC, IMO will lose public confidence and face a significant obstacle to the smooth implementation of any future conventions. In reality, the chances of postponing the Sulphur Cap 2020, are very, very small.

About the Korean Register

The Korean Register (KR) is an IACS member classification society established in 1960 with the purpose of promoting safety of life, property and the protection of the marine environment.

KR currently classes an international fleet of 3,032 vessels totalling 69 million GT. It is headquartered in Busan, South Korea and operates a network of 66 offices around the world. It is authorized to perform statutory and certification services in 78 countries.

BIMCO relaunches ship benchmarking system

BIMCO is relaunching ship benchmarking system Shipping KPI after two years of redesign. The system helps shipowners and managers make strategic decisions about their fleet.

"The Shipping KPI system enables me, as a shipowner, to make rational strategic decisions on how to run my fleet, by benchmarking with other ships in the segments we compete in. It is an important step for BIMCO in its goal of developing digital solutions for the industry," says Sadan Kaptanoglu, owner of Kaptanoglu Group, President Designate of BIMCO and chair of the Shipping KPI steering group.

Shipping KPI is based on self-reporting by 300 companies and a total of 6,000 ships. It lets users compare performance parameters between ships of similar type, tonnage, trades or flag states, while remaining anonymous.

Users can compare 33 different Key Performance Indicators (KPIs) – for example budget performance, ship availability, contained spills and officer retention. The KPIs are based on 64 individual performance indicators.

BIMCO's short term target is to get more than 10,000 ships into the system to create an even better foundation for comparison and analysis.

Shipping KPI, a community tool

"We see Shipping KPI as a community effort. It is by the industry for the industry. It is designed for shipowners and ship managers, to help them compare apples with apples, without giving over proprietary data to their competitors. It enables us at Kaptanoglu Group to manage our fleet better," Kaptanoglu says. BIMCO has improved the reporting tool and made sure that the reporting values conform to IMO-rules and industry-standards. A lot of work has also gone into improving the user experience.

Confidential data

When you benchmark in the Shipping KPI system, the lowest level you can compare your ship or ships with is the data from a minimum of ten ships, owned by at least three different companies.

The data is hosted with an external company, which is independently audited to verify its ability to safeguard the data. It should be noted that BIMCO does not have direct access to the data provided by the participating companies.

Free of charge

Shipping KPI is run by BIMCO on a not-for-profit basis. New users have to pay a sign-up fee, but thereafter, the tool is free for BIMCO members. Non-members have to pay a sign-up fee and thereafter an annual subscription of €1,975.

About BIMCO

BIMCO is the world's largest international shipping association, with 2,100 members in over 120 countries. Its global membership includes shipowners, operators, managers, brokers and agents.

Hempel announces price increases

As raw material prices continue to increase in 2018, at the end of February major coatings manufacturer Hempel announced increases in sales prices of selected products.

Over the past two years, the cost of many raw materials used in the manufacturing of coatings has continued to rise.

In the last six months alone, for example, the cost of epoxy has increased by 20% in Europe and North America and as much as 58% in the Middle East and South & East Asia (source: ICIS Pricing and Technon Orbichem). In the same period, the price of zinc has increased nearly 15% globally, reaching a ten-year high at the start of 2018 (source: London Metal Exchange).

"There are regional differences, but overall global prices are clearly rising," explains Michael Hansen, Executive Vice President & Chief Commercial Officer at Hempel.

He continues: "We have done our best over the past months to absorb these price increases and limit the effect on our customers. We are working closely with our suppliers, our R&D and our manufacturing set-up, but increasing prices is a reality and the trend is clearly continuing. We have no other option than to increase the prices of some of our products in our protective, marine, container, yacht and decorative segments."

About Hempel

Since 1915 Hempel has been a world-renowned coatings specialist, providing protection and inspiration to the world around us. Today it has over 6,000 people in 80 countries delivering trusted solutions in the protective, decorative, marine, container, industrial and yacht markets.

Hempel is proudly owned by the Hempel Foundation, which supports cultural, humanitarian and scientific causes across the world.

Shipowners increasingly modifying propellers to meet EU MRV requirement

Belgian underwater repair specialist Hydrex says it is carrying out more modifications to a ship's underwater areas and equipment in addition to the company's more common damage rectification work.

The increase in this type of work — to propellers, in particular — follows the recent introduction of the European MRV regulation which has seen more shipowners look at ways of further reducing fuel consumption (and emissions) when operating to and from European ports.

The EU MRV (Monitoring, Reporting, Verification) regulation entered into force in July 2015. It mandates shipowners and operators to monitor, report and verify CO_2 emissions for vessels larger than 5,000dwt calling at any EU and EFTA port. Data collection requirements became effective on a per voyage basis in January 2018.

One way of saving fuel is by operating at lower engine speed. But this can detract from the ship's overall efficiency because propellers are generally optimised for a certain rotational speed.

An example of the company's performance-enhancing upgrade work was a recent project carried out on a 229m-long bulk carrier berthed in Bremerhaven. In this case, the bulker's five-bladed propeller was modified to achieve optimum efficiency at lower speeds.

"A major benefit of this approach is that the work is carried out rapidly without the need to take the vessel out of service for drydocking, which is costly in terms of both time and money," said Hydrex Production Executive Dave Bleyenberg. "A propeller modification can easily be combined with any other maintenance or repair operation that needs to be carried out on the vessel. Thanks to the flexibility of our teams this allows a vessel to keep its schedule."

Hydrex engineers are able to carry out underwater repair, conversion and modification work anywhere in the world, in any weather conditions, even in ice. "Extreme winter conditions will not prevent our divers from providing the services required," added Bleyenberg.

Fuel savings, although important, are not the only reason to carry out propeller modifications while ships are afloat. A further case study shows that after several ice-going vessels suffered propeller damage due to harsh winter conditions, resulting in the blades needing to be cropped, the customer was keen to reduce the risk of his other ships suffering similar damage from ice and other debris in the future.

Before the next winter season, during which equally harsh conditions were expected, Hydrex engineers carried out a modification programme, altering the blades to a very specific design which would make them less prone to damage, while having a minimal effect on the overall efficiency of the propellers. This was undertaken in close cooperation with the propeller manufacturer.

Such modification tasks are an addition to the normal portfolio of Hydrex underwater repairs. "We can offer you the best possible solutions when propeller blades are damaged after impact with ice and debris, even when the damage is quite extensive," said Bleyenberg.

In these circumstances, Hydrex typically uses its propeller blade cold straightening technique. Should a piece of the blade be broken or if there is other damage too extensive for straightening, a section of the blade will be cropped. In either case, the work is carried out using equipment developed in-house by Hydrex's own design engineers. Neither repair will require the vessel to be drydocked, enabling normal commercial operations to continue with the minimum of delay.

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BIMCO report names top three performing bulk terminals

The three best performing dry bulk terminals in the world are Santander and Bilbao in Spain and Quebec in Canada, according to BIMCO's 2017 Dry Bulk Terminals Vetting Report.

Santander was rated first in all four major categories: terminal handling of loading/unloading; terminal mooring and berthing arrangements; information exchange between the ship and the terminal and terminal equipment.

The report evaluates terminal and port performance from around the world to improve safety standards and the turnaround time of ships calling ports.

The results provide an insight into what it takes to be a "good bulk terminal", but BIMCO still needs more reports from members to establish better ratings and statistics, and to show a more robust picture of the current standards at terminals around the world.

"In general, we see a good standard across the world, but with some complaints, for example due to language problems. But even with an increase of 35% of reports coming in this year compared to 2016, we still need more data to make valid global statistical analysis," says Aron F. Sørensen, Head of Maritime Technology and Regulation at BIMCO.

This is the second issue of the report and the data covers the period from January 2015 to December 2017; 115 ships, provided 598 reports, from 278 different terminals around the world.

BIMCO's goal is to get 1,000 ships participating in the survey, mainly through networking with members, the media and through speaking about the report at conferences.

The Port of Quebec in Canada (photo: Quebec Port Authority).

"We need to get the word out all the way to the shipmasters. That is the crucial challenge. Because the more reports we get the more valuable it becomes for all the participants and the shipmasters themselves," Aron says.

Generally, the standard is good with over 93% of ports reviewed as average or better, with positive feedback coming from the communication between ship and terminal, the loading and unloading and the standard and maintenance of equipment.

The report was first launched at the start of 2017 and will be available on an annual basis.

Some ports are well below standard

At the other end of the spectrum, a number of ships complained of a lack of language skills when visiting certain ports; permanent pressure on ship/crew and master; unexpected claims; and unnecessary bureaucratic and offensive port authorities. In addition, ports rated badly when the cost of terminal services was either too expensive or the service was non-existent.

BIMCO's future plans for the vetting of dry bulk terminals will be based on a two-step approach. Step one will be to have at least 1,000 ships participating in the survey in order to provide a robust annual report.

Step two will follow up on the results by communicating with terminals and other stakeholders with the aim of improving procedures and best practices.

"We would like to encourage shipmasters in the bulk fleets to report their experiences after each terminal call to the dry bulk vetting scheme. The information will be invaluable for our members and the broader industry to help guide the planning of future calls at terminals around the world, and for terminals to improve their service," Aron says.

The BIMCO Dry Bulk Terminals Vetting Report 2017 is available free of charge to download from the BIMCO website.

New Gottwald MHC for Japanese port

Konecranes is to supply a diesel-electric Gottwald Model 4 mobile harbour crane to Miike Port Logistics (MPL) of Japan. According to the manufacturer, the crane should be ready to ship to the Port of Miike at the end of the year.

MPL says it will use it for dedicated bulk handling, mainly consisting of coal and coconut husks.

In 2006, MPL acquired a smaller version of the Gottwald MHC, which has been used across a range of commodities, handling dry bulk with a motor grab. This will continue in use, with the new crane replacing a life-expired bulk gantry crane.

Explaining the reason why MPL had gone for another MHC, Makoto Aso, President of MPL's procurement arm explains: "Bulk handling technology from Konecranes has proven to be very productive and reliable at many terminals around the world. MPL has been very impressed by the performance of their Konecranes cargo handling equipment to date. It was logical to opt for a Konecranes Gottwald Mobile Harbor Crane in order to further expand their bulk handling activities."

Holger Schauer, who is the regional sales manager for Konecranes Port Solutions, noted that, since 2003, Gottwald had delivered one Model 2 and nine HMK 170 E mobile harbour cranes, the predecessor of Model 2, to nine terminals across Japan. However, MHC has taken delivery of the first Model 4 mobile harbour crane to be operated in Japan.

The Model 4 is a four-rope grab crane, which can lift up to 95 tonnes at a maximum outreach of 46 metres. MPL has asked for an additional overload indicator to also be fitted. *Barry Cross*

Riga on course to transfer coal handling to Krievu Island

In Latvia, Riga Freeport is on course to transfer all coal and dusty dry bulk handling to new facilities on Krievu Island by the beginning of next year. This will leave the Andrejosta and Eksportosta areas of the existing port relatively dust free in future.

The move is being partially funded by the European Union's Cohesion Fund.

"As of 1 January 2019, not even a single tonne of coal will be processed in the city centre", says Andris Ameriks, Chairman of the Board of Directors of the Freeport of Riga.

"The co-financing of the Cohesion Fund was approved with a particular aim: to improve the quality of the environment in the centre of Riga whilst ensuring a possibility to establish new terminals in another part of the port."

Work on the Krievu island project began in 2010. At the end of 2015, the core infrastructure of the project was completed. This consists of four piers, which have a combined length of 1.2km and alongside draught of 15.5m at the piers. All linking roads and utilities are also in place.

As part of Phase II, additional cargo storage areas are being built, the water supply and sewage systems expanded and the electricity capacity improved. A 23-metre high 'dust fence' is also to be built to stop dust drifting onto nearby areas.

An automatic rail wagon tippler will be a particular feature of the new development. Not only will this be faster, but also cleaner than current facilities at the port.

"Thanks to new, modern technological solutions — underground automatic wagon turnover stations, bulk freight conveyor lines, coal spraying and the wind fence, it will be possible to ensure effective and environmentally friendly storage and transhipment of cargo on Krievu island", says Ansis Zeltiņš, CEO of the Freeport of Riga.

Barry Cross

ETE adds new handling equipment in Portugal

In Portugal, the ETE Group has announced new equipment additions to several of its terminals.

In Lisbon, this involves the Poço do Bispo Multipurpose Terminal (TMPB) and Santa Apolónia Terminal (TSA), which have bought three new Liebherr LRS 545 reachstackers.

Sines Multipurpose Terminal (TMS), for its part, has acquired two Liebherr L586 XPower loaders

Further north, at the Port of Leixões, the General Cargo and Dry Bulk Terminal (TCGL) has taken delivery of a new Liebherr LHM420 mobile harbour crane, which has a maximum lifting capacity of 121 tonnes. This is the seventh MHC acquired by TCGL since it began operating in 2001.

Barry Cross

Yuzhny Commercial Sea Port achieves strong results in 2017 – and is aiming higher

In 2017 the State Company 'Yuzhny Commercial Sea Port' handled around 12mt (million tonnes) of cargo. This is the best result in Ukraine among the state stevedoring companies. In 2018, the company plans to raise the cargo turnover by a further one million tonnes. Moreover, the aim is to boost the production capacity to 34mt within ten years.

At the end of the previous year, the company approved the development project and a strategic plan to increase capacity. The plan is based on: the construction of a specialized cargo complex for bulk cargo; the development of the railway infrastructure; and the modernization and upgrading of handling equipment. The company conducts audits and plans to attract international investors.

Development

Today the state company uses its facilities as much as possible. The depth at the berths, which are used by the stevedoring company, makes it possible to handle Newcastlemax and Capesize vessels loaded with 200,000 tonnes and more of cargo and with draughts up to 18.5m.

The development of the company and its future is a modern specialized complex for bulk cargo — ore, coking and thermal coal. Its construction is planned to be finished by 2028. This complex will provide the rise in the cargo turnover at the state terminal to 34mt per year: 24mt of export cargo and 10mt of import cargo.

The project is designed to be realized in three stages: the construction of the railway cargo area, two units of defrosting facilities, stations for loading/unloading wagons; new conveyor lines; and reconstruction of berths No. 5-8.

In accordance with the design and budget documentation and assessment report, the total cost of the construction will be more than $177 million. This amount is really huge for the state company, so successful and prompt modernization is possible in co-operation with the investor.

Coal and ore cargoes are a high priority for the state company, and consequently, the development of the specialized complex for bulk cargo will be the object of special monitoring. Today the port starts launching projects which will provide the functioning of the company during decades.

2017 results

In 2017, the State Company 'Yuzhny Commercial Sea Port' handled about 11.6mt of cargo. Ore made up 7.2mt (61.9%), thermal and coking coal made up 1.28mt (10.4%) and 1.7mt (13.9%) correspondingly, and other cargo made up 1.42mt (metal, grain, chemical products). Main cargo owners are companies of SCM group (Metinvest, DTEK), state enterprise PJSC 'Centrenergo' and others. There were 190 vessel calls including 34 vessels with imported coal for power engineering. Cargo turnover rose by 39.4% in the fourth quarter as compared with 2016. The rise in import by 53% (2.9mt) for Ukrainian state and private companies and metal producers was recorded. In January 2018, the cargo turnover made up 982,600 tonnes, which is 17.6% more than in January 2017.

Iberia enjoys successful year

At Carboneras, coal imports are up 28% while gypsum exports have grown by a staggering 41%.

Barry Cross

Records tumble in Spain's best ever year for dry bulk

Ports in Spain posted record figures for dry bulk throughout 2017, with the uptick in traffic continuing into the current year. As the chart below shows, all ports in the top ten posted positive growth, with the entire ports network overseen by the Puertos del Estado organization, registering dry bulk growth of almost 10% when compared to 2016.

The north-western port of Ferrol-San Cibrao was Spain's second leading dry bulk port in 2018, increasing traffic by 11.16% to 10.45mt (million tonnes), mostly due to significant increases in imported coal for electricity generation. Despite this, the port authority remains reluctant to forecast traffic for 2018, simply pointing out that it handles a diverse range of commodities that are impacted by lots of variables. Nevertheless, it hopes to at least maintain its current tonnage.

There are no capacity problems at all at the port, which can continue to grow in terms of dry bulk. This is especially true of the outer harbour development, where space is available for dry bulk terminals of any type, something which is possible given draught of 20 metres alongside all of them.

Ferrol-San Cibrao handles a large portfolio of commodities, including coal, bauxite, scrap and aluminium. Significantly, volumes are relatively stable within certain normal variations brought about by known circumstances.

Nevertheless, the port authority is working to attract all types of new dry bulk, with terminal operators prepared to consider any particular commodity. There are, in addition, supporting logistics and networks all around the port.

TOP TEN SPANISH PORTS 2016/2017 BY TONNAGE (MILLION TONNES)

Port	2016	2017	% difference
1. Gijón	16.02	19.19	19.77
2. Ferrol-San Cibrao	9.40	10.45	11.16
3. Tarragona	9.06	9.51	4.97
4. Huelva	5.75	6.48	12.64
5. Castellón	5.19	6.46	24.33
6. Cartagena	5.30	5.82	9.71
7. Almería	4.69	5.62	19.74
8. A Coruña	4.34	5.05	16.38
9. Bilbao	4.36	4.54	4.15
10. Barcelona	4.43	4.46	0.79
Total all ports	**91.99**	**101.04**	**9.83**

Interestingly, the use of rail by many port clients is relatively low, although major efforts are being made to improve this situation, with the port authority working with terminal operators in the inner port to boost the overall percentage. At the same time, a new rail connection is to be built to the outer harbour.

Given the broad portfolio of commodities, the port has to be mindful of contamination and all operators have adopted high standards to achieve this, all of which has been overseen by the port authority. Curiously, Ferrol-San Cibrao has not been a value-added port in terms of processing dry bulk, although space does exist should this become necessary in the future.

The port has no problems with draught, hence bulk carriers of any size can operate there, especially in the outer harbour, where vessels requiring 20 metres of water can access facilities.

Last year was a record one for the Port of Huelva, which sits on Spain's southern Atlantic coastline. Total traffic amounted to 32.3mt, of which dry bulk accounted for 6.6mt, compared to the previous year's figure of 5.8mt, equivalent to growth of 13%.

Most bulks did well, but three, in particular, stood out.

Minerals ores, especially copper and zinc concentrates, grew by 6% to 2.7mt. Today, Huelva remains Spain's reference port for this type of traffic, with 42% of overall bulk traffic accounted for by this sector.

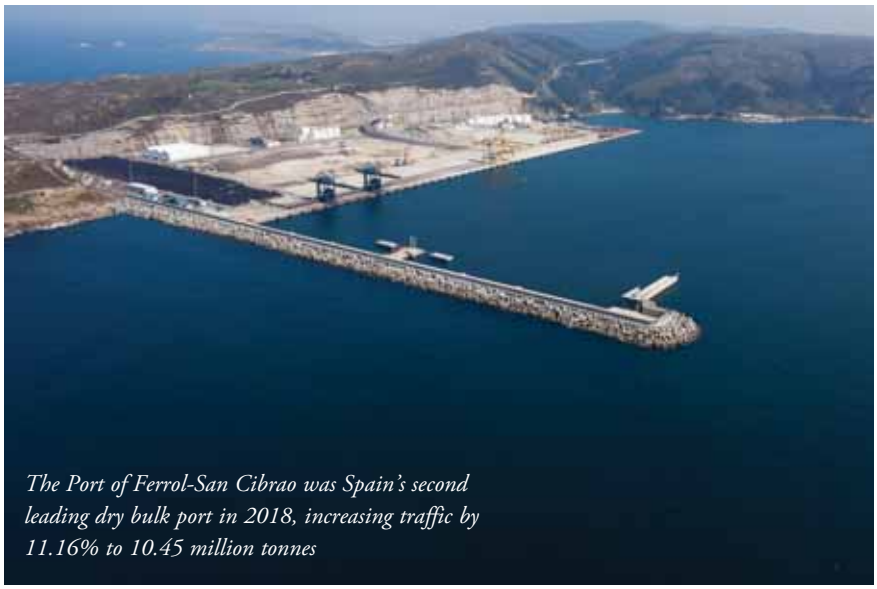
There was also a 60% increase in grain for livestock and foodstuffs, especially cereals and derivatives, which amounted to 2.5mt. This is now 38% of the total bulk business and also encompasses feed and fodder.

Finally, although on a smaller scale, coal and petcoke registered a hike of almost 90%, reaching a year-end figure of 700,000 tonnes, approximately 10% of the total.

Growth in the early part of 2018 suggests that Huelva should again do well in 2018, with an initial forecast of around 7mt of dry bulk.

Recent studies show that the port can continue to grow its traffic base, given a combined berthing line of 2,400 metres and sufficient quayside lift to absorb future growth. Furthermore, the port can offer covered storage of 400,000m^2. Unlike most Spanish ports, Huelva has more than enough surrounding space to grow should the need arise to boost capacity. It is already the largest port in the country, covering an area of 1,700ha.

As well as consolidating existing traffic, the port authority is also seeking to diversify into other areas, with various studies under way to identify good fits. One of these may well be a role as a port to warehouse and ultimately distribute bulks to emerging markets further south. In a role as a "trading" port, it would also be looking to add value to raw materials prior to their dispatch. Indeed, the port authority stresses that any company wanting to use the port as a logistics hub would find that the necessary equipment to do so is probably already in place, as is the infrastructure and supporting technology.



The Port of Ferrol-San Cibrao was Spain's second leading dry bulk port in 2018, increasing traffic by 11.16% to 10.45 million tonnes

Around 15%, or 900,000 tonnes, of dry bulk traffic is moved by rail, with imports being particularly important in this respect. This traffic is registering continuing growth.

"As part of its Intermodal Strategy, the Port of Huelva is promoting the use of rail as one of its main pillars of economic and environmental efficiency in the terrestrial transport of freight," notes a spokesperson, adding that, within the service area of the port, there are 45km of sidings and running lines, which generated 2,400 train operations last year, of which 840 had involved only dry bulk.

Thanks to co-financing by the EU, the 'Intermodal Platform of the Port of Huelva' project has enabled the port to build a discharge pit for solid bulk arriving by train, which has helped boost turnaround times and reduce pollution. In fact, the port has its own air quality forecast system in place, which was developed as part of the 'Safe & Green Port' programme. This gives a 24-hour warning, based on metrological conditions and the type of operation that is to take place.

Dry bulk handling takes place both at public quays and at a private terminal concession operated by Impala Terminals, where added value services can be provided. One of these is the blending of copper concentrates, significantly increasing their market value.

At present, the main dry bulk quay, Muelle Ingeniero Juan Gonzalo, is being upgraded to enable an intermodal logistics hub to be created that has state-of-the-art equipment and is highly efficient, as well as safe.

According to the port authority, whatever value added services that can be offered will help boost growth at the port and are to be encouraged.

Finally, in respect of vessel size, the spokesperson notes that existing infrastructure is sufficient to accommodate the various sizes of bulk carrier calling at the port, with maximum draught of 12 metres available. Nevertheless, studies are undertaken of market trends and vessel sizes to make sure that no restrictions have to be imposed should vessels grow and this is presently the case at the port.

In 2017, the Spanish Mediterranean Port of Castellón de la Plana (rendered locally as PortCastelló) handled 6.46mt of dry bulk traffic, equivalent to an increase of almost 25%. The port is now the fifth most important in Spain in respect of this type of traffic.

"We're just 23,000 tonnes behind Huelva, in fourth place," says port authority president Francisco Toledo. "The main reason for the dramatic growth is an increase in the import of raw materials for the ceramics sector, mainly clay and feldspar."

In the first two months of this year, the increase in dry bulk traffic has been in the order of 30% and the expectation is that the port will end the year with a similar increase to 2017, as long as the economy continues to do well.

Toledo recognizes that dry bulk requires

a lot of specialist storage space on land. Last year, Castellón made a further area of 90,000m² available for dry bulk, requiring investment of €6 million. This reflected the fact that the port was handling a further 1.2mt annually.

"In 2018, we going to bring more areas into operation in the south dock. Fortunately, we have enough space available to keep on growing," he notes.

The port handles three main commodities: raw materials for ceramics, agribulk and pet coke. It is the first of these that is showing the most dramatic growth; pet coke traffic is essentially stable; agribulk has declined slightly, given the limitations the port currently has.

"At the moment, we have projects under consideration related to the agribulk sector, which we hope to be able to grow," says Toledo. "Work should start in a few months' time."

The amount of dry bulk Castellón handles is all the more astonishing given the fact that the port currently has no effective rail connection.

"This is a handicap that we are looking to resolve and a project is on hand to provide a rail connection to the port's southern dock. This could enter service in 2020. Spain cannot continue to have the low level of land transport by rail that it has at present, either in terms of competitiveness or the environment. Castellón therefore has to have a good rail connection because the growth in rail transport will be unstoppable within a few years time."

Another area where Castellón is seeing growth is in vessel size. In 2017, the port beat previous records no fewer than three times in terms of the largest bulk carrier it had received. It's a trend that should continue, as lines seek to cut costs. Unlike other ports in Spain, Castellón has a draught of 16 metres and can handle virtually any vessel currently deployed in this trade.

In recent years, the growth in dry bulk traffic has meant that the port has introduced several environmental protection features and is due to bring in even more.

In 2017, for example, 150 metres of wind protection panels were erected to study the decrease of the dispersion of dust particles in the atmosphere. Given their success, the port has invested in two new ones.

Furthermore, given the high concentration of HGV traffic in and around the port, a package of measures has been introduced given the high levels of emissions these make. For example, some traffic flows have been changed to keep them away from sensitive areas, maximum speed has been reduced to 30km/h and speeds checked by radar. Those drivers who have failed to completely sheet down loads have also been fined, while sprinkler systems have also been introduced.

"In addition, a large coke warehouse has been erected at a cost to BP of €14 million, which has definitely eliminated the problems associated with outdoor storage," says Toledo. Other operators have also invested in covered warehousing.

"Finally, I would like to point out that the port authority is working on an ambitious project to turn PortCastelló into a Smart Green Port."

Although none of the port's dry bulk terminals offers added value services as such, other companies located within the port do. Castellón offers facilities to grind, dry and mix clay in order to obtain the product that best suits the needs of each company.

The Port of Castellón de la Plana's dramatic growth in bulk throughput can be attributed to the increase in the import of raw materials for the ceramics sector, mainly clay and feldspar.

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"A new facility is currently under construction and will be completed shortly, which shows that effectively adding value to products is a growing area because it is what increases profit margins," says Toledo.

Cartagena, which is located on the Mediterranean coast, is another of Spain's major dry bulk ports. Last year, traffic rose by almost 10% to 5.82mt, making it Spain's sixth most important port for this type of traffic.

One of the main reasons for the upswing in traffic is that the new Repsol refinery now uses the port to export the pet coke that it makes. There were also notable increases in imports of cereals and derivatives that are used to make animal feed.

As for 2018, the port authority notes that over the past decade the average annual increase in traffic has been in the order of 4% and that this is, once again, the target that they are aiming for.

Significantly, the port is well placed to continue adding volume, since there is sufficient capacity to double existing traffic levels. Indeed, in the past few years, land reclamation projects have seen 60ha of land won back from the sea, which has been used to site two brand new dry bulk terminals and a logistics activity area.

The types of dry bulk commodity handled by Cartagena split neatly between vegetable and mineral. In the former, there is agribulk: cereals and derivatives, soya beans, animal feed and fodder. The latter mostly comprises solid fuel. Both sectors are increasing in volume. However, in the past, construction materials used to constitute major traffic for the port, but ever since the financial crisis of 2010 and following the building of the afore-mentioned Repsol plant, construction materials have given way to solid fuel.

Not resting on its laurels, the port authority is trying to increase scrap metal exports. At present, there is a dedicated 230,000m² scrap terminal, which is accessed via a 576-metre quay that has alongside draught of 21 metres. Quayside lift consists of two MHCs, of 100 tonnes and 140 tonnes respectively.

Cartagena is another of Spain's port that currently relies exclusively on road for movement of dry bulk. However, all this is to change considerably in the near future, since a rail connection is being built that will encompass access to all terminals by the end of the year.

In terms of the environment, Cartagena has been recognized by the European Sea Ports Organisation (ESPO) as one of the top five ports in Europe in terms of sustainability. Indeed, in the past few years, a series of measures has been undertaken to improve the efficiency of the water and electricity networks to reduce usage by more than 10%.

Cartagena offers users 100,000m² of covered warehousing and 400,000m² of open stockpile for those companies that are established manufacturers in the port and which effectively use it as their distribution hub. Various examples are Bunge, Fomdesa, Holcim, Lafarge, Agrosur, Repsol and Química del Estroncio.

Finally, in respect of vessel sizes, Cartagena remains one of Spain's deepest draught ports, capable of receiving vessels drawing up to 21 metres of water, so can therefore accommodate any bulk carrier currently afloat.

Spain's south-easterly port of Almería registered a 19.74% increase in dry bulk traffic last year, in which time it handled 5.62mt.

The port itself is divided between harbour operations at Almería and at Carboneras. At the former, gypsum exports rose by 32% and salt by 84%; at the latter, coal imports were up 28% while gypsum exports grew by 41%.

To understand why coal imports went up so strongly, it is important to realize that in years of low rainfall, as was the case last year, Spain produces less hydroelectric power and therefore has to import more coal. On occasions, one of the two adjacent Endesa power stations fed from Carboneras is closed for maintenance and that results in less coal being required.

However, last year, there was also a rise in demand for coal in the off-shore Balearic islands, with new infrastructure at the port now dedicated to this.

As for how 2018 might pan out, coal traffic will again depend heavily on rainfall, making predictions difficult to make so early in the year.

The overall feeling at the port is that current infrastructure is adequate to deal with demand, especially since this varies between broadly established parameters.

A port authority spokesperson, for example, explains that while last year's coal imports increased dramatically, this was still within previously understood expansion ranges, which will sometimes mean that overall volumes of dry bulk at the port will rise and fall.

While in the longer term gypsum exports have remained stable, clinker has fallen.

As for new possible dry bulk commodities, the port authority reports that the re-opening of the iron ore mine at Guadíx is under consideration. However, it remains to be seen if it is finally put into production and whether it will be Almería or Carboneras that handles shipments.

Both ports are unusual in that rail plays no part in the movement of dry bulk consignments, despite the large volumes involved. Previously, iron ore was shipped by rail and that might recommence if the above mentioned mine reopens.

Mindful of the environmental contamination potential of its traffic, the port authority has built a new dust trap fence and introduced sprinkler systems, while agreements have been struck with operators to close down operations whenever there are strong winds. An agreement has also been signed with a university to monitor particle collectors.

Although neither Almería nor Carboneras offers added value services, there is a bagging operation for imported peat that takes place at one of the port's warehouses.

Vessels sizes do appear to be on the increase, especially at Carboneras, which sees calls from large coal bulk carriers.

In the Port of Bilbao, dry bulk traffic last year grew by 4% to 4.5mt. Around 22% of this traffic is accounted for by soya beans, which grew for the second year running. The port also handles considerable quantities of cement and clinker, as well as other non-metallic minerals.

For last year, and despite the threat of Brexit, the UK remained Bilbao's leading market, with dry bulk tonnage to and from that country up 62%.

At present, the port authority doesn't have any investment planned for new dry bulk facilities, nor it is actively pursuing any new commodities for the moment. However, the port is operated by various concessionaires, who are continuing reviewing their traffic base.

BILBAO'S MAIN MARKETS

	Tonnes	Compared with 2017 for dry bulk
The UK	881,762	62%
Brazil	825,510	25%
Low countries	346,169	293%
Germany	251,276	–4%
Argentina	247,018	145%
The USA	223,411	–54%
Russia	191,276	–10%
Morocco	175,924	113%
Libya	139,189	–4%
Irish Republic	85,363	15%

Portugal celebrates mostly positive growth in dry bulk in 2017

Although not on the same scale as Spanish ports, those in Portugal posted some interesting increases in traffic last year. Indeed, when looking at total traffic across all traffic sectors, 2017 was a record year, with 95.9mt (million tonnes) handled, an increase of 2.2%.

Of all ports, Lisbon showed the best growth. In 2017, it handled around 5.4mt of dry bulk, up 17% over the previous year's figure of 4.6mt. Much of this additional traffic was generated by the movement of clinker, mostly to countries in the North of Africa.

The port authority (APL) is hoping for a slight increase in dry bulk traffic in 2018. This will confirm trends established in 2017, when cement traffic did well and also the agribulk food market, which is expected to see additional activity in 2018 accentuated by the impact of drought on national cereal production.

According to the APL, the current capacity of solid bulk terminals in the Port of Lisbon is far from being exhausted, and there is still room for growth in volumes handled.

Indeed, in the first two months of 2018, Lisbon posted growth of 10.4% in dry bulk movements, mostly brought about by the cement market, but also by additional tonnages handled of barley, wheat, sunflower and rapeseed, and soya cake.

The port is mainly known, though, for its exports of clinker, cement and sand, and imports of corn, soybeans and wheat, as well as scrap and waste iron.

Going forward, the APL says that it is strongly betting on growth in the agribulk sector, for which it claims Lisbon has the best storage and best natural conditions in the country. Facilities for the large vessels associated with these trades remain first class. It is adamant that it offers facilities required by today's deep draught bulk carriers, particularly those working in the agribulk sector. For example, there are berths sufficient to accommodate 255-metre long vessels, drawing up to 17.5 metres of water.

"The export of bulk cement to destinations such as the United Kingdom, France and Spain is clearly a traffic that we are attracting, given solid prospects of growth," notes the port authority.

Quizzed about terrestrial transport of dry bulk to and from the port, the APL notes that inland waterway accounts for approximately 62% of total movements and road the rest.

Rail is used, although not extensively, the major problem being that many end users either aren't rail connected or don't make use of neighbouring branch lines. Nevertheless, the APL remains committed to rail development. In the shorter term, it wants to see as much road traffic as possible shifted to inland waterway and perhaps also to rail.

Currently, the port authority is developing a market and feasibility study looking into the navigability of the Tagus estuary. The aim is to improve conditions of the existing river service and also attract inter-terminal movements along the river itself.

In terms of environmental protection, one of the large agribulk terminals at the port has recently invested in new handling equipment that has incorporated elements aimed specifically at preventing air pollution. This is important, since the facility handles 200,000 tonnes of cereals annually, possibly increasing to 500,000 tonnes, equivalent to 8,000–20,000 road trips per year.

Lisbon is an interesting port in that three of its six main dry bulk terminals, namely those operated by Sovena, Iberol and Cimpor, are associated with industrial units that process raw materials.

In terms of cement, for example, the local plant is equipped with a heating facility where both clinker and cement are produced; these are then shipped for export through the port terminal.

As for agribulk, the specialist terminals receive raw materials such as grain and oilseeds. These are then sent for processing at soybean, sunflower and rapeseed extraction units, while others are turned into biodiesel and other refined

Midstream grain handling at the Port of Lisbon.

products. Part of the overall output is then shipped through the port's terminals.

Portugal's ETE Group was founded in 1936 and is, today, the country's most expansive dry bulk handling company. Within the umbrella, there are nowadays some 42 separate companies, of which ETE/TMPB, Aveiport, Portsines and TCGL are possibly the best known in the dry bulk field. Indeed, ETE GROUP operates in all the country's leading ports, with facilities in Aveiro, Leixões, Lisbon, Setúbal and Sines. They lead dry bulk cargo operation in Portuguese ports, handling around half of the total volumes.

According to spokesperson Pedro Virtuoso, in 2016, the group's terminals accounted for approximately 12mt of dry bulk, increasing to 13mt last year. Although this was a 7% year-on-year increase, Virtuoso concedes that the traffic base in 2016 was negatively impacted by dock workers' strikes, which had depressed cargo throughput. "For 2018, we are expecting tonnage to increase," he says.

Capacity is not a problem, since there is room to expand at all current terminals and concessions, he adds.

The main commodities handled are coal (which accounts for 49% of total volume), feed and food stuffs (10%), scrap (9%) and clinker (8%).

"Last year, there was an increase in all commodities we handled compared to 2016," he says, noting that other bulks such as sand/silica, wood pellets, sugar and cement all form part of the group's overall portfolio.

"We are looking into other dry bulks that we would like to attract to our installations. Were we to be successful, we wouldn't have to add to our existing installations," says Virtuoso.

In terms of terrestrial movements, most ETE Group terminals are serviced by road, with only a small percentage accounted for by rail. Virtuoso estimates that, in Lisbon, for example, rail accounts for just 5% of total dry bulk traffic, rising to 10% in Aveiro and reaching 20% in Sines.

"Port authorities are not focused on changing over to rail," he remarks, noting that, in the port of Lisbon, about 25% of the port total consignments are moved up and down river by barges. For decades, the ETE Group has been the most important player in the Iberia Peninsula in respect of inland waterways cargo transport. This traffic has shown an upward trend and is expected to increase even further in the near future, due to a new river terminal being built by the Group, connecting our port terminals with the northern Lisbon logistics platform."

He reports that ETE has environmental protection systems in place at all its dry bulk terminals, but is nevertheless constantly looking at ways of improving these still further.

In terms of adding value, Virtuoso points to the company's multipurpose terminal in the Port of Sines, where coal blending is an important money generator. It is also a growing part of the company's activities, he adds.

He confirms that, in line with most other countries, Portugal is receiving calls from ever larger bulk carriers; in this respect, Portugal is fortunate in having few major draught restrictions, although these vary from port to port. Indeed, depending on installation and trade, vessels vary from around 4,000dwt and 150,000dwt.

Last year wasn't such a good one for the Port of Leixões and the Douro (APDL), which handled 2mt of dry bulk. This represented around a 1% decline over the previous year. Significantly, January was the most important month of that year, when 282,000 tonnes were handled.

During the course of 2018, the APDL is expecting a "significant increase" in dry bulk traffic. It bases this prediction on what has happened so far in the year. In January and February, for example, 434,000 tonnes passed through the port area, which represents an increase of 6% over the same period in 2017.

Quizzed as to whether the port has sufficient capacity to handle growing volumes, the answer was a definite affirmative. There are several terminals in the port that handle dry bulk, with quays of up to 690 metres in length and alongside draught of 11 metres and, in some cases, 12 metres. Quayside lift enables loads of up to 104 tonnes to be handled.

Dry bulk is the responsibility of the port's Leixões General Cargo and Dry Bulk Terminal (TCGL), whose main handling focus is centred around the use of mobile harbour cranes. When these handle agri-bulk, discharge is undertaken using 40m^3 grabs, which can generate productivity rates of 800 tonnes per hour.

Silos de Leixões (SDL), which has an operating area of 2.3ha, is responsible for grain storage. It has facilities that can store cereals, cereal derivatives, oil seeds and other foodstuffs. It has a combined capacity of 120,000 tonnes, of which 100,000 tonnes is in vertical silos and 20,000 tonnes in horizontal facilities.

The port also has a dedicated Cement Terminal, which both loads and discharge bulk cement. Concessionaire is the Companhia Geral de Cal e

Cimentos, S.A (SECIL). The operating area covers 1,500mt^2 and alongside draught is ten metres.

The main dry bulk commodities are woodchip, scrap metal, scrap glass, woodpellets, stone and agri-food. According to the APDL, volumes have continued to increase in the past few years. However, in agribulk given over to animal feed, there has been a slight downturn, although this has been offset by gains in other sectors.

Significantly, the port is targeting biomass. This is currently being moved in 20ft and 40 ft containers, although will later be moved as bulk. However, this will require new infrastructure. In the Silos de Leixões concession, a new 1,300m^2 has been carved out to accommodate this new biomass bulk, but there is also the possibility of introducing new space dedicated to this type of cargo on land adjacent to the port under the jurisdiction of the APDL, if new products can be captured.

In terms of terrestrial connectivity, dry bulk connections with the interior are undertaken purely by road. However, improvements have been made in the port to allow part of the overall cargo to use rail.

As for environmental protection against dust produced by dry bulk at terminals in Leixões, this consists of barriers formed of containers to designate handling areas, as well as the use of sprinklers to reduce the amount of dust in the air, and hoppers that also limit that amount of dust that can escape into the atmosphere.

A port authority spokesperson noted to *DCi*, "As environmental protection is one of the major concerns of the port, we are constantly studying innovative solutions that can reduce our negative impact. At the moment, for example, we are looking into using some chemicals especially developed to reduce as much dust movement as possible."

In terms of added value, Silos de Leixões is active, undertaking product de-infestation, cleaning and transport to industry. This whole sector is seen as one of "growing opportunities", although is highly competitive.

Finally, in respect of vessel sizes, those chartered in the solid bulk sector that operate at Leixões are generally of a considerable size, particularly those carrying woodchip, which are in the 65,000-tonne range. However, given draught of 12 metres at the port, most vessels of this type can be accommodated.

The risk of 'unsafe' CE certifications for category C standard equipment

The complexity of regulations, the strength of habit, the cost of technical and safety standards — both in the acquisition and understanding of documents, and their application within business — all like behind the major risks associated with 'unsafe' CE certifications, *writes expert Marc des Rieux of C3-expert.com.* This is especially true of machinery that comes under category C standards (a standard dealing with detailed safety requirements for a particular machine or group of machines).

In certain markets, such as continuous conveyor belt bulk handling, which falls under EN 620 (category C), I have observed that a very large number of conveyors that bear the CE mark, do not precisely meet the safety requirements of the Machinery Directive 2006/42/EC and repeated by the category A standard, reference EN ISO 12100v2010.

In my observations, I was able to deduce that all of these statements were, in my opinion, 'non-compliant', and the reasons for this included:

Habitual practice

The problem, resulting from the use, can be defined thus: the study of a project is carried out first of all according to a mechanical approach. When one study is complete, this adds a layer of 'security' to a project, which becomes almost 'frozen' mechanically. This is common practice, although it is contrary to the principles of the 'New Approach' described in EN ISO 12100.

First reason

As markets are very competitive, manufacturers have to spend as little time as possible on the development of their technical offer. The best way to achieve this is to rely on copy-paste of previous business and/or files that have been established for a long time. Unfortunately, this way of doing things, for which the economic reason is understandable, 'freezes' the conceptions for the future, especially when the contract is signed.

This first reason, falling under the breach in terms of safety compliance, comes from a multitude of poorly understood technical standards that are supposed to represent the state of the art. As a result, these standards are poorly enforced. This fact is reinforced by the certainty of a well-established knowledge that prevents any questioning (see # usage).

To illustrate this severe statement and among many other poorly understood standards, ISO 5048 (technical standard) — which defines the method of calculating a conveyor — includes in its article 5.3.3 a formula for calculating the chain profile (so of parabola, of loop). This loop forms the belt between two supports and gives the admissible upper and lower limits of sag (lowest point of the loop). In its 1973 version, this article was completed by two examples and in its 1987 version, these were rightly deleted, since the example values were erroneous. Unfortunately, in 2018, it is still the 'wrong' example values that are applied in the designs. Later in this article, I present the relation with EN ISO 12100.

Second reason

It is necessary to get back into the context of the hierarchy of laws to understand where the drift is leading, in good faith or otherwise, for unfortunately 'unsafe' CE certifications.

The Machinery Directive 2006/42 / EC specifies, in its articles 173 and 174 (note: use the *Guide for the application of the Machinery directive 2006/42 / CE 2nd edition*), a hierarchy of "the most adequate solutions and in the sequence indicated".

These articles of the Directive are superseded over by EN ISO 12100v2010 in Articles 4e and 6.1, Step 1, Note 1. Indeed, if Article 4e is subject to interpretation because of a comma instead of a new paragraph (4 e: remove the dangerous phenomenon, or reduce the hazard ...), Article 6.1, Step 1, Note 1 is particularly clear, without discussion or possible interpretation, specifying that everything that exposes to at least one hazard should be removed if it is possible and if it is not possible, then and only then, will it be used as a way to reduce the hazard (example: safety hood, grid, etc.).

So why is this prescription not applied or too infrequently?

As stated in the preamble, the complexity of the standards is such that when you are told that the safety standard that covers your type of machine is No. xxx, it is a rare individual that bears in mind that this standard can only be applied once the general standards — such as Category A — have already been applied. QED!

This complexity can be seen, for example, in the EN 620 standard which follows 29 standards as a reference, and 17 other standards that are noted in the bibliography. That means, a first set of 46 standards must first be applied in order to master the application of EN 620; to this we must add the normative references and library standards mentioned in each of the first level standards, and so on. It's a lot !!

Proposal

In order to put everything in good order to meet the standards of Category C, I recommend that this warning is added: "*This EN xxx standard, like all Category C standards, applies only after the exhaustion of the solutions prescribed in the general category A standards, notably EN ISO 12100v2010 # 4 e and 6.1, Step 1, Note 1.*"

Readers of this article can express their support for my wording, above in italics, by writing to *Dry Cargo International* — or to me via the magazine which will pass on all correspondence — in order to obtain the introduction of this additional wording to the C standards.

Representative examples

Below are four examples of belt conveyor designs — because this is my area of expertise — whose certification is unsafe; this affirmation is proven by calculation.

Extra radical case, n°1

Here, the entire machine should be removed.

I believe 100% of 'speeding up' conveyors should be removed because they are 'unsuitable for their destination' (mechanical aspect) and they involve at one risk (safety aspect). The proof lies in the calculation of the fall parabola of the product, projected on the unloading pulley, which must be considered as the angle of travel of the aggregates at the time of contact on the downstream belt.

Indeed, moving the product on the downstream belt at speed is not carried out according to the expected functions, and this is the cause of several problems with the machine.

General case n°2

In this case, a conveyor has a centre -to-centre distance of 425m. In its original form, it was equipped with nine pulleys and 144 return idlers. After calculation, the new design had only two pulleys and 27 return idlers — i.e. a reduction in the number of potentially hazardous components — [100-(100/9 * 2)] = 78% for the pulleys and [100-(100/144 * 27)] = 81% for the return idlers. These changes were motivated by recurrent disturbances on the original version and that the optimized design solved to ensure a very high level of reliability and security.

General case n°3

This is certainly the most common case, which concerns conveyors with a centre-to-centre distance of 42m and above. For these conveyors, the common practice is a design comprising one snub pulley in head, three pulleys for the pre-tensioning device (GTU) and, sometimes, one snub pulley associated with the tail pulley and with, for the pitch between return idlers, a standard pitch of 3m.

Here, the ISO 5048 and ISO 3870 technical standards, well understood and well applied, make it possible to reduce the number of pulleys from six or seven pieces to two pieces and to increase the pitch between 3m and 12–15m return idlers, for a very high level of reliability and security.

General case n°4

These are conveyors with a centre-to-centre distance of up to 30m, for which in most cases, there should be zero return idlers, instead of a number of unnecessary idlers. For these conveyors, it goes without saying that the number of pulleys is limited to two, except and subject to calculation, extractors (+1).

Reinforcing opinion

To ensure the relevance of these four examples, there is a conveyor that has been in service since 2002, with a flow rate of 700tph (tonnes per hour), with a centre distance of 1,100 m of center distance, 28m of elevation, with one head pulley and one tail pulley. The return idlers have a step of 12m. This suggests that all smaller conveyors can have such a simple mechanical design for perfect safety compliance. Yes! It's ok!

Reminder

As can be seen from the examples above, machine calculation notes are essential to a true statement of conformity for certification purposes; it is still necessary that these calculations are carried out properly.

What are the risks of an unsafe certification? ?

Given the estimated number of machines (conveyors) in service, whose certification is probably insincere, we can consider, according to the adage 'not seen, not taken', that the subject is unimportant.

The risks, in case of control or audit following an accident or near-accident, are a withdrawal, a revocation, a termination of the conformity statement (EN ISO 17000). Such a situation leads to the immediate cessation of the operation of the machine and the obligation to carry out the safety modifications for compliance to be able to operate the machine again. For example, a CRAM (* CRAM : Regional sickness and work accident insurance fund) in France had to order modifications to a conveyor in a cast iron foundry, to be carried out within three months, under penalty of shutdown.

In case of an accident on a machine, which is shown by experts to have an unsafe certification, the owner is then vulnerable to a court conviction (Case M ... 1996) with serious consequences for the company.

Manage compliance as a good family man

To achieve a high safety level (rules of good governance), you have to start with the removal of machines, machine parts and components that are hazardous and have no functional utility and replace these with machines that offer better reliability, with a very high level of safety.

There are organizations that can assist the machine owner to obtain, at least, an opinion on the quality of the safety compliance of his machine. First and foremost, CRAM engineers and insurers in general can provide advice or direct the request to an expert.

The habitual practice today is to call on a control body. Nevertheless, the report issued can be a false guarantee of conformity if the competence and the mission of the organization are limited to note that this or that exposure to a hazard is protected or unprotected. In this context, it will be difficult to say that this or that component, exposing him to a hazard, has no use, an affirmation demonstrated by a calculation for which, in general, he is not authorized.

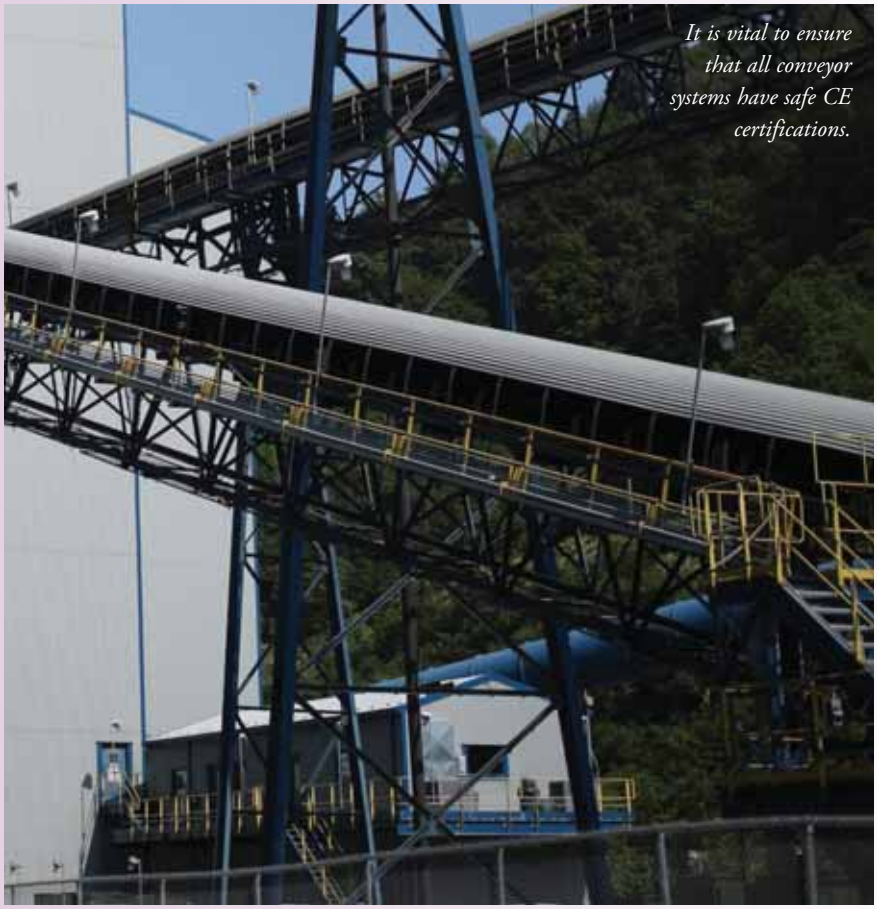
C3 Expert has created the labels 'C3 Label' and 'C3M Label' in order to guarantee, after the audit, a safe CE certification of the machines and with an easy and safe maintenance.

In a word!

This article should encourage the reader to consider the design of the machines under his responsibility and to ask the question for each component posing a risk, according to the list of hazards established from the standards EN ISO 14121, 14121-1, 14121 -2 'Machine Safety – Hazard Assessment'. It will sometimes be necessary to recalculate the machine according to an optimized design, that is to say a design whose components not justified by the calculation have been removed.

Nota bene:

Your remarks and comments on this text are welcome to change practices to the benefit of all.



It is vital to ensure that all conveyor systems have safe CE certifications.

VIGAN adjusts equipment to grain market trends

NIV 600 pneumatic ship-unloader head, installed in Dunkerque (France) in 2016.

Over the last decade, the global grain industry has slowly but constantly evolved revealing the following market trends.

The growth in worldwide population and grain production has led to an increase in demand for grain storage solutions and silos with bigger storage capacities.

Increased capacity and speed required by industry players continue to have a huge impact on the grain trade, having namely motivated the need for larger-size equipment for the unloading of increasingly large vessels.

These trends have become evident through various projects and requests that Belgium-based VIGAN has faced during the last few years. As a result VIGAN adjusted its equipment to meet worldwide industry changes and new standards.

NIV-type pneumatic ship unloaders

VIGAN Engineering S.A. designs and manufactures a complete range of pneumatic and mechanical conveying systems for products in bulk not only through the supply of equipment, but also by managing complete turnkey projects.

While offering both mechanical and pneumatic solutions, VIGAN is widely recognized throughout the world as an expert in pneumatic bulk handling technology.

Pneumatic ship unloaders of NIV type are specially adapted to medium size vessels up to post-Panamax, mainly because of the boom length of the unloaders, which can reach up to 30 metres.

VIGAN's pneumatic equipment can handle most free-flowing products with densities between 0.5 and 0.9 and a natural angle of repose of less than 40°. Suitable products include all kinds of grains (corn, wheat, barleys,...), oilseeds, raw materials for animal feed, wood pellets, typical chemicals such as soda ash, alumina, and also slightly compacting products such as soy bean meal.

Through an optimized and gentle handling process, VIGAN's equipment does not damage the products.

Each machine is customized and optimized according to the customer's technical requirements and site specifications: gantry type (stationary, self-propelled on rubber wheels or on rails), unloading capacity (from 160 to 800tph [tonnes per hour]), boom length (up to 30m), diesel/electrical power unit and many special optional devices.

Since its foundation in 1968, VIGAN has been continuously improving its own know-how with state-of-the-art design of major components of the suction part, such as:

- **VIGAN turbo-blower(s):** VIGAN's high-pressure three- to four-stage centrifugal turbo-blower(s) have automatic air regulators (also called frequency inverters) for optimized energy

consumption (power consumption reduction of around 25% compared to traditional systems).

- **filter & airlock:** VIGAN's pneumatic unloaders are fitted with a self-cleaning filter which operates through a jet pulse system (high pressure). VIGAN airlocks are produced in-house: different models are available to suit the diverse configurations.
- **VIGAN's telescopic piping system:** VIGAN has never stopped improving the wear-resistance of its piping, particularly on the Ni-Hard (nickel-chrome alloy) elbow which has a life expectation exceeding 'five million tonnes'.

Making the right choice

As each case is specific, VIGAN is helping its customers making the right choice of equipment. It is important to ensure that the machine selected is the most appropriate for the job to be done, which is generally a rather complex matter.

As a matter of example, to unload up to five million tonnes of seeds per year, VIGAN usually recommends the use of one or two pneumatic ship unloaders on a gantry. For higher unloading rates, VIGAN recommends a mix between NIV and SIMPORTER (mechanical ship unloader). In this case, the pneumatic ship-unloader would be dedicated to also assist in the cleaning of ship holds, which is the least efficient phase during the unloading of seeds.

The main advantages of the pneumatic unloaders are efficiency, reliability and cost-effectiveness. Indeed, the pneumatic systems offer:

- most efficient cleaning of the vessel or barge hold;
- low energy consumption (0.7kW/h per tonne unloaded), thanks to the direct drive of VIGAN high pressure multi-stage centrifugal turbo blower(s) and its frequency inverter steering;
- very low breakage/damage of the products;
- no spillage thanks to its totally closed design;
- no dust: filter with sleeves and automatic self-cleaning; and
- low noise thanks to acoustic insulation.

NIV 600 as VIGAN standard

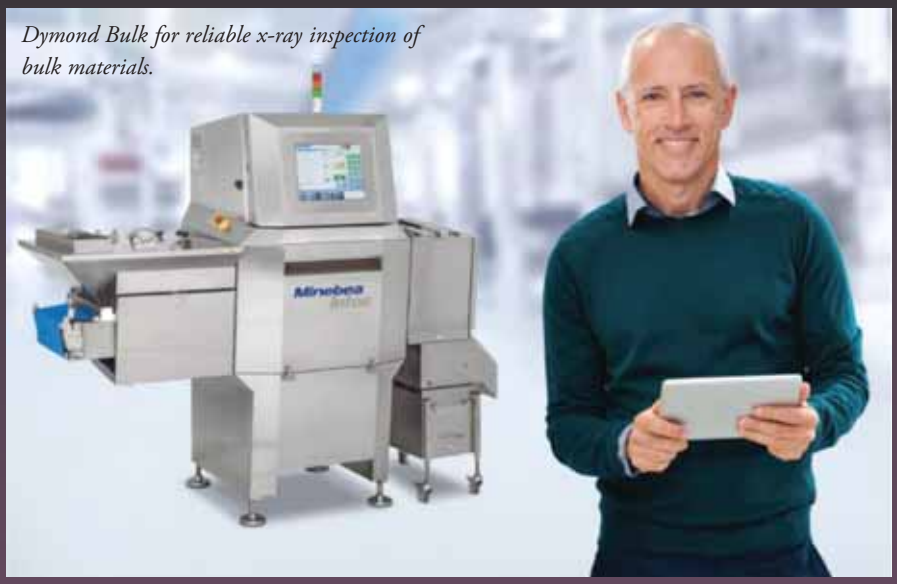
In order to adapt its equipment to market trends, VIGAN has evolved year by year to design, manufacture and erect equipment of higher capacities. The VIGAN 'NIV 600' pneumatic ship-unloader, first designed in 2000, has now become the standard, representing on average 60% of NIV-type pneumatic ship-unloaders sold by VIGAN over the last five years.

Bigger and bigger capacities

VIGAN continuously invests in R&D and larger manufacturing facilities to offer handling equipment in line with the market demand. The company namely invests in the design of even higher capacity equipment, like 800tph pneumatic ship-unloaders. In order to serve its customers better and to be prepared for the future, VIGAN is expanding its manufacturing facility in Nivelles, with a major extension of an even larger pre-assembly hall.

VIGAN is convinced that pre-assembly of all ship-unloaders in its factory guarantees quality and shortens erection time locally, thereby cutting expenses to the minimum.

Weighing up the pros and cons of inspection technologies with Minebea Intec



Dymond Bulk for reliable x-ray inspection of bulk materials.

Minebea Intec is a leading manufacturer of industrial weighing and inspection technologies. With its headquarters in Hamburg, Germany, for over 147 years the company has been offering products and services which have become synonymous with innovation, performance and reliability. The product portfolio includes platform scales, load cells, vessel and silo scales, checkweighers, metal detectors, X-ray inspection systems and user-friendly software solutions.

With around 1,000 employees worldwide, 19 sites and a network of over 185 certified international distribution partners, Minebea Intec is a global player in its industry. Having sold more than 90,000 inspection systems, 350,000 industrial scales and indicators, around 1,000,000 industrial load cells, and services worldwide, the company can be relied upon by its customers and partners from a wide range of industries.

Minebea Intec is part of the Sensing Device Business Unit of the MinebeaMitsumi Group, one of the leading suppliers of high-precision production components, such as ball bearings and engines, as well as high-quality electronic components, such as sensors, antennae and IoT solutions. The group, based in Tokyo, has over 78,000 employees worldwide and reported a consolidated net turnover of JPY 638,926 million (approximately €4.8 billion) for 2016.

New: X-ray Inspection System Dymond Bulk

Minebea Intec continues to expand its foreign body detection product range with the introduction of the new X-ray inspection system Dymond Bulk. The supplier of industrial weighing and inspection technologies developed this innovative system specifically with bulk goods in mind. The X-ray inspection device is particularly suitable for processes between incoming goods and packaging lines in the food industry.

Dymond Bulk reliably inspects bulk goods like nuts, smaller fruits, frozen vegetables, and also spices, coffee and seeds, and eliminates any foreign bodies it identifies. The X-ray inspection system not only identifies foreign bodies made from metal, plastic and stone, but also bits of dirt and glass, which has obvious benefits for all goods that are introduced into the production process 'straight from the field'. "In food production, the 'sorting and cleaning' stage for raw materials is by no means a precise science," explains Global Product Manager Inspection Michael Zabawski from Minebea Intec. "The X-ray inspection system Dymond Bulk can make a significant difference here, increasing safety and quality parameters even before the refinement process."

Dymond Bulk stands out because it is so user friendly. A conscious effort has been made to simplify the complex technology for the user: from real-time detection via colour-based contamination analysis, through to straightforward belt replacement and an easy-to-clean inspection system.

Bulk goods like seeds, coffee, nuts and smaller fruits are reliably inspected and foreign bodies eliminated.

Why grabs will always endure an open and shut case

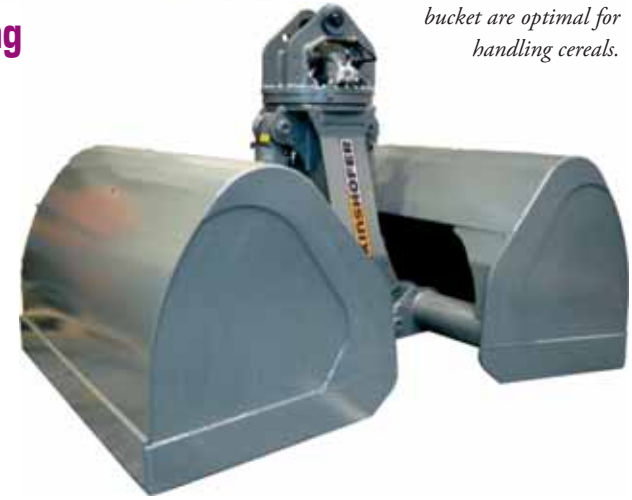
The closed shells of Kinshofer's C40VHD re-handling clamshell bucket are optimal for handling cereals.

Jay Venter

Less dust with closed Kinshofer re-handling clamshell buckets

For over 46 years, Kinshofer GmbH has been a renowned manufacturer of high-quality attachments for truck-mounted cranes. The company is now well on the way to becoming a favoured producer of excavator attachments, too.

In the last two decades, Kinshofer has become more and more popular in the re-handling business, producing large orange peel grabs (P-Series) for excavators with an operating weight of up to 200 tonnes and re-handling clamshell buckets (C-Series) for excavators and carriers with an operating weight from 18 tonnes

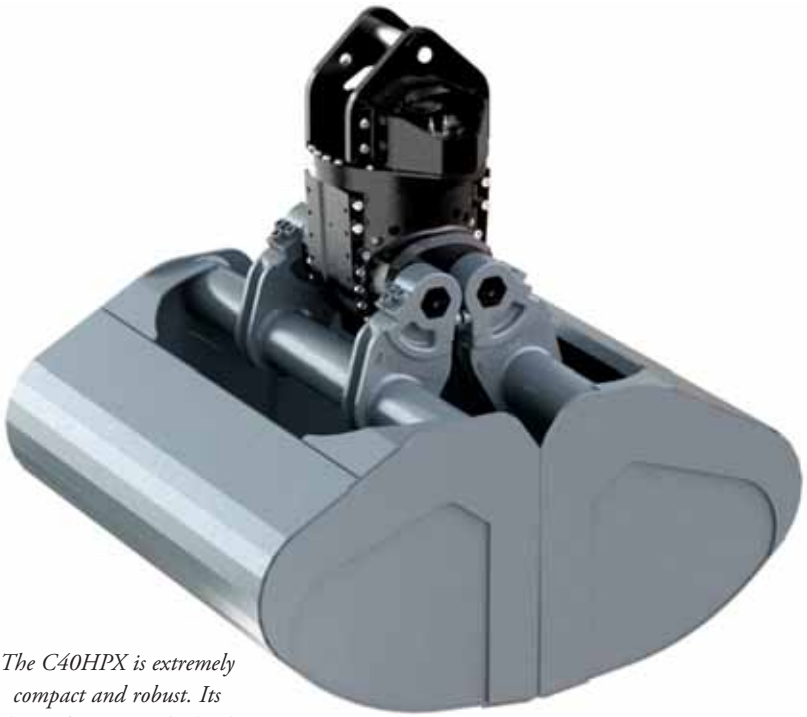


up to 80 tonnes.

Today we know, that fugitive emissions from grain buckets take the form of grain dust. This dust escapes all through the process of re-handling corn, cereals and flour. The total dust is more than we estimate. In Minneapolis, for example, "about 22,500 tonnes of fine dust would be spread around the plant areas each year".

There are different methods of preventing the dust from getting into the air. Sophisticated techniques against hazardous dusts — like spraying water, raising windfences, applying coatings or crusting — are used as a result of fugitive dust.

However, when re-handling grains, it is possible to reduce significantly the escape of dust, and particle pollution in the air — so not spoiling food cereals — by using clamshell buckets with closed rather than open shells.



The C40HPX is extremely compact and robust. Its closing force stays absolutely constant, from the very beginning to the end of the grabbing act.

Kinshofer produces re-handling clamshell buckets with closed shells for carriers up to 40 tonnes for loading bulk materials like coal, fertilizers or grain — either with vertical cylinders or with the revolutionary cylinderless HPXdrive. These C40VHD and C40HPX grabs successfully prevent material and dust from getting out of the bucket.

More advantages of the C40VHD and the C40HPX include: optimal loading due to the high volume of the torsion-resistant shells and precise positioning thanks to the integrated rotation. Long life is ensured thanks to the use of 500 HB steel in the manufacture of cutting edges. The shell back walls (8mm/0.31in, HB 400) also resist highly abrasive materials. Bearing points have specially coated bushings and hardened pins. Due to wear-resistant closed shells, the clamshell re-handling buckets are ideal for very fine-grained loads like cereals.

The integrated rotation has sophisticated features: swivel and bevel are sealed, rotary feedthrough and motor are accessible directly, and an integrated non-return valve guarantees a secure retention of the load. Excellent digging characteristics are the result of high closing forces due to two vertical cylinders (C40VHD) or of an absolutely constant closing force (C40HPX).

Kinshofer is a strict believer in innovation and quality. Thomas Friedrich, President & CEO of the Kinshofer Group, noted in December when acquiring the Doherty Group: "Kinshofer continues its strategy to provide the industry with a 'One-Stop-Shop' solution of outstandingly engineered products to increase efficiency and, more importantly, profitability of our customers."

The revolutionary HPXdrive technology is a specific and unique technology of many different KINSHOFER attachments. There are no protruding or vulnerable cylinders.

NEGRINI
since 1967
S.R.L.

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

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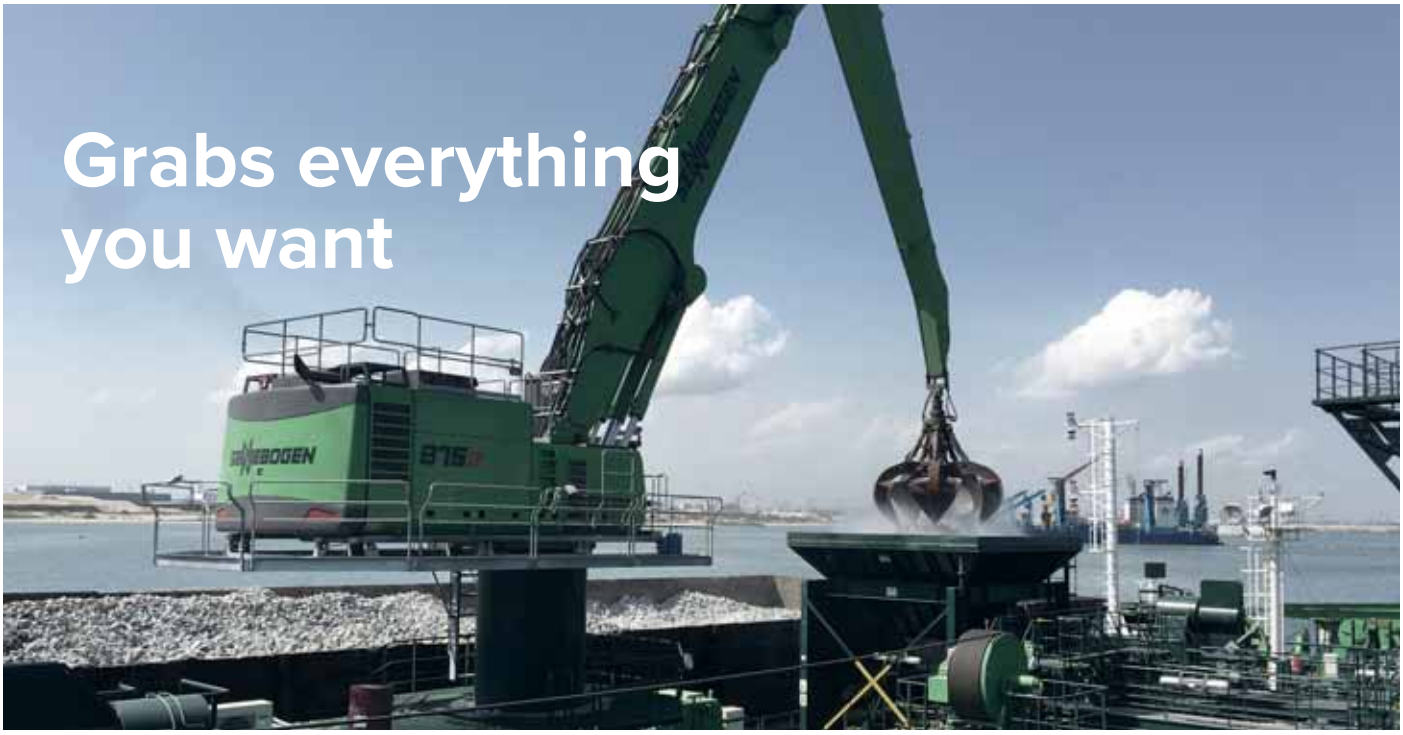
More than 70 years experience



Grabs everything you want

Our products

For all kinds of bulk handling

- Cactus Rope Grabs
- Clamshell Rope Grabs
- Hydraulic Cactus Grabs
- Hydraulic Clamshell Grabs
- Hydraulic Log Grabs
- Hydraulic Demolition & Sorting Grabs
- Quick Change System
- Multipurpose Spreader

All our grabs are custom made, designed and produced to our customers requirements.

J&B Grabs are highly efficient for large volume and low deadweight handling.

We grab everything you want!

Recent deliveries by J&B Grabs

An 8,000-litre J&B grab.

Recent grab deliveries by J&B Grabs (J&B Grijpers) include:

A light weight grab for dredging

- A grab with a weight 8,000kg and a capacity of 8,000 litres.
- The grab is hydraulic driven with four cylinders for high cutting forces.
- The floating pins and bushes are greased by a central greasing system.

Four grabs on transport to Belgium

2 x LHG125, for cereals

- Capacity: 8,000 litres.
- Own weight: 3,800kg.

1 x LHG100, for cement clinker

- Capacity: 2,500 litres.
- Own weight: 2,000kg.

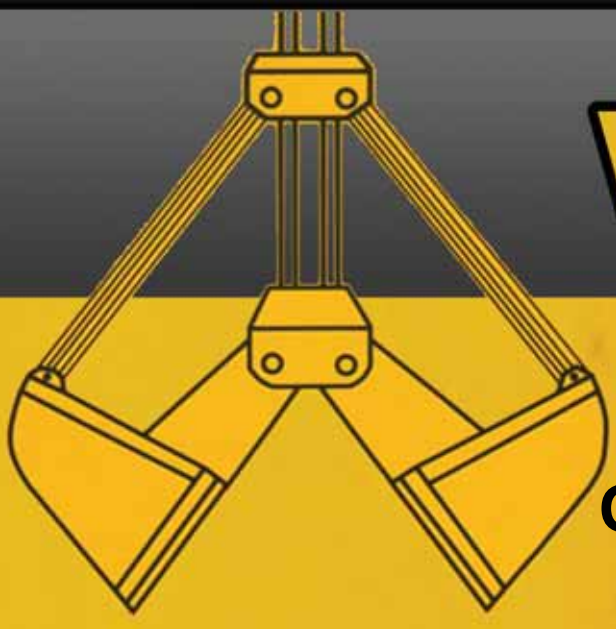
1x Grab LHG100 repaired

- Pins and bushes renewed according to the wishes of the customer.

Located in the Netherland, J&B Grabs delivers parts and grabs internationally.

J&B Grabs are used among many brands and types of available cranes; some examples are E-Crane, Sennebogen, Caterpillar, Hitachi, Liebherr, Volvo, Fuchs and more.

Four J&B Grijpers grabs being transported to Belgium.



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New, faster, lighter, stronger: the nemaX®

Dry bulk terminal operators are always looking for ways to increase terminal efficiency.

It's also important to optimize profits for shareholders, and to increase the competitive edge. Grabs are extremely decisive for terminal efficiency. That's why Nemag has introduced its most productive grab for iron ore yet: the nemaX®. This new grab for handling iron ore will increase productivity by more than 10% and has the lowest maintenance costs ever.

The dry bulk terminal operator environment is changing rapidly. There is extreme pressure on handling rates because of the overcapacity in the dry bulk market. This creates a growing concern among shareholders to increase yields from their investments. At the same time costs for wages, maintenance and energy are rising.

An innovative solution

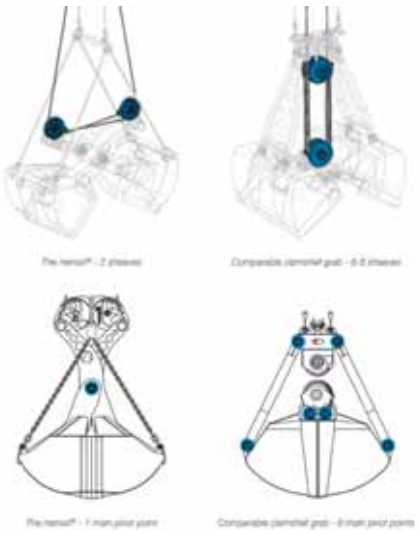
To create an attractive position in the market, for terminal operators it's important to achieve the highest productivity and shortest turnaround time for each vessel. In short: the terminal operator wants to commit to the highest productivity requirements combined with the lowest handling cost per tonne of material transferred. This would result in efficiency and the incentive of a return on despatch money. An innovative solution is needed to achieve this.

Existing infrastructure

A typical dry bulk terminal is equipped with a captive infrastructure with capital-intensive assets like quays, unloaders, conveyor lines and stacking/reclaiming equipment. These assets are depreciated over a long period of time. Typical hourly rates for such installations are high and may go up to US$1,000 per hour. The assets are generally working at maximum capacity, both technically and operationally. In many cases, there is no possibility of increasing performance. This often leads to a situation where a terminal operator is forced to accept both the situation and its limitations.

The cheapest way to increase productivity

The productivity of a grab unloader is the product of the grab's payload times cycles per hour. The productivity is also determined by the speed of the crane, travel distances and the opening and closing time of the grab. The basic crane configuration cannot be upgraded without



very costly modifications. By far the easiest and most cost-effective solution is to exchange the grab for an efficient one. The lowest deadweight combined with speed of closing and opening are of paramount importance, and that's exactly what Nemag's new grab offers. Through exhaustive computer simulations, Nemag has succeeded in developing a new generation of — patented — grabs for handling iron: the nemaX® grab. Using the nemaX® will increase the productivity performance of the entire installation by at least 10%.

The nemaX®: a new generation of grab

The nemaX® features a deadweight efficiency of only 25–28%, and a grab ratio of 2.5 to 3. This means on average that the nemaX® is about 15% lighter than any comparable clamshell grabs on the market. The nemaX® is also the fastest grab on the market; the optimized closing mechanism enables a 20% shorter closing time and maintains closing force on the lip plates at high levels. The result is an increase in productivity of at least 10%, starting immediately from the very first grab cycle and continuing all the way down in the hatch. As well as this improvement, there is an additional productivity gain from extended free digging and improved cleaning up.

Extremely low maintenance costs

But there is more: the nemaX® offers also extremely low maintenance costs.

When buying a new grab, the purchase price should be the number one consideration, right? Or... maybe not? On average, the asset investment costs (CAPEX) of a four-rope grab are around one eurocent per tonne of cargo transferred, calculated over the grab's lifespan. Grab maintenance costs, on the other hand, can be as much as two to three eurocents per tonne of cargo transferred, calculated over the grab's lifespan. This means that over time, the total maintenance costs will exceed CAPEX costs. It's justified to ask what's more important, CAPEX or operating expenditure (OPEX). You can determine a grab's CAPEX by looking at the purchase order. Grab maintenance costs however, are often 'hidden' in general maintenance budgets and are difficult to trace back to an individual grab.

Bulk terminals with clear insight into maintenance costs have concluded that asset investment costs (CAPEX) are of minor importance compared to the total maintenance costs. Grabs are always moving — day in, day out, 24 hours a day. There's no way to prevent normal wear in an iron ore grab altogether. But when a grab has fewer moving parts, it requires less maintenance. And that's precisely what the nemaX® offers. Using a nemaX® grab allows the client to save significantly on maintenance costs per tonne of cargo transferred.

The nemaX® achieves this thanks to the following features:

1. Fewer moving parts
The nemaX® design reduces the number of moving parts to the bare minimum: only two sheaves and 70% fewer moving parts than in a comparable clamshell grab.

2. Only one main pivot point
The nemaX® has only one pivot point with two high-quality spherical roller bearings — compared with six pivot points in a conventional clamshell grab with 12 slide bearings.

3. Closing cables have a long lifespan
The way in which the hoisting wires have been reeved reduces flexing along the sheave blocks by 75% compared to a 2 × 5 parts clamshell grab. Metal fatigue in the closing cables is reduced proportionately, resulting in a longer service life for these cables. And nemaX®'s unique working principle minimizes the clogging and wear of sheave assembly and closing cables and significantly extends the lifespan of the closing cables.

4. Closing cables are easy to switch
The anchor points of the closing cables are located at an accessible working height, making it easy and safe to reeve in new closing cables — without having to set up an elevated work platform, for example, or scaffolding.

5. Based on full FEM calculations
The grab mechanism and shells have been entirely optimized by means of computer simulations. In addition to performance simulations based on DEM (Discrete Elements Method) and MBD (Multi Body Dynamics), the mechanism has been optimized with the aid of Finite Element Method (FEM). Nemag's extensive grab construction expertise and on-the-ground experience have been incorporated in these FEM calculations.

6. Robust design
The nemaX® grab has an exceptionally robust, patented symmetrical layout. The grab design features a number of highly specific design solutions that combine to give the structure high stability and lend the grab a strong structural resistance against impact.

About Nemag

Nemag, a family business founded 93 years ago, is an excellent partner for the handling of dry bulk materials and enjoys a strong reputation worldwide. Nemag provides a full range of grabs and various types of quick-release links and rope-pear sockets. Whether it's handling coal and iron ore, loading and unloading wheat, scrap materials, minerals, biomass or other bulk goods, Nemag has an appropriate and reliable solution. The aim is always to reduce handling costs per tonne of dry bulk materials transferred for steel plants, power stations, OEMs and commercial terminal operators. Alongside innovation, customer support and a highly intensive after-sales service are of paramount importance to both Nemag and its customers. A global network of specialized representatives supported by Nemag specialists is ready to assist customers worldwide.

Red Dot Award for the nemaX® grab

Generally awarded to consumer products on the cutting edge of innovative design, one of the Red Dot Awards this year has gone to an unusual candidate: the nemaX® grab from Nemag. Previous product design winners have included the iPhone, the BMW 5 series and the GoPro Hero. This is the first time in history that an industrial grab has received this internationally acclaimed distinction. The expert jury was won over by the outstanding design quality exemplified in the innovative nemaX® concept.

Nemag's nemaX grab was awarded a Red Dot Award this year.

Higher productivity, lower maintenance

The patented nemaX® is one of the most productive grabs on the market, increasing the entire productivity of a dry bulk terminal by at least 10%. Its optimized closing mechanism helps it close 20% faster, facilitates ergonomic maintenance at safe heights, and reduces spillage. The nemaX® has 70% fewer moving parts and the lowest maintenance costs on the market. The design capitalizes on the mechanical properties of high-tensile steels by preventing multi-axial stresses in the main construction. The resulting lean, graceful design has a minimum of joints and welds that are vulnerable to fatigue, ensuring cost-effective operation and maintenance.

Evaluation platform for good design

Dating back to 1955, the Red Dot Award is presented in several categories, including product design, communication design and design concept. In 2018, designers and manufacturers from 59 countries submitted more than 6,300 objects to the competition. True to the motto "In search of good design and innovation", a jury assessed the products individually based on the original. The strict assessment criteria, which include level of innovation, functionality and durability, provide a frame of reference which the jurors then complement with their own expertise. The nemaX® grab has won this year's Red Dot Award for Product Design, which is most frequently presented to consumer products.

Multi-award winner

As Professor Peter Zec, PhD, founder and CEO of the Red Dot Award, explained, "Success in the Red Dot competition is proof of the good design quality of the products and once again shows that companies are on the right path. All of the products are characterized by outstanding functionality. This demonstrates that the designers have understood their clients and their needs." The Red Dot Award is not the only recognition conferred on the nemaX®.

Winning designs showcased internationally

The nemaX® grab will be featured in the *Red Dot Design Yearbook 2018/2019*, which showcases all of the year's winning products. In addition, the winners will be prominently profiled in the Online Exhibition, in the Red Dot App and on Red Dot 21.

Belgian customer orders Beco hydraulic clamshell bucket

For a customer in Belgium, BV Beco has manufactured another hydraulic clamshell bucket for the handling of sand with a capacity of 2,600 litres, light execution, an own weight of 2.3 tonnes with hydraulic rotor.

The clamshell bucket has also been provided with a central distribution block on which all the grease points of the clamshell bucket come together. The entire clamshell bucket can be lubricated by means of one lubrication point.

The clamshell bucket has also been equipped with a connection piece in order to suspend the clamshell bucket on to the crane. It has been made of high tensile steel 690, wear-resistant material, hardness HB400 and S355.

RAM Spreaders quadruples productivity of biomass loading at Riga Bulk Terminals

CBH system offers alternative to loading using grabs

With growth in environmental awareness and increasing demand for renewable energy sources, growth in biomass exports have increased. As a result Riga Universal Terminal (RUT) in Latvia had begun handling biomass pellets and woodchips, but was looking for innovative ways to cope with demand while still being cost competitive for its clients.

After extensive research, RUT's management was steered towards a system called Containerised Bulk Handling (CBH). This particular system allows the commodity to be directly loaded into containers and tipped into the ships hold with rotating spreader RAM Revolver® attached to a Liebherr mobile harbour crane.

RUT's expansion

Riga Universal Terminal, located just outside the beautiful city centre of Riga in Latvia was formed in 2001 and rapidly developed to become one of the top terminals in the port of Riga.

In 2013 international operator Portek Group from Singapore took note of this success and acquired RUT. The innovative management team has grown the business from traditional sources, adding different kinds of cargo. The multipurpose port can handle containers, breakbulk, timber and various types of bulk materials.

> **"That's a production productivity increase of 300%! Such a result we would have never expected. We are very satisfied!"**
>
> **Kaspars Buris — Technical Support Manager RUT**

Due to a rising demand of renewable energy sources, a few years ago RUT started handling sunflower pellets, wood pellets and wood chips. Being biomass products, wood pellets and chips are quickly becoming a valuable commodity and are in high demand as a reliable and renewable energy source.

The increasing demand meant that RUT had to look at more efficient high capacity loading systems to continue growth.

CBH — good option for material handling

When considering the different options available, RUT had thought about buying a new material handler in the region of €1.3 million as well as the possibility of having to sell one of its existing Liebherr mobile harbour cranes (MHC) in order to buy a bigger and much more expensive crane.

With the support of its Liebherr service partner Alfis Ltd. and the sales agency Intersafe Marine AB, RUT soon got the recommendation for the RAM Revolver®

Containerised Bulk Handling with the revolver allows for high capacity loading of up to 45 tonnes per cycle. Utilizing the existing Liebherr MHC and the skilled operators; RUT projected 30 cycles per hour.

This meant that for a small investment the RUT could increase loading rates making the terminal more profitable with higher annual tonnage for a small investment in crane attachment.

Operation

The RAM Revolver® and purpose-built high capacity containers were delivered in January 2017 and they made a difference straight away.

While loading vessels with wood chips, RUT compared the work of a material handler with the work of a RAM Revolver® by measuring the time it takes to load the vessels with each machine. It found out that the material handler had a maximum capacity of handling 200tph (tonnes per

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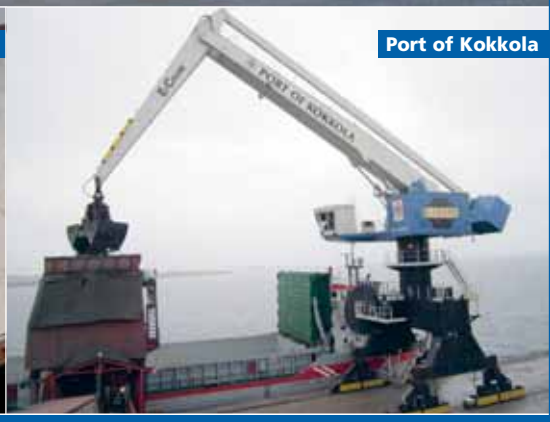

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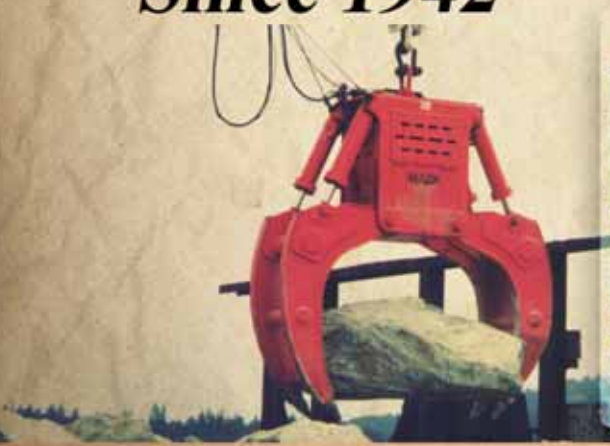

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hour), while the RAM Revolver® reached speeds of 800tph on the first usage, which can only increase.

Facts about RAM Revolver®

Loading bulk with RAM Revolver® is revolutionary because of the reduction in material loss and pollution.

The system first uses containers which can be enclosed with a lid to stop any material loss.

Secondly the system adds little energy to material when tipping gently at the bottom of the hatch where there is very little dust generated.

RUT is very proud and happy of being able to operate with this innovative kind of machinery; and is looking forward to welcoming guests from other ports and companies to show them the fast and easy operation of its new RAM Revolver®.

Facts about cargo handled by RUT:

Even though the RAM Revolver® is widely used in bulk handling in Australia and South America, the one in Riga is now the very first of its kind working in Europe.

Offices with engineering support are available in Germany, UK, Holland & Scandinavia.

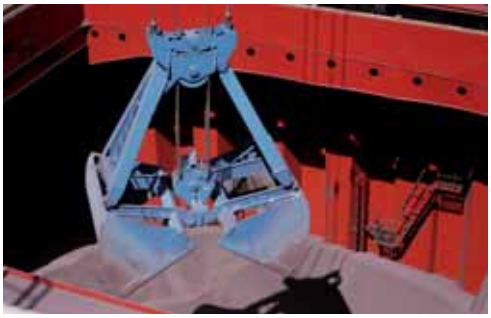
Facts about cargo handled by RUT

Even though the RAM Revolver® is widely used in bulk handling in Australia and South America, the one in Riga is now the very first of its kind working in Europe.

Facts about revolver loading rates

WORLDWIDE NUMBER ONE

IN ROPE-OPERATED GRABS



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Investment in quality pays its way for port operators

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

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

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

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

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

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

Since 2006 Page Macrae Engineering has supplied bulk grabs and dust-controlled hoppers to QUBE Logistics who are now the largest supplier of port stevedoring services in Australia, and, since 2010, has expanded their portfolio to be one of Australia's largest providers of logistics services also.

QUBE Darwin hopper and grab solution.

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

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

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

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

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

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

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

It is from these projects that the company developed its range of diesel-

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

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

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

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

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

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

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

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

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

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

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

Smart grabs: Credeblug develops its remote control and automation kit

A Pulanfi clamshell grab.

Credeblug's GIITS (Grab Intelligent Interface and Transmission System) connects the grab with the crane control.

Credeblug, based in Northern Spain, boasts a comprehensive handling system catalogue and it is prepared, both technically and structurally, to tackle new challenges and continue developing its machines and systems. The company has extensive experience in the design and manufacture of clamshell grabs, orange peel grabs and tongs, all under the Blug brand. Its grabs are extensively used in bulk handling situations, as well as elsewhere.

Within water treatment plants, river and port dredging, dam construction and offshore markets, Credeblug's Pulanfi technology is the result of a very ambitious development started in 2010 and validated with the three tonne-capacity prototype's tests in 2013. Pulanfi manipulators are prepared to work down to depths of 1,000 metres in marine environments and include vision, lighting and control devices.

This is a modular solution that could be adapted to different materials handling using the same grab structure. It has been specially conceived to be used in natural disasters assistance where no specific tools are normally available (for example, to recover sunken loads or help with massive oil leaks' sealing). The first Pulanfi units are already on the market and a good reference is the unit delivered for Lee Tunnel in London. This unit is Atex certified, usable for Zone 1 (Category 2) with presence of hydrogen sulphide in the surface and submergible up to 100m.

To continue with this process, in 2016 Credeblug joined the biggest European consortium of companies involved in offshore technology development project called Harsh and coordinated by the Basque Energy Cluster. This sea-based platform will allow the company to test the components and systems of its technology under real conditions and fatigue effects during 2017–2019 period.

The current market is moving towards cranes and grabs automation where cycle time and cost minimization are some of the main goals. This tendency needs to be based on reliable technologies that could improve crane operated duty in a safe way. That's why Credeblug has developed GIITS (Grab Intelligent Interface and Transmission System), a wireless system that connects the grab with the crane control so that all the safety devices information could be used without increasing or modifying wire's requirements. This system is already available on its third version — GIITS 2017_0.3. All the data collected is monitored and analysed in real time by Blug Remote platform and then visualized in a web environment where customers can get access to grab and crane status, modify the set-up and check productivity and maintenance information.

Blug is not the biggest grab supplier but the company has been chosen regularly by demanding end customers and crane manufacturers, offering the full range of grab requirements in port activity and matching the market's requirements in terms of after sales service.

The main goal and vision of the company is to allow customers and partners to have a good experience and end result so that they want to repeat using Blug's grabs.

In 1965 Blug Ibérica S.A. was founded by Jesus Letona with the clear idea of giving adapted solutions to any handling or production need, principally in the metallurgical sector.

For many years the company has successfully designed different types of rolling mills, cutters, presses, roller tracks and many other machines of great technical complexity and always maintaining Blug brand's guarantee. DCi

Moving with the times?

portable bulk handling equipment

Konecranes Gottwald Model 4 mobile harbour cranes handling bulk material. A similar crane will handle coal and coconut husk in the Japanese Port of Miike.

Konecranes strengthens its bulk handling presence in Japan with a Model 4 mobile harbour crane

At the end of 2017, Konecranes received its first order for a Konecranes Gottwald Model 4 mobile harbour crane from Japan. The crane will be dedicated to bulk handling.

Konecranes will supply the eco-efficient, diesel-electric Model 4 crane to Miike Port Logistics (MPL). MPL will begin to operate the crane which was ordered via Chikuho Seisakusho Co., Ltd. (CS) at the end of 2018 at its terminal in the Port of Miike. The machine will be dedicated to bulk handling, mainly of coal and coconut husk.

MPL has been operating a smaller Konecranes Gottwald mobile harbour crane since 2006. This crane has been handling different types of cargo, including bulk, with a motor grab. Miike's new mobile harbour crane will replace an ageing bulk gantry crane. Makoto Aso, President, CS, explains: "Bulk handling technology from Konecranes has proven to be very productive and reliable at many terminals around the world. MPL has been very impressed by the performance of their Konecranes cargo handling equipment to date. It was logical to opt for a Konecranes Gottwald mobile harbour crane in order to further expand their bulk handling activities."

Holger Schauer, Regional Sales Manager, Konecranes Port Solutions, says: "We are pleased that the fleet of Konecranes Gottwald mobile harbour cranes at Japanese terminals is growing. Since 2003, we have delivered one Model 2 and nine HMK 170 E mobile harbour cranes, the predecessor of Model 2, to nine terminals around the country. The new crane will be the first Model 4 mobile harbour crane to be operated in Japan."

The four-rope grab crane has a maximum lifting capacity of 95 tonnes, an outreach of up to 46m and a high-performance grab curve. To meet the special requirements in Japan, Konecranes will deliver the crane with an additional overload indicator.

Konecranes is a renowned global group of Lifting Businesses™, serving a broad range of customers, including manufacturing and process industries, shipyards, ports and terminals. Konecranes provides productivity enhancing lifting solutions as well as services for lifting equipment of all makes. In 2017, group sales totalled €3,136 million. The group has 16,400 employees at 600 locations in 50 countries. Konecranes shares are listed on the Nasdaq Helsinki stock exchange.

Enhancing the performance of mobile harbour cranes: Evolution Q9 XT

The worldwide increase in bulk material transports faces ever greater challenges to logistics companies. The challenge invariably is that the bulk material —whether sticky or granular — needs to be handled efficiently and fast. For the efficient, fast and safe loading and unloading of ships, mobile harbour cranes and ship-unloaders play an essential role. In many cases, this is possible only if the equipment is fitted with the right type of high performance steel wire ropes. In the form of its Evolution Q9 XT high performance steel wire ropes, Teufelberger-Redaelli has developed a product that can unleash its full potential especially on cranes used to handle bulk materials.

Teufelberger-Redaelli offers eight-strand high-performance steel wire ropes that are used successfully on ship unloaders and mobile harbor cranes from well-known crane manufacturers. Using the company's steel wire ropes as hoist ropes, mobile harbour cranes unload any type of bulk material and that practically around the clock. In addition to Teufelberger-Redaelli's renowned products such as Evolution QS816V and Evolution Q8, which have proven their worth in the market for many years, its brand-new Evolution Q9 XT is a recent development that makes loading operations more efficient yet.

Teufelberger-Redaelli's Evolution Q9 XT high-performance steel wire rope is used mainly on mobile harbour cranes and ship-unloaders in the bulk materials segment where it wows its users with outstanding longevity. The compacted Evolution Q9 XT features four core strands and a unique design that makes it extremely resistant to shock loads. Its structure without centre wire prevents the core from being damaged in use. Otherwise, the result would be unscheduled and thus particularly costly early downtimes.

The minimized risk of damaging the rope's core significantly prolongs the rope's service life and reduces the number of necessary rope changes due to handling problems. The four SUPERFILL® compacted core strands, in combination with the plasticized core, ensure very high stability to lateral pressures and prevent the ingress of water into the core. The latter is a quality that is of particular importance for use in harbours. Its 248 compacted outer wires put the rope into rope category number 11 that permits a large number of broken wires before the rope must be replaced.

However, the selection of the right high-performance steel wire rope is only the first step toward working successfully with a crane. The international team of application technicians from Teufelberger-Redaelli supports customers in installing the ropes and provides them with advice and hands-on assistance with regard to any rope-related matters throughout the rope's entire service life.

Teufelberger-Redaelli which together account for over 400 years of expertise, offers an exceptional range of highly developed special steel wire ropes. The extended product portfolio can satisfy a wide range of applications for offshore and onshore oil & gas activities, for passenger and material transport, mining, industrial lifting in construction and harbours, personal protection as well as for development and production of innovative systems for lifting.

About Teufelberger-Redaelli

Teufelberger-Redaelli is a globally renowned brand that specializes in the development, design, manufacture and distribution of high-performance steel wire ropes with locations in Austria, Italy and China. Teufelberger-Redaelli is part of TEUFELBERGER group, an internationally successful family enterprise focusing not only on wire rope, but also develops and manufactures fibre rope and strapping in Austria, Czech Republic, USA, Thailand and Sweden. In 2017, TEUFELBERGER group — together with Redaelli — generated €225 million sales, 90% of which is generated abroad with a workforce of 1,300 members worldwide.

Hitachi fleet provides reliable support on 'urban mining' operation

A fleet of Hitachi wheel loaders and excavators is providing crucial support to Heros Sluiskil BV (Heros), a facility in the Netherlands that extracts valuable raw materials from incinerated domestic and industrial waste for reuse. Heros has been a loyal Hitachi customer since 2011 and now has a fleet of ten machines including a ZX350LC-6 excavator and nine ZW-6 wheel loaders.

During its 'urban mining' process, Heros extracts ferrous materials such as iron, and non-ferrous metals such as aluminium and copper, from incinerated bottom ash. The remaining material forms the basis for the production of high-quality secondary aggregates, used for example in road construction or concrete products.

A demanding location

On the challenging 45-hectare site, the Hitachi machines are used to carry out a variety of tasks. The ZX350LC-6 medium excavator is used to open up the stockpiles of incinerated bottom ash, which can be stored on site for three to six weeks. One of the ZW310 wheel loaders takes material from the pile and transports it to the feeder of the separation and processing equipment. A ZW250-6 works in another section, where scrap metal is separated, while the company's largest wheel loader, a ZW370-6, is used to unload material from ships that dock in the adjacent canal. The smallest Hitachi wheel loader on site, the ZW180-6, works for 16 hours a day in the 2,700m² non-ferrous upgrading facility.

"We chose the Hitachi ZW180-6 to work inside the plant, as it's easy to manoeuvre and able to reach the height of the feeder," says Peter David, Head of Machines and Planning at Heros. "It's also versatile for tidying the stockpiles, loading the machine and cleaning the floor."

Reliability and service are key

To ensure the highest level of support, the machines are provided with full maintenance and service contracts, and extended warranty from Hitachi's local dealer Pladdet (a sub-dealer of Hitachi Construction Machinery Nederland), which is conveniently located 20km away. "Reliability and service nearby are the most important things for us," says David.

Such demanding conditions require a fleet of the most robust and durable equipment. "It's a very corrosive environment," adds David. "The bottom ash can stick to machines like concrete or cement. In fact, the reliability of the Hitachi machines in combination with the maintenance programme ensures we don't incur any unexpected costs."

Ecofert using six CASE wheel loaders at the Port of Ravenna to ship fertilizer worldwide

CASE WHEEL LOADERS — ROUND-THE-CLOCK PROFITABILITY

Six CASE 721F wheel loaders are in use at the Port of Ravenna in Italy. They are being used by Ecofert for handling and loading fertilizer for shipment to countries worldwide. The contract was managed and concluded by MAIE, CASE's long-standing dealer in the Emilia Romagna region of Italy. In the words of Andrea dal Bello, Sales Manager at MAIE: "Our customer needed wheel loaders capable of transporting heavy loads from the warehouses to the loading dock, and then loading the fertilizer onto cargo ships to be sent from Ravenna to countries around the world." Fourteen-tonne CASE wheel loaders were the obvious choice. These extremely robust, technologically advanced machines are designed to ensure manoeuvrability, high bucket force and low fuel consumption.

The granular fertilizer handled by Ecofert for Yara, a large Norwegian firm with a production facility in Ravenna, is stored in seven warehouses in an area covering 15 hectares. The wheel loaders enter the warehouses and then load the fertilizer into hoppers. These then feed conveyor belts that carry the fertilizer to silos for packaging (after which it is transported by lorry or ship). The loaders carry 40 quintals per trip.

However, CASE wheel loaders clearly offer other advantages besides just the amount of material they can handle. They feature CASE's HI-eSCR engine technology, which eliminates the need for exhaust gas recirculation or any diesel particulate filter (DPF). This technology only uses durable components, it is maintenance-free and fuel efficient. Another advantage is that it is safe to use near flammable materials, as the

maximum exhaust temperature is 200°C, much lower than that of a DPF.

Another feature that is extremely valuable in material handling applications is the CASE heavy duty cooling option, which prevents clogging of the radiator. An extra-thin inlet grille stops bigger particles; sealed radiator covers guarantee the cooling air is 100% filtered; and the wide core radiators increase the self-cleaning performance of the reversible fan.

Franco Amadori, Director of Ecofert, explained what all this means: "To ensure round-the-clock production we need equipment that can guarantee maximum reliability combined with low operating costs, and CASE machines give us exactly what we need."

It comes as no surprise that CASE machines make up two thirds of the company's fleet, which includes new G-Series wheel loaders currently being used at one of its recycling facilities. The relationship with MAIE, the dealer in Ravenna, is also important, as the customer explained: "We have been working with MAIE since 2009 and this is the third time we have bought new machines. They have a well-established network and guarantee immediate support whenever we need it. They know our business well and have the expertise to respond to our needs."

This expertise is reflected in very concrete actions. Dal Bello explained: "Ecofert's CASE wheel loaders have been adapted to suit the specific type of work. They have been painted with special wax to prevent the fertilizer from corroding them and certain parts have been replaced with a material that cannot be damaged by dust." Optional fittings have also been adapted, for example the bucket dimensions have been modified to comply with road traffic regulations, as required for vehicles used at ports.

The operators are also satisfied. Gianluca Pollini from Ecofert told us: "The engine is powerful (FPT Industrial, 195 hp) and can easily withstand work cycles that alternate loading and travelling over large areas. The loaders are extremely manageable, an essential requisite when deployed inside warehouses." Operators also appreciate the visibility and comfort they provide: "The low shape of the rear hood provides excellent visibility, which is further enhanced by the rear view camera. And, when working long shifts, cab design is also of fundamental importance. CASE offers five-star comfort, with height-adjustable ergonomic seats and ventilation, air filtration and pressurization systems."

Comfort, power, cost efficiency — CASE is the key to profitability, whatever material is to be handled.

CASE Construction Equipment sells and supports a full line of construction equipment around the world, including loader/backhoes, excavators, motor graders, wheel loaders, vibratory compaction rollers, crawler dozers, skid steers, compact track loaders and rough-terrain forklifts. Through CASE dealers, customers have access to a true professional partner with world-class equipment and aftermarket support, industry-leading warranties and flexible financing.

CASE Construction Equipment is a brand of CNH Industrial N.V.

Belgian company Casier Recycling invests in its first CASE wheel loader

Casier Recycling, a generations-old business in Belgium, is benefiting from operational advantages after acquiring its first CASE wheel loader.

CASE Construction Equipment's G-Series wheel loaders are suitable for a wide range of applications, many highly specialized, and the work of Casier Recycling is a good example. At a 90,000m² facility in Deerlijk, Belgium, Casier collects, sorts and processes 12,000 tonnes of scrap ferrous metals, 2,500 tonnes of non-ferrous scrap, and 500 tonnes of wood residues every month. This is a big operation in which a CASE 721G wheel loader plays an essential role — and Casier is finding that the machine has useful advantages over the wheel loaders it previously bought from other manufacturers.

Casier was established in 1900 by brothers Charles and Gerard Casier and today the business flourishes under the direction of the family's fourth and fifth generations. In 1957 Casier relocated from the municipality of Zwevegem to Deerlijk, both in the Flemish province of West Flanders, to take advantage of a site with a direct railway connection.

This allows a rail-locomotive, in addition to a fleet of 12 trucks, to bring materials directly to Casier's premises. Casier uses 450 put-down containers, which are loaded by fixed and mobile cranes, and has the CASE wheel loader to move heavy scrap materials around the site. The 721G typically has to move heavy loads to a weighbridge across distances of up to 300 metres.

The wheel loader's work at Casier is demanding and continuous, so the machine has to be high in reliability and low in maintenance requirements, to minimize downtime. Because of the long operating hours it is also important for the wheel loader to have a comfortable cab and easy controls, to reduce operator fatigue. And because the wheel loader moves around a

From left to right: Koen Debaere, Casier Recycling's Technical Director; Joachim Vanlerberghe, Sales Director Delvano and Bernd Casier.

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site busy with other machinery and people, its cab must afford excellent outwards visibility, to minimize the risk of accidents. These were the main considerations when Casier purchased a new wheel loader in 2017, but the company also wanted its new machine to be more compact and manoeuvrable than its wheel loaders from other brands, and to consume less fuel.

Casier Recycling's Technical Director, Koen Debaere, explains: "We had heard from colleagues at another waste recycling company that CASE wheel loaders are good for cab comfort, quietness, and fuel efficiency, and out-of-cab visibility was one of the benefits CASE talked about when launching the new G-Series range. But we also had to be sure that the G-Series is tough - in our business it has to be capable of working very hard for many hours without any problems."

Looking for a machine that could meet these requirements, Casier visited its local CASE dealer, Delvano NV, in the village of Hulste, 10 kilometres north of the city of Kortrijk. As a sub-dealer of CASE dealer KEY-TEC, Delvano sells and supports the full line of CASE construction equipment in the provinces of South West Flanders and South East Flanders, as well as the Walloon region of Hainaut.

Debaere remembers: "We informed Delvano that we particularly wanted to look at some used — very used! — examples of the old F-Series wheel loaders, to see how they hold-up after years of tough work. What we saw reassured us of the quality. After that we sat in the cab of the new G-Series to check out the comfort features, the clarity and ease of the controls, and the outwards visibility — and decided this was the machine for us. We have been very satisfied with our purchase."

All seven models in the latest-generation G-Series range, launched in early 2017, deliver new levels of operator comfort to help maximize productivity. Visibility is enhanced by a full-width panoramic windscreen and a slim engine cover; ease of operation by an operator control interface with an eight-inch display which is easy to use in all external light conditions; and comfort by a fully-adjustable seat-mounted console, active suspension seat, and in-cab noise levels of just 68dB.

The new G-Series is also designed to provide unprecedented levels of fuel efficiency — a fact that Casier Recycling will happily confirm, as the company's 721G is consuming about 10% less diesel than its previous wheel loaders. The G-Series's FPT Industrial diesel engines feature Selective Catalytic Reduction (SCR) engine technology which keeps exhaust temperatures lower and improves fuel efficiency, as well as eradicating the need for a diesel particulate filter (DPF) or exhaust gas recirculation (EGR).

CASE also offers buyers the peace of mind of CASE ProTech. This suite of product assurances includes extended warranty and a maintenance contract, enabling G-Series owners to accurately forecast total operating costs.

The recycling of heavy metals and wood is just one type of work in which CASE G-Series wheel loaders are exceptionally productive, safe, and affordable. The seven G-Series models — from the 521G with a 3.9t bucket payload to the 1121G with a 10.2t bucket payload — are scaled for all kinds of work. All over the world the G-Series can be found working hard for supply yards, construction sites, agricultural businesses, waste and scrap movers and recyclers, snow removal teams, mass excavation sites, and quarries. It is this robust versatility which explains the G-Series' popularity.

Delvano NV sells and supports the full line of CASE equipment in the provinces of South West Flanders and South East Flanders and Hainaut, and has been a sub-dealer of CASE Dealer Key-Tec since 2012.

Six new Liebherr LH 60 M Industry Litronic material handlers for voestalpine

The reliability and efficiency of the Liebherr material handlers convinced voestalpine.

A total of six new Liebherr LH 60 M Industry Litronic material handlers that comply with exhaust emissions standard Stage IV/Tier 4f will be joining the fleet of voestalpine Stahl GmbH in Linz. The first machines have already been delivered and are impressing with their high level of efficiency and reliability.

voestalpine AG is a renowned global technology and industrial goods group with 500 group companies and locations. It focuses on product and system solutions made from steel and other metals. Under parent company voestalpine Stahl GmbH, its Steel Division is the division that generates the highest revenue. The Steel Division's product portfolio includes high-quality steel strips, heavy plates and casting products. voestalpine Stahl GmbH operates a 100,000m² scrapyard in Linz with annual throughput of around six million tonnes of steel.

When choosing suppliers the company always seeks professional partners with a high quality standard. This is why voestalpine has been working with Liebherr machines for over 25 years. The six new LH 60 M Industry machines will primarily be used for unloading carriages, sorting scrap and loading scrap charging boxes.

Reliability takes priority

Between 160 and 180 scrap charging boxes are loaded each day for the utilization of the steelworks. In order to guarantee the five-shift operation runs smoothly 24 hours a day, seven days a week, and to supply the crude steel production with high-quality scrap material, optimal machine availability was a key purchasing criterion. Liebherr scored highly with the reliability of its material handlers and with excellent customer service. The LiDAT fleet management system supports the service partner: messages from the machine control system can be sent directly to an employee by email, which then enables them to provide support more quickly.

Economic and efficient

Each LH 60 M Industry will achieve an average of 6,000 operating hours each year, which is why efficiency was extremely important to voestalpine in its choice of machine. All Liebherr material handlers are equipped with the Liebherr Power Efficiency (LPE) system as standard. The intelligent machine control optimizes the interaction of the drive components in terms of efficiency, thereby ensuring low fuel consumption. The Liebherr ERC energy recovery system also gives a massive power boost and provides increased handling capacity. This is reflected in further fuel savings and lower operating costs. The LH 60 M Industry complies with the requirements of exhaust emissions standard Stage IV/Tier 4f thanks to the Liebherr SCR technology, which comprises an SCR catalytic converter and other components, such as an injector and AdBlue supply. voestalpine is impressed by this complete system, which reduces the exhaust emissions very effectively without a particulate filter.

Ideally optimized for specific requirements

A particular challenge in the specification of the machine was that the grabs had to fit perfectly into the carriages being unloaded and at the same time have a high level of stability.

As a result, Liebherr worked with voestalpine to develop and test a new bespoke five-tine grab for the LH 60 M Industry: the GMM 80–5 with a 0.9m³ capacity and opening width of 2.34m. The latter corresponds exactly to the width of a truck, meaning that the grab is also adapted to the carriage width.

All the new LH 60 M Industry machines are perfectly equipped for deployment in scrap handling at voestalpine. The clever outrigger geometry and the sturdy undercarriage with reinforced axles ensure maximum stability and provide the basic prerequisite for precise work. Thanks to the standard proportional controls, the machine operators can move the equipment and the grab very precisely. The equipment length and the range of the LH 60 M Industry also satisfied expectations. Thanks to the solid tyres with damping holes, the machines have high levels of driving comfort when travelling over long distances. With the spacious and ergonomically designed cab, the drivers work in a pleasant environment that enhances their alertness and concentration.

Experience the Progress.

The Port range – material handling machines from Liebherr

- Specially developed machines for port handling applications
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- High-performance machines with outstanding lifting capacities and excellent reach
- Ergonomic workspace for consistent high performance

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TTS offers customized portable equipment to its customers

Millions of tonnes of goods are handled as dry bulk materials throughout the year all around the globe. Influenced by economical and local market tendencies and rules, modern stevedores are choosing a flexible approach to terminal equipment in order to achieve maximum performance at the handling facility.

Stationary equipment offers high performance, but has one major disadvantage: it is stuck in one, place and is usually only able to handle single tasks. However, mobile equipment can be easily relocated and can often be used for more than one task.

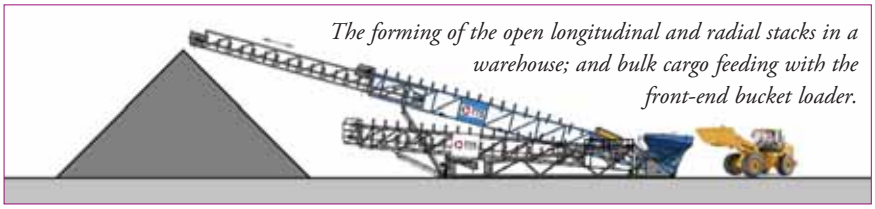
The main advantage of portable equipment from Latvian company TTS is its flexibility which gives three main advantages to the owner.

Portable loading, unloading or transferring equipment offers three main advantages:

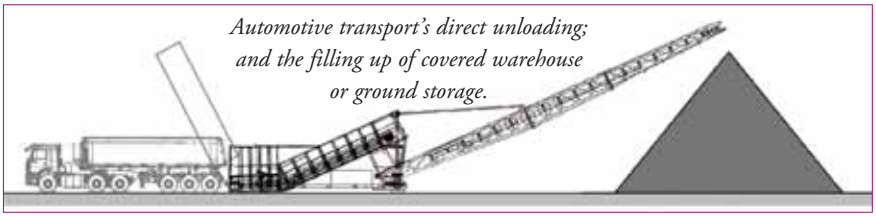
- it is not attached to one place, so can be easily moved to another location within the operating area, or relocated to another city or even country;
- it can be used for multiple purposes — for example, a mobile stacker can also serve as a shiploader, container or railcar loader; and
- it can handle different types of materials.

Shown here is a TTS mobile stacker operating in a coal terminal, with five different scenarios for its use.

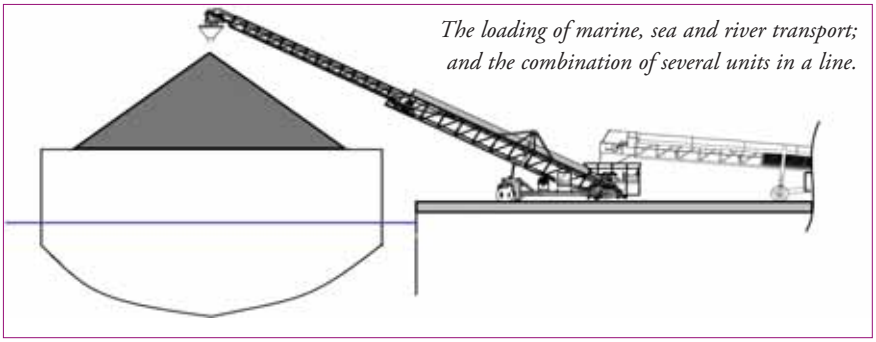
As long as TTS produces tailor-made products, these five options are not the only ones the company offers; TTS's approach is not to offer standard models, but rather to develop advanced machines that are customized to the exact needs of the customer.



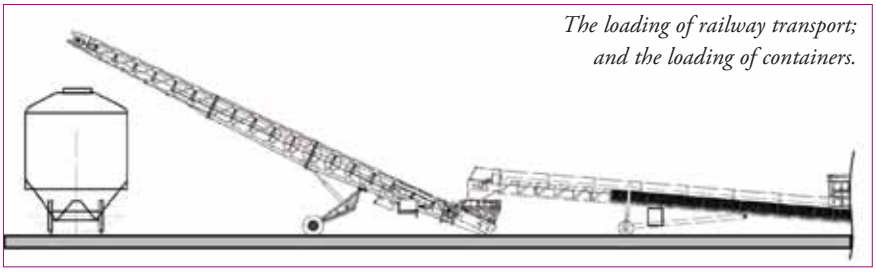
The forming of the open longitudinal and radial stacks in a warehouse; and bulk cargo feeding with the front-end bucket loader.



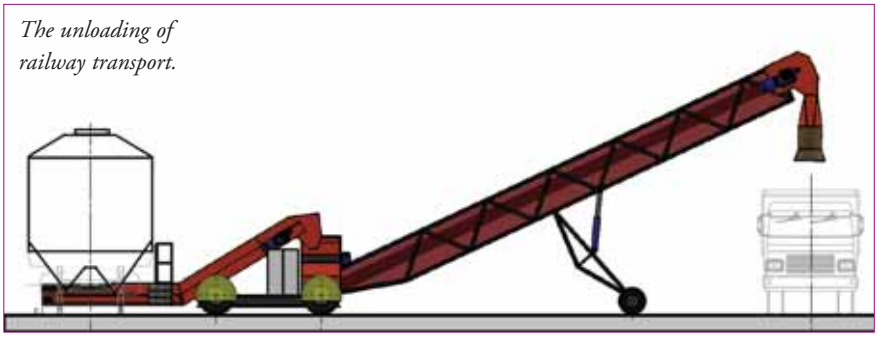
Automotive transport's direct unloading; and the filling up of covered warehouse or ground storage.



The loading of marine, sea and river transport; and the combination of several units in a line.



The loading of railway transport; and the loading of containers.



The unloading of railway transport.

Additional Samson® truck unloader for AS Silsteve at the Port of Sillamae

The new mobile Samson® material feeder will receive bulk fertilizers and grain direct from 45-tonne tipping trucks and will discharge onto an ongoing SAMSON shiploader at a peak output rate of 625m³ per hour. This material feeder will complement the existing SAMSON shiploader with twin Samson® feeders which has been active at the Port of Sillamae, Estonia, since 2015 and another SAMSON shiploader supplied a few years earlier.

SAMSON is to provide a mobile material feeder for the port of Sillamae (example, photo SAMSON).

The mobile Samson® feeder includes a 3m-wide rubber belted apron design unit mounted on a steel structure and supported by double apron bars located at every pitch of the conveyor chain.

To accommodate a variety of trucks and loaders the universal entry point includes a 4.5m-wide flared entry section thus increasing the volume of the feeder entry and reducing vehicle alignment time.

As fertilizers and grain are free-flowing materials this material feeder is fitted with a cross-cleat belt for material adherence during transfer. The discharge chute and all possible hose ends, couplings and bolting are in stainless steel to prevent against corrosion and provide longevity when handling fertilizers.

The Samson® feeder has forward mounted wheel units and is towable using the access ramps. For shiploading the unit can be positioned at a 180° arc around the shiploader reception hopper.

The modular design of the Samson® feeder allows for easy containerized transportation to the client's site.

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 Group Field Service GmbH and AUMUND Logistic GmbH (Rheinberg, Germany) are consolidated under the umbrella of the AUMUND Group. The global conveying and storage technology business is spearheaded through a total of 15 locations in Asia, Europe, North and South America and a total of five warehouses in Germany, USA, Brazil, Hong Kong and Saudi Arabia.

Stand'Hop™ multi bulk wharf hopper from RBL-REI offers flexibility and ease of use

Global bulk handling company, RBL-REI is closely involved in the port, mining and cement industries, as well as others.

With its main headquarters located in Paris and Angers (Loire valley area), RBL-REI has several facilities in France and abroad.

It is widely represented throughout the world with commercial agencies which allow it to consider projects of the largest scale.

In order to meet the expectations of its customers as closely as possible, RBL-REI has developed the Stand'Hop™, a standard dedusted hopper for port applications.

The Stand'Hop was developed to enable its clients to avoid the following common problems during their projects:

- environmental constraints;
- high transportation and erection costs, especially in certain areas;
- low equipment flexibility (clogging issues);
- high operational and maintenance costs;
- long delivery times; and
- high CAPEX for reduced traffic.

With its experience on nearly 30 wharf hoppers operating worldwide, with the Stand'Hop™, RBL REI is able to offer an industrial and efficient solution for its clients, one which guarantees:

- conical hopper, no retention of product;
- cone and structure completely hot dip galvanized;
- possibility to mount up to eight bag filters on the first model, and 12 bag filters for the second model;
- hopper fully delivered in 40ft containers, for low cost, quick and easy access to delivery areas;
- easy erection procedure, low supervision time; and
- reduced OPEX & CAPEX.

The range of RBL-REI's hopper is divided in two models, to be able to handle loads from all the clamshell grabs that are

GENERAL CHARACTERISTICS				
Opening	✔	Ø7m	✔	Ø9m
Useful capacity		35m³		100m³
Height		12m		14m
Wheelbase		5.5 x 5.5m		8 x 8m

OPTIONS				
Dedusting	✔	Bag filters	✔	Spraying
Extraction	✔	Belt conveyor	✔	Clamshell
If clamshell	✔	Telescopic chute		
Movement	✔	Fixed	✔	Mobile
If mobile	✔	On wheels	✔	On bogies
Power supply	✔	By hose reels	✔	By Power Generator
If power generator	✔	Autonomous		
Accessories	✔	Cone cover		

currently on the market.

A number of options are available to customize the Stand'Hop™ to adapt the hopper at the needs of the customer.

Since the launch of this new product, in the past few months RBL-REI has been awarded five contracts to supply the Stand'Hop™ to European and African markets.

With the Stand'Hop™ RBL-REI has developed a new product that gives the client customized solutions, from the very early stages to the final commissioning. The company has decades of experience and unique skills, allowing it to design innovative bulk handling solutions, for any kind of bulk materials (including cereals, cement, clinker, aggregates, coal...)

RBL-REI now has a range of products to solve environmental or flow constraint problems. These include:

- Curvoduc™, an engineering technology dedicated to overland curved conveyors, for mining and tunnelling applications;
- Stand'Hop™, the dedusted hoppers for port applications; and
- ZZ Belt™, a technology dedicated to vertical conveyor belts.

DOCKSOLID hoppers: the cornerstone of Buttimer's range of mobile equipment

Over the last number of decades, Buttimer as a company has expanded and diversified into one of Ireland's most innovative mechanical engineering companies. A key part of this has been the emphasis placed on mobile ship-unloaders and other portside equipment. So much so, in fact, that it led to the development of the DOCKSOLID brand, which is owned and managed by Buttimer Engineering but specializes exclusively in bulk port equipment.

DOCKSOLID is a range of mechanical handling solutions for port terminals handling grains, coal, minerals, cement, fertilizers, powders or other dry bulk commodities. The brand includes extremely robust and reliable ship-unloading systems, with a focus on flexibility of use and highly manoeuvrable mobile equipment. In the two decades that DOCKSOLID has been on the market, Buttimer has developed a broad range of clientèle, predominantly based in Ireland, UK and Poland. These include Port of Cork, Dublin Port, Port of Gdynia and Associated British Ports to name but a few. As stated earlier, bulk handling has become an increasingly prominent aspect of the Buttimer activities and so it is always on the lookout for new clients and exciting opportunities.

Undoubtedly the most popular piece of DOCKSOLID port equipment is the ship-unloading hopper which has become the cornerstone of the brand. The DOCKSOLID range of hoppers has been purpose-built for use in situations where ease of use, robustness and value are of paramount importance. They include a number of key design features such as the robust structure, state-of-the-art dust control and extreme manoeuvrability and flexibility which sets DOCKSOLID apart from its competitors. The standard hoppers come in a range of pre-set models which address the most common handling requirements. In addition, Buttimer is flexible enough to address custom requirements through the manufacturing of bespoke models at the customer's request.

Whilst the standard hopper can perform the vast majority of portside duties, Buttimer offers other options under the DOCKSOLID name to satisfy the needs of all customers. The Environmental hopper provides everything one would expect from a hopper and more, with a dust control flex-flap, dust extraction filters and a discharge chute in order to minimize noise and air pollution. There is also the option of the much larger rail-mounted Environmental hoppers which are fitted to a rail system, therefore offering less flexibility but with the capability of handling much larger loads.

The DOCKSOLID tagline; 'Clean.

Flexible. Robust' is more than just a marketing slogan, it is everything that the brand stands for. This is evidenced by the continual striving for innovation to make the hoppers as clean, flexible and robust as possible.

Clean

Environmental hoppers are fitted with advanced dust control functionality including reverse-jet extraction filters, and a non-return valve 'flex-flap' system. Features include a wind block thimble around the opening grab, aspirated retractable discharge chutes as well as cladding and curtains to prevent and subdue emitted mist.

Many dry bulk products emit dust while being handled, representing a potential health risk to port workers, an explosion risk and, of course, also a loss of product. The DOCKSOLID dust control features can significantly reduce these risks making the hoppers some of the effective, safest and environmentally friendly on the market.

Flexible

DOCKSOLID Mobile Hoppers use a bespoke dual-tie-bar steering system, making them extremely manoeuvrable: giving flexibility of use around the terminal and allowing easy repositioning between hatches or even between ports. Wheel-mounted mobile units can be towed or self-driving, and can quickly and efficiently be brought to and from the quay side - essential in multipurpose terminals.

Robust

DOCKSOLID hoppers are designed to handle the deadweight and dynamic loads exerted by the flow of dry bulk product during the unloading process. They have a torsionally stiff structure, and robust frame. Mobile unit have a load-equalizing suspension system, both on its wheels during driving and its pads during loading, to mitigate dynamic loads and eliminate stress points on the hoppers frame. The hoppers are designed to last and endure the demands of a busy bulk terminal.

As the bulk handling industry has expanded over the years, the industry has become increasingly competitive. This has meant it is essential that Buttimer and DOCKSOLID stay at the top of the game and continue to deliver the highest standard. With this in mind, Buttimer will continue to improve on its already renowned hoppers.

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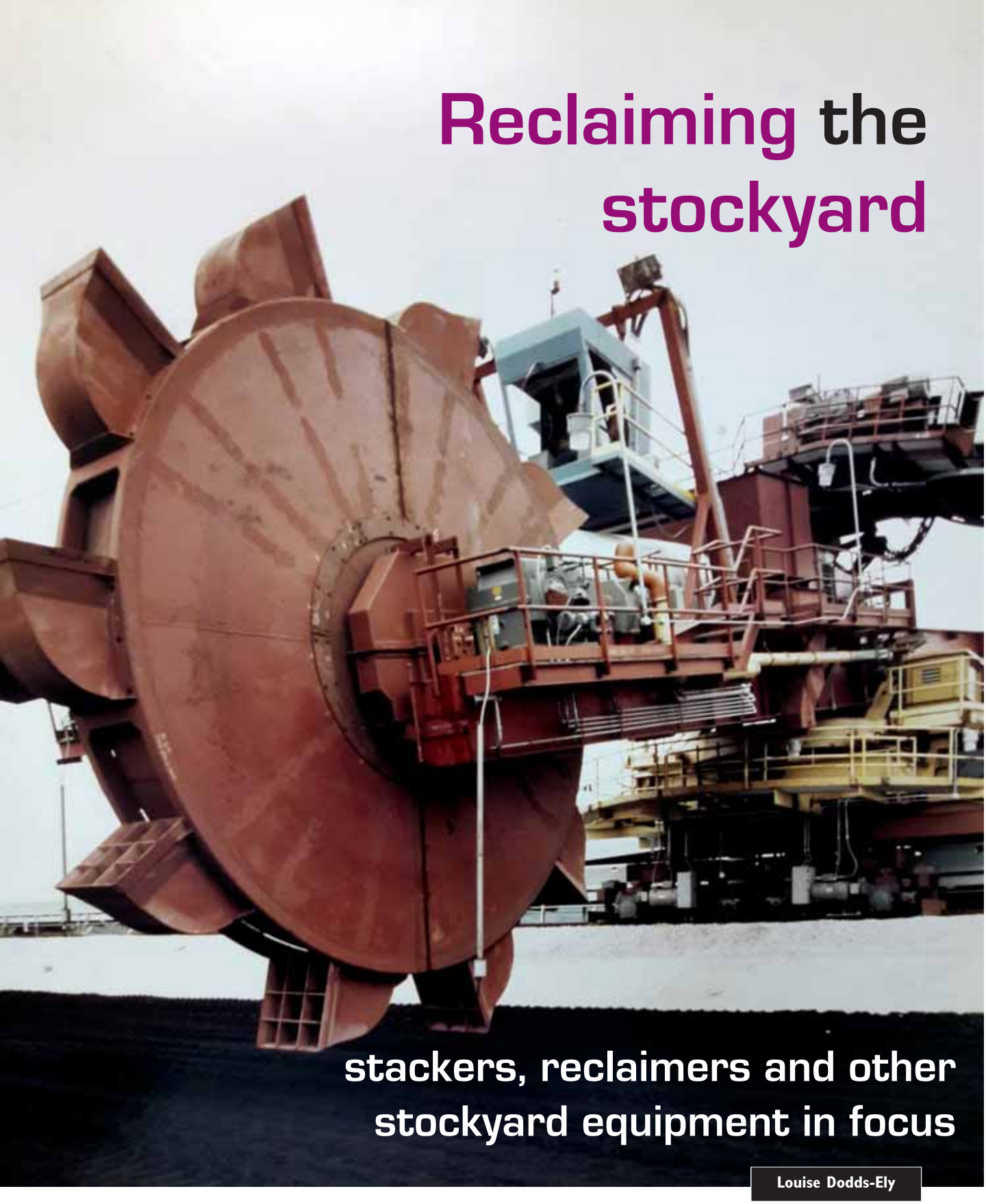
Reclaiming the stockyard



stackers, reclaimers and other stockyard equipment in focus

Louise Dodds-Ely

Longevity and durability are key to popularity of Heyl & Patterson stackers

Heyl & Patterson has been engineering solutions for bulk material handling since 1887. In the early 1960s, Heyl & Patterson began to focus heavily on the coal industry. The company saw the need for the stacking equipment and started manufacturing stacker reclaimers to aide in the effective management of coal and iron ore stockpiles.

Stacker/reclaimers are often ideal machines for terminals, coal yards or transfer sites dealing with the stockpiling of bulk materials. With extensive experience, Heyl & Patterson engineers outdoor stacker/reclaimers custom-designed to meet the specific needs of any site.

Capacity requirements, yard limitations and environmental conditions are crucial factors in the design of a stacker reclaimer. Customization of equipment is important to optimize the efficiency of the material handling process, as no two sites are quite the same. Working alongside a site's operations team, Heyl & Patterson engineers will be able to appropriately size a boom design that can span from 50 to more than 200 feet.

The entire machine travels along a yard rail, which can vary in gauge dependent on customer requirements. Tailoring the design to the needs of the operator is crucial to the implementation of new yard equipment. Heyl & Patterson Stackers can be designed with a number of optional features, including a collapsible tripper, reducing the length of conveyor needed and the amount of chute work required to transfer coal. Heyl & Patterson refers to its units as light- to medium-duty stacker/reclaimers, as they handle between 2,000–4,000tph (tonnes per hour). However, they are heavy duty in terms of durability and longevity. Heyl & Patterson equipment often reaches lifespans measurable in decades. In 1966 Heyl & Patterson installed its very first stacker for a steel mill on the shores of Lake Michigan; stacking at 2,500tph and reclaiming at 660tph transporting iron ore pellets from pile to blast furnace. This unit is still in use 52 years later. In 1972 Heyl & Patterson fabricated a 4,000tph slewing boom, allowing for the stacking and reclaiming of coal for a Kentucky-based power plant. Today, more than 45 years later, this stacker/reclaimer is still operational and continues to stack and reclaim coal off the Ohio River.

Ageing coal yard equipment can be seen across the country. With many plants lacking the capex budget to invest in new equipment, maintenance services are vital to prolonging the useful life bulk material handling equipment. To help customers stay competitive, Heyl & Patterson engineers recommend maintenance, rehabilitation and upgrade services to keep machines living longer and running more efficiently; increasing capacity and preventing the need for a capital equipment replacement. With yearly equipment inspections it is possible to assess wear patterns and conduct preventative maintenance to avoid equipment downtime.

Upgrading seasoned stacker reclaimers could involve the improvement of mechanical, electrical or structural systems. For improved operational control and efficiency many have found that upgrading electrical systems to utilize variable frequency drives has lessened wear and tear on mechanical systems as acceleration and deceleration is better regulated. Including variable frequency drive lines on the bucketwheel allows for variable speed of bucket rotation for controlled reclaiming. For further regulation of operations Heyl & Patterson can provide a machine mounted cab upgrades, which enable one operator to govern all functions of the machine, including; luffing, slewing and travel, all while maintaining a bird's eye view.

Types of stacker/reclaimers engineered by Heyl & Patterson:

Pivot equilibrated stacker reclaimer

- designed to stockpile and reclaim material through luffing and slewing movements;
- capable of stacking/reclaiming material on both sides of the feed conveyor; and
- can be customized specifically for stacking or reclaiming

Mast equilibrated stacker reclaimer

- designed to stockpile and reclaim material through luffing and slewing movements;
- capable of stacking/reclaiming material on both sides of the feed conveyor;
- can be customized specifically for stacking or reclaiming; and
- mast design support extended length boom

Trencher stacker/reclaimer

- designed to stockpile and reclaim material in a limited yard capacity area; and
- stockpiles and reclaims by travelling along the runway.

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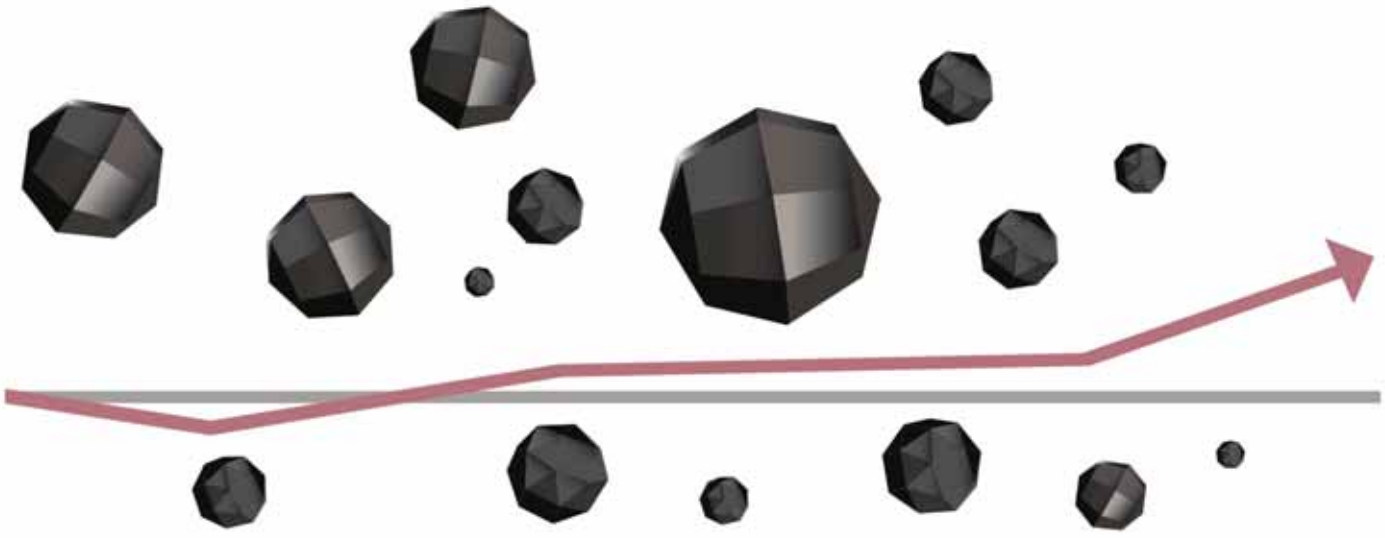

Coaltrans Conferences

coaltrans.com/poland

After Limay I, SCHADE now also supplies stockyard technology for Limay II Power Station

Installation is currently under way on the Limay II Project (photo: SCHADE).

Two tripper cars with capacities of up to 1,540tph (tonnes per hour) and two semi-portal reclaimers with capacities of 770tph were supplied by SCHADE Lagertechnik, Germany, to the new Limay II power plant in the Philippines in October 2016. Installation of the SCHADE machines started in August 2017 after sufficient construction work on the project had been completed. Commissioning of the Limay II plant is planned for the spring of this year.

Over the past few years, SCHADE has won several orders for large-scale circular and longitudinal stockpile equipment in China, South Korea and other countries of Southeast Asia. The Limay II project is the third in a row in the Philippines, where the projects are partly running in parallel. SCHADE Lagertechnik, a member of the AUMUND Group, had previously supplied two semi-portal reclaimers and two tripper cars for the Limay I power plant. This project was successfully handed over last summer. Before that, SCHADE was awarded the order for several machines for the Malita power plant project, also in the Philippines. Each time the customer was a concern from Taiwan which constructs coal-fired power stations in the Philippines for the San Miguel Corporation.

"SCHADE is taking advantage of the increased demand in the Philippines for circular storage and indoor longitudinal stockpiling with reclaimers. Circular storage and longitudinal stockpiling with semi-portal reclaimers usually require lower investment. They can be designed completely covered with a roof and are therefore much better for the environment, due to lower dust emissions," says SCHADE Sales Director Andreas Markiewicz. In all projects, the option to store relatively large amounts of material on a small surface area played an important role. Other advantages of the equipment were the ease of reclaiming and stacking the coal, as well as the suitability of this design for different types of coal, some of which can be highly volatile.

For longitudinal stockpiling SCHADE offers a large variety of enclosed solutions with its semi-portal reclaimers, so that even large volumes of material (over one million tonnes of coal) can be stored in a small, enclosed area. In a circular stockpile, storage capacities of around 360,000 tonnes are possible.

The tripper car was completely pre-assembled and lifted onto the rails with a crane (photo: SCHADE).

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 Group Field Service GmbH and AUMUND Logistic GmbH (Rheinberg, Germany) are consolidated under the umbrella of the AUMUND Group. The global conveying and storage technology business is spearheaded through a total of 15 locations in Asia, Europe, North and South America and five warehouses in Germany, USA, Brazil, Hong Kong and Saudi Arabia.

SIBRE's intelligent braking solutions benefit from 60 years of experience

Based on 60 years' experience and keeping to its time-honoured slogan 'sure to be safe' SIBRE Siegerland Bremsen has cemented a worldwide reputation as a leading supplier of reliable and long-lasting industrial brake systems with innovative remote condition monitoring and mechanical drive components for heavy duty equipment, used in ports, mining and metal, oil and gas, pulp and paper, and wind turbine markets. SIBRE's systems are widely used in bulk handling stockyards.

From the beginning, the company's focus was set on technical innovation, the most modern manufacturing technology, and high customer satisfaction. SIBRE is ISO 9001 certified.

With eight subsidiaries and representatives strategically based to support the needs of all its customers, SIBRE has a worldwide presence. Its in-house research and development department works continuously to ensure an optimum combination of a top quality product, great ease of use, and market-driven prices both for plant engineers as well as plant operators. SIBRE's team of highly qualified engineers, technicians and designers continuously develop brakes and drive components to be the most reliable systems with ease of maintenance in mind. The company's in-house test facilities make it possible for such steps to be taken to meet the needs of the end user. SIBRE's experience, in conjunction with the most modern construction and manufacturing technologies, makes it possible to develop for custom solutions. When working on a design layout, SIBRE uses a modern, efficient construction 3D-Software with the engineer in mind.

SIBRE's product development not only optimizes the maintenance group's time, it extends into sensor systems such as the company's SMART and SLP systems that exponentially minimize downtime. The development of SIBRE's SMS (Status Monitoring System) for Models USB, TEXU and SHI brakes uses monitoring switches, contacts, temperature sensors and strain-gauge technology to consistently read the actual status of the brake. These continuous status messages about the condition of the brake systems reduce maintenance costs, optimize maintenance planning, increase process reliability and diminish unscheduled downtime.

One of SIBRE's most recent products is the its IBC-control system for belt conveyors. This is ideally qualified for observing essential safety functions and control of brake cascades.

For example, well-defined brake cascades can be installed at transfer stations on independent belt conveyor systems, avoiding piling of the transported material during emergency stops and clamping. According to requirements, linear, progressive or digressive deceleration curves can be defined with the IBC-control system.

Soft braking in the operation prevents tension stress peaks in the conveyor belt. Identical deceleration curves and braking times can be achieved even under varying load conditions and/or with different brake systems in the plant.

IBC-control systems for electro-hydraulic drum and disc brakes consist of a programmable frequency inverter with function modules (software) and an input unit (pedal, internal or external parametrization interface, process control module with measuring sensor). A frequency change will be generated at the output of frequency inverter. This frequency change is used for the activation of an electro-hydraulic thruster so that its hydraulic force can be varied. The resultant actuating force of the electro-hydraulic thruster is effective opposite to the braking force of the braking system. It is this relation that forms the basis for the control of the braking operation.

IBC-Control Systems are qualified for subsequent installations and the ideal choice for modernization of machines and drive systems. The IBC provides flexible use through a wide range of permitted input voltages. SIBRE products are designed for open-cast mining to conform to all provisions of dust ignition proof.

Keeping the customer in mind, SIBRE consistently develops innovative products with the reliability to which its customers have grown accustomed. The ABC-V drum coupling is entirely produced in the SIBRE facility, located in Haiger, Germany. With a range of sizes, designed for medium to high torque values, it is ideal for crane hoisting gear, conveyors, stacker reclaimers, ship-unloaders, container cranes, and metal operations.

Offering a torque range up to 1,025kNm and radial loads of up to 550kN can be transferred with a maximum coupling diameter of 1,025mm provides a high safety factor.

High quality coated forged steel guarantees durability, wear resistance, and high material strength.

Together with the arched drum roll (hardened rolling bearing steel), it is possible for the hub to oscillate relative to the housing. This allows for a compensation of angular displacement up to ±1° and an axial shifting from ±14mm up to ±110mm.

For over 60 years SIBRE has dedicated itself to designing, developing and manufacturing lasting products. Continually honouring its slogan 'Sure to be Safe' while keeping products maintenance-friendly, SIBRE strives to exceed its customers' expectations.

Eka brings smart commodity management to the commodities markets

Eka is a renowned global provider of cloud-based Smart Commodity Management software solutions. Its analytics-driven, end-to-end commodity management platform enables companies to efficiently and profitably meet the challenges of complex and volatile markets.

The company's best-of-breed CTRM/ETRM solution manages commodity trading, enterprise risk, compliance, procurement, supply chain, operations, logistics, bulk handling, processing, and decision support. Eka's app-based analytics solution uses advanced algorithms and commodity-specific models to solve high value business issues, including position consolidation, risk, supply chain, P&L evaluation and attribution, procurement, margin analysis, and plan performance. Eka partners with customers to accelerate growth, increase profitability, improve operational control, and manage risks and exposures.

Eka is a team of 315 staff with offices in the Americas, Asia, Australia, and EMEA, serving a rapidly growing global client base across multiple commodity segments.

Eka sees rapid adoption of 3D stockpile Quality Management Solution

Eka's Quality Management Solution (QMS) enables site operators to more effectively meet quality standards, increasing profits and saving valuable resources.

In late March, Eka Software Solutions, a widely respected global provider of Smart Commodity Management software solutions, announced that its Stockpile

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Quality Management Solution (QMS) has experienced unprecedented acceleration in adoption across 2017 and 2018. Eka's QMS uses a true volumetric physical three-dimensional stockpile model to accurately track material quality.

Producers must deliver products at the right grade to their customers, but delivering higher quality products than what is contracted wastes resources and reduces profits. Producing the right product mix requires an accurate assessment of product quality in each stockpile, and an accurate prediction of what will be delivered, so the right material can be sourced and mixed to achieve the correct quality level.

Eka's bulk handling software platform makes it possible to effectively manager sites and save money. It automates process decisions, improves utilization of site assets, and gains real-time visibility into all movements, inventory and quality.

Eka's QMS uses innovative volumetric physical flow modelling to create a three-dimensional representation of the quality of material lots in real time. Using Eka's QMS, operators can better match inventory quality specifications to sales quality specifications. Without this specific quality information, site operators deliver higher quality materials than necessary to ensure they meet specified delivery targets, or they deliver lower quality materials and incur penalties.

With Eka's QMS, mine and port operators maximize margins while removing the possibility of penalties and avoiding wasting valuable resources.

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- Monospiral and Level-Wind configurations
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Cable Festoon
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Cable Chain
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Rugged Energy & Data Transmission Systems

Conductix-Wampfler has one critical mission: To keep your bulk material handling operations running 24 / 7 / 365. You need proven, worry-free energy solutions - and Conductix-Wampfler has them. Our systems provide reliable electric power and water to stacker/reclaimers, barge and ship loaders/unloaders, bulk conveyors, tripper systems, and gantry cranes. Conductix-Wampfler systems are rugged, low maintenance, and time-tested in tough, dusty environments. All products are backed by the largest sales and service network worldwide!

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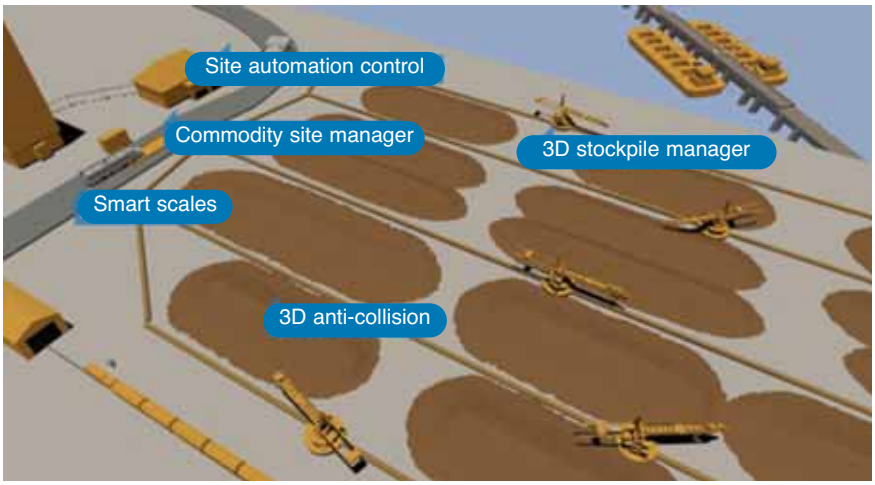
Benefits include

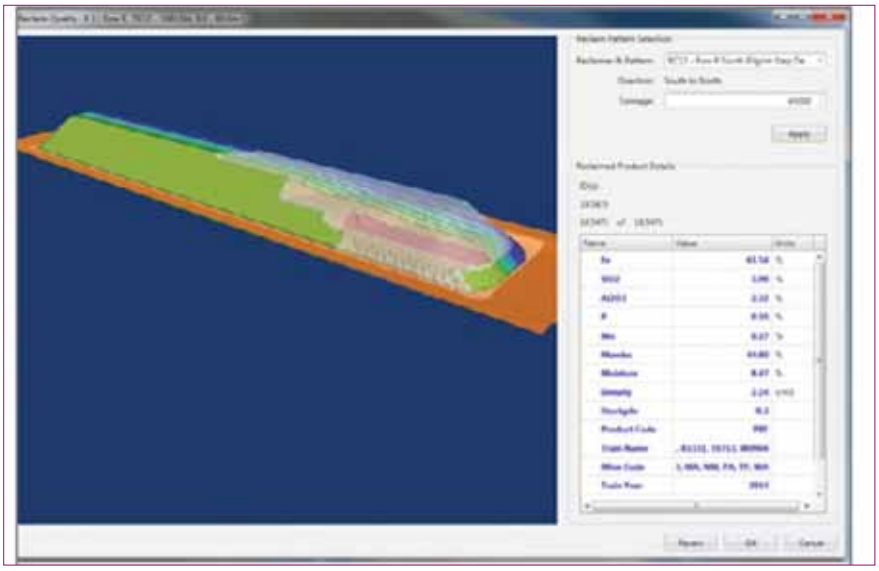
- **More accurate quality predictions for cargo** and more narrow quality delivery envelopes, increasing confidence that planned deliveries will meet actual quality requirements.
- **Integration with terminal planning functions**, reducing risks associated with ensuring the right material is available to the right place at the right time, decreasing uncertainty and lowering logistics costs.
- **Increasing stockyard real estate** by using known and visible material type locations rather than physical gaps in stockpiling.
- **Stockpile tracking and modelling** linked directly to production systems, eliminating the need for constant corrections and reconciliations. No time is spent analysing discrepancies, saving time and reducing costs.
- **Exact, real-time status of stock and position**, eliminating manual updates of stockpile shapes and locations, improving the timeliness of decisions while avoiding unwanted results.

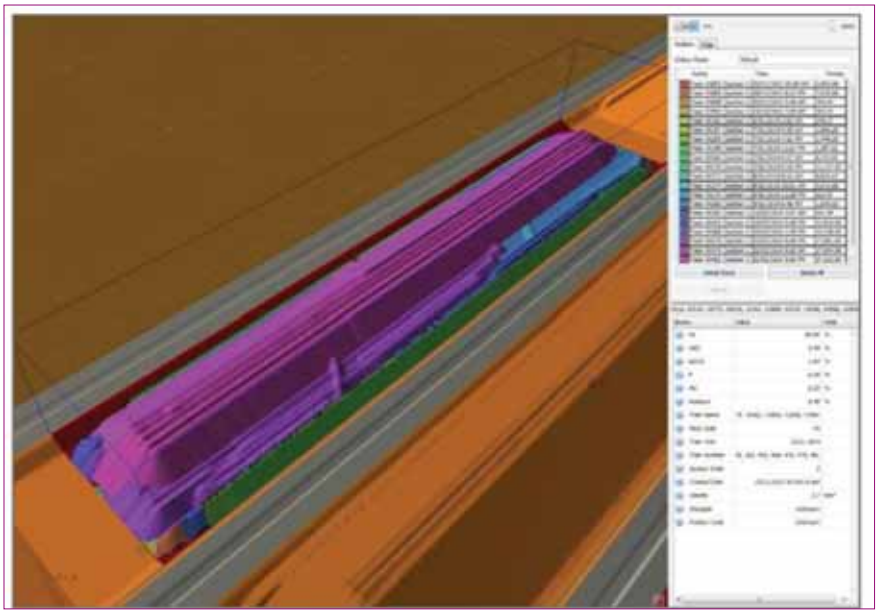


The Eka advantage for stockpile management: create user defined stacking patterns based on performance, capacity, or quality; gain 3D dynamic 'fly-around' view of stockpiles; maximize stockpile and yard capacity with consistent stacking results and true infill stacking; and use with InSight CM® – 3D Anti Collision to gain a 3D, real-time view of all machines and stockpiles at a site, including quality information.

"Eka's InSight CM QMS enables bulk materials site operators to meet customer expectations without wasting resources," said Stuart Watt, GM of Bulk at Eka. "We are currently implementing systems into iron ore, coal and bauxite stockpile sites and assisting companies to operate more efficiently and profitably. We are excited to continue our expansion into new operations and commodities across the globe."

Eka's InSight CM runs some of the largest ports in the world.





Rio Tinto licenses Eka's CTRM software and commodity analytics platform for planning and scheduling of critical operations

In 2016, Eka Software Solutions welcomed one of the world's largest metals and mining companies, Rio Tinto, to the growing list of Eka's CTRM software and commodity analytic solution users.

Rio Tinto sought a software solution to integrate various systems and replace a largely manual process to provide an accurate production plan at optimum time intervals. Eka's solution delivers a variety of inputs including maintenance plans, stock levels, current performance, rail schedules, plus ship arrival forecasts and loading sequences. Outputs include detailed task schedules for execution that are dynamically updated in real time.

Rio Tinto was already using Eka's software for executing production plans and was impressed with the state-of-the-art 3D stockpile control and material tracking capabilities. By integrating Eka's systems for planning and scheduling, the company gains context rich analytic information that enables it to make the best decisions in operations and maximize throughput.

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Time to pre-assemble

EMS-Tech Inc. delivered a wholly assembled stacker-reclaimer, weighing 1,200 tonnes, to ArcelorMittal Mines via barge in 2013.

Recent years have seen a significant increase in demand for the shipment of fully pre-assembled and pre-commissioned machines or, alternatively, pre-assembled modules (PAMS) to project sites. There are two motivators for this: (1) excessive costs associated with doing the assembly work on site and (2) a desire to minimize the time to complete the assembly work on site. In many cases, customers want to upgrade their existing shiploaders or stacker/reclaimers, to more efficient, modern machines, while minimizing the impact on their existing day-to-day operations. EMS-Tech Inc. has been at the forefront in this regard, having delivered many projects utilizing this 'pre-assembled' methodology, with due consideration given to the many options that are available today.

Conventional erection methodology at the client's existing location, with ongoing operations, requires careful evaluation of the following issues: (1) How much down-time will be needed to decommission their current system and install their new replacement? (2) How much area will be required for 'lay down' of delivered pieces and is this area currently available at site? (3) Will the 'lay down' area impact existing bulk material storage at site and will this affect ongoing operations during the erection phase? (4) In addition to an outdoor lay-down area, is there indoor storage available, preferably with climate controls, so that electrical, or sensitive, equipment can be stored or specialized work can be completed? (5) Is there parking available at site or nearby for the large number of additional personnel? (6) Does the client's site have existing union agreements which may impact the project? (7) What other projects are being undertaken by the client in the same timeframe and what impact will they have? (8) Climatic conditions is another consideration, especially in Canada, as project execution at the client's site can take months to complete, and inclement weather can impact equipment deliveries, work force mobilization, and hence the project schedule itself.

Delivery of Wholly-Assembled Machines (WAMs), or pre-assembled modules (PAMs) eliminates most of these issues and opens up many options with access to more convenient and suitable assembly locations. Fabrication facilities often have yards, or adjacent yards, large enough to allow pre-assembly. Nominated fabricators have the required infrastructure already in place and the required skilled trades available to complete these activities. Water access is often available at the assembly site, allowing the fully assembled machine to be rolled onto a barge using Self Propelled Mobile Transporters (SPMTs) or pick-up by heavy-lift vessel.

EMS-Tech Inc. has successfully fabricated, pre-assembled and delivered machines in remote locations around the world with this delivery method. With careful planning, and the involvement of an experienced team, EMS-Tech has proven this methodology to be one that yields positive results on both the cost and scheduling fronts. The company can typically shorten the overall project schedule by employing multiple fabrication facilities around the world, while delivering the resulting PAMs to a central location for final assembly. Equally significant is the cost reduction resulting from the employment of skilled teams at specialized sites, as opposed to the use of labour at the final site which can be commercially challenging, or simply unavailable. These WAM and PAM delivery techniques have been employed successfully for three large shiploaders, and one stacker/reclaimer delivered to Vancouver B.C. Canada, another shiploader delivered to Sorel, PQ, Canada, another shiploader delivered to Argentina, and a second stacker/reclaimer delivered to Port Cartier, PQ, Canada. More will surely follow. EMS-Tech can have the machine up and running in less than two weeks under the right conditions, with minimal disruption to the existing plant and production.

As industries grow, project sites become smaller, and real-estate encroaches on these project sites, shipment of fully assembled machines will become the norm rather than the exception. When assembly is done in combination with pre-commissioning at the pre-assembly site, EMS-Tech's customers can be fully operational with their new equipment quickly, as the majority of the fine tuning required for a machine of this size, will be resolved prior to arrival at the job site.

With contributions from Robert Maybee, Senior Sales Engineer; Jim Lindsay, Senior Project Manager; and John Elder, VP Sales & Marketing with EMS-Tech Inc.

Pre-Assembled Boom Head End section being prepared for transfer to barge for delivery to Neptune Bulk Terminals in North Vancouver BC.

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Keeping limestone mine stockpiles dust-free with Martin Engineering solutions

Limestone mine uses unique strategy to prevent fugitive dust emissions

It's no secret that limestone is the dustiest substance in the cement production process, largely because it's the primary ingredient, *writes Mark Strebel, Dust Division Manager, Martin Engineering*. Managers at Continental Cement Company, LLC, in Hannibal, Missouri, USA clearly understand the potential impact of fugitive dust emissions on workers and the local community, and they take preemptive steps to create the safest operational environment possible.

"We opened the underground limestone mine in 2013 and brought it to full commission in 2015," said Leonard Rosenkrans, Environmental Manager at Continental Cement. "Dust generation is unique to each operation, and it's only when the mine is fully operational that adjustments can be made, so once we identified problem areas, we immediately sought solutions."

Spraying the material after discharge allows the chemical additive to better penetrate the cargo stream.

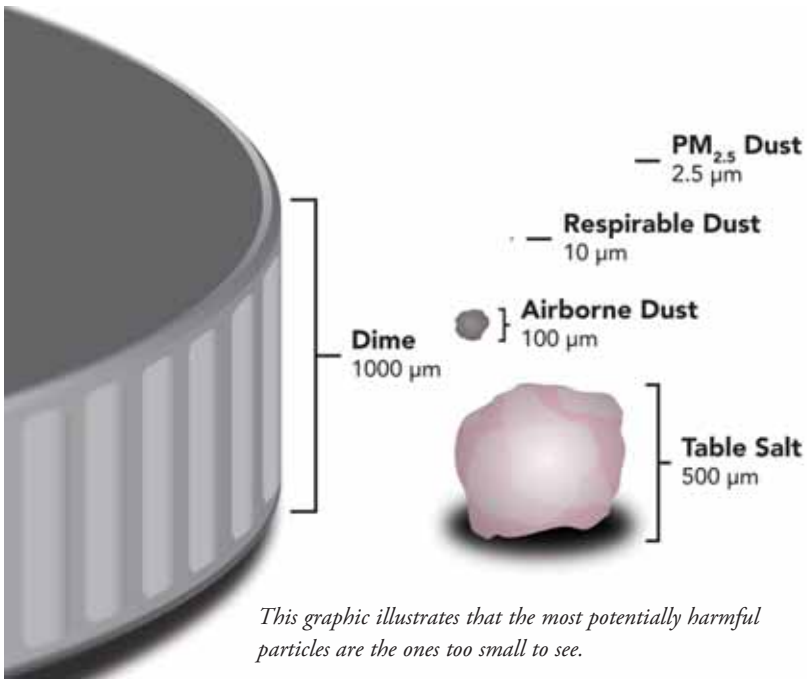
An efficient process

Only a short drive from author Mark Twain's boyhood home in the small town of Hannibal on the banks of the Mississippi River, Continental Cement has been in operation since 1903. Over more than a century, the company has continued to improve and increase operations to reach a current cement production capacity of 1.2 million short tons (≈1.1 mil. tonnes) of clinker annually.

Having utilized most of the suitable limestone from surface quarries over the many years of cement production at the location, a 350ft (106m) underground mine now provides the primary source of limestone, which makes up 75% of the raw material required to produce the meal in the company's Type I/II, and Type III Portland cement. Yielding 1.6 million short tons (≈1.4 million tonnes) of limestone annually, the extracted material is transported via truck and high-speed conveyors in order to move it to the surface, where it is held in a 100,000 ton (≈91,000 tonne) outdoor storage pile, then processed through a four-stage preheater/precalciner dry process cement kiln.

Although the cement plant is a 24-hour operation, the mine works on a ten-hour-per-day, four-day a week schedule. Fifty-tonne trucks dump 600–650 tonnes per hour (tph) — 544–589 metric tph — of extracted limestone into an underground hopper that feeds an impact crusher, which reduces the rocks to 4in (101mm) minus. The aggregate is then loaded onto Conveyor 0, a 60in (1,524mm)-wide belt travelling approximately 700fpm (3.5m/s) for 400ft (122m). The rock is discharged through a transfer chute onto Conveyor 1, travelling up the 1,300ft (400m) inclined belt to the surface and dropping 20ft (6m) onto the outdoor storage pile.

With plans to potentially add another kiln in the near future, demanding even more production from mine operations, the need for dust control is critical to the operation. "The two main areas we identified as having unacceptable dust emissions were at the underground crusher hopper and outdoors where the material was discharged onto the stockpile," Rosenkrans explained. "With the mine having a single exhaust point, we didn't want the dust from trucks offloading into the hopper to travel through the mine shaft, lowering visibility and reducing air quality. Also, with a high drop at Conveyor 1 when the storage pile is low, we didn't want dust to travel long distances on windy days. Unfortunately, our previous dust control equipment wasn't doing the job."



This graphic illustrates that the most potentially harmful particles are the ones too small to see.

Solutions that unveil further obstacles

Small particles are released from normal operations, such as loading/unloading, transferring or crushing material. At 200 microns or less in diameter (200 micrometers), a particle can remain airborne and ride ambient air currents for

long distances. At particle sizes less than 50 microns (roughly half the diameter of a human hair) they become non-visible to the naked eye and can penetrate the body's natural defences (cilia, mucus, etc.), entering deep into the lungs and potentially causing long-term health issues.

The most common industry solution attempts to address particles released from normal operations, such as loading, unloading, wind and disruption of material, by using water for surface suppression. The goal is to wet the surface of cargo to promote cohesion of particles to prevent them from becoming fugitive airborne emissions.

The original dust control equipment followed that traditional approach, with a goal of wetting the surface of the cargo in order to promote cohesion of particles and prevent them from becoming fugitive airborne emissions. However, Continental Cement discovered issues with this type of solution when applied to its material handling and stockpiling operations.

Operators learned that limestone dust was not being adequately controlled by the water alone. In addition, the water supply was found to have an excessive sodium content, causing the nozzles, valves and other components to quickly deteriorate and fail, resulting in leaks and insufficient water pressure.

A HOLISTIC VIEW OF DUST CONTROL

Martin Engineering representatives visited the site with a trailer containing a fully functional Martin® Dust Control Unit (DCU), allowing a full demonstration of the unit's capabilities. Conducting an end-to-end walkthrough of the cargo flow, technicians were able to determine the best course of action.

"After inspection, we devised a plan that optimized the dust control at both locations, while using as much common equipment as possible," said Brian Nance, Product Engineer at Martin Engineering. "Martin's DCU is designed to independently control dust at several application points, thus allowing for the use of much of the same technology, while employing a different strategy for each of the two emission areas.

Integrating the system with the plant's PLC helps operators to monitor and adjust chemical outputs.

"Using the same additive, we were able to offer treated water suppression close to the hopper's point of emission and then also apply the chemical at the transfer point between Conveyor 0 and Conveyor 1 to mitigate emissions all the way up to the stockpile discharge point."

Constructed over two days and scheduled to coincide with mine downtime, three technicians installed the DCU at a location with water and electrical power. A six-nozzle cradle-mount system was installed to provide serviceability at the Conveyor 1 discharge, and a manifold system was placed to address the issues at the dump pocket. Material monitoring sensors were employed at both locations to ensure application only when needed.

The pumps in the DCU are powered by variable frequency drive (VFD), allowing independent control over the flow of water and chemicals for each pump. Water application is monitored, and the proprietary Martin MEL-101 chemical binder additive is dosed at the proper ratio to suit the operating conditions. Fail-safe mechanisms are incorporated to shut the unit down and close valves to protect pumps and other equipment from line blockages or breaks. The entire system is integrated with the plant's system, so that it can be monitored remotely from the central control room for the plant.

Using additives, limestone dust particles are able to agglomerate with each other, increasing in size and weight and making them less likely to become airborne, thus preventing fugitive emissions. With an approximate 300:1 water-to-additive ratio, the MEL-101 supports the water's role in providing dust suppression using economically concentrated quantities. To control costs, the VFD driven pump regulates chemical flow by only releasing chemical when material is detected.


Monitors, valves and boosters are set in accessible cabinets, so the system is easy to inspect and maintain.

SPRAYER PLACEMENT IS KEY

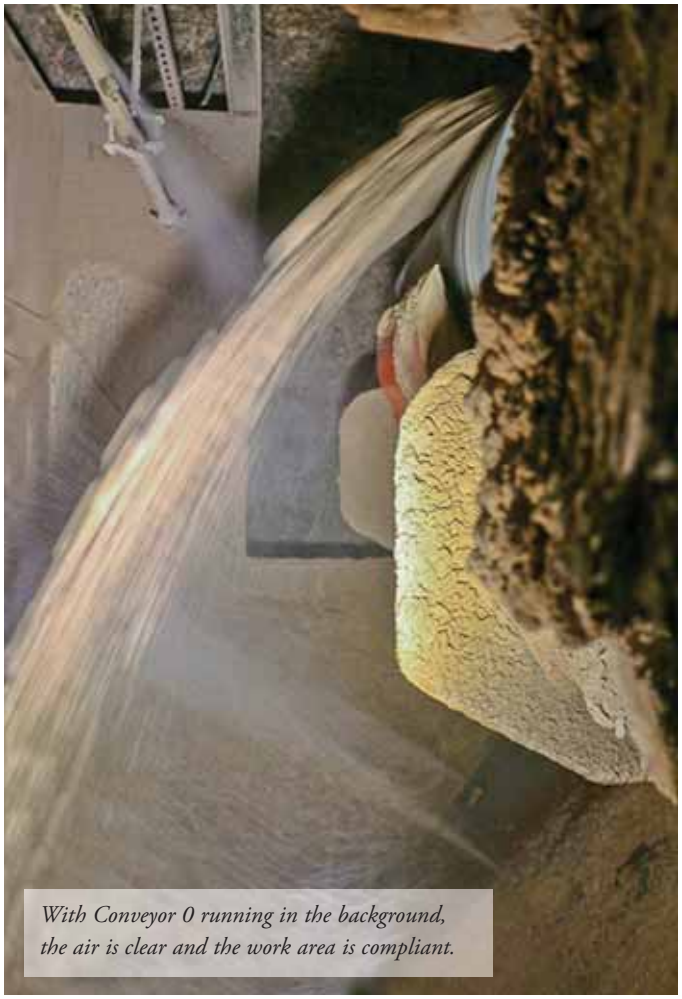
"The theory behind how we placed the spray heads is important," said Nance. "It's common practice for companies to spray the top of the material after it's been loaded on the belt as it's exiting the settling zone. But that approach wouldn't work for this application."

He went on to explain, "The problem with only spraying the surface is that only surface particles are treated, and the fines tend to ride on the bottom layer near the belt, preventing them from being effectively

coated. The untreated particles easily become fugitive once the cargo is disrupted or transferred."

Due to the difficulty of treating particle emissions at the discharge of Conveyor 1, technicians set up the Martin DCU to spray the material in the transfer chute between Conveyor 0 and 1. "By attacking the material from the top and bottom while it's in free fall, we are able to effectively coat more of the dust particles," said Nance. "As cargo continues its transit and is discharged onto the stockpile, the particles are already treated and remain in the material flow."

Nozzles were placed at the hopper mouth, so the DCU could spray treated moisture inward toward the impact zone. As the cargo is loaded by haul trucks into the dump pocket, the discharge creates a tremendous amount of airflow, lifting the small particles into the air. Prior to the Martin system's installation, fugitive dust would exit the far end of the hopper and settle in the immediate work area or travel with the prevailing air movement through the mine. This raised concerns over workplace air quality. By keeping the particles within the material flow, the new dust control system helps minimize health and safety issues, reduce wear and tear on equipment and create a better work environment.



With Conveyor 0 running in the background, the air is clear and the work area is compliant.

Results

After some fine-tuning to obtain the optimal chemical-to-water ratio, as well as proper sprayer placement for best coverage of the cargo flow, the system has eliminated most visual signs of dust emissions and has drastically improved air quality in and out of the mine.

"It's almost like a light switch," Nance said. "Turn the DCU on and the dust is no longer present at either of the emission points. Turn it off and within a few minutes, the dust returns."

Martin's preemptive dust mitigation strategy helped Continental stay ahead of state and federal regulations on dust emissions. Along with improving the work conditions inside and outside of the mine, the cement manufacturer continues the positive relationship it has had with the community since its inception.

"The Martin team has gone above and beyond to make sure everything is operational and efficient," Rosenkrans concluded. "We are currently considering a service contract for the new dust system, and potentially including the company's onsite blade replacement service as well. From our first encounter, we've had a positive experience throughout the entire process and we're very satisfied with the result."

The dust management system treats the material from the top and bottom during discharge.

The payback

There are 22 employees in the mine. The cost of cement industry dust to society and workers has been studied in depth by the EPA to justify dust regulations[1]. The cost of the installation was about $50,000 and the annual maintenance and chemical costs are about $35,000 per year. The five-year Net Present Value (NPV) of the costs plus the investment is about $200,000. Using the data from the EPA report, the benefit to society created by Continental from being proactive in the mine is about $375,000. So, the intuitive decision to be proactive in protecting the workers and surrounding neighbourhoods was a wise choice. There are many ways to look at the direct benefit to the company, including reduced health and safety issues as well as increased equipment life. Sometimes it pays just to do the right thing.

Martin Engineering, based in Neponset, IL, is a major manufacturer of flow aids and conveyor products around the world for a wide variety of bulk material applications, including coal, cement/clinker, rock/aggregate, biomass, grain, pharmaceuticals, food and other materials. The firm offers manufacturing, sales and service from factory-owned business units in the US, Brazil, China, France, Germany, Indonesia, Mexico, Peru, Russia, South Africa, Turkey, India and the UK, and under exclusive licence with ESS Australia.

1. *https://www.epa.gov/sites/production/files/2016-04/documents/ria_cement-2010.pdf*

REMA TIP TOP brings together its global conveyor belt business under one roof

The new Belting Business Unit was launched on 1 April 2018 at REMA TIP TOP. By combining its global conveyor belt resources in one place, the globally active system provider of services and products in the field of conveyor and materials preparation technology is strengthening its presence on the global conveyor belt market.

With a total of five plants in South Africa, France, Poland, and China, REMA TIP TOP is already one of the major suppliers of conveyor belts, which are a very important part of today's bulk stockyard. "Until now, all our brands have operated separately on the market. By moving closer together and better taking advantage of the synergies in our company, we will be able to considerably increase our market share," says Udo Zimmer, CEO of REMA TIP TOP AG. With this new business unit, the aim is to make the company one of the world's largest providers of conveyor belts in the world.

Mega trends such as the growth of the world population, increasing urbanization, and technological advancements on the Asian continent in particular are causing a boom in the steel industry, port logistics, the energy sector, and the construction sector. These trends mean the forecasts for conveyor belts on the world market are looking good: the volume is expected to grow by 13%, reaching €6.2 billion between 2017 and 2023. REMA TIP TOP has a clear idea of how to harness this potential:

"We are mainly looking at the growth regions of Southeast Asia, Australia, and Latin America," explains Stefan Flohr, Head of Belting Business Unit at REMA TIP TOP. The company plans on significantly expanding its presence there. "Our greatest advantage is our global service network, which allows us to offer our customers comprehensive services on the basis of the appropriate conveyor belt, ranging from installation through to maintenance and monitoring," Flohr emphasizes, and then adds: "When it comes to the REMA TIP TOP complete range of wear protection, conveyance technology, and components for the preparation of raw minerals, customers can place the efficiency of their entire system in our hands and know that we will come through for them."

In keeping with the REMA TIP TOP philosophy, every system is subjected to a holistic approach in order to optimize the added value for the operator and minimize overall costs. By appointing Flohr, REMA TIP TOP is placing an experienced conveyor belt expert at the head of the new unit. As the CEO of the company's South African holding, he is responsible for production in both plants of Dunlop Belting Products and has been instrumental in shaping the success of these product lines over the past few years.

Pivotal point and hub for conveyor belts in Europe

Over the past few months, REMA TIP TOP has already taken great steps to enhance its competitiveness on the conveyor belt market. In keeping with this, the company opened a central conveyor belt logistics center for all of Europe at the beginning of 2017 in the Dutch city of Arnhem. It serves as a pivotal point and hub within the company for flexibly and quickly delivering conveyor belts from the factories throughout Europe. Another important milestone on the way to expanding conveyor belt business was the appointment of Bertrand Heckel as Director Global Belting Sales in October 2017. In appointing him, they have brought on board a distribution and sales pro with many years of international experience in the conveyor belt business.

When it comes to belt production, REMA TIP TOP focuses on producing technical and high-strength belts, with high tensile strength, low abrasion, and high heat resistance, for example. In 2009, REMA TIP TOP acquired the affiliate company Dunlop Belting Products, which produces innovative high-performance conveyor belts at its two locations in Benoni (Gauteng) and Howick that meet or even exceed all of the most common international standards. Following in 2015 was the takeover of the French COBRA group with plants in France, Poland, and China. There the company produces high-quality conveyor belts especially for the mine, steel, cement, quarry, gravel, sand, food, agrarian, packaging, and logistics industries. Furthermore, REMA TIP TOP has also produced sidewall conveyor belts for moving bulk goods up steep inclines in the German factory in Desdorf since 2004. Up to 15,000 metres of steel cord belting is also regenerated and renewed there every year.

About REMA TIP TOP

REMA TIP TOP is a system supplier of services and products across the world for conveyor and processing technology and for tyre repair. The company has a global service network, offering a broad spectrum of rubber products, linings, and coatings for industrial and automotive uses. With almost a hundred years of experience, REMA TIP TOP has collected a unique range of expertise in material development and industrial services. The company is active in the belting, material processing, surface protection, and automotive divisions.

At the end of the 2017 fiscal year, REMA TIP TOP had generated revenues of more than a billion euros. The company has more than 6,300 employees across the globe, with more than 140 subsidiaries and affiliated companies — including renowned brands like Dunlop Belting Products South Africa, Cobra/Depreux, and Asplit.

The invisible conveyor belt destroyers

Conveyor systems are major components of the average bulk material stockyard, and it is important that they are safeguarded against damage. This article addresses how ozone and ultra violet is dramatically shortening the working life of conveyor belts

There are an awful lot of things that damage conveyor belts. The constant abrasive action of material being loaded at speed onto the belt and then being accelerated across its surface at the discharge point; the hammering the belt surface and its carcass takes as aggressive materials (often sharp and heavy) are being dropped onto it; the ripping and tearing that occurs when rocks or foreign objects become trapped; the softening and distortion of the rubber caused by oils and resins; the hardening and premature ageing of the rubber caused by heat. The list goes on and on.

All of these factors are, of course, very well known to operators of conveyors. The fact that conveyor belts can be engineered to significantly limit the amount of damage each of these factors can cause is also pretty common knowledge. However, what is definitely not common knowledge within the world of industrial conveyor belts is that there are also two other 'invisible' and inescapable factors that cause very serious damage on a daily basis. And all the while they are rapidly shortening the operational life of your conveyor belts. Those factors are ozone and ultra violet light.

If you type "The effects of ozone on rubber conveyor belts" into your search engine then only one belt manufacturer's name seems to appear — Dunlop Conveyor Belting in the Netherlands. Here, Dunlop's Les Williams explains what causes this little known phenomenon, its vastly underrated consequences and how to avoid them.

From protector to destroyer

Ozone occurs naturally in the upper atmosphere, where it is formed continuously by the action of solar ultraviolet radiation on molecular oxygen. At high altitude, ozone acts as a protective shield by absorbing harmful ultraviolet rays. Wind currents carry ozone to the atmosphere at the Earth's surface.

At low altitude, ozone becomes a pollutant. Ground level or 'bad' ozone is not emitted directly into the air, but is created by the photolysis of nitrogen dioxide from automobile exhaust and industrial discharges. The effects are known as ozonolysis.

Splice joints are prone to stress concentrations.

The variability of weather, airflow patterns, seasonal changes, motor vehicle and industrial emissions, geographical and climatic conditions such as higher altitudes and coastal areas mean that ozone concentrations (and therefore the level of exposure) can differ greatly from one location to another. That said, ground level ozone pollution is an ever-present fact of life that must never be under-estimated.

Even tiny traces of ozone in the air will attack the molecular structure in rubber. It also increases the acidity of carbon black surfaces with natural rubber, polybutadiene, styrene-butadiene rubber and nitrile rubber being the most sensitive to degradation. This can have several consequences such as surface cracking and a marked decrease in the tensile strength of the rubber.

Ozonolysis

Ozonolysis is the reaction that occurs between the molecular structure (double bonds) and ozone:

The immediate result is formation of an ozonide, which then decomposes rapidly so that the double bond molecule is split. The critical step in the breakdown of molecular chains is when polymers are attacked. The strength of polymers depends on the chain molecular weight or degree of polymerization. The longer the chain length, the greater the mechanical strengths including the highly important tensile strength. By splitting the chain, the molecular weight drops rapidly. There comes a point when it has little strength whatsoever and a crack forms. Further attacks occur in the freshly exposed cracks which continue to steadily grow until they complete a 'circuit' and the product separates or fails.

A partner in crime

To make matters worse, 'bad' ozone has a partner in crime that also has a seriously detrimental effect on rubber. Ultraviolet light from sunlight and fluorescent lighting accelerates rubber deterioration because it produces photochemical reactions that promote the oxidation of the rubber surface resulting in a loss in mechanical strength. This is known as 'UV degradation'.

Somewhat ironically, the rapid decline in the ozone layer in the upper atmosphere over the past several decades is allowing an increasing level of UV radiation to reach the earth's surface. Continuous exposure is a more serious problem than intermittent exposure, since attack is dependent on the extent of the exposure. As you would expect, the problem is exacerbated in sunnier, hot climates but even in the most moderate of environments, the problem is nonetheless ever-present.

Hidden effects

Ozone cracks form in rubber that is under tension. However, the critical strain needed is only very small. Even a belt that is not fitted on a conveyor has a certain amount of intrinsic tension. The cracks are always oriented at right angles to the strain axis. Ozone attack will occur at the points where the strain is greatest and the rubber is flexing in use. Splice joints are particularly prone to stress concentrations.

At first glance, fine cracks in the surface rubber may not seem to be a major problem but over a period of time the rubber becomes increasingly brittle. Transversal cracks deepen under the

repeated stress of passing over the pulleys and drums. As mentioned earlier, the ozone continues to attack so the cracks steadily grow until catastrophic failure occurs. Again, surface cracking may not initially seem to be a cause of concern but there are often other potential risks such as scrapers catching on the cracks and tearing off parts of the cover. Re-splicing can also become more and more difficult as the adhesion properties of the rubber diminish.

Yet another 'hidden' problem is that moisture seeps into the cracks. This then penetrates down to the actual carcass of the belt. In multi-ply belts, the fibres of the weft strands of the plies expand as they absorb the moisture, which in turn causes sections of the carcass to contract (shorten) as the weft strands pull on the warp strands of the ply. This can often result in tracking problems that are difficult to pinpoint and which no amount of steering idler adjustment can compensate for.

There can also be significant environmental and health and safety consequences, especially when the belt is being used to carry materials such as cement, coal or grain because fine particles of dust penetrate the cracks. This dust is then discharged (shaken out) on the return (underside) run of the belt.

Ozone damage accelerates damage caused by heat.

Magnifying other causes of damage

Apart from the damage caused in their own right, the cracking of the rubber covers by ozone and UV exposure also play a major role in magnifying other causes of damage. As the rubber covers become more brittle and lose strength they also lose the ability to resist abrasive wear. Oil-resistant belts also suffer because the cracked surface allows the oil to penetrate much more quickly and deeply leading to increased swelling and belt distortion. In heat-resistant belts, the cracks allow heat to penetrate the carcass more easily. An increase of only 10°C in the core temperature of the belt carcass can reduce the life of the belt by as much as 50%.

Excluding accidental mechanical damage, unless they are being used to transport extremely aggressive materials modern-day conveyor belts should be expected to last

for many years. However, conveyor operators continue to replace belts months and years before they should have to, completely unaware that the need to replace has almost certainly been accelerated by the effects of ozone & ultra violet.

New technology

Several years ago, we were amongst the very first in the world to make use of new technology that enabled the effects of ozone to be tested and measured. We invested in the very latest ozone testing equipment for their research and development laboratory. Mandatory testing to EN/ISO 1431 international standards was introduced for all Dunlop belting products and comparison tests also applied to samples of belts made by other manufacturers.

As a direct result, special anti-oxidant additives that act as highly efficient anti-ozonants were introduced into all Dunlop rubber compound recipes to provide protection against the damaging effects of ozone and ultra violet, thereby further extending the working life of our belts.

EN/ISO 1431 testing

To scientifically measure resistance to ozone in accordance with the EN/ISO 1431 test method, samples are placed under tension (20% elongation) inside the ozone testing cabinet and exposed to highly concentrated levels of ozone for a period up to 96 hours. Every sample is closely examined for evidence of cracking at two-hourly intervals and the results carefully measured and recorded.

Because of the sheer size of industrial conveyor belts, it is common practice amongst manufacturers and distributors to store rolls of belting in open-air storage yards. Belts can often be held in stock for long periods, sometimes for several years, before they are eventually despatched to their final destination and ultimately put to use. During that time they are vulnerable to the effects of ozone and UV radiation. A number of conveyor belt users have reported that surface cracking was apparent at the time of delivery.

Test samples are checked for cracks every two hours for 96 hours. It is vital to ensure that belts are resistant to ozone and UV.

Some rubber literally disintegrates.

No hiding place.

The importance of having conveyor belts that are resistant to ozone and ultra violet can no longer be ignored by those that use them. Unless conveyor operators start insisting on ozone and UV resistance then belt manufacturers and suppliers will continue to ignore the issue. You will hardly ever find a belt manufacturer or supplier that even mentions ozone and UV. Please be my guest and check it out for yourself. This is because the special additives (anti-ozonants) required to create the necessary resistance cost money and at the same time help to appreciably extend the operating life of the belts they are supplying.

It may sound cynical but the reality is that it is not really in the best interests of belt manufacturers (or traders and service companies for that matter) for conveyor belts to run and run and run, particularly if they are trying to compete on price, which is pretty much the usual approach. This is especially so when you consider that a huge proportion of belting is directly or indirectly imported from Asia. We have hardly ever tested a competitor's belt (and never an Asian import belt as far as I know) that has survived the EN/ISO 1431 test specific conditions without cracking. In many cases the rubber literally disintegrates.

For all buyers of rubber conveyor belts there must now be two absolute pre-requisites when choosing any type of belt. Firstly, regardless of type, the rubber covers must always have good resistance to wear (abrasion) and, just as importantly, they must be fully resistant to the effects of ozone and ultra violet. Without these all-important properties the belt will not provide genuine value for money because it will need to be replaced far sooner than necessary.

My advice is to always insist on certification provided by the actual manufacturer that confirms that the belt you are ordering is fully resistant to ozone and ultra violet as in accordance with the EN/ISO 1431 test method.

ISO 1431. Lateral cracking. The effects of ozone on rubber.

Sammi offers sophisticated solutions for stockyard management — and more

Technologically advanced equipment, several application fields, the flexibility to adapt itself to most demanding customers — these are the key points of Sammi's strategy for being competitive in the complex and selective sector of bulk handling industry. In over 40 years of history, Italian manufacturer Sammi has expanded its reach, by increasing and improving its human and technical skills. It is now capable of being involved in different application fields, such as mines and quarries, cement works, dock plant, glass production plants, foundries and steel plants, off-shore plants, and oil & gas (O&G).

Sammi designs and manufactures a wide range of bulk handling equipment, including: almost all types of conveyors, extractors, vibrating hoppers, tripper cars, belt conveyors for stacking, movable dock machinery for loading ships, shiploaders and unloaders.

However, Sammi focuses not only on the production stage, but it also covers the whole lifecycle of the equipment supplied. Sammi wants to support the final user of its equipment, by providing maintenance and after-sales services to meet the expectations of its customers.

Thanks to its desire to solve all the needs — however sophisticated — of its customers, it has gained the trust of many investors all over the world, establishing lasting commercial relations in North Africa, Middle East, Ukraine, China, Indonesia, United Arab Emirates.

In the recent past, Sammi was awarded of a contract for a cement plant in Belgium for a complete handling and storage system to be installed at the quarry of the cement factory. The project includes the design, manufacture, supply and installation of two transport lines complete with towers and tunnels including one tripper car; stockpile building for limestone storage; two transport lines complete with towers and tunnels for the recovery and feeding of the cement factory.

In the O&G market, Sammi has carried out an important recent project in Poland. After having won the commission by KT KINETICS TECHNOLOGY for the Lotos EFRA project, in 2015, Sammi's specialized team started to design the equipment required. The company has used all its expertise developed over the years to meet the needs of the customer.

The project concerns the manufacturing of the coke storage and loading facilities, whose function is to handle the coke product from the closed coke slurry system (CCSS) to the storage stockpile and then from this one to the truck loading station. The coke from the CCSS unit is delivered to the storage bulk hall, where a shuttle conveyor allows for the distribution of material through the building length. To prevent the dispersion of explosive coke dust, a loading bellows is provided under the shuttle.

From the stockpile, the coke is delivered to the truck loading system by means of a semi portal scraper that keeps materials sending it to a conveyor chain up to truck loading station. In case of reclaimer shutdown, petcoke can be routed directly to the truck loading station with a bypass route. Moreover, it is important to underline that all the systems are Atex certified to guarantee safety and suitable to work at temperatures from –25°C. The first level control system is performed by a fully redundant PLC.

All the steps of the project — which has not yet been

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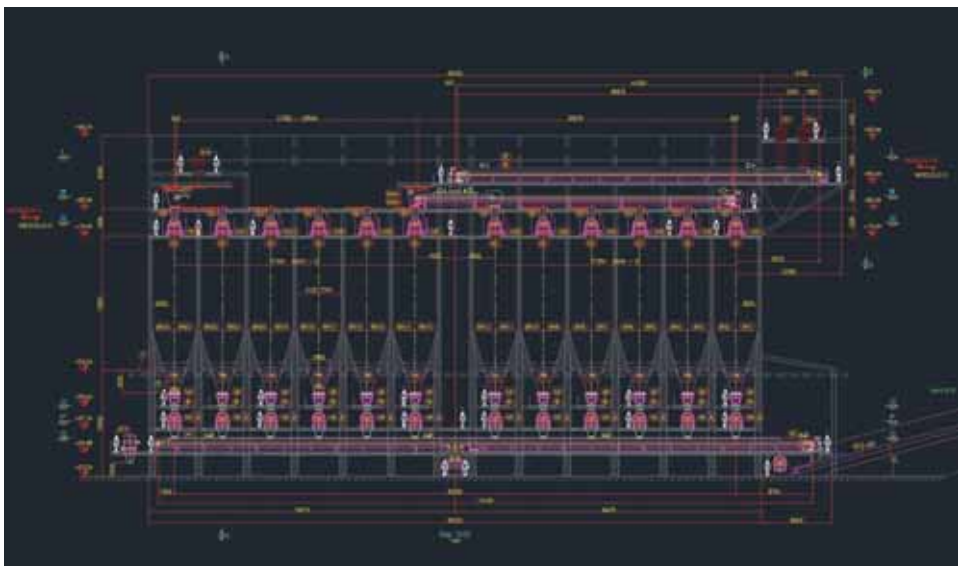
completed — have been followed by Sammi, from the beginning with the initial design to the following main phases, such as production, monitoring, final assembly. In accordance with the philosophy of the company "There are no barriers, only new challenges", this recent contract is only a starting point for further international growth of Sammi.

In the tunnelling field the company is currently working on a new project for the management of material coming from the activity of two TBM excavators.

In this case the stocking system is required to properly divide material with high asbestos content (that needs to be processed in a dedicated plant). Hence 24 concrete bins will be provided, each with a capacity of 900m^3, with a different discharging path for material, to be set after analysis results on product extracted by a sampling system placed prior to entering the bins.



Over the years, Sammi has always tried to extend its target market, offering new specific services and facing new markets. This approach is clear with the latest company acquisitions. In December 2017, SAMMI S.r.l. took control of the company Shi.E.L.D. SERVICES S.r.l., an enterprise specialized in all activities related to management, design and operation of the major type of ships, floating transfer station and floating cranes. It is worth noting that Sammi can boast excellence in this field, having provided several loading systems for transshipment vessels for different materials.

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The Great Lakes and St Lawrence Seaway System

Louise Dodds-Ely

The heart of North America

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

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

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

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

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

own flag carriers. Salties flying the flags of other nations connect the Lakes with all parts of the world.

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

Management of the Seaway

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

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

US Saint Lawrence Seaway Development Corporation (SLSDC)

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

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

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

Canadian St. Lawrence Seaway Management Corporation (SLSMC)

The St. Lawrence Seaway Management Corporation is a not-for-profit corporation responsible for the safe and efficient movement of marine traffic through the Canadian Seaway facilities, which consists of 13 of the 15 locks between Montreal and Lake Erie. The Corporation plays a pivotal role in ensuring that the waterway remains a safe and well-managed system, which it shares with its American counterpart, the Saint Lawrence Seaway Development Corporation. The Corporation's mandate promotes efficiency and responsiveness to the needs of shipping interests, ports, marine agencies, and provincial and state jurisdictions.

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

SLSMC: connecting the heartland of North America to the world

Today, cargo moving through the combined Great Lakes/Seaway System supports over 227,000 jobs in Canada and the US. While these numbers are impressive, the St. Lawrence Seaway can contribute even more to the North American economy. The existing Seaway locks and channels have the capacity to handle double the present shipping volume, and reach 80mt (million tonnes) of cargo annually. One of the SLSMC's initiatives to make the most of this available capacity is its programme to convert the Seaway's high-lift locks to Hands Free Mooring (HFM) and Remote Operation. This programme began in 2013. The Canadian Seaway has now been completely fitted, in time for the opening of the 2018 season on 29 March this year. The entire System is expected to be fitted in

SEAWAY MONTHLY TRAFFIC RESULTS
December 2017

Traffic (in thousands of tonnes)	SLSMC - Combined Traffic			
	Year to Date		Change from 2016	
	2016	2017	Tonnes	%
Total Cargo	35 010	38 121	3 111	8.89%
All Grain	11 266	10 069	-1 197	-10.62%
Iron Ore	6 233	8 039	1 806	28.97%
Coal	2 248	2 257	9	0.40%
Dry Bulk	8 892	10 485	1 593	17.92%
Liquid Bulk	3 685	3 790	105	2.85%
General Cargo	2 628	3 426	798	30.36%

Vessel Transits	2016	2017	Transits	%
Total Transits	3 774	4 119	345	9.14%

The St. Lawrence Seaway Management Corporation

2019, when the US Seaway complete work on their locks. Using vacuum mooring pads to secure a ship in a lock eliminates the need, in most cases, for Seaway personnel to manually tie up ships using lines.

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

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

According to the latest figures (see p98), as expected tonnage through the Seaway shows a marked improvement, especially in the movement of dry bulk cargoes. While grain — the Seaway's largest bulk cargo — has fallen by 10.62%, iron ore has surged with a significant increase of 28.97%, leading to an overall growth in dry bulk of 17.92%.

Algoma: Great Lakes/St. Lawrence short sea shipping behemoth

Algoma Niagara, *the fifth vessel in the* Equinox Class *fleet renewal, sailed her maiden voyage in November 2017 in the St. Lawrence Seaway and Great Lakes trading area. The* Algoma Niagara *is the first Seaway-sized self-unloading vessel in the* Equinox Class *design.*

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

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

Domestic dry bulk

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

The Algoma fleet operates to the ISO 9001:2008 and ISO 14001:2004 Quality and Environmental Management Systems standards, as well as the IMO's ISM Code (International Management Code for the Safe Operation of Ships and for Pollution Prevention).

Algoma Central Corporation has embarked upon a major fleet replacement programme, which continues to see many older vessels replaced by modern, state-of-the-art and environmentally sustainable carriers of the future. Algoma resets the bar for both operating and environmental performance with the innovative design of the Equinox Class of vessel.

Self-unloaders

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

Gearless bulk carriers

Algoma Central Corporation provides dry bulk shipping services to shippers who do not require self-unloading technology. For more than 50 years Seaway-size gearless bulk carriers have cost effectively

The Algoma Niagara.

transported Canadian and US grain harvests eastward through the St. Lawrence Seaway System, and iron ore shipments back to the Great Lakes.

Equinox Class

Algoma Central Corporation is renewing its domestic dry bulk fleet with the Equinox Class of vessels.

Algoma's Equinox Class vessels bring new technological advancement in fuel efficiency, reducing its environment footprint and its forward-thinking design has made Algoma a frontrunner in the marine industry.

Recent developments

Algoma Central Corporation is continually evolving and developing. Some of Algoma's recent developments are detailed below:

- two new Equinox Class ships have joined operations;
  - *Algoma Sault* 740ft self-unloader has been delivered to Canada from the Yangzijiang Shipyard in China;
  - *Algoma Innovator* 650ft forward-mounted boom self-unloader has arrived from the 3 Maj Shipyard in Croatia;
- Algoma acquired two river-class vessels from ASC in December, 2017. They have been re-named the *Algoma Buffalo* and the *Algoma Compass*. Both ships will complement the company's existing fleet to ship salt, aggregates, and other commodities.

Algoma supports many different industries some of which include

- iron & steel;
- agriculture;
- construction;
- salt (for winter road de-icing); and
- power generation.

2017 statistics

Sixty per cent of Algoma's domestic cargo carried moved through some part of the St. Lawrence Seaway system in 2017.

Approximately 38% of the cargo transported through the Seaway was Algoma cargo. Algoma transported over 20 million tonnes of domestic dry-bulk cargo in 2017.

The Algoma Innovator.

Lake Carriers' Association reviews major issues facing Lakes shipping

US-flag Great Lakes freighters (lakers) moved 85.7mt (million tonnes) of cargo in 2017, an increase of 3% compared to 2016, *reports Glen G. Nekvasil, Vice President of the Lake Carriers' Association*. The 2017 float was, however, 2.4% behind the fleet's long-term average.

Iron ore for steelmaking totalled 46mt, an increase of 4.3% compared to 2016.

A significant development in the iron ore trade in 2017 was the closing of the ore dock in Escanaba, Michigan, in April. On April 18 the US-flag laker *Wilfred Sykes* loaded 22,823 tonness for delivery to Indiana Harbor, Indiana. The iron ore mine that shipped through Escanaba, which is located on the northern shore of Lake Michigan, has exhausted its mineable reserves. This means all domestically mined iron ore now must transit the locks at Sault Ste. Marie, Michigan, in order to feed blast furnaces in Indiana, Ohio, Michigan, and Pennsylvania.

Coal loadings in US bottoms increased 2.8% to 13.3mt. Shipments of low-sulphur coal from Lake Superior rose 7%, but loadings at Lake Michigan and Lake Erie docks dipped 8%.

Shipments of aggregate and fluxstone rose increased 1.7% to 21.55mt.

Shipments of cement, salt, sand and grain were generally in line with recent years.

Lake Carriers' Association (LCA) remains engaged on a number of issues affecting the future of Great Lakes shipping. Key among them is enacting the Vessel Incidental Discharge Act, which would establish a uniform, federal discharge standard for ballast water and other vessel discharges and assign enforcement to the US Coast Guard. Currently two federal agencies, the US Coast Guard and Environmental Protection Agency, and seven of the eight Great Lakes states regulate ballast water and compliance with so many differing requirements is nearly impossible. Safe and efficient waterborne commerce needs uniform federal regulation and the US Coast Guard is best qualified to enforce those regulations.

LCA continues its efforts have another heavy icebreaker built for Great Lakes service. The winters of 2014 and 2015 were well beyond the US Coast Guard's capabilities and as result, more than 6,000 jobs and $1.1 billion in economic activity were lost.

Congress has approved construction of the vessel, so the Association's focus in now on funding the icebreaker. This past December and January underscored how real the need is. After two mild winters, heavy ice again formed and nearly 2mt of iron ore and coal that were to be shipped in US-flag lakers were either delayed or outright cancelled. The good news is the omnibus appropriations bill passed by Congress in March includes an additional $3 million for design of the heavy icebreaker.

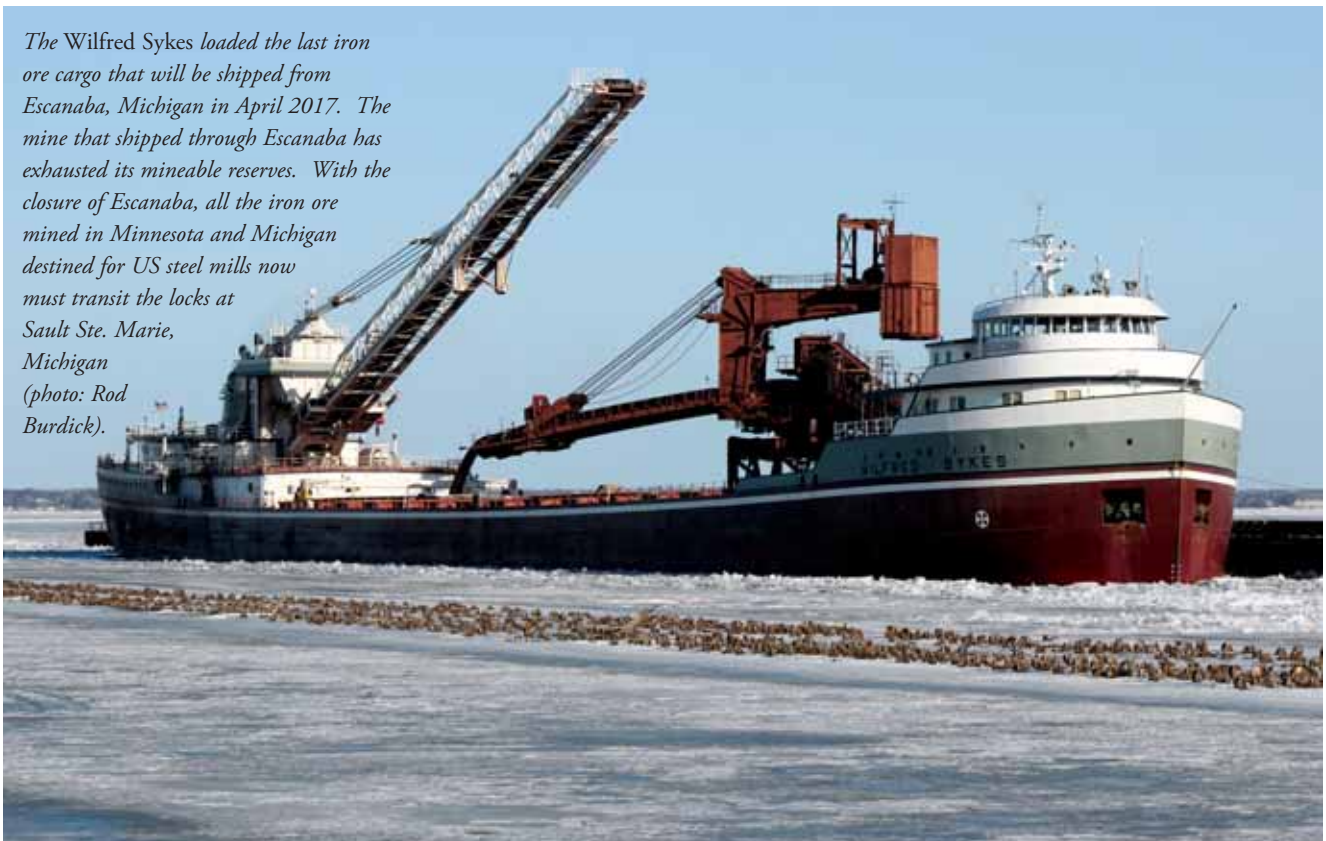
As noted earlier, the closure of the ore dock in Escanaba, Michigan, increases the need to build a second Poe-sized lock at Sault Ste. Marie, Michigan. The Soo Locks are now the only way Minnesota and Michigan iron ore can reach domestic steel mills by vessel.

Equally important is the fact that the Poe Lock now handles most of the cargo transiting the Soo Locks. In 2017, 67.4mt of the 75.3mt that passed through the Soo Locks moved through the Poe Lock.

Construction of a second Poe-sized lock is stalled because a US Army Corps of Engineers (Corps) analysis of the lock's benefit/cost (b/c) ratio assumes railroads can move the cargoes delivered by vessels. That was not true when the analysis was performed in 2005 and is even less so in 2018. The Corps has acknowledged the b/c ratio is flawed and is conducting an economic reevaluation that should be complete by mid-2018.

The US Department of Homeland Security (DHS) and the US Treasury strongly support a second Poe-sized lock. A DHS study of a six-month closure of the Poe Lock estimates nearly 11 million Americans would lose their jobs. There is really only one conclusion the Corps' economic reevaluation can reach: build a second Poe-sized lock.

These are challenging issues, but LCA and its members remain committed to Great Lakes shipping. During the winter of 2017/2018 LCA members spent $65 million maintaining and modernizing their vessels. A number of vessels have been repowered in recent years to further reduce the industry's already small carbon footprint. Great Lakes shipping is here to stay.



The Wilfred Sykes *loaded the last iron ore cargo that will be shipped from Escanaba, Michigan in April 2017. The mine that shipped through Escanaba has exhausted its mineable reserves. With the closure of Escanaba, all the iron ore mined in Minnesota and Michigan destined for US steel mills now must transit the locks at Sault Ste. Marie, Michigan (photo: Rod Burdick).*

Port Milwaukee: connecting to the world

Algoma Enterprise *delivering salt.*

Port Milwaukee is a regional transportation and distribution centre located on the western shore of Lake Michigan within the Great Lakes/St Lawrence System. It is a landlord port whose tenants handle over 2,000,000 tonnes of bulk cargo annually being transported within the Midwest region to support the construction, agriculture, and energy sectors.

The port's 14 miles of railroad track, with over a dozen dockside rail berths, is serviced daily by the Union Pacific Railroad and Canadian Pacific Railway who distribute

Herbert Jackson *delivering limestone.*

Federal Danube *loading grain at the CofCo International grain elevator.*

Sam Laud *delivering slag to St Mary's Cement port facility.*

bulk products arriving by self-unloading Lakers. This water-to-rail connectivity provides an efficient and cost effective regional supply chain through Port Milwaukee that meets customer needs while minimizing the number of trucks utilizing the interstate highway system.

The port's bulk stevedore tenant is Kinder-Morgan, which primarily handles salt, limestone, and bottom ash. It also has bagging operations for salt and milorganite located at the port. The port has several tenants whose facilities distribute bulk products. They include Cargill, Compass Minerals, LaFargeHolcim, and St Mary's Cement.

The limestone is barged to a local power plants and the bottom ash is brought into from those same plants to be barged out. The majority of the salt is used by municipalities for de-icing roads throughout Southern Wisconsin and Northern Illinois with a portion of it being of a higher purity for use in the chemical industry. It is all delivered to the port from mines within the Great Lakes/St Lawrence System and then distributed by rail and truck.

Alpena *delivering cement to LaFargeHolcim.*

LaFargeHolcim brings in its cement by vessel from Alpena, MI to its port storage silo and then ships it out utilizing both rail and truck to its customers in Southern Wisconsin. St Mary's facility receives slag from Great Lakes steel mills delivered into Port by self-unloader. It is then crushed and distributed to customers by truck.

There are also significant bulk handling operations in Milwaukee done at private docks which are not port tenants. St. Mary's Cement has a receiving silo and CofCo International has a grain elevator adjacent to the Port. CofCo distributes Wisconsin grown agricultural products such as corn and soybeans by water through one of two routes for international export: either by river barge from Milwaukee through Chicago and down the inland river system to the Gulf of Mexico or in vessels from ocean carriers such as Fednav Ltd., Polsteam, and Wagenborg that then transit out of the Great Lakes through the St Lawrence Seaway to Europe, North Africa, and the Middle East."

Cleveland-Cliffs Inc. to locate HBI production plant at Ironville Terminal

On 15 June last year, the Toledo-Lucas County Port Authority announced that Cleveland-Cliffs Inc. will locate its first hot briquetted iron (HBI) production plant at Ironville Terminal in East Toledo. This project has the potential to create up to 130 permanent jobs, more than 1,200 construction jobs and represents a $700 million investment in the Toledo Region. This project was made possible due to partnerships between the Port Authority, JobsOhio, Midwest Terminals of Toledo, City of Toledo, Lucas County, Regional Growth Partnership, and the Ohio Rail Development Commission.

"We are excited to add to the already substantial economic impact the Port of Toledo has on this region," said Paul Toth, President and Chief Executive Officer of the Toledo-Lucas County Port Authority. "We acquired Ironville with the intention of locating a large-scale industrial user on the site who required marine and rail capabilities, and we truly feel this project is the perfect match for the remaining portion of the site."

Lourenco Goncalves, Chairman, President and Chief Executive Officer of Cleveland-Cliffs Inc, said, "Today's announcement marks a very important strategic milestone for Cleveland-Cliffs as we begin to implement our plans to be the sole producer of high-quality HBI for the EAF steel market in the Great Lakes region. We look forward to the strong margin and earnings potential this new product will generate for Cleveland-Cliffs shareholders." Goncalves added: "We thank Governor John Kasich, JobsOhio and a number of local partners in the Toledo community for their efforts to help advance this project, including an offer of approximately $30 million in grants and other financial incentives. We will continue to work closely with the State of Ohio through the environmental permitting process, and are excited to bring a significant number of high-paying jobs to Ohio."

Cleveland-Cliffs Inc. will lease approximately 100 acres on the east side of the site from the terminal operator, Midwest Terminals of Toledo. Existing infrastructure and material handling capabilities on the site met the company's requirements for its site selection process.

Construction on this project began on 5 April this year, with a groundbreaking event, held by Cleveland-Cliffs Inc., to celebrate the construction of its first HBI production plant. Cliffs' domestically produced HBI will supply a Great Lakes market currently estimated at three million metric tonnes, which is currently supplied exclusively by imports of commercial quality pig iron and HBI from countries such as Russia, Ukraine, Brazil and Venezuela, among others. Start-up of the plant is expected to happen in the summer of 2020. The new development has the potential to add 100 new vessel calls per year at the Port of Toledo. The finished product will ship from the facility via truck and rail.

"The Lucas County Commissioners are excited to be a part of this opportunity for redevelopment of the Ironville site. This investment is a game changing opportunity for Lucas County and our workforce. Transportation is our most competitive advantage and this project proves it. The partnerships we have fostered over many years with the Port Authority and other public and private entities is the gold standard in Ohio and we look forward to working with Cleveland-Cliffs to ensure our workforce is ready for these exciting new jobs," said the Lucas County Commissioners.

PROJECT DATA

Cleveland-Cliffs Inc. is:

- Largest and oldest US independent iron ore mining company
- Major supplier of iron ore pellets from mines and pellet plants in MI and MN
- Driven by core values of safety, social, environmental and capital stewardship, Cliffs endeavours to provide stakeholders with operating and financial transparency

Premier location for development:

- Proximity to electric arc furnace steel producers for fast and reliable deliveries
- Logistical advantages: Port of Toledo; access to rail lines; good existing road infrastructure; access to affordable natural gas
- Prime location in US Midwest region allows plant to receive iron ore pellets from Cliffs' Northshore Mine in Minnesota

About Ironville Terminal

Ironville Terminal, formerly known as the Chevron property, was purchased by the Toledo-Lucas County Port Authority in 2008. The Port Authority formed a public-private partnership with Midwest Terminals of Toledo through a long-term lease for the property. The acquisition of Ironville Terminal made the Port of Toledo the largest land mass seaport on the Great Lakes. Approximately $18 million has been invested in the site to date. The Port of Toledo supports 7,000 jobs and has an annual economic impact of over $1 billion on the local economy.

About Cleveland-Cliffs Inc.

Cleveland-Cliffs Inc. is a leading mining company. Founded in 1847, Cleveland-Cliffs Inc. is recognized as the largest and oldest independent iron ore mining company in the United States. The company is a major supplier of iron ore pellets to the North American steel industry from its mines and pellet plants located in Michigan and Minnesota. Driven by the core values of safety, social, environmental and capital stewardship, Cleveland-Cliffs' employees endeavour to provide all stakeholders operating and financial transparency.

Port of Bécancour on track to maintain cargo volumes in 2018

Photos : Jean-François Paquin.

The Port of Bécancour (Société du parc industriel et portuaire de Bécancour — SPIPB), which can trace its origins back to the 1960s, handles approximately 1.9mt (million tonnes) of cargo each year, with dry bulk representing about 85% of that volume.

The mission of the SPIPB is to promote the economic development of the province of Quebec by developing and operating a self-financed industrial park and port facilities. The SPIPB is mandated by the Quebec government and the Ministère de l'Économie, des Sciences et de l'Innovation to be in charge of the enforcement of its incorporating Act. It aims to promote the establishment of new companies and to provide the infrastructure needed for the implementation of significant scope companies.

It is therefore important to note that the great majority of the cargoes discharged at the port is consigned to industries located in the industrial park and that all the liquid cargo loaded in the port is transformed and shipped by industries located in the industrial park.

Port facilities of the SPIPB are situated at Bécancour, on the South shore of the Saint-Lawrence River between Montreal

and Quebec City. They are situated in freshwater, and comprise five berths and a ro/ro ramp. The following facilities are available:

- a bulk liquid terminal located less than a kilometre from the port facilities and linked to berth B-1 by a network of pipes allowing the transfer liquids directly from ships to tanks;
- a railway line linking the port facilities to the CN railway network;
- a merchandise handling and storage land that covers 61 hectares (151 acres) of which 14 hectares (35 acres) are paved, lighted and located close to the berths;
- two pneumatic ship-unloaders belonging to the Aluminerie de Bécancour Inc.; and
- a gatehouse to control access to the port and a scale to weigh handled goods.

This year, close to 1.9mt is expected to transit the Port of Bécancour. In accordance with the last years, about 20% of that tonnage will be coming from the Great Lakes, including mostly chemical grade salt and grain for two of the industries located in the industrial park. Furthermore, dry bulk cargo will represent around 85% of the cargo that will be loaded or unloaded in Bécancour in 2018. This includes alumina, calcined petroleum coke, grain, chemical and de-icing grades salt.

The fact that the majority of the cargo unloaded at Bécancour is consigned to industries located in the industrial park and that all of the liquid cargo is transformed and shipped by industries situated in the industrial park says a lot about the importance given to those industries in the port's daily operations. Indeed, priority to use port infrastructure is given to the industries located in the industrial park.

This spring, in order to increase storage capacity and to ensure adequate space for the cargo consigned to the Canadian northern mines shipped through the port of Bécancour, SPIPB will develop an additional 75,000m^2 available for storage in the port mostly for project cargo and containers. This will define the port of Bécancour as the rotating plate for the Northern Canada mining industry. Most of the cargo handled in Bécancour is bulk, but each year, up to 320,000m^3 of project cargo is shipped from Bécancour to the north during the high season to maintain and develop some of the mines.

The Trois-Rivières Industrial Port Zone goes into action

After more than two years of work, partners of the Trois-Rivières Industrial Port Zone (IP Zone) are ready to take action.

As a result of the implementation of the Quebec government's Maritime Strategy, the City of Trois-Rivières, Innovation et Développement Économique Trois-Rivières and the Port of Trois-Rivières have committed to creating an IP Zone in Trois-Rivières.

Agreements to this effect were concluded in 2016. A local committee of partner representatives was created to oversee the project. These partners have proudly announced the commencement of prospecting activities to attract businesses to the Trois-Rivières IP Zone.

The local committee has established the delimitation of the IP Zone, a development plan, an action plan, a prospecting strategy and a financing plan. They have worked tirelessly to complete the action plan. Various studies have been conducted to identify opportunities as well as niche markets.

To support the prospecting activities to be deployed in the coming months, a brochure with a special insert and a promotional video were produced. A new website has also been launched.

More detailed results of these projects will be presented to companies as well as to the various partners during a joint information day with the Bécancour IP Zone, which will be held on Monday 30 April at the Auberge Godefroy. This event will also be an opportunity to present the various financial programmes which companies will have access to through the IP Zone.

"The Port of Trois-Rivières plays a major role in the development of Québec's maritime industry while contributing to its influence beyond our borders. I am delighted with the work that has been carried out — and which will continue — by local stakeholders to give the city of

Trois-Rivières a dynamic, competitive and efficient industrial port zone," says Jean D'Amour, Minister for Maritime Affairs

"We are in a position today to appreciate the work carried out by an effective committee, who has delivered tangible results less than two years after the creation of the Industrial Port Zone. This achievement is the result of exemplary teamwork where all partners have shown remarkable initiative. Through their audacity, rigorous efforts and their experience, it is now possible to pursue prospecting efforts on the international market," says Julie Boulet, Minister of Tourism, Minister responsible for the Mauricie region and Member for Laviolette

Jean-Denis Girard, Member for Trois-Rivières, adds: "Bringing together about a dozen organizations with the common objective of implementing an Industrial Port Zone in Trois-Rivières represents a significant challenge which was successfully met over the past year. With an innovative approach, Trois-Rivières is positioned as a smart and attractive choice for its many advantages. I would like to acknowledge the partners' exemplary collaboration, namely the City of Trois-Rivières, Innovation et Développement Économique Trois-Rivières, the Ministère de l'Économie, de la Science et de l'Innovation (MESI) and the Trois-Rivières Port Authority."

Yves Lévesque, Mayor of Trois-Rivières, is very supportive of the initiative, saying: "The port city of Trois-Rivières hinges on a strategic advantage which is highlighted through the Industrial Port Zone. This added benefit makes our city more attractive and will help support the development of our manufacturing sector."

Gaétan Boivin, President and CEO, Trois-Rivières Port Authority concludes by saying: "The future is bright thanks to the collaborative strength of our partners who all share the same goal. The IP Zone is an important lever for development for a port city like Trois-Rivières, and the TRPA has made it part of its On Course for 2030 strategic plan, which will be unveiled soon."

Port of Hamilton enhances dry bulk facilities with new investments

Vessel awaits loading at G3 Canada Ltd. grain terminal, Port of Hamilton, Pier 26.

The Port of Hamilton is the largest Canadian port on the Great Lakes, handling approximately 10mt (million metric tonnes) of cargo annually.

In 2017, the vast majority of the port's cargo was dry bulk, totalling 8.mt. This total was comprised of:

- steelmaking commodities such as iron ore and metallurgical coal;
- dry fertilizers such as UAN and potash; and
- Ontario-grown grain (corn, wheat and soybeans) destined for export.

Major recent initiatives at the Port of Hamilton have included:

G3 Canada Ltd. Grain Terminal

A major new grain export terminal opened for business at the port this past year. This $50 million investment was made by G3 Canada Ltd. The new 50,000-tonne facility is capable of discharging a 40-tonne Super-B truck in under five minutes. Grains and oilseeds are loaded at the new terminal for transport to G3's facilities on the St. Lawrence River, and from there are shipped onwards to export markets around the world. The Hamilton Port terminal is part of the company's vision to create a coast-to-coast Canadian grain enterprise.

Parrish & Heimbecker Flour Mill

Also in 2017, a new $45 million flour mill, constructed by Canadian grain company Parrish & Heimbecker started operation at the Port of Hamilton.

The facility is the first new-build flour mill to built in the Canadian province of Ontario in 75 years, and is integrated with

Parrish & Heimbecker grain terminal, Port of Hamilton Pier 10.

First ship calls at multiuser dock at the Port of Sept-Îles

At 8am on the morning of Sunday 25 March, the Port of Sept-Îles welcomed the first ship at the multiuser dock. The *Magnus Oldendorff* then sailed for Qingdao, China, with a shipment of 196,000 tonnes of iron ore concentrate from Quebec Iron Ore.

"The entire port team has joined together to undertake this exciting new chapter in the commissioning of the largest shiploaders in North America. We expect, as is normal, that ship arrivals in April and May will enable us to fine-tune the equipment and handling systems. The same will go for training for port employees and key partners involved in commissioning the new facility — Société ferroviaire et portuaire de Pointe-Noire (SFPPN) and Logistec Stevedoring," said Carl Allard, Asset Manager at the Port of Sept-Îles.

"Today's opening by Société du Plan Nord of the new SFPPN conveyor also provides an opportunity to stress how this vital investment will benefit users. The new link between the storage facilities and the multiuser dock will deliver access to this new world-class facility without the cost users would otherwise have to assume. Another important point is that the project has benefited from the close partnership between SFPPN and the port. It includes a $2.4 million investment by the port to complete the conveyor tower," said Port President & CEO Pierre D. Gagnon.

Inaugural event

An event marking the commissioning of the biggest port terminal in North America is currently being organized in collaboration with key industry and government partners. The Port of Sept-Îles will officially celebrate this historical milestone before summer arrives in the company of dignitaries and guests from the community, industry, and government.

About the Port of Sept-Îles

Boasting diverse, state-of-the-art facilities, the Port of Sept-Îles is one of North America's largest ore-handling ports, with a projected volume of more than 30 million tonnes for 2018. The port facilities at Sept-Îles play a vital and strategic role in the economy of Eastern Canada. Annual economic impacts are estimated at nearly $1 billion and almost 4,000 direct and indirect jobs.

P&H's existing grain terminal at the port's Pier 10.

Hamilton Port Authority (HPA) President & CEO Ian Hamilton attributes the steady growth in the agricultural sector to the port's ability to respond to market opportunities: "Global demand for food is growing, and Canada has an impeccable brand internationally for food safety and quality." Capacity at the port has been growing steadily to keep up with this demand.

"The Port of Hamilton has attracted more than $200 million in agri-food related private sector investment in recent years, which means our terminal operators have the ability to move more product, more efficiently," said Ian Hamilton.

Success with primary agricultural commodities has led to the attraction of new supply chain partners to the Port of Hamilton.

The port now has 14 tenants in the agri-food sector, from food processing, grain milling, and beer brewing, to food-grade trucking and warehousing. "We brought together all the right ingredients, and now we're really cooking," said Hamilton.

Lakes & Rivers Logistics handles more than 1mt of bulk and breakbulk each year

Lakes & Rivers Logistics, Inc. of Gary, Indiana is a stevedore cargo handling business operating at Buffington Harbor on Lake Michigan. The union-proud company management has experience handling more than 1mt (million tonnes) of bulk and breakbulk annually, including raw materials for steel making, aggregates, fertilizers and grain. The Buffington Harbor location on Lake Michigan in Gary, Indiana allows for access to rail, river, lake and highway transportation options.

The Buffington Harbor location has direct access to the St. Lawrence Seaway via Lake Michigan, is directly served by the Canadian National Railway and has easy highway access to Interstates 80, 90, 94, 65 and 294. Lakes & Rivers Logistics has 1,000 feet of contiguous dock space and ten acres of open storage.

The operation provides material handling for bulk and freight materials coming into the port on barges, lakers and ocean vessels and transfers that cargo to trucks and trains.

The operations at Buffington Harbor in Gary support the vision of Gary Mayor Karen Freeman-Wilson, who is hopeful the city will have its own port to provide jobs and expand cargo handling options beyond the needs to the local steel mills and supporting industries to feed the local economy. To that end, the city in 2017 established a port authority.

The company operates with experienced union labour led by superior leadership. In January 2018, industry native James Dillman was named chief operating officer of both Lakes & Rivers Logistics, Inc. and its affiliate Jack Gray Transport, Inc.

"Jim's expertise and achievements in the industry are unparalleled," Danette Garza, owner of Lakes & Rivers Logistics, Inc. and Jack Gray Transport, Inc., said of Dillman's hiring in January. "His leadership will not only move our companies forward but will advance the stevedoring and port industries in Northwest Indiana. We couldn't be happier to have him directing our operations."

Dillman began his career in the stevedoring industry in 1986 as a stevedore superintendent in Chicago for Ceres Terminals. He has since held executive positions including CEO, president and vice president, managing stevedoring, port and vessel operations in North America, Australia, India, Indonesia, Asia, South America and New Zealand. Dillman most recently served as chief executive officer of Diversified Port Holdings (DPH) in Jacksonville, Florida, which operates nine ports with nearly 600 employees. Prior to his position with DPH, Dillman served as president of Metro Ports — headquartered in Long Beach, California — for four years and was responsible for the operations of 21 ports throughout North America.

"Lakes & Rivers Logistics, Inc. and Jack Gray Transport, Inc. are incredible companies providing critical services for the industry," Dillman said. "I'm honoured to have been selected to serve as COO for these fine companies and am looking forward to working side by side with their leadership team."

Major developments under way at Port of Indiana-Burns Harbor

The Port of Indiana-Burns Harbor completed a landmark year in 2017 and is poised for significant future growth as a result of several historic developments. In addition to handling an 8% increase in cargo shipments in 2017, the port doubled the size of its bulk terminal, attracted a nationally-renowned stevedore in Metro Ports, handled its most valuable cargo ever, and announced a $20 million expansion made possible by earning one of only ten 'FASTLANE' small project grants awarded in the US last year.

Roughly 53% of Burns Harbor cargo is dry bulk. In 2017:

- fertilizer was up 4% (~7%);
- limestone was up 24% (~21%).

Additional dry bulk cargo the port handles in significant amounts include

- coal (~6%)
- coke (~4%)
- grain (~4%)
- minerals (~2%)
- salt (~1%)
- slag ~10%)

Major bulk shippers include

- Cargill;
- Carmeuse Lime & Stone;
- Frick Services; and
- Mid-Continent Coal & Coke.

photo: Rich Allen.

FASTLANE GRANT

Port of Indiana-Burns Harbor has been was awarded one of ten FASTLANE grants by the US DOT, confirmed in October last year. The $9.85 million grant will supplement an overall $19.7 million dollar expansion effort.

Projects include:

- two rail yards with storage for 183 railcars;
- facilities to accommodate 90-car unit trains;
- a new shipping berth
- a new 2.3-acre bulk cargo terminal with multimodal connections for handling cargo transfers between ships, barges, rail cars, and trucks;
- 4.4 miles of new rail track added to the existing 14-mile rail network; and
- extensions to a retaining wall and paving of a dock apron which will result in a additional 1,200 feet of usable dock space.

"Indiana's ports are critical hubs for jobs and economic growth and this expansion will help our state attract even more business to northwest Indiana," Governor Eric J. Holcomb said. "This new investment will not only improve the region's economic vitality, but also the international competitiveness of our entire state."

"Improving infrastructure is one of the best ways we can foster growth, and our federal and state governments continue to make investments to attract new business and help existing businesses expand," said US Senator Todd Young, a member of the Senate Transportation and Commerce Committee. "Our ability to move raw materials and finished products is critical for economic success and this FASTLANE Grant will help our Lake Michigan port strengthen the Hoosier economy."

photo: Nick Szymarek.

METRO PORTS ARRIVES IN 2017

In July last year, Metro Ports — the country's oldest stevedoring company — alongside executives from the Ports of Indiana, celebrated the grand opening of the new bulk terminal facility at the Port of Indiana-Burns Harbor, which has immediately doubled the size of the bulk terminal at the port. Metro Ports is now managing the loading and unloading of shipments along the port's East Harbor for port tenants and outside companies shipping bulk cargoes, including products for the steelmaking, agricultural, manufacturing, energy and construction industries.

Metro Ports is the brand used to collectively identify stevedoring affiliates of Metropolitan Stevedore Co. and its parent company, Nautilus International Holding Corp., both based in Long Beach, Calif. The company's roots date back to 1852 when its original parent corporation, California Stevedore and Ballast Co., was established during the Gold Rush era, and it has maintained continuous family ownership for 165 years. Metro Ports operates at 27 US ports on the East, West and Gulf Coasts in 10 states. This is the first non-coastal, Great Lakes terminal for the country's oldest stevedore.

Metro Ports handles a wide range of bulk and breakbulk cargoes around the country, including aggregates, potash, coke, coal, cement, fertilizer, borax, bauxite, RoRo, military, steel, wind energy, yachts and project cargo.

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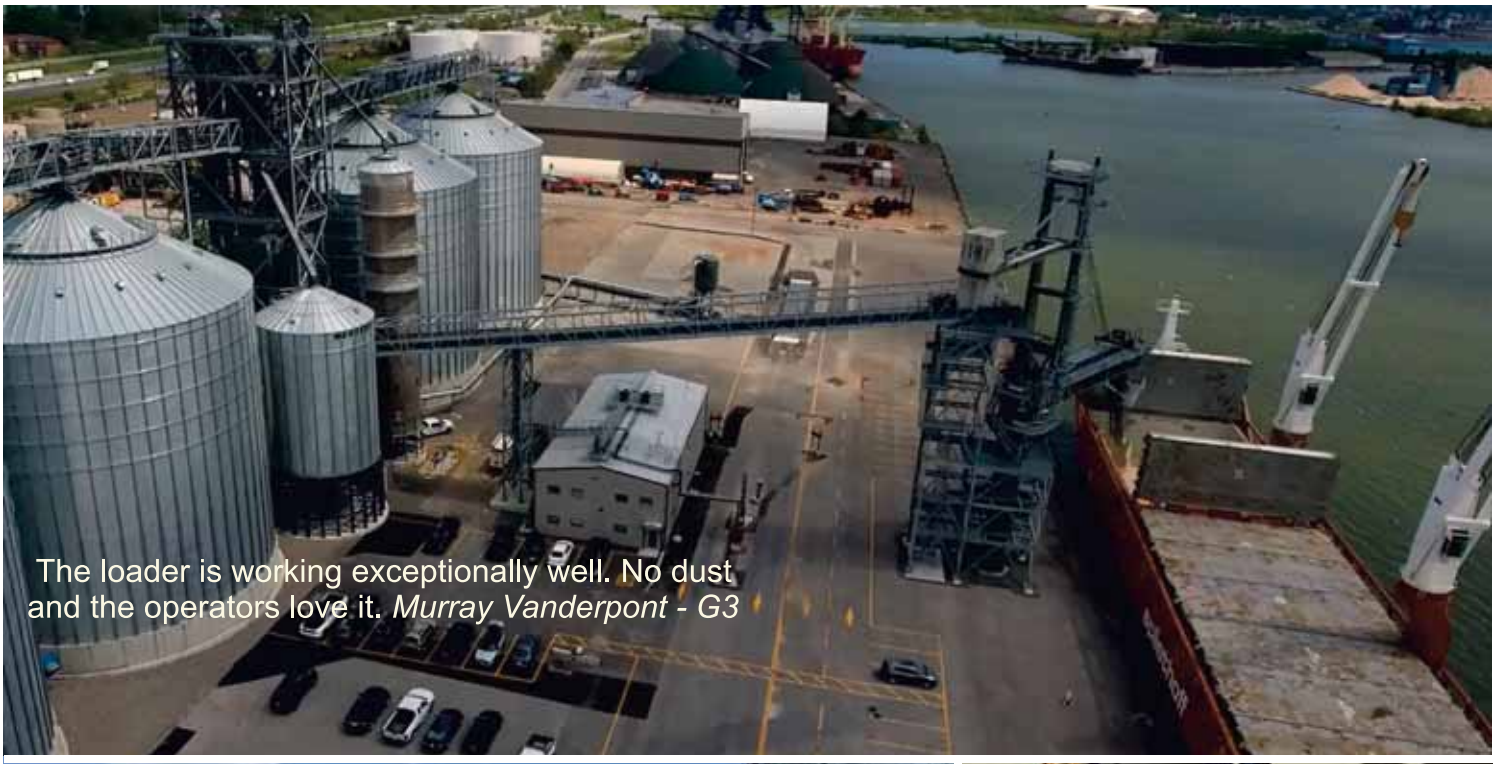

The loader is working exceptionally well. No dust and the operators love it. *Murray Vanderpont - G3*

Ausführung	
Leistung:	1.500 t/h
Fördergüter:	Getreide
Abmessungen:	27 m Ausleger
Bauweise:	Stationär
Schiffsgrößen:	Laker
Bemerkungen:	KIKO Staubarm Beladekopf

Design	
Capacity:	1.500 t/h
Products:	Grain
Dimensions:	27 m Boom
Type:	Stationary
Ship size:	Laker
Remarks:	KIKO with DSH

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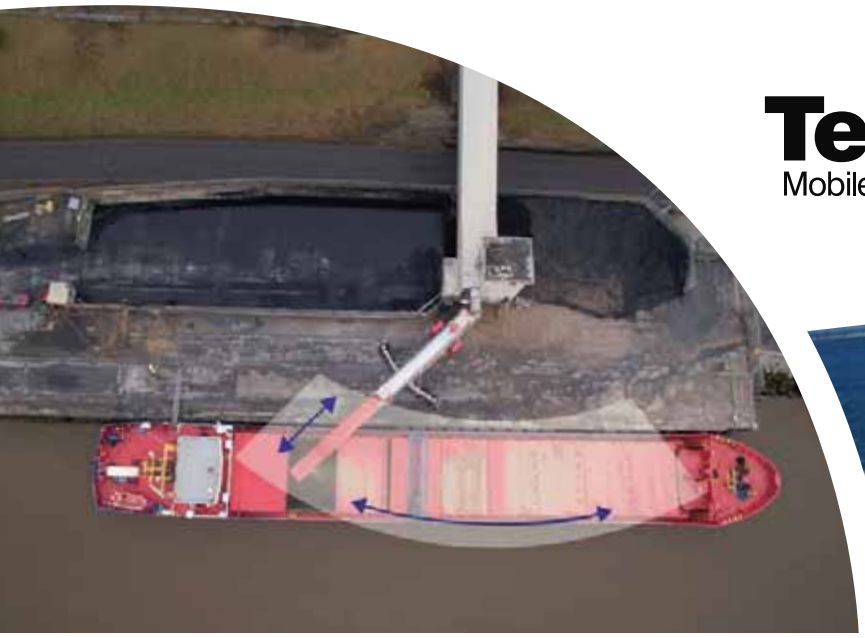

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