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featuring...

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Grain and soya trade flatlining

Recent signs have provided further evidence of restraints on global commodity import demand growth through 2019 and into next year. Although such indications have been accentuated by negative short-term influences, which may be at least partly reversed, forecasts for world seaborne dry bulk trade point to a very limited increase this year.

An update on the global economy's progress published last month by the OECD organization re-emphasized expectations of a deceleration. The report suggested that "the global expansion continues to lose momentum ... growth is expected to ease further". World economic output is now forecast to grow by 3.3% in 2019, compared with last year's 3.6%, and downside risks have become more prominent.

Grain/soya

In the grain and soya sector a lack of growth potential currently is a highly visible feature. Both wheat and coarse grains trade, and soyabeans and meal trade, seem likely to experience unchanged volumes in respective 2018/19 trade years while, at present, there are no obvious pointers to a resumed upwards trend later.

As shown in table 1, recent US Department of Agriculture forecasts show soyabeans and meal trade in the year ending third quarter 2019 almost ceasing to grow. The stable annual volume calculated, 214mt (million tonnes), follows three years when 4–6% rises were seen. The current year's lost momentum has been especially affected by a predicted downturn in China' s soyabeans imports which could be 6% lower at 88mt, mainly reflecting disruption caused by tariffs imposed.

Iron ore

Expectations for steel production trends, in the main countries using imported raw materials, suggest that positive effects on iron ore import demand probably will be quite limited this year. Output of crude steel in China, Japan, South Korea and the European Union could be flat in 2019, compared with the previous twelve months.

One exception is India, which achieved 5% growth in crude steel production to 106mt last year (overtaking Japan), and may see a continuation of the robust upwards trend. Although India's iron ore imports are relatively small, because domestic ore is mainly used, foreign purchases may increase from the estimated 16mt seen in 2018. Also a larger favourable impact is likely in the coking coal sector where India is a major importer as a result of insufficient good quality domestic supplies.

Coal

Prospects for a modest strengthening of global seaborne coal trade this year are still apparent, although there are greater doubts about the contribution of China's import demand. Some forecasts suggest that China's steam coal purchases, in particular, could decline sharply during 2019. This view has been reinforced by events in the past few months when weakening influences, albeit perhaps partly temporary, were a very visible feature.

The immediate outlook for world coal import demand is not as negative as it may sometimes seem. According to data released by the International Energy Agency a few weeks ago, global coal demand was up by 0.7% in 2018, supported by increased use in India and Southeast Asia. IEA analysts highlighted greater usage in Vietnam, Philippines and Malaysia — all importers — as well as Indonesia, where coal's share in the power generation mix expanded.

Minor bulks

Global seaborne trade in cement is one of the larger minor bulks sector components, and evidently increased strongly in 2018, reaching over 130mt. Another rise seems possible this year. Major importers last year were China with about 14mt and USA with about 13mt.

Bulk carrier fleet

Vessels in the Panamax (65–99,999 deadweight tonnes) segment comprise one quarter of the world bulk carrier fleet. As shown in table 2, Panamax fleet capacity is likely to accelerate in 2019 to well over 3% growth, despite an expected upturn in scrapping activity, reflecting much higher newbuilding deliveries.

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

	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19*
European Union	31.4	33.5	34.3	32.2	32.9	34.3
China	70.4	78.4	83.3	93.6	94.1	88.0
Other Asia	30.3	32.3	34.2	35.0	35.3	37.5
Others	38.9	41.0	43.7	43.9	50.9	54.0
World total	**171.0**	**185.2**	**195.5**	**204.7**	**213.2**	**213.8**
% change from previous year	+13.2	+8.3	+5.6	+4.7	+4.2	+0.3

source: US Dept of Agriculture, 8 March 2019 *October/September marketing years* * forecast*

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

	2014	2015	2016	2017	2018	2019*
Newbuilding deliveries	12.8	9.9	9.4	8.9	5.5	9.5
Scrapping	4.8	6.8	8.4	3.6	0.1	2.5
Losses	0.0	0.1	0.0	0.0	0.0	0.0
Plus/minus adjustments	0.1	–0.2	–0.1	0.1	–0.1	0.0
World fleet at end of year	**192.4**	**195.2**	**196.1**	**201.5**	**206.8**	**213.8**
% change from previous year-end	+4.4	+1.5	+0.5	+2.8	+2.6	+3.4

source: Clarksons (historical data) & BSA 2019 forecasts *forecast

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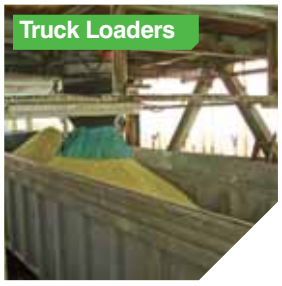

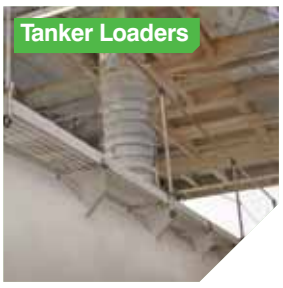

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Brumadinho mine collapse will cut up to 100mt from Brazil's exports

Mine closures forced following the collapse of a dam at the Brumadinho mine, which cost more than 300 lives, will cut up to 100mt (million tonnes) from Brazil's ore exports this year.

Ten mines in Minas Gerais state which normally produce about 100mt of ore a year, have been halted until the dams which hold back waste at these mines can be reinforced. As a result, Brazil is likely to export little more than 300mt of ore this year, 25% less than was expected.

Some extra ore could be produced from the mines at Carajas, but not enough to fill the gap, and in any case Carajas's higher grade ore is more expensive than that from Minas, which many steel companies around the world prefer. Hundreds of thousands of people who live downstream from the dams, fearful of the consequences of another collapse — the one at Brumadinho cost more than 300 lives — have forced the hand of both Vale, and the government.

Because the world price of ore has increased sharply following the Brumadinho dam collapse, and may soon reach the $100 per tonne mark, Vale's revenues may hold up this year, despite a cut of $3–3.5 billion from its earnings in Minas Gerais. But the authorities in Minas Gerais anticipate the state's revenues being down by at least 7%, as thousands are laid off, with severe impact for many more.

Towns are being forced to lay off staff, and slash spending. Railways companies which normally take Minas ore to the terminals at Tubarao, or near Rio de Janeiro, will be badly hurt as well, as will ports themselves. The mine shutdowns have also affected pig iron production in the state, which depends on ore produced locally, and several smelters have shut.

Bringing ore from further afield, a logistical nightmare, would cost pig iron producers at least $30 per tonne more than is now the case. Much of the 40mt of ore used each year by Brazil's steel mills, most located in Minas Gerais, Rio de Janeiro, or Sao Paulo states, also normally comes from mines in Minas Gerais. These companies too, are having to seek more expensive ore to continue operating. Whatever happens, Vale and other companies will have difficulty supplying all the ore usually sold to steel companies in China and elsewhere around the world. Most of this will have to be obtained from mines in Australia.

Patrick Knight

US aluminium heads criticize plans for quota system in return for lifting tariffs

US aluminium bosses have criticized a push by the United States to persuade Canada and Mexico to accept a quota system, in return for lifting President Trump's tariffs on steel and aluminium.

The tariffs were imposed last year, and have proven unpopular. However, top executives in the industry say that the use of quotas will make it "harder, even impossible" for US companies to grow and invest.

The quota strategy could have a negative impact on supply chains, and tie up funds, said Jean-Marc Germain, chief executive of Amsterdam-based Constellium N.V. which operates a number of facilities in the U.S. "Not all tariffs are created equal," Germain said. He explained that antidumping and countervailing duty cases "have proved to be extremely effective against unfairly subsided imports of Chinese aluminium." However, he added, "so far the tariffs have done nothing to stop China's trade distorting behaviour in the market."

Quotas could exacerbate the situation. "We know aluminium regularly crosses the border multiple times before reaching an end user as a finished product," Germain said. "Under a hard quota system, that metal could end up stuck at one side of the border after the quota has been filled."

Several companies have been seeking full exemption for Canada and Mexico, given the integrated supply chains in North America — especially in the automotive industry.

Speaking on behalf of the association, Germain called on Trump to scrap the tariffs, arguing they represent "bad policy".

A recent study by the Organisation for Economic Co-operation and Development found China provided its aluminium industry with subsidies in excess of US$70 billion between 2013 and 2017 — 85% of which went to five firms. The overcapacity has been blamed for depressing prices and pulling production away from U.S. producers.

"The real issue on the world stage with aluminium and fair competition is China," Germain said. "The rest of the world is by and large playing by the rules. … That's why we're saying a targeted action against those players in China who don't play by the global rules is the solution to our problems."

Mexico City and Ottawa have resisted the quota strategy.

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Diverse pressures shaping Asia's coal trade

Richard Scott, Bulk Shipping Analysis

Events over the past twelve months have intensified uncertainty about the trend of coal imports into Asia both in the immediate future and longer term. Attention is focused mainly on the region's role as an importer, although export supplies are also a feature. Some positive influences which could continue providing firm support for import demand are still prominent, yet there are clear signs of potential restraints on growth and evidence of these having an impact has emerged.

Amid economic progress in a number of Asian countries and accompanying increases in energy usage, additional coal consumption, often dependent on imported supplies remains a favoured option. An offsetting influence, however, is the steps being taken by governments, especially in the larger economies, to reduce pollution by moving progressively towards cleaner energy sources. This environmental influence seems likely to greatly restrain the coal imports trend.

Within global seaborne coal trade Asia is by far the biggest regional buyer, comprising four-fifths of the total. Consequently this region is closely watched for any indications of changing patterns evolving. The largest individual importing countries are China, India and Japan, while South Korea and Taiwan are also major importers. A group of smaller importers is becoming more prominent as well. After a sharp downturn four years ago an upwards trend in the region's annual volume has persisted, perhaps followed by another rise in 2019.

Slackening economic drivers

Among Asian countries robust economic growth continues to drive energy use, especially electricity consumption. There are contrasting features, with Japan and South Korea having already reached mature stages of development where energy demand has stabilized. In China, India and

numerous smaller economies energy demand is still growing rapidly, amid relatively fast expansion of economic output.

The latest International Monetary Fund update published in early April calculates gross domestic product growth in 'emerging and developing Asia' at 6.4% in 2018, a similar performance to the 6.5% seen in the previous year. This group includes China and India but several large economies (Japan, South Korea and Taiwan) are not included. A sub-group comprises five members of the Asean organization (Association of Southeast Asian Nations) — Indonesia, Malaysia, Philippines, Thailand and Vietnam.

In China a slowdown of 0.3 percentage points to 6.6% GDP growth was seen in 2018, from 6.9% in the preceding twelve months, but India's performance was stronger by 0.4 percentage points, rising to 7.1%. Within the Asean five group the average growth rate was almost unchanged at 5.2%. Japan's growth last year was under half of the previous year's rate, at 0.8%, while South Korea saw a slight deceleration to 2.7%.

According to the IMF's estimates, the emerging and developing Asia group could see a slight further slackening to 6.3% GDP growth during 2019. Contrasting with a continued slowing trend in China to an estimated 6.3%, in line with the group's average, India's economy may accelerate modestly to 7.3% expansion. The Asean-5 countries are expected to achieve an almost unchanged 5.1% rise. Growth rates in Japan and South Korea may show small changes.

Varying consequences for coal are implied by these changes. Where economic growth trends are positive, support for energy consumption is evident and coal usage is sometimes strengthened as a result, while negative economic trends tend to reduce support. But other drivers of coal demand are influential, often greatly modifying the impact. In one country, Indonesia, a major coal exporter, the overall economy's performance is not so relevant, because trade involvement reflects the import demand evolution in Asian and other buying countries, and the strength of competition from alternative suppliers.

Imports trend strengthens

Seaborne coal imports into Asia have risen strongly over the past three years, rebounding from the previous downturn, as shown by the table. A cumulative rise in annual volumes of more than 150mt (million tonnes) has been recorded, resulting from an average 6% growth rate. The pattern among importers was not uniformly positive throughout the period, however: India saw reduced volumes followed by a sharp recovery.

During 2018 a robust 67mt or 7% increase in Asian regional imports raised the total to just over one billion tonnes. The 1,008mt volume estimated by Clarksons Research for last year compares with 941mt in the preceding year, which was in turn a rise of almost 7%. This rapid advance followed 3% growth to 883mt in 2016 when the recovery began.

Two elements have not changed much in the past three years. Imports into both Japan and Taiwan remained quite stable, with 2018 volumes differing only by a limited quantity from three years previously, lower in Japan but higher in Taiwan. Elsewhere growth was a common feature, although in India a strong increase last year was preceded by two annual volumes which had been down by about one-tenth from previous peak levels.

The largest proportion of Asia's seaborne coal imports, four-fifths,

comprises steam (or thermal) coal grades, chiefly used in the electricity generating industry. Cement production and other manufacturing industries are also sizeable consumers. The remaining one-fifth, comprising coking coal, is used in the steel industry by mills employing blast furnace technology to make pig iron as the intermediate product.

Imports of both types are needed by the largest coal buyers in Asia — China, Japan, India, Korea and Taiwan — reflecting either an absence of domestic supplies, or insufficient quantities of the required grades available from domestic mines. In India and China domestic coal is produced in enormous quantities, satisfying a large part of the national market. Other countries, Japan, Korea and Taiwan rely wholly or almost wholly on imported supplies.

While coal imports into Asia are greatly affected by changes in electricity generation and steel production trends, and also by developments in other consuming industries, the impact of these influences can be diluted or masked by changing impacts from other factors. Large increases or decreases in domestic coal production and supplies, and domestic coal price variations, is one prominent aspect. Effects from variations 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 markets of many countries.

Recently the International Energy Agency estimated that global coal demand rose by 0.7% in 2018, mainly due to expanded consumption in India and Southeast Asia. Coal's share of total electricity generation was 2.6% greater than in the previous year, and coal generated about two-fifths of global power output, compared with the next largest fuel source, gas, with one-fifth. In several Southeast Asian countries coal use expanded markedly.

Importer variations

In China coal imports weakened abruptly at the end of last year but the 2018 total was still higher than seen in the previous twelve months. As the table on p10 shows, last year's seaborne imports volume (thus excluding overland movements, mostly from Mongolia) are estimated at 236mt, a 19mt (9%) increase. This total followed a large increase in the preceding year and was still the biggest among Asian buyers.

Coal consumption in China, a major influence, rose by 1% in 2018, although coal's share of the national energy mix continued to fall, by 1.4 percentage points from the previous year, to 59%. Another influence on imports, production from domestic coal mines, rose by 5% to reach 3,550mt. The Chinese market was restrained by anti-pollution measures designed to improve air quality in cities. More emphasis was placed on cleaner energy sources, including gas, nuclear power and renewables which comprised a larger share of the energy mix, rising by 1.3 percentage points to 22.1% of the total. The impact of these changes restricted coal imports.

India experienced a large 27mt (13%) coal imports expansion in 2018, raising the total to an estimated 230mt volume, following the downturn seen previously. Domestic production grew but the total and enlargement of rail transport capacity was unable to fully satisfy growth of demand, leading to additional purchases from foreign suppliers for use in the

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ASIA COAL TRADE — MAIN IMPORTERS (MILLION TONNES)

	2015	2016	2017	2018	2019*	2019 % change**
China	164	200	217	236	220	–7
Japan	185	184	187	183	185	+1
India	222	199	203	230	245	+7
South Korea	126	125	141	141	140	–1
Taiwan	67	65	69	69	69	n/c
Other importers	92	110	124	149	166	+11
Total	**856**	**883**	**941**	**1,008**	**1,025**	
% change	–7.3	3.2	6.6	7.1	1.7	

** forecast ** 2019 forecast compared with previous year*

source: Clarksons Research, Bulk Shipping Analysis 2019 forecasts and calculations

electricity generation, steel and other industries.

Coal imports into Japan, the third largest Asian buyer, were about 2% lower at 183mt last year, remaining within the range seen in recent years. Since the nuclear power station disaster eight years ago most nuclear plants have remained closed, placing greater reliance on coal as well as other power station fuels. Only limited nuclear plant reopenings have occurred, because of safety checks and political opposition. The steel production trend has not been strong enough to boost coking coal purchases.

After a sharp expansion two years ago, South Korea's coal imports remained unchanged in 2018 at 141mt. The government is prioritizing environmental aspects, especially air pollution reduction, and is attempting to cut the country's heavy dependence on coal while emphasizing the alternatives of natural gas and nuclear power generation. In Taiwan, imports also flatlined last year, totalling 69mt.

A rapidly expanding part of the Asian region's coal imports in the past few years has been contributed by several smaller importing countries. This group — comprising Malaysia, Pakistan Philippines, Thailand and Vietnam — raised its total by about a quarter in 2018, to over 120mt, after two annual increases around 20% were seen. New coal-fired power stations being introduced, enlarging dependence on foreign supplies, were instrumental.

Pointers to the future?

A cautiously positive view of Asia's seaborne coal imports suggests that further growth could be seen in 2019. Currently, however, it seems unlikely that more than a limited increase will unfold. An aspect complicating analysis and forecasts is that commercial influences in some countries may be outweighed by policy influences related to environmental issues and other developments.

Consumption of coal in a number of countries has become a much more central issue for policymakers seeking to reduce air pollution to acceptable levels within a short period, and also to cut greenhouse gas emissions in the longer term. Although changes in policy affecting coal imports are foreseeable as possibilities, the extent and timing of changes and how effective these might prove are not easily predictable. Other policy modifications may be unforeseen.

Attention in recent years has focused particularly on China and India where it is perceived that political influences are having a major impact on coal imports or may do so in the future. These two major importers together received over 460mt last year, approaching half of the Asia total, and potential for destabilization of the trend has already been seen. Any large change in their foreign purchases, upwards or downwards, has a wide impact especially if it is unexpected.

In India a target of greatly reducing or eliminating coal imports was announced several years ago and still seems to be a long-term aim. While it appears that such a target is unachievable in the foreseeable future, even gradual progress would substantially weaken seaborne coal movements. In China, consequences for coal imports resulting from a range of government policy measures affecting coal consumption, production and the domestic market are often difficult to predict. An abrupt decline in coal imports at the end of last year is an example.

Provisional forecasts

The value of firm forecasts may appear questionable, given the wide potential for unpredictable policies to affect coal trade,

in addition to the normal commercial imponderables relevant to all seaborne commodity movements. Guesswork is inescapable, and the end result is perhaps a quantification of a viewpoint rather than a reliable prediction.

Reflecting this background, the table shows tentative calculations for 2019 coal imports into Asian countries. The direction of the annual change in regional volume could be up or down. But a modest 1–2% increase, raising the total to about 1,025mt currently seems quite realistic. However, whether some individual components, especially China and India, will see changes of the magnitude suggested (7% changes, downwards for China and upwards for India) is debatable. Marginal or no change in Japan, Korea and Taiwan is also a questionable outcome.

Prospects for some smaller importers seem more solidly positive, at least in the next year or two and possibly into the longer-term. A large part of Asia's incremental coal imports expected in the current year is concentrated within this group, which could see a 17mt or 11% rise, to 166mt. Clear signs of rising volumes are evident, especially in Bangladesh, Malaysia, Pakistan, Philippines and Vietnam.

As an illustration of this trend, Vietnam is one relatively minor importer which has already become more significant. Seaborne steam coal imports are estimated to have grown over the past few years, from a minimal 2–4mt annually to reach about 23mt in 2018. Continuing expansion is predicted. Although Vietnam produces substantial coal volumes in the northern part of the country, most newer coal-fired power stations are located in the south, and are mainly using imported coal.

For the bulk carrier fleet, advantages derived from participation in Asian coal import trades are limited by a large element comprising short-haul movements, requiring less transport capacity than needed for longer voyages. Major supplier Indonesia within the region is in close proximity to importing countries. Indonesia last year reportedly exported steam coal totalling over 420mt, much of which was purchased by neighbouring buyers. Exports to China were massive, including a large volume of low-grade lignite. Some forecasts suggest that the export total could increase again this year.

DCi

Asian agribulk: productivity shortfall remains an issue

'Westernization' of diets brings its own challenges

Kunal Bose

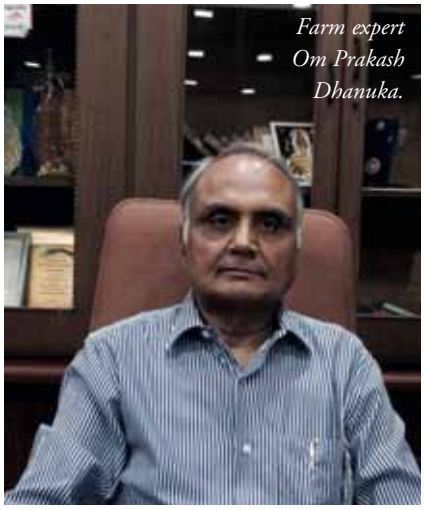
China and India are the two most populous countries in the world with the respective headcount being 1.42bn and 1.365bn. China has a communist regime with President Xi Jinping being the supreme leader. Didn't President Donald Trump address Xi as 'king' during a state visit to Beijing in 2017? In contrast, India is a democracy where every five years a government is chosen by popular franchise. Irrespective of the kind of regime, Beijing and New Delhi face a common challenge of feeding giant size populations. Not only that, as urbanization is happening in both countries — at a much more rapid rate in China than in India — with much higher disposable income with the urban population than in the past, their dietary habit is increasingly resembling that of the West. This has thrown a challenge to the two regimes to rapidly increase the supply of meat, fish and dairy products.

A daunting conundrum for the two countries is how to feed such big populations with limited farmland and water and avoid famine in times of crop failures that were experienced by both in the past. China has to take care of dietary needs of the single biggest constituent of the global population of 7.5bn with less than one-tenth of the world farmland. The challenge for India, according to farm expert Om Prakash Dhanuka, is to "sustain nearly 18% population and 15% livestock of the world with merely 2.4% of its land and 4% water resources."

Referring to a 2017 report of the United States Geological Survey, Dhanuka says India with 179.8m hectares under cultivation has 9.6% of the global net cropland. Though India has the single biggest ownership of cropland among all the countries in the world, productivity in the country for most crops remains well below the world average. This compares poorly with the best productivity achieved in places like Israel, with the most efficient use of whatever little water is available, also China and the US. To give two examples: first, Indian rice yield of 2,191kg a hectare falls way short of the global average of 3,026kg a hectare. Second, the country's wheat productivity of 2,750kg a hectare also compares poorly with world average of 3,289kg a hectare.

India has not fared too well in terms of productivity for the whole range of oilseeds, sugarcane and cotton, pointing to the holes in extension programmes and availability of farm ingredients of quality and in ideally required volume.

"I see some commonalities in farm scenes of China and India where crop sizes in a season and their changing export surpluses or import requirements depending on domestic supplies have a


Farm expert Om Prakash Dhanuka.

significant bearing on global farm product prices. Both countries have predominantly farms of small sizes. Over 90% of all farms in China have land holdings of less than 2.5 acres making the average farm size among the smallest in the world. As for India, the average size of farms shrank by over 6% between 2010/11 and 2015/16 from 1.15 hectares to 1.08 hectares. With landholdings becoming smaller, the share of small and marginal holdings (up to two hectares) was up to 86.21% in 2015/16 from 84.97% in 2010/11," says Dhanuka.

China has around 350m acres of arable land which is split among some 200m farms. So the country cannot produce food the way that giant farms in the West with the best of equipment and technologies do. Yet another agricultural resource that is not in ideal shape is the irrigation system. Even then much to the surprise of the rest of the world, China benefiting from excellent extension services and sheer grit of hardworking farm hands has made progress on agriculture development in less than past five decades that required a century and a half for the Western world. By Western standards, average farm holdings in China and India are tiny making it a challenge to introduce mechanization. But agro-industrial landscape in the two countries has any number of gleaming meat, dairy and alcoholic beverage factories owned either by domestic or foreign investors.

National Geographic has quite aptly described the Chinese agricultural landscape "less like a blanket of green than a patchwork quilt." The small farmland holdings that have not stopped China from achieving world beating productivity rates for rice, wheat and corn are a historical legacy. During Mao Zedong, the country had collectivization of farming which robbed growers of the right to decide what to grow. The state after recommending crops would also appropriate entire production on harvest. No wonder farmers denied land ownership and freedom of crop choice, the country could not avoid suffering "great famine" in the late 1950s and early 1960s. But it was not till the beginning of 1980s that the collective farming was ended. The farmland was distributed among peasant families with the state retaining ownership of land. For all practical purposes, farmers since then have a sense of ownership of the plots allotted to them and they can also decide what crop to grow. Add to this ingenuity of farmers and help from official extension agencies with technical and farm inputs, the result is no less than a miracle in terms of productivity. When President Xi says "our rice bowl should be mainly loaded with Chinese food," it is seen as an order to strive for greatest degree of self-reliance from cereals to meat to dairy products.

Recommending agriculture reform for China, the World Bank says there should be firm property rights for farmers, greater

levels of compensation for land acquisition and framing of legal limits for rural land to be acquired by local governments for public purposes. Why only China, this recommendation holds good for India and other countries where to support urbanization rural land is acquired. Authorities in China and India will have to consider progress in urbanization as they plan for food supply in future years. For example, by 2030, up to 70% of the Chinese population, some one billion will be living in cities. They will always fancy Western dietary habits. India, according to the World Bank, will have half its population living in urban centres by 2050.

The new diets of growing numbers of people living in urban centres are resulting in a gradual structural change in agriculture sector of both China and India. The share of animal husbandry, dairying and fisheries in gross value added in agriculture in the two countries is steadily increasing while the share of crop segment in GVA is falling, says economist Pranab Mohanty. For the food and drinks companies in the West, China and India have become prized markets for their sheer size and consumer obsession with global branded food products. Furthermore, in view of limited agricultural resources at the country's disposal, Beijing is encouraging Chinese companies to buy foreign food companies and also acquire farmland abroad. In contrast only a few Indian groups have acquired tea plantations in Africa.

For food security, China and India have made it a practice to maintain large inventories of food grains. To build and maintain the stocks of rice and wheat, New Delhi has an elaborate procurement programme across the states. In the 2018/19 agriculture season (July to June), India's wheat procurement at 35.8mt (million tonnes) was the second highest ever. Rice buying by government agencies is a record 45mt. The Indian buffer norm says ideally the country should be holding stocks of 41.1mt of wheat and rice on 1 July every year. But at present reckoning, the stocks will not be less than 77.2mt. Siraj Hussain, India's former agriculture secretary says: "Excess stocks pose a challenge for safe and scientific storage. They also cause enormous financial burden on the country's budget... as procurement agencies have to pay interest on borrowed capital, which will have to be finally paid as food subsidy."

What about China? According to the US Department of Agriculture estimates, China alone was holding nearly half the global stocks of 273mt at the start of 2018/19 marketing season. Even while a scorching hot, dry summer has ended a good five years of plenty in many wheat producing countries, it is unlikely that China, which consumes 16% of the world's wheat would release any from its inventory. Beijing's obsessive concern with food security comes to light from the 135% growth in the country's wheat inventory in only five years from 54mt to 127m tonnes at 2018/19 beginning.

Earlier this decade, India did export nearly 3mt wheat in 2012/13 and then 2.673mt in the following year from central government stocks. But in the last three years there was no export from the official inventory. The ruling prices of milling grade wheat of the US, Russian and Australian origin in the world market being considerably lower than the economic cost of wheat in Indian central pool, the only way the country could think of selling wheat in the global market is by doping it with subsidy. But that will fall foul of the World Trade Organization? India, which proclaims its commitment to free and fair trade in commodities, finds Brazil and Guatemala joining Australia to lodge a formal complaint with WTO against it alleging that the world's second largest sugar producer continues to provide subsidy to sugarcane growers and in the process has created a glut and depressed prices for the commodity.

India, which made back to back bumper production of sugar in 20117/18 and 2018/19 creating a huge domestic surplus thought of finding relief through exports. New Delhi at the start of 2018/19 season in October gave the industry a minimum indicative export quota of 5mt with an offer to defray handling, internal transport and freight costs.

Even then, with Indian currency now strengthening and low global prices for the commodity, exports are likely to remain within a range of 2.5mt to 3.5mt, according to some industry officials and dealers. Not only the transport subsidy that has fallen foul with the regular major exporting nations, but they also are pointing to other benefits that New Delhi is providing to farmers and sugar factories.

As has been pointed out earlier, because of limited coverage of farmland by the irrigation system, the fate of crop in India and China is largely decided by monsoon behaviour. Thanks therefore, to normal monsoon rains in most major crop producing Indian states in the current season (July to June), the country is reported to have food grain production of 281.37mt during 2018/19 compared with 277.49mt in the previous agriculture season when also the monsoon proved to be benign. Rice production is to be up 4.59mt to 115.6mt and wheat will be marginally better at 99.12mt.

China's rice production in 2018/19, according to the USDA, is 140.8mt, down 5.2mt from last year. The 2018/19 output is found to be 3% less than the five-year average. Rice yield at 6.82 tonne a hectare has suffered a setback of 1%. In the meantime, USDA has forecast a rise of 2.6mt in global wheat production, largely on a sizeable increase in projected China production. Newly released data from China's National Bureau of Statistics shows higher harvested area, yield and production for the current marketing year. DCi

Independent study reveals LNG reduces shipping GHG emissions by up to 21%

Landmark Well-to-Wake study represents definitive figures for GHG emissions and confirms LNG as major contributor in meeting IMO's 2050 GHG targets for shipping.

Reducing GHG emissions is a priority.

The independent study report launched on 11 April has revealed that Greenhouse Gas (GHG) reductions of up to 21% are achievable now from LNG as a marine fuel, compared with current oil-based marine fuels over the entire life-cycle from Well-to-Wake (WtW). It also confirms that emissions of other local pollutants, such as sulphur oxides (SOx), nitrogen oxides (NOx) and particulate matter (PM), are close to zero when using LNG compared with current conventional oil-based marine fuels.

The study, commissioned by SEA\LNG and SGMF, was conducted by leading data and consultancy provider thinkstep according to ISO standards. The report, which has been reviewed by a panel of independent academic experts, is the definitive study into GHG emissions from current marine engines.

Commenting on the report, SEA\LNG Chairman Peter Keller stated: "The Life Cycle GHG Emission Study is a long-awaited piece of the "LNG as a marine fuel" puzzle. It not only confirms what we already knew in terms of LNG's immediate impact on air quality, human health and its cleanliness, but clearly highlights the genuine, substantiated GHG benefits of using today's marine engines capable of burning natural gas. Moving from current Heavy Fuel Oil (HFO) to LNG does reduce GHG emissions. LNG does contribute to the International Maritime Organization (IMO) GHG reduction targets. And it is clear that LNG is the most environmentally-friendly marine fuel that is readily available and safe, both today and in the foreseeable future."

On an engine technology basis, the absolute WtW emissions reduction benefits for LNG-fuelled engines compared with HFO fuelled ships today are between 14% to 21% for two-stroke slow speed engines and between 7% to 15% for four-stroke medium speed engines. Seventy-two per cent of the marine fuel consumed today is by two-stroke engines with a further 18% used by four-stroke medium speed engines.

Study partner Chad Verret, Society for Gas as a Marine Fuel (SGMF) Board Chairman, added: "LNG is SAFE to use, fully compliant and readily available as a marine transport fuel. Standards, Guidelines and Operational Protocols are all in place to ensure that the safe way is the only way when using gas as a marine fuel. LNG meets and exceeds all current and 2020 marine fuel compliance requirements for content and emissions, local and GHG. With the world LNG Bunker Vessel fleet doubling in the next 18 months and those vessels being deployed at major bunkering hubs, LNG as a ship fuel is rapidly becoming readily available."

Ongoing optimization in supply chain and engine technology developments will further enhance the benefits of LNG as a marine fuel. Additionally, bioLNG and Synthetic LNG — both fully interchangeable with LNG derived from fossil feedstock — offer the potential for significant additional GHG emissions reductions. For example, a blend of 20% bioLNG as a drop-in fuel can reduce GHG emissions by a further 13% when compared to 100% fossil fuel LNG.

Dr Oliver Schuller, Team Lead Energy & Mobility at thinkstep stated: "The main goal of this study was to provide an accurate report of the life-cycle GHG emissions from LNG as a marine fuel compared with conventional marine fuels."

This is a comprehensive report using the latest primary data to assess all major types of marine engines and global sources of supply with quality data provided by Original Equipment Manufacturers including Caterpillar MaK, Caterpillar Solar Turbines, GE, MAN Energy Solutions, Rolls Royce (MTU), Wärtsilä, and Winterthur Gas & Diesel, as well as from ExxonMobil, Shell, and Total from the supply side. It is quality assured in assessing the supply and use of LNG as a marine fuel according to ISO standards. And objective having been peer-reviewed by leading academics from key institutions in France, Germany, Japan and the USA."

About SEA\LNG

SEA\LNG is a UK-registered not for profit collaborative industry foundation serving the needs of its member organizations committed to furthering the use of LNG as an important, environmentally superior maritime fuel.

SEA\LNG has members across the entire LNG value chain including providers of the product, users, engine and asset suppliers, and class societies. SEA\LNG is already recognized as an International expert in LNG matters. Each member organization commits mutually agreed human resources, data analysis and knowledge sharing in support of SEA\LNG initiatives and activities and financially contributes via a membership fee. SEA\LNG is guided by a board, which is led by chairman Peter Keller, who was elected as Founding Chairman in 2016.

About SGMF

The Society for Gas as a Marine Fuel (SGMF) is a non-governmental organization (NGO) established to promote safety and industry best practice in the use of gas as a marine fuel. It has Consultative Status with the IMO and is the definitive information resource for the industry.

Formed in 2013, governed by a representative board, the Society is driven by two principal Committees; Technical and Environmental. SGMF has several Working Groups at any one time solving issues and producing outputs such as Formal Publications and Technical Guidance Notices for the industry. The Society has produced six-ISBN publications to date and has over 135 international members ranging including energy suppliers, port authorities, fuel suppliers through to equipment manufacturers, training organizations and classification societies.

About thinkstep

thinkstep is a global consulting and software company in the field of sustainability, especially life cycle thinking. thinkstep has grown considerably over the last 25 years. thinkstep's environmental sustainability software, data and consulting services help businesses drive operational excellence, product innovation, brand value and regulatory compliance.

Pragmatism should drive the adoption

By focusing on a select group of commercially impactful digital solutions, enriched by customer input, near-term benefits are achievable; Dennis Mol, Vice President, Digital and New Business Transformation, MacGregor, explains how.

Dennis Mol, Vice President, Digital and New Business Transformation, MacGregor.

When seafarers were being lost as sea because of leaking wooden hatch covers, MacGregor solved the problem by inventing and manufacturing the industry's first watertight steel hatch covers; lives were saved and cargo protected.

Almost a hundred years on, and whilst the hatch cover issue is essentially remedied, many more challenges remain. Currently none more so than the protracted depressed market conditions which are affecting shipowners' commercial activities and very survival in economic terms.

These issues require practical solutions, much like the 'see-it and solve-it' approach to replacing unsafe wooden hatches that were a clear choice for operators a century ago. In the age of digital advances, are there equally obvious solutions for shipowners and operators to turn to now? MacGregor believes there is, and that similar significant advantages are available today through the value that digitally-enabled capabilities can offer. Their use is standard practice in other industries on mission-critical equipment, so why not in the maritime sector?

If there was a generation of operators that could really benefit from the commercial advantages of digitally-enabled equipment maintenance and the optimizing of cargo space, it is this one. So one might consider why uptake is slow? Often when we talk about digitalization, accelerated learning and intelligent solutions, it is part of a wider discussion dominated by theoretical-level or longer-term concepts, such as fully autonomous vessels, so realizable near-term advances sometimes become lost in the dialogue.

At MacGregor we are involved in visionary discussions, which are important and relevant. However, focusing on blue-sky thinking and talking about what digitalization can do in the broadest terms only serves to drive a wedge between shipowners and operators and access to these near-term benefits, particularly in current market conditions.

Creating solutions customers need and understand

MacGregor is offering a pragmatic approach. We are 'doers' and well known for our engineering capabilities. We listen to customers, design equipment and whole solutions that meet the requirements of a specific ship and its operations. We can also do this in the digital arena, creating a solution that the customer needs, understands and will gain benefit from.

MacGregor has chosen to focus on a select few, commercially impactful digital solutions to bring to the market. Drifting a little away from visionary stories about where the market could go, and moving towards the provision of real services that have a tangible operational impact.

This gains credibility as our intelligent cargo handling applications translate into valuable, commercially viable solutions.

A population of experts

In line with an accelerated development approach, we completed our first 'Google design sprint' during March. These have a sophisticated methodology, where a maximum of seven people gather in one room to consider a specific problem, in our case a challenge that a customer is facing. The group comprises different MacGregor engineering and software specialists and customers, all working together; so a population of experts. They participate in a disciplined, time-based process over a week from Monday morning until Friday afternoon. The objective is to experiment at speed and with a very high focus on taking the initial idea to a customer valuable concept and digital mockup.

We have simulation software that our engineers use to pre-design and analyse how, for example, an offshore crane works in reality. A Google design sprint includes thinking about how such a digital simulation platform can help to prepare for and advise real-time operations, with higher efficiency and increased operational windows within its safety margins.

We are asking customers to join us because we believe that with more enriched information, especially weather data, currents and wave heights, the simulation platform will be able to deliver much greater prediction and safeguarding accuracy.

Our objective is to reach a point where we can confidently advise a customer that a crane could operate for half an hour longer than would have been previously possible, because more relevant data will help to mitigate against taking a more conservative approach.

So, in this sense, we have the underlying technology, but you might call it a rough

Dennis Mol has a maritime background, working in the heart of the industry for over 20 years. Holding different commercial and executive roles with other leading corporations, and an advisory position with a startup company, he is well-placed to understand all facets of the maritime industry. He combines business with technology, driving an entrepreneurial spirit within the well-respected cargo and loading handling specialist, MacGregor.

# of digital agendas

diamond. Polishing it with enriched data delivers a solution that helps customers earn more money from their ships.

Moving from a conceptual remit

Our approach is breaking down traditional barriers, and our experience is that customers are willing to share information that may have previously been considered as commercially sensitive. We are demonstrating our intention to be practical and share our knowledge, moving our digital advances out of a conceptual remit.

The idea that companies must disrupt or be disrupted to survive has relevance for us all. If we are not thinking along the lines of a tangible digital agenda, you can be sure that others will be. These companies are smart and agile and we are alert to their capabilities, but what they do not have is our extensive operational knowledge.

Our cargo and load handling experience is second to none. A newcomer cannot really develop a valuable application until it fully understands the market and operating environment. MacGregor has a very strong position and we are able to translate our operational and technical knowledge into valuable, new solutions.

Having said this, we are also open across all of our digital developments to collaborating with start-up companies, particularly in the areas of geospatial weather analytics, the use of on-board devices to support capacity optimization and the ability to analyse offshore crane data.

These capabilities can provide actionable insights and help accelerate the development of new services for our customers.

We are not promising the world because we know how difficult it is to deliver that, but we are ambitious for our customers and ourselves. We are taking encouraging cases, working closely with customers and learning from each other to deliver commercial value.

MacGregor also benefits from being part of the Cargotec family, a company committed to being the leader in intelligent cargo and load handling, which provides the financial capability to invest in new technologies and take full advantage of the Group's capabilities.

Four focus areas

When it comes to digitalization, MacGregor is focused on helping customers to enhance their operations either through earning more money on the ship, or to build and operate more efficiently and with lower costs.

Our digital agenda is concentrated in four specific areas; predict, safeguard, optimize and automate. These are 'category' words referring to the potential value we can create by applying or deploying digital technologies.

To explain this further, our 'predict' category includes elements such as enhanced maintenance capabilities. Here, for example, we can use our knowledge to develop algorithms that can predict when certain equipment requires maintenance, based on use and condition rather than conventional 'time-based' service schedules.

The offshore crane and associated Google design sprint work referred to earlier is a relevant example within the 'safeguard' and 'optimize' categories.

MacGregor's proven Cargo Boost service is included within the 'optimize' category. Over the past three years, more than 100 containership optimization upgrades have been completed for highly reputable owners and the benefits demonstrated in service.

Applying this knowledge, we have started a development programme to tailor our optimization algorithms for breakbulk ships focused on increasing capacity utilization and accelerating the stowage process. The next application will be to help RoRo customers remove discharging process flaws onshore and optimize offloading operations.

The fourth category is 'automate'. Good examples of activities in this area are our autonomous offloading crane technology and automated mooring systems, the latter currently under development, which apply technological advances from a robotics domain.

Scalable solutions, available to many

The MacGregor digital agenda is valid for one vessel or an entire fleet. The kernel of a solution must be as widely applicable as we can make it so that it is scalable and of benefit to the many, not the few. There will always be a degree of customization required but, by minimizing this, we are able to offer cost-efficient solutions to shipowners, operators and shipbuilders today.

MacGregor has a long history of solving problems in the shipping industry. Its watertight steel hatch covers have successfully prevented the deaths of many seafarers. Now, the company is showing how a pragmatic approach to digitalization can have a positive impact on the industry.

Naval Dome puts shipping industry on red alert for cyber-attack

The maritime sector is being targeted by highly motivated cyber criminals and the shipping industry should be on the highest alert for a cyber-attack, warned Naval Dome CEO Itai Sela on 11 April.

Speaking at the Singapore Maritime Technology Conference (SMTC) 2019, organized by the Maritime and Port Authority of Singapore, Sela said: "Somebody, somewhere is targeting the maritime sector. The shipping industry should be on Red Alert."

Sela's warning follows widespread concern that the maritime industry remains vulnerable and is not doing enough to protect itself.

During a round table discussion in which several companies informed the Greek shipping community of the importance of cyber security, one analyst said that while the industry is "concerned about the cyber risk it struggles to understand where and how best to manage it."

Naval Dome CEO Itai Sela, speaking at the Singapore Maritime Technology Conference (SMTC) 2019.

US congressman John Garamendi made a similar comment during a Brookings Institution debate on securing US maritime commerce. "Congress is aware of the cyber risks," he said, "but not adequately engaged nor adequately addressing the problem."

"The maritime industry is just not prepared," Sela told SMTC delegates. "Shipping is a US$4 trillion global industry responsible for transporting 80% of the world's energy, commodities and goods, so any activity that disrupts global trade will have far reaching consequences.

"It is easy to understand why shipping is now in the cross-hair of the cyber-criminal or activist. But the maritime industry still believes it is enough to have a Level 1 solution to protect against a Level 4 threat."

Referring to the global certification standard IEC 62443, which has been adopted by several certification bodies, Sela explained the four levels of security used for safeguarding against a cyber-attack.

"A Level 4 attack is extremely sophisticated and intended to cause the most amount of disruption for either political, social or financial gain. It is the Level 4 type attack criminals are using to penetrate the shipping industry," Sela said, referring to an incident in which the navigational equipment aboard a fleet of 15 tankers was simultaneously hacked.

The easiest way for hackers to penetrate ship systems is to attack systems at the ship manager or original equipment manufacturer's (OEM) head office, said Sela. "All a hacker has to do is infiltrate these systems and wait until some someone sends an infected email to someone onboard ship — the attack is delivered. It spreads. It's autonomous."

Sela said: "For a few thousand dollars sophisticated 'viruses' can be easily bought on the dark web, so it is quite easy to implement a Level 4 attack now. Level 4 cyber protection result in a system or equipment that even those with enough time, money and motivation will be unable to penetrate. Every shipboard PC-based system has to be protected individually."

The current regulations consider improving interactions between the operator and machine as the optimum way of combating maritime cyber crime. However, Naval Dome believes the best solution is based on technology that removes the human element altogether.

In his presentation to the Singapore maritime community, Sela suggested that a ship can be used as a very effective weapon to "create chaos and destruction" at the port. "A ship whose systems are under the control of the cyber-criminal could result in pollution, cause collisions or groundings, or be used as an incendiary device. The result could be catastrophic if a vessel is not secured to the highest level. Over the last three years we have developed a type-approved Level 4 solution certified to prevent shipboard systems from being hacked."

Sela said a country like Singapore must have the ability to monitor all the ships that enter its waters in order to verify whether its infected or cyber clean. "I strongly recommend that all Port Authorities have the ability to control the cyber threat that each and every vessel entering their waters brings with them. This will protect assets and avoid potential disaster," he said.

GAC ship agency services

cause for cautious optimism for 2019?

Supporting the long-term growth and stability of the dry bulk market through increasing efficiencies

Despite escalating trade tensions, tighter credit market conditions, shifting commodity flows and slow global growth, there is an air of cautious optimism in the dry bulk markets for 2019, *writes Neil Godfrey, GAC Group Sales Director – West.* This contradicts the recent news that the sector is potentially set for a rough ride in 2019. The International Monetary Fund has warned the world economy is slowing and the agency's updated World Economic Outlook lowered estimates for growth in 2019 by 0.2% to 3.5%, its second downward revision, resulting in negative implications on the shipping industry.

Cutting across this data is another forecast from Clarksons Research, who say that global tonne-mile demand growth is set to accelerate to 3.1% in 2019 from 2.7% in 2018, supported by China's robust iron ore demand from Brazil and Australia,

and grain trades.

According to a separate outlook report by Lloyd's List, it was noted that the dry bulk sector is estimated to have grown by 4.1% to 5.18 billion tonnes of cargo transported in 2018.

As market dynamics surrounding the dry bulk industry remain uncertain, low-profit margins and financial pressures are forcing shipowners and operators to place greater emphasis on their own supply chains, as a first point of examination as they seek to rationalize their operations and push for greater cost efficiencies — and ultimately, shore up their bottom lines.

Emphasis on service quality

Many shipowners are looking to control and limit a range of OPEX costs including repairs and maintenance, crew costs, insurance and ship agency — all without having to compromise on quality.

Partnering with reliable and competent ship agents can enable owners and operators to navigate through these challenges, ensure the smooth operation of the supply chain, add value and streamline operations.

However, low profit margins and financial pressure in the dry bulk sector is pushing shipowners and operators to focus on cost reduction over quality — leaving them exposed to increased financial, legal and safety risks, and creating an unsustainable environment for quality ship agents to operate within.

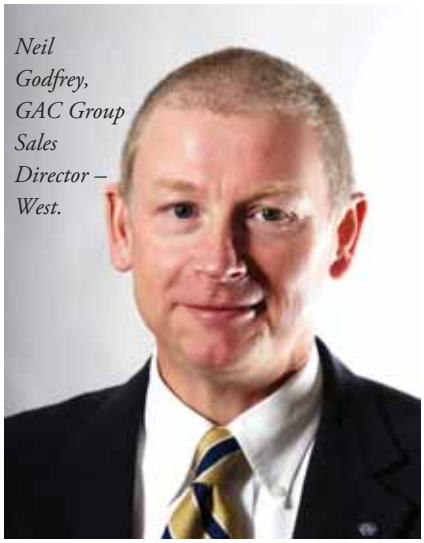
It is crucial for owners and operators to understand that a 'race to the bottom' approach to selecting a ship agent may

generate short-term savings, but lifecycle costs could be substantially higher if the appointed ship agent is not able to deliver services in a prudent manner. Adhering to the evolving spectrum of health and safety compliance policies and procedures is also critical to avoid considerable legal and financial implications.

As one of the world's major global providers of ship services, GAC has been handling dry bulk commodities and vessels since the 1950s and takes care of a wide range of tasks, including husbandry, liaison with cargo suppliers, receivers and surveyors, ship spares delivery, bunker fuel supplies and more.

GAC's network of more than 300 offices in over 50 countries, combined with the Group's in-depth market knowledge and tailor-made approach ensures customers experience a reliable, compliant service — delivering both cost efficiencies and operational requirements. GAC serves as a 'one-stop shop' for customers where all their needs can be co-ordinated and delivered through a single vendor — minimizing lengthy administrative work.

Additionally, in the run-up to the IMO Global Sulphur Cap in 2020, GAC Bunker Fuels has launched a Fuel Changeover Service, to help ship owners and operators save time and money while staying compliant with the development of ship-specific fuel changeover plans. The full suite of services includes berthing arrangements, discharge and disposal of ROB HFO in tanks, tank cleaning and disposal of waste as well as refuelling with compliant fuel.



Neil Godfrey, GAC Group Sales Director – West.

To further aid efficient planning of dry bulk operations, GAC monitors port conditions for potential problems. This includes disruption to loading or discharging, restrictions, new requirements, and port authority updates.

Trust is key

In dry bulk shipping, the success of a ship agent is determined by the agent's ability to get a vessel into port, loaded, discharged, serviced and on its way in the quickest, safest and most economically efficient manner possible.

It is 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. Shipowners and operators want to know that they can depend on compliance and quality from their agent. If an agent fails to comply with health and safety regulations and should an incident occur, the financial and legal implications for the shipowner could be severe.

As dry bulk operators continue to navigate through a turbulent market, they need to adopt a long-term strategy that will allow them to maintain cost efficient operations.

As the sector steadily recovers, ship agents who proactively adapt to the changing landscape will be able to differentiate themselves in a competitive market and act as key partners for all those operating in the sector. DCi

Port of Tilbury expands grain terminal

Significant investment increases capacity

Port of Tilbury, London's major port, has completed its new major storage expansion at the port's Grain Terminal as part of the growth strategy. The new flat store increases the capacity by an additional 16,000 metric tonnes of both import and export wheat.

The grain terminal is one of the UK's largest and celebrates its 50th year of operation in June this year. The terminal handles over 1.4mt (million tonnes) annually of combinable crops for both for the export and UK markets. With this new flat store in operation, the terminal now has a current storage capacity of 136,000 tonnes to support its key customers including Frontier and also Millford Grain which has taken a long-term commitment to store its grains at the terminal.

This flat storage facility is 36m x 66m and 6 metres in height. It is built adjacent to the existing grain terminal and utilizes the mill gallery conveyor system with overhead conveyors feeding the new storage unit automatically. It has a capacity of auto inload of 500 tonnes per hour.

Peter Ward, Commercial Director at The Port of Tilbury said: "As we celebrate the grain terminal's 50th year, this new flat store provides us with more capacity to support our customer's growing volumes. We are one of the UK's largest grain stores with over 35mt of product handled over the past 50 years and we hope to continue to play a significant part in the sector in the next half century. Our flexibility, capacity and quality accreditations, including AIB, TASCC and Organic Certified, allows us to deal with any changing trade patterns."

Commenting on the expansion, Alistair Groves from Millford Grain said: "The addition of this new flat store facility considerably helps Millford Grain as a business, and our customer's requirements. It also underlines the port's commitment to long-term investment for our sector".

The Tilbury Grain terminal is the key strategic facility in the South East of the UK for the grain import and export markets handling grain from around the world. The grain terminal has over 200 silos ranging in size from 60 metric tonnes to over 2,000 metric tonnes, supporting the flour and ingredient market for the southeast, London and up to the Midlands. The terminal also operates a monthly coastal shipping service from Tilbury to its sister port in Kirkcaldy, Scotland for Carr's Milling.

About the Port of Tilbury

Forth Ports Ltd owns and operates Tilbury, alongside seven other commercial ports on the Firth of Forth and the Firth of Tay: Grangemouth, Dundee, Leith, Rosyth, Methil, Burntisland and Kirkcaldy. In October 2018, PSP Investments became majority shareholder in Forth Ports Limited, to along with other minority co-investors, GLIL Infrastructure, First State Super, Construction and Building Unions Superannuation.

The Port of Tilbury is the number one UK port for forestry products, construction materials, paper, grain, recyclables and warehousing space. The port has a strong market presence in bulk commodities, ro-ro, cars and cruise vessels. The port's London Container Terminal handles a mix of short and deep sea services, is the UK's number four port for containers and has the greatest reefer (refrigerated container) point connectivity in Europe.

Tilbury's strategic location makes it a natural point for distribution, with nearly 20 million people living within 75 miles. Serving the UK's market, the port offers customers excellent transport links to and from the UK's capital and across the South East where over 50% of the population live and work.

The port is a diverse multi-modal hub, covering around 1,000 acres (850 acres and the London Distribution Park, in addition to the Tilbury2 site) and is well positioned to access the M25 orbital motorway and the rest of the UK's national motorway network. In addition, there are direct rail connections within the port and dedicated barge facilities.

On 20 February 2019 the port received development consent from the Secretary of State for Transport to build Tilbury2 – a new multimillion pound port terminal adjacent to the current 930 acre site in Thurrock, on the outskirts of Greater London. Construction is underway and Tilbury2 will be built on a site covering in excess of 150 acres, which was part of the location of the former Tilbury Power Station. When operational in spring 2020, Tilbury2 will be the UK's largest unaccompanied ferry port and the country's biggest construction processing hub, with AEO-trusted trader status.

Coal handling has begun at both Krievu Island terminals at the Freeport of Riga

To free the centre of Riga from coal cargo and transfer the handling of coal to the new terminals equipped with modern technologies on Krievu Island, in 2012 the Freeport of Riga Authority launched the Development of Infrastructure on Krievu Island for the Transfer of Port Activities from the City Centre project. This February, with the fist coal carriers moored and loaded, both Krievu Island terminals SIA STREK and SIA Riga Coal Terminal started their work. This means that the largest investment project in the history of the Port of Riga is nearing its completion.

All coal cargoes coming to the Port of Riga head straight to the new Krievu Island terminals and are unloaded at the new cargo platforms. At the same time, ships take out coal cargoes from Eksportosta that have been handled there. Sanita Kaire, Krievu Island Project Manager at the Freeport of Riga Authority, said: "Krievu Island is already fully functioning. From the beginning of February, trains have been coming to Krievu Island Station and ships have been loaded at both Riga Coal Terminal and STREK terminal."

The first ship, coal carrier *Trina Oldendorff*, moored to the SIA Strek terminal on 18 February. It loaded 69.3 thousand tonnes of coal and headed for the Port of Amsterdam. Meanwhile, SIA Riga Coal Terminal accepted its first ship, bulk carrier RB MYA, on 26 February. It loaded 77 thousand tonnes of coal in the Port of Riga and departed for Porto Torres in Sardinia.

Along with handling ships, Krievu Island will continue adjusting and testing its modern handling equipment and conveyor lines and testing its technological processes. In the coming weeks, all coal cargoes will leave the centre of the city and move to Krievu Island to be handled in a more environmentally friendly way. New handling processes and a wind fence of more than 2km will protect the environment from coal dust.

Hutchison Timsa acquires rotainers

In Mexico, Hutchison Ports Timsa is to buy 200 rotainers, costing $2.6 million, and two revolver spreaders to enable its facilities to handle boxes containing dry bulk shipments. This new equipment will be deployed in the Port of Manzanillo, where the company will have a total of 340 rotainers and four revolvers spreaders. These, it is stressed, will make current operations more productive and result in faster vessel turnaround times.

In a press release, the company stressed that this is a viable alternative to traditional belt loading systems, as it increases the productivity of operations involving the handling of mineral bulk cargo, since vessel are required to spend less time alongside the quay, with up to three mineral bulk vessels being attended to simultaneously.

Each of the rotainers can hold up to 36 tonnes of dry bulk and accommodate commodities with a density range of up to 9.1 tonnes/m^3. This means that copper, zinc, lead and iron concentrates can be conveyed, as well as iron ore in pellet form, among others. They are also hermetically sealed, making transport safer.

As for the spreader, it can rotate each of the containers through 360° if required to do so.

HPS says that this system is environmentally friendly, since it prevents dust emissions from escaping into the air during handling operations and also prevents dust egress during the movement from warehouse to port. *Barry Cross*

Tarragona aims to reinforce its leading agri-food role

The Spanish Port of Tarragona is aiming to increase its market share in the agri-food products market, where it is already the leading port. It also wants to attract new bulk commodities into its overall traffic mix.

Last year, the Mediterranean port handled around 5.7 million tonnes of agri-food and livestock products. The former is sourced from countries such as Argentina, Romania, Ukraine and the United States and then transported to animal feed manufactures based at Lleida, Zaragoza, Girona and, to a lesser extent, industries in Soria and Huesca.

Some 60% of the raw materials handled by Tarragona eventually end up feeding local livestock, with the port authority stressing it is the leading Spanish port in terms of grain and flour traffic and also in feed and forage. *Barry Cross*

Leading forest products business invests with Peel Ports

Jenkins, a UK logistics provider specializing in paper, pulp and other forest products, is to invest in a £17m new custom-built warehouse at the Port of Liverpool. Jenkins, which has been a tenant at the Port of Liverpool for ten years, has reached an agreement on managed services at Liverpool and London Medway, with the aim of increasing traffic significantly at both ports.

The commitment secures over 500,000ft^2 of warehouse space, 300,000ft^2 of which is new investment in a bespoke state-of-the-art paper and pulp facility at the Port of Liverpool. The facility will provide a major increase in capacity at Liverpool allowing Jenkins to increase its throughput. Construction on the warehouse is due to begin 2019 and be completed in 2020.

Operating from eight locations in the UK and Ireland, Jenkins provides stevedoring and specialized materials handling, dedicated quayside warehousing, and a range of other warehouse and transport services. The company is owner-managed and has been operating for 35 years.

Paul O'Hare, Managing Director of Jenkins said: "We're really excited about this major new development in Liverpool that will significantly increase our footprint in the UK and allow us to expand the range of services we can offer our customers in the North West."

Mark Whitworth, CEO of Peel Ports said: "We're seeing increased demand for imports of paper and pulp products, especially in the South East, where our new managed service with Jenkins will provide the capacity for market growth that our customers are looking for."

Arinaga inaugurates new dry bulk terminal

The Canary Islands Port of Arinaga has inaugurated a new €8 million dry bulk terminal, which is owned by the local Yecasa Group. This is formed of Yesos Canarias, Gramelcan, Proyecto Dover, and the Arabella and Camarex shipping line, which has a fleet of ten vessels.

Company president, Enrique Delgado, says he wants the port to be converted into a hub for transshipment of dry bulk commodities to ports in North and West Africa. However, in order to do this, he believes the port authority will have to offer rate discounts.

Port of Aringa.

Yecasa, which is already in talks with international operators, says the terminal will be able to accommodate vessels of up to 25,000dwt and that there are on shore facilities able to warehouse commodities prior to shipping them across to Africa. It is prepared to offer discounts on rates for feeder vessels and now expects both the port authority and stevedores to follow suit.

Delgado revealed that the Arinaga terminal is one of the first in Spain to be almost entirely covered, thereby minimizing negative environmental impact.

In total, the facility can store 60,000 cubic metres or around 90,000 tonnes at one of its warehouses. These are serviced by 300 metres of conveyors that can move up to 500 tonnes per hour, as well as a 100-tonne hopper.

The new terminal will triple existing maritime traffic at Arinaga, which should be handling up to ten to 12 vessels per month.

Previously, Yecasa had operated from the Reina Sofía dock at the Port of Las Palmas, but this had run into financial difficulties and has now been re-concessioned to Hamilton y Cía. *Barry Cross*

New dry bulk facilities up for offer in Brazilian ports

The Brazilian Federal Government is to auction three more port areas on the São Paulo Stock Exchange, in August. Two of these are in the Port of Santos, and have designated for the handling of liquid fuel, fertilizer and salt.

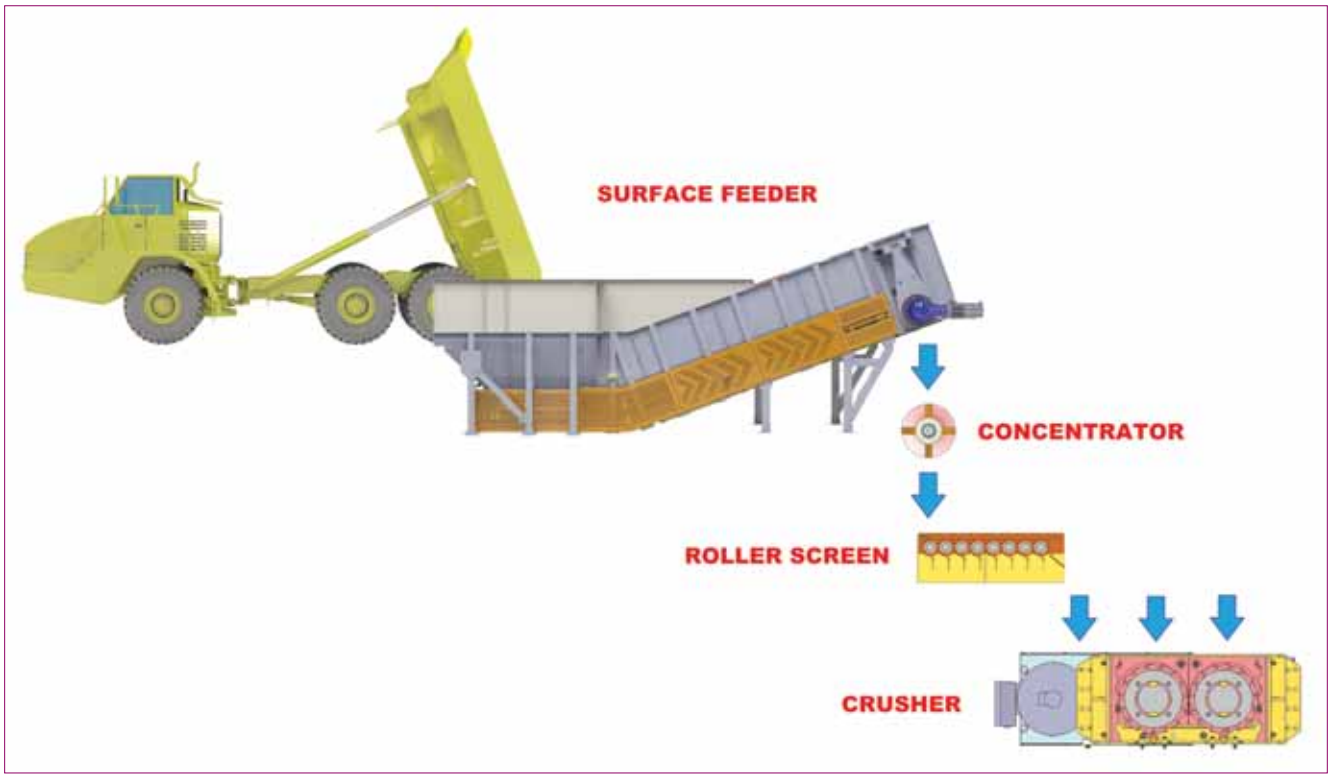
Port of Paranaguá.

In addition, in the Port of Paranaguá, an area is being offered for concession based on the handling of wood pulp. These form part of the Investment Partnerships Program (PPI) and require investment of $110 million.

The Santos STS20 25-year concession consists of three warehouses totalling 29,278m². They are connected to the quay by conveyor belts and have priority access to berths 22 and 23. They specialize in the movement of fertilizer and salt, and will require investment of $56 million.

At Paranaguá, Terminal PAR01 will be a specialist general cargo (cellulose) facility. It has an area of 27,530m², with both road and rail connections. Investment in the 25-year concession will be $26 million. *Barry Cross*

Gambarotta Gschwendt surface feeder becomes a material conditioning system



Recently, the R&D department at Italian bulk handling equipment manufacturer Gambarotta Gschwendt has developed new accessories for its Tirex surface feeder. These include:

- **weighing system:** installed on the feeder's inclined part, allowing constant control of the quantity of material supplied to the plant. The system guarantees high accuracy and has already been tested on apron feeders.
- **outflow concentrator:** as known, the outlet width of the surface feeder is about 2.6m. The following conveyor might have a narrower inlet (for example, in the case of a bucket elevator); in this case, in order to grant an efficient flow of the material, a certain vertical distance must be provided between the outlet and the inlet of the two conveyors. Nevertheless, this vertical distance can be significantly reduced by the introduction of Gambarotta Gschwendt's outflow concentrator, thus driving the flux in the centre of the feeder outlet.
- **sizer/breaker at the outlet of the surface feeder:** the supplied material might have to be reduced in dimensions. In order to do this, a sizer can be installed on the outlet.
- **roller screen:** installed on the outlet, it makes it possible to eliminate the small size material from the flow; additional breakers and rollers are also capable of separating further foreign materials.

With the above mentioned accessories the surface feeder becomes a very efficient and complete unit, able to receive the material from trucks or loaders, weigh it, reduce it to the right size and eliminating small size material and even foreign particles, while conveying.

These new successful features of the surface feeder have enhanced the unit greatly, and allowed Gambarotta Gschwendt to sell numerous units to some important Chinese companies.

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

Freyer Hafenlogistik receives support from Lower Bavaria

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

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

The philosophy of family businesses is largely the same no matter where you go: great diligence and tradition, as well as long-standing and reliable partners with which you can form excellent cooperative relationships. One such family business is Freyer Hafenlogistik in Germersheim am Rhein, Germany, which is now in its fourth generation. In 1902, the great-grandfather of the current managing director, Peter Freyer, began mining gravel and sand in Neckarsulm. In 1969, the business was successfully relocated to the port of Germersheim and underwent a transformation. Since then, everything has revolved around the loading and unloading of ships.

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

Fleet expansion for even more flexibility in the port

At the beginning of 2019, Freyer further developed its fleet with the new 870 E mobile material handler from SENNEBOGEN in order to provide the required flexibility. In addition to two older 305 telehandlers and a smaller 860 from SENNEBOGEN's D-series, the new port machine fits perfectly into the on-site processes. Thanks to the machine, which has a total length of 25m, all the ships arriving at the port can be served. During the project planning phase, done in co-operation with Schlüter Baumaschinen, it was particularly important to ensure the filling of the existing 16m-high silo. Thanks to the generous boom length and high stability of the 110-tonne machine, this is no problem at all.

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

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

"Of course, we don't make machine decisions just like that. As a family business, we must consider things very carefully. We were extremely impressed with the mobile 870 E from SENNEBOGEN. It features the smallest yet most stable mobile undercarriage on the market. This allows us to be agile on site and use the machine flexibly," explains Peter Freyer.

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

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

Ten years of innovative technology from CRS

A fleet of CRS' heavy duty 'Coaltainers®' was included as part of a Container Rotation System commissioned for The Port of Ust Luga in Russia.

Container Rotation Systems (CRS), based in Sydney, Australia, has had a productive year thus far. Below are a few case studies worth mentioning:

CRS coal system up and running

Late March and early April, the CRS team commissioned the first Container Rotation System in Russia. The Port of Ust Luga had a contract to load over 3mt (million tonnes) of coal per year, with the potential to increase these quantities over the coming years. Having four Kone ship-to-shore cranes, CRS designed an innovative rotating head frame that will allow N-S-E-W rotation of the Rotainer to allow better loading and trimming of the ship. A fleet of CRS' heavy duty 'Coaltainers®' was included as part of the total package.

CRS receives order from Lithuania

In April 2019, CRS received an order for its 2,900mm 'High Cube' container system for Klaipeda Port, Lithuania, thereby extending its product portfolio to the Baltic Region.

Rotainer Eurospec 38s will be connect to a Liebherr mobile harbour crane for this particular application.

A fleet of CRS' specially designed, 2,900mm Rotorcon, heavy duty container will be part of the package.

The client will load an array of different product such a grains, fertilizers and scrap metals.

Bisha Mining orders third Rotainer HD

Bisha Mining Eritrea, has placed an order for another Rotainer HD (Heavy Duty) for its loading operation in the Port of Massawa in March 2019.

The mine's current units have been extremely successful, with over 40,000 loaded rotations clocked on each Rotainer.

Mine life has been extended for at least a further five years and, whilst continuing to operate the current units to end of mine life, a third unit will be added to the fleet to maintain full productivity during maintenance periods.

The units will have CRS' super reliable 360° rotation system, but the new unit will have its upgraded lid lifting system.

CRS receives order for 850 lid lock conversion kits

In February 2019, CRS announced that its newly developed, automated lid locking system has been ordered by an Australian Minerals processing plant for 850 units of its 1,450mm half height containers.

These kits were developed by the CRS team to make generic-type open top containers suitable for rotation where rotation and secure lid locking is a must.

It also assist site logistics by allowing several container lids to be stacked up to ten high for storage when not in use.

Tried and testing via Rotainer Rentals on the prestigious Crown Casino development in Sydney, the system is now available for global distribution,

These kit easily fits Seaco, Caru, ISG-Pit to Ship, CMIC as well as many other brands of containers.

CRS announces 40ft-high cube system

In February 2018, CRS also revealed that after significant R&D it was able to release to the global market a 40ft rotating container system.

This new container and Rotainer is purposely designed to cater for industries such as woodchips, biomass, grains and waste.

Bisha Mining Eritrea, placed an order for another Rotainer HD (Heavy Duty) for its loading operation in the Port of Massawa in March 2019.

The unique ground-up approach with the patented design of the Rotorcon container has enabled CRS to offer to its clients a 2,900mm high, 40ft long, fully certified open top container.

No cumbersome internal bracing required, suitable for use with 180° and 360° container rotators.

If required, CRS offers hard lids and flexible top cover options.

The 40ft Rotorcon is perfectly mated to CRS' Rotainer Eurospec 32s and 38s.

CenTrax belt tracker for RWE Eemshaven power plant addresses

RWE Generation's Eemshaven power plant is the largest coal and biomass power plant in the Netherlands. Covered conveyor belts ensure dust-free transport of the coal from ships to the power plant or the storage yard. This process was always accompanied by jerks and jolts due to frequent belt mistracking. The constant downtime of the conveyor belts caused delays in supply and additional costs. RWE consulted TBK Group, after which it was decided to install the TBK CenTrax tracker rollers for a trial period. Within a month, it was already clear that CenTrax was the solution to the mistracking problem.

Gert-Jan Arkema, Maintenance Engineer Bulk Handling at RWE Generation Eemshaven, explains "We use several conveyor belts at our power plant. We use a hopper to transfer the coal from one conveyor to another, but coal from the US and Russia is often damp, which means it sticks to the walls of the hopper. As a result, the load is then skewed when it reaches the conveyor belt, resulting in mistracking.

Solid and robust

Alex Budding, the account manager at TBK Spillage Control adds: "It soon became clear that RWE were looking for a solid and robust system. The previous system used by RWE did not meet this requirement. In September last year, we installed a CenTrax type SO-1200 under the RWE ROECA11 conveyor. The swivel bearing of the CenTrax tracking system is robust and rotates extremely smoothly. Furthermore, the swivel bearing is fitted with ball bearings and an angular contact bearing, in order to properly absorb the axial and radial forces. Arkema is extremely satisfied with this, "TBK has shown that they were able to help with enthusiasm and professionalism. The trial tracker rollers were installed free of charge. The trials were positive, the tracker rollers simply proved their worth. Our response was 'This is exactly what we need!'."

Optimal contact between roller and conveyor

The CenTrax system is a multi roller tracker system, consisting of a central roller and a tapered tracker roller on both sides. The robust rollers are lined with 8mm of extremely wear-resistant rubber. The rubber vulcanization process is carried out in an autoclave. This creates a permanent and seamless bond between the rubber and the steel roller shell. The rubber has a diamond profile, to ensures optimal contact between roller and conveyor. Even when the conveyor belt is wet, as in the case of RWE, where a wet conveyor belt is the result of damp coal.

51 CenTrax tracking systems

The combination of roller lining and swivel bearing, means the CenTrax belt tracker system has no equal. "This became clear within a month of the trials, and so I was allowed to immediately arrange the

belt mistracking issues

installation of 51 CenTrax tracker systems," Budding says proudly. "As standard, we always perform a strength calculation for the CenTrax construction, a 'finite element method', which is what we did on the tracker rollers for RWE." Arkema confirms that "Coal is a heavy load for conveyor belts, but in the case of the residual gypsum and bottom ash products, a smaller and lighter version is sufficient. We have had CenTrax installed on almost all our conveyors!"

Cost savings

Arkema: "Previously, we had to stop the conveyors several times a day. We would stop everything to carry out a thorough clean. Sometimes that would cost us a total of a half day in delays and costs. Now, a stop only occurs when a ship is empty or when the belt has run for a certain time and requires cleaning. Our downtime frequency is currently many times lower, resulting in huge cost savings. Reports of mistracking have dropped from 250 times per month to only three times per month. The investment soon pays for itself."

Installation

"Complete shut-down of the power plant was not an option, so several sessions were planned to install everything. The entire project took about three working weeks, including installation," Budding explains. Arkema is very satisfied with the collaboration: "Agreements were always kept, and if any hiccups occurred, TBK would not think in terms of problems, but in terms of solutions. My experience of the collaboration with TBK is extremely positive."

About Eemshaven power plant

In 2015, RWE commissioned a new 1,560MW-capacity state-of-the-art coal-fired power plant in Eemshaven, Groningen. In the coming years, this new power plant will play an important role in Netherland's energy supply. This is why the Dutch government, over ten years ago, designated the Maasvlakte and the area around Eemshaven as locations for new power plants. This was partly because of the proximity of a port for the supply of fuel, and the availability of sufficient cooling water. As from the second half of 2019, 15% of coal at the Eemshaven power plant will be replaced by sustainable biomass in the form of wood pellets. The replacement of coal by sustainable biomass is an important mainstay in achieving the national target of 14% renewable energy generation in the Netherlands by 2020, as stipulated in the 2013 Energy Agreement (Energieakkoord).

E-Cranes in coal handling

With multiple successful operations throughout the world, E-Crane has proven to be a trusted, all-in-one solution for the coal handling industry. E-Crane has been an ideal solution at many ports and terminals for barge loading and unloading, shiploading and unloading, and stockpiling. While each project is different, the modular and flexible design of the E-Crane makes it ideal for any coal handling operation.

USA operations

The history of E-Cranes in the coal handling industry began in Ruhr area in Germany around 30 years ago, but really took off in the United States market. The E-Crane product was brought to the USA in the late 1990s. Since then, the majority of the E-Cranes installed in the USA were utilized for bulk material handling operations along the inland waterways with coal as the primary commodity to be unloaded.

The US inland waterways are one of the most populated areas for E-Cranes, as there are many different ports and stevedoring facilities that require a high production, reliable machine. Within the US bulk handling market, many of E-Crane's major clients are within the power generating sector. E-Crane is an ideal solution for power plants because of the versatility to handle both the fuel for the plant as well as the other materials needed for the quality control process. One of the largest customers in the power industry is American Electric Power. AEP owns several cranes which operate along the Ohio river at its plants.

Along with power generation, terminal management firms like Kinder Morgan have also realized the advantages of E-Crane. Two E-Cranes currently operate at Kinder Morgan IMT in Port Sulphur, LA, USA, cleaning coal barges along the Mississippi River. Beelman River Terminals also utilizes an E-Crane to unload and clean coal barges at their facility near St. Louis, MO.

E-Crane continues to be successful with many bulk unloading projects along the US inland waterways and beyond.

Successes in the Asian Market

Recently, E-Crane has been a part of several coal handling projects in the Asia, particularly in Indonesia and Vietnam, where E-Cranes are successfully used in all stages of the coal supply chain.

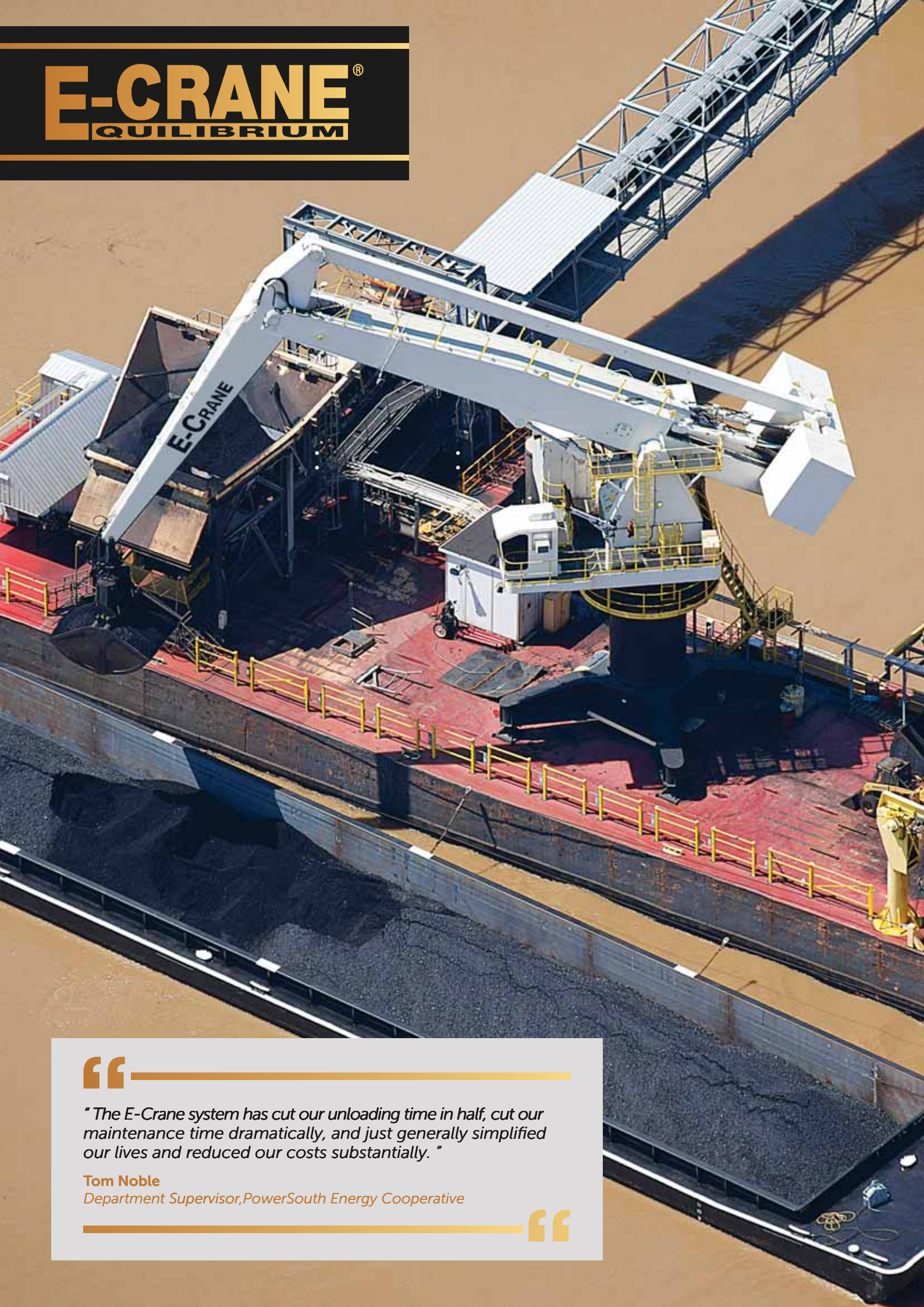
Close to the coal mine in Central Kalimantan, Indonesia E-Crane has supplied a floating transfer station which unloads coal from smaller barges and transfers it into 300ft coal barges.

In the next step of the supply chain E-Cranes are used to unload these same barges into hoppers for storage and blending at a dedicated coal terminal. In the final step of the process, a floating E-Crane is used to load coal into Capesize vessels. On the receiving side, multiple E-Cranes are used in cement plants in SEA to unload coal.

About the E-Crane

E-Cranes provide longer outreach ranges than typical material handlers, up to 47.8m (156'). This outreach allows for unloading any type of barge or ship with minimum cleanup. E-Crane duty cycle capacity ranges from 6 to 50 metric tonnes (6.6 to 55 US tons). Although E-Cranes are compatible with any type of grab, E-Crane's clamshell buckets are designed with a powerful closing force affording maximum fill and eliminating spills and carry-back. E-Crane cabs are equipped with a state-of-the-art control system for easy machine operation which builds operator confidence, reduces, cycle times, and maximizes productivity.

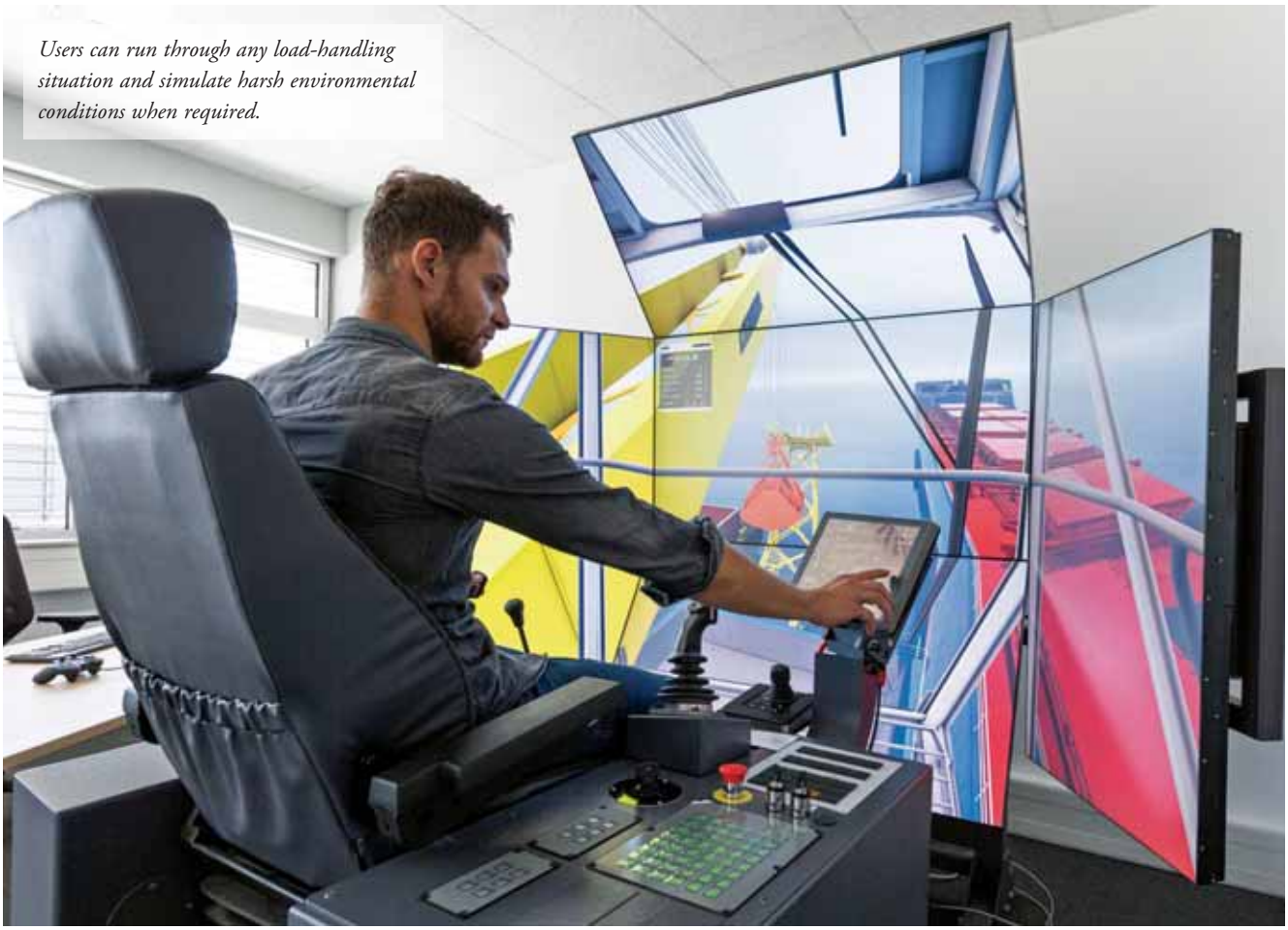
E-CRANE® QUILIBRIUM



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

Tom Noble
Department Supervisor,PowerSouth Energy Cooperative

Liebherr LiSIM simulator for Port Nelson in New Zealand



Users can run through any load-handling situation and simulate harsh environmental conditions when required.

A new Liebherr simulator is on its way to New Zealand. Port Nelson ordered a classroom solution in order to simulate ship crane and mobile harbour crane operation. The simulator has even the possibly to add further Liebherr crane modules in the future.

Port Nelson at the top of New Zealand's South Island will soon have its own training simulator supplied by Liebherr. At the time of writing, it was on the water, with an arrival date for April.

The simulator is actually two in one allowing for training on more aspects of real port operations, with both a generic ship crane simulator and the LiSIM version of the LHM 550 mobile harbour crane, both utilizing much of the same hardware. The ship crane simulation-software features the CBG series, a floating four-rope grab crane with a boom length of 28 metres and a maximum lifting capacity of up to 45 tonnes.

The LHM 550 mobile harbour crane simulator is equipped with its original LiTRONIC crane controls and has training programmes installed for basic operations, bulk, breakbulk and container handling, reflecting the port's present and future operations. Simulators are globally recognized as a highly effective training method offering numerous advantages. The development of this sophisticated training tool was prompted by Liebherr's extensive experience in crane operator training. Based on the original Litronic® crane control system, LiSIM® is the only realistic virtual solution available on the market for learning the precise and innovative control of Liebherr maritime cranes.

"The simulator allows benchmarking of current driver skills and monitoring of drivers using periodic checks, plus can be used to assess new drivers for suitability without the costs associated with running a real crane, such as fuel and wear-and-tear. It will make for safer and more efficient handling in a variety of weather conditions," Jonny Cook, the port's Container Operations Manager reported. "We also expect it to reduce box damage during operations," he added.

Step-up in safety

"Port Nelson are a long-standing customer with us, and it's great to see them buying our very first MHC simulator for Oceania," Liebherr's Gordon Clark commented. "There's even the possibility to add further modules if they want to train others, for example offshore customers. It could end up being a stand-alone profit centre."

Port Nelson's General Manager Operations, Matt McDonald sees the simulator purchase as a "step-up in safety" for the port. "Training new personnel on the quay is expensive, but also dangerous as they learn to handle large lifts, occasionally in windy or adverse conditions. We can also simulate situations that you hope never to see in real life and train people on how to react to them, the same as the aviation industry has done for years."

Classroom solution

Wide-ranging functionality is essential for the simulation of daily routines and extraordinary situations that machine operators face in the real world of maritime cranes. Due to the flexibility of the virtual environment, users can run through any load-handling situation and simulate harsh environmental conditions when required.

Port Nelson ordered the LiSIM classroom solution, which is designed for easy integration into existing training centres. The seat and controls are mounted on a base and the monitors on a sturdy display frame.

Experience the Progress.

The Port range – material handling machines from Liebherr

- Specially developed machines for port handling applications
- Newly designed lighter equipment for improved cycle times and larger bulk and break-bulk handling capacities
- High-performance machines with outstanding lifting capacities and excellent reach
- Ergonomic workspace for consistent high performance

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LIEBHERR

Continuous ship-unloader ensures efficient, eco-friendly coal supply

As part of its plans to expand power supplies in the Guangzhou/Hong Kong/Shenzhen conurbation, the Chinese company New Energy Power Co. Ltd. commissioned thyssenkrupp Industrial Solutions with the construction and delivery of a continuous ship-unloader (CSU) in 2015. Since the end of 2018 the ship-unloader has been keeping a new power plant in the Chinese city of Lufeng supplied with coal. The machine can unload 2,000 tonnes of coal per hour from ships with deadweight capacities of between 50,000 and 150,000 tonnes.

The thyssenkrupp ship-unloader is characterized by eco-friendly and continuous transportation of material from the hull of the ship up to the pier conveyor. The coal, which is picked up in the horizontal section of the L-shaped bucket elevator, is transferred to the boom belt of the ship unloader via a rotating distributor on the bucket elevator head. From there the coal flows through the centre of the machine on an intermediate conveyor which acts as a link to the pier conveyor. Ensuring the stability and reliability of the system was a particular focus of development work due to the in part extreme weather conditions in the region. The whole conveying route from the ship hatch through the unloader up to the pier conveyor is enclosed, meaning that there is only limited dust or material spillage, even in strong winds.

The longitudinal axis of the unloader conveyor can be moved in three dimensions. The lifting and slewing movement of the entire boom and the fact that the bucket elevator can be rotated through 360° ensure that all the coal deposits can be collected from a ship hatch, even those close to the floor and sides of the hull.

The operator of the unloader is supported by a computer-aided unloading (CAU) function. In an automated operation the coal is removed layer by layer down to the floor of the hull. An additional mobile device is then only needed at a later stage to collect residues. The mobile device is lifted from the pier into the hatch from an attachment point on the base of the bucket elevator and then moved to other hatches on completion of its work. The ship-unloader can be operated from the cab on the boom head or remotely from the pier or ship's hatch.

Use of continuous systems for bulk material unloading is on the increase, especially in the medium- to high-output ranges. These unloader types permit the effective, dust-free and low-noise unloading of coal, ores, phosphates, sulphur, fertilizers and other bulk materials from ships. thyssenkrupp developed the continuous ship unloader back in the 80s and has since supplied more than 60 systems to customers around the world.

VIGAN reports death of former CEO and Honorary Chairman

It is with great sadness and emotion that VIGAN announces the death of Lucien Beauduin – Former CEO and Honorary Chairman of VIGAN Engineering — in March 2019, at the age of 87.

After his education as agricultural engineer (AIGx) followed by an MBA in the USA, Lucien Beauduin's career was built in a wide variety of sectors.

He started in the sugar beet industry at the Raffineries Tirlemontoises; he left a secure position to start a new venture with his son Charles Beauduin in the textile and electronic industries.

In 1989, Beauduin took over VIGAN and served as Chief Executive Officer for 15 years.

In 2004, he passed the operational leadership of VIGAN to Nicolas Dechamps, still the Managing Director today, and started a new career in the banking sector. He seconded his son in the construction of a €500m industrial group, the VANDEWIELE group.

VIGAN is especially indebted to Beauduin for his numerous investments in the factory in Belgium to improve and industrialize production. It is undoubtedly thanks to him that VIGAN is at the forefront of the global pneumatic unloader market.

But he will mostly be remembered for his vision, his charisma and leadership in sales and marketing.

More than a seasoned businessman, Lucien Beauduin was recognized by everyone as being passionate, nonconformist, benevolent, and anxious to help others.

VIGAN team will miss him and presents its deepest condolences to his wife and family.

VIGAN Engineering is part of the VANDEWIELE group, a major global manufacturer of weaving machines for carpets and velvets.

Repeat orders boost VIGAN activities in Taiwan

The Taiwan flour milling industry is completely reliant on wheat and corn imports to fulfill the population's growing consumption as well as the increasing feed demand.

Grains are mainly imported from the United States and transit through the two largest Taiwanese ports — Kaohsiung and Taichung — where VIGAN has been present since 1990.

A PARTNER OF CHOICE

Eastern Media International Corporation (EMI) operates warehouses at Taichung and Kaohsiung ports for the storage of agricultural bulk products such as wheat, barley, soybean and corn. This important player in Taiwan for grain imports manages four silos and handles around 10mt (million tonnes) of grains per year.

Following the building in the 1980s of new silos for grain storage, as well as the first Panamax size bulk carrier, EMI bought two VIGAN SIMPORTER-type mechanical ship-unloaders, with a rated capacity of 650tph (tonnes per hour) each, for Taichung plant in 1991.

Twenty years later, in 2011, EMI repeated the order for a VIGAN machine for Kaohsiung, but this time opted for a 400tph pneumatic ship-unloader,

particularly suitable for easy and efficient hold cleaning. In 2014, another VIGAN pneumatic ship-unloader, with a capacity of 600tph, was added in Taichung, followed in 2018 by a second 600tph NIV on the same quay.

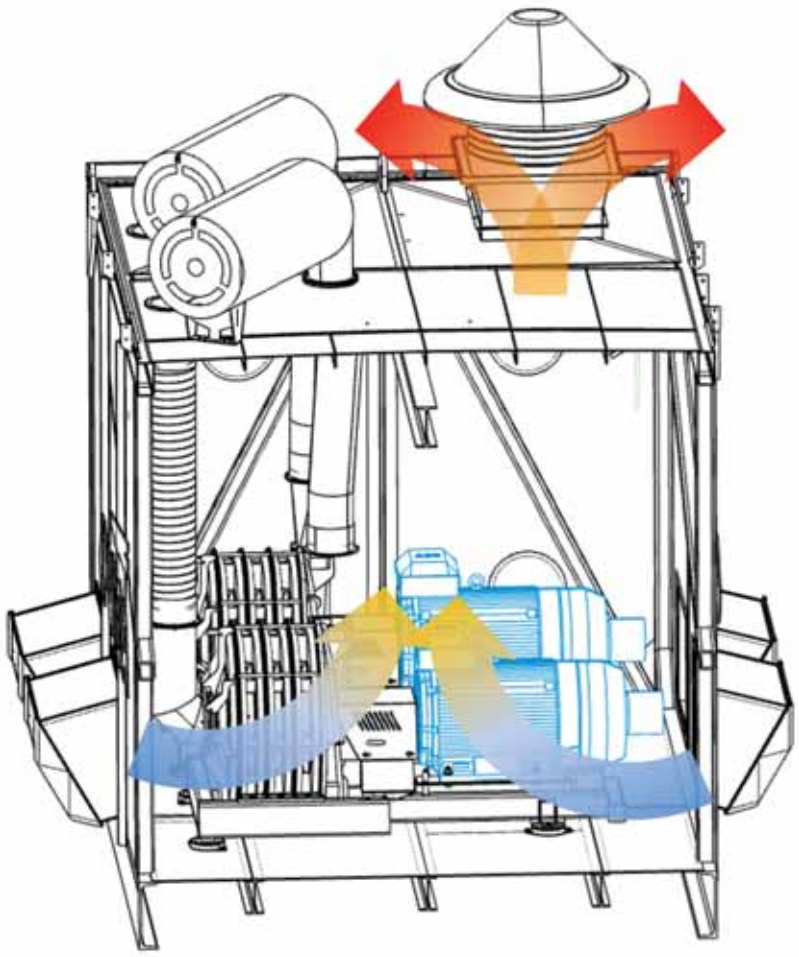
The recently installed VIGAN pneumatic unloader is built on a self-propelled gantry on rails with a rail span of 12 metres.

A heavy duty chain conveyor (650tph) of ±16.5 metres long, with two outlets with chute, feeds two wharf conveyors.

The machine is equipped with:

- two centrifugal four-stage turbo blowers VIGAN (patented technology) with direct coupling with electrical motors of 250kW, 440/380 Volts, 60Hz with temperature and vibration control;
- a frequency inverter allowing a capacity variation; and
- a boom length of 31m between the elbow and the filter axis.

All is centralized in one place for easier operation and maintenance: turbo blowers, airlock, motors, electrical cabinets, hydraulic group; electrical cabinets are separated from the engines and the airlock for a better protection against dust and heat. The cabin is equipped with full aeration and ventilation systems (ventilation fan), and noise insulation is guaranteed by the silencer and acoustic baffles.



Other technological advances include:

- improved direct coupling engine-airlock; and
- improved operator cabin signal screen.

VIGAN's core product

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.

Year by year, the VIGAN 'NIV 600' pneumatic ship-unloader has become the standard, representing on average 60% of NIV-type pneumatic ship unloaders sold by VIGAN over the last five years. DCi

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Moving in step with the market

mobile equipment: the backbone of bulk handling operations

The 9300 E from SENNEBOGEN impresses with its high safe working load over the entire working range, while the mobile undercarriage with all-wheel steering and 14 wheelsets ensures agility and low ground pressure. The Skylift 1100 cab adjustments gives the 9300 E something quite new in the area of mobile harbour cranes. The adjustment system enables the operator to move comfortably and safely to the optimum working position, while the machine can be safely moved around the harbour area in the lowered position.

Louise Dodds-Ely

SENNEBOGEN 9300 E mobile harbour crane – uniting flexible applications with ease of maintenance

Crane manufacturer SENNEBOGEN, based in Lower Bavaria, Germany, recently expanded its range to include the SENNEBOGEN 9300 E, a modern mobile harbour crane with a reach of 40m and convenient safe working loads of up to 90 tonnes. As demand grows, the newest machines are being delivered to customers in ports worldwide at the beginning of 2019. During the bauma trade fair, which took place earlier this month, SENNEBOGEN presented the current generation of the 9300 E on its company grounds in Straubing.

As a mobile harbour crane, the SENNEBOGEN 9300 E is designed for the demanding handling of general cargo and bulk goods. The machine can be operated using either two ropes or four ropes. The concept behind the mobile crane represents an interesting solution for a many ports, as its performance data covers a wide range of operations. With a working radius of 40m, the crane can handle bulk

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goods for ships up to the Panamax class, as well as containers for standard and feeder ships. At the same time, with a safe working load of 90 tonnes at a working radius of almost 20m, it is an attractive solution for handling heavy loads and general cargo.

A WORLD FIRST: CAB ADJUSTMENT FOR MOBILE HARBOUR CRANE

The elevating cab is particularly impressive. Elevated to a height of 21.2 m, the operator has an ideal view from his comfortable and spacious Portcab harbour cab. The ascent is made even more comfortable, as the operator steps into his cab at a height of just under 9m, and can be comfortably lifted to the ideal working height by means of the Skylift 1100 cab adjustment.

ROBUST MACHINE CONCEPT – EASY MAINTENANCE

When it came to the design of the mobile harbour crane, special attention was paid to ease of maintenance and accessibility of the machine components. Hence, the powerpack and winch house are easily assembled in two modular units. The powerpack, which houses all drive components as well as the drive unit itself, is not only easily accessible, providing ample space for all service activities, but also features a roof that can be opened so that any large components can be serviced safely and easily. The powerpack is designed so that the components are installed in the same position in both the diesel and electric versions, simplifying subsequent service activities. The drive unit itself is available in two versions, as a 563kW level 5 diesel engine or as an efficient electric motor with an output of 615kW.

In addition to the drive unit, the powerpack contains all the relevant machine components and can be easily accessed for maintenance purposes, even via an opening in the roof.

With its star undercarriage with 14 wheelsets, the 9300 E remains compact when travelling, while the folding outriggers give it stability in the working position on an outrigger area of 11.5m x 11.5 m. Overall, the machine features a convincingly simple and robust technical concept for the undercarriage. After all, the reliability and availability of SENNEBOGEN machines are criteria that appeal to customers all over the world.

SENNEBOGEN 830 E: electric material handler for efficient handling operation

For decades, SENNEBOGEN has made a name for itself in the industry with its electrohydraulic concepts. The 830 E electric material handler with cable drum and additional power pack was on display at the bauma trade fair in early April.

Also mobile thanks to power pack

SENNEBOGEN has been an innovator in electrically operated material handling machines for about 30 years. In addition to reducing operating costs by up to 50% in comparison with conventional diesel engines, electric material handlers offer further cost and efficiency advantages. SENNEBOGEN's 830 E-Series, with its 160kW electric motor and integrated power pack, offers maximum flexibility.

The benefits of electrohydraulic drive systems are manifold, as are the implementation versions of SENNEBOGEN material handlers. Every machine from the current product line-up can be equipped with an electric motor at the factory as a customer-specific option. The advantages of an electric material handler are obvious.

Lower wear enables much longer service intervals in comparison with diesel engines. At the same time, oil and filter changes are eliminated. What's more, the electrically driven machines are always ready for use and, if necessary, can run around the clock without refuelling. Finally, SENNEBOGEN electric material handlers aren't just cost-effective, they are exceptionally environmentally friendly and give off no emissions. Moreover, electrohydraulic drive systems make work much more comfortable for the operator thanks to vibration-free, low-noise propulsion.

Emission-free electric material handler

One of SENNEBOGEN's top-selling material handling machines is the 830 of the current E-Series. Equipped with a 160kW electric engine and mobile undercarriage, the machine combines maximum flexibility with the advantages of the electrohydraulic drive. The necessary cylindrical cable drum is mounted directly to the undercarriage.

Power pack always on board: unplug the cable and go

If the application requires the machine to be driven out of the hall quickly or used at another location in the facility, it takes a concept which combines the advantages of the electric drive with the necessary mobility of the mobile machine. To do so, SENNEBOGEN developed a diesel power pack installed in the counterweight and successfully established in various machine models from the 818 to the 840.

What this means in practice is: as soon as the machine has to leave the stationary power supply, all the operator has to do is remove the large plug, roll up the cable which connects the machine to the mains on the cable drum and start up the diesel power pack built into the counterweight of the SENNEBOGEN 830 E. Then just switch the motor to diesel mode and the machine is ready to go.

At the bauma trade fair, SENNEBOGEN showed its 830 E which, in place of the counterweight, there as a high-performance diesel power pack at the rear of the exhibition piece. This supplies the motor with energy and all of the machine's work operations can also be carried out separately via the fuel-fed power pack. The advantage is clear. The electric machine can be moved anywhere within just a few steps, without worrying about the limited length of the power cable. Thanks to the integration of the power pack into the counterweight, the 830 E remains exceptionally manoeuvrable and compact, and makes the most of its strengths as a full-fledged, emission-free material handling machine.

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SENNEBOGEN 817 E: compact, flexible, versatile – and now electric too

Developed specifically for the needs of the recycling and waste management sector, SENNEBOGEN's smallest material handling machine, the 817 E-Series is, like all of the company's products, available with a wide variety of drive solutions.

The little SENNEBOGEN 817 is agile and compact, robust in continuous use and can be controlled with precision. The machine is already showing off these strengths today in numerous waste recycling applications. Thanks to its array of standard production equipment features such as temperature-controlled fan drives, outstanding sound insulation and the tried-and-tested, reliable hydraulic system, the 817 holds up extremely well under tough operating conditions, such as dust, heat and prolonged stress. There are also requirements which require even more from this little machine. That's why the SENNEBOGEN 817 E even comes in a variety of models as an electric material handler.

Electrically driven and still mobile?

With an operating weight of around 17 tonnes and equipment lengths of up to 9m, the 817 E is specifically tailored for use in the hall, in which energy-saving and environmentally friendly electric drives are particularly important. SENNEBOGEN has played a pioneering role in electric drives for decades and offers a great many options. For example, electric machines with a power pack run on electricity alone and only need to supply themselves with power from a diesel generator in the tail in order to bridge the time it takes to get to the next supply point. Power supply from the ceiling or via cable drums has proven effective in numerous applications and is also available for the 817 E.

Project-based battery solutions

Solutions with rechargeable batteries are currently the subject of great discussion in the market, which simply means: everybody wants them, but not many want to pay the price to have one. The reason for this is that the technological maturity of battery-based machines is not currently suited to the widespread use of machines with correspondingly high power requirements. Such applications would either require replaceable batteries or would severely limit the machine's duration of use per day, which still reduces the attractiveness of such solutions at present.

However, for cases in which the use of battery-supported technology makes sense or the general conditions so require, SENNEBOGEN currently engineers and implements such solutions upon request.

With its 817 E-Series, SENNEBOGEN offers a compact material handling machine for waste recycling. A wide variety of electric drive solutions are already available for it today.

Dozers and cranes: synergy for better results

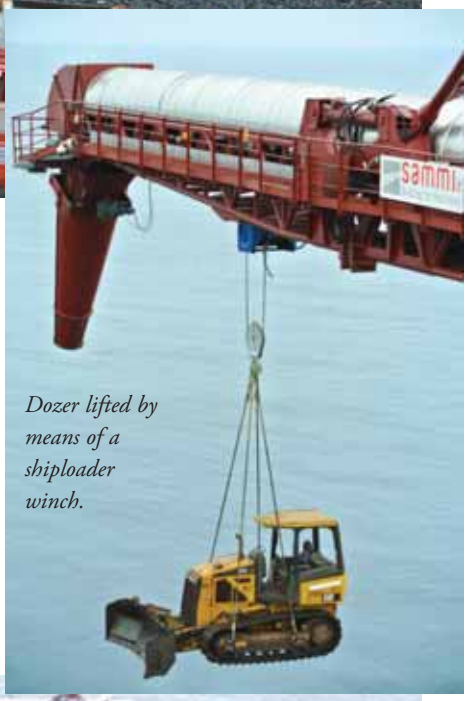
Dozer in the barge collecting cargo towards the crane.

The last decade has seen the evolution of various types of floating transshipment terminals in the logistics market. These have been deployed for various purposes such as loading, discharging, lighterage of ocean-going vessels to overcome the restrictions of port infrastructures. The most common ones, however, are used for offshore loading of dry bulk cargo — mainly coal.

For mining and trading companies a successful logistic chain depends especially on its flexibility and the control that operators have on it, and optimizing the logistics portfolio through a mix of owned and outsourced assets can be the key to manage costs and promote higher import or export performance.

Such a model can offer the opportunity to increase the utilization rate of logistics assets, ensuring they are operated in a cost-efficient configuration and contributing to a higher return of the investment.

In this scenario, nowadays more often, the owners prefer to subcontract to third parties the management of transshippers,



Dozer lifted by means of a shiploader winch.

Dozer trimming cargo in the cargo hold of a bulk carrier.

floating cranes, barges, and also of portable bulk handling equipment such as dozers.

Shi.E.L.D. Services can offer this service at all levels of the logistics chain and, because of its daily presence in the field, it has observed how portable bulk handling equipment — such as dozers — are playing a key role, especially in the performance of coal transshipment operations.

It is indeed common practice to put the dozers into the feeder barge during the transhipment activities to push the cargo towards the crane and to ensure that it can be easily grabbed at full load at every cycle. The collection of the cargo in the barge hold is performed by the dozers in a more efficient way than a 30–40t crane would do and the result of the synergy between the dozers and the cranes, which can work at their maximum capacity for a longer period of time, is an optimized transshipment cycle.

Dozers are also put into the OGV cargo hold towards the end of the loading, to avoid broken spaces and to optimize in this way the OGV loading capacity.

The optimization of this activity is fruitful from the very beginning, if it's managed by skilled operators, or anyway by operators with long experience.

For this reason, Shi.E.L.D. Services has structured itself to propose the management of dozers as a turnkey service. The scope of the service is to offer not only the equipment, but also the dozer drivers and skilled technicians for all routine/non-routine maintenance, ensuring the efficiency and the availability of the equipment at a fixed cost for the shipowners, with the following advantages:

- faster implementation time;
- lower capital investment;
- lower operating costs; and
- higher loading/discharging rate.

Shi.E.L.D. Services can count on locally based networks to provide services in a very short time. Local companies have been co-operating with Shi.E.L.D. for a very long time, and have already been assessed by its surveyors to ensure that they comply fully with Shi.E.L.D. Services' strict safety, performance and reliability standards.

Dozer being placed into the barge by means of a crane.

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STEERING GEARBOX RATIO	1 : 178
PINION/CROWN RATIO	1:8.57
TOTAL STEERING RATIO	1 : 1526
MAX STEERING OUTPUT PEAK TORQUE	2x5.000 Nm
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Getting the bulk market moving with precision traction and steering systems from Borghi Assali

The company Borghi Assali designs and builds, with particular expertise, traction and steering systems (electric or hydraulic) for all mobile harbour machines.

Borghi Assali works especially in the field of mining and port machines, equipping all the wheeled mobile machines for bulk material handling. It is able and available to study, develop and produce every kind of special drive and steering system, thanks to its very big and modern technical department.

The company's technical strength lies in its abilities in the customization and use of electric power in place of hydraulic power in any machine. It is able to study and to produce electric traction and steering systems (also in high voltage) in a very compact size (the same dimensions of hydraulic machines), able to move very slowly (0.30km/h) in any environment and with any load without problems related to heating and power (special winding to have power even at low RPM) in the electric motors.

Borghi Assali has wide experience in this field and it has a lot of important customers around the world. For example: Mitsubishi Caterpillar (MCFE), Yale (NMHG Craigavon Ireland), BPR Rico, Orion Lifts, Rocla, Linde, Cesab (Toyota M.H.), Cargotec (Moffet), Italgru, Terranova Technologies, Bedeschi, Telestack, RBL-REI, Van Aalst, Technobalt, Unibelt, Ascom, Colmar, Plan, Gipo, Glama, Isoloader, BMC Cranes, Manitex, and Aviogei.

After an international research project in 1992, Borghi Assali started to produce steering axles for forklifts and airport tractors.

The company, thanks to its wide range of products, can satisfy the different requirements of customers, both in Europe and internationally.

Mobile hopper, travelling on Borghi Assali bogies.

New automated turning and milling station

Borghi Assali has recently started an industrial investment with the support of the Emilia Romagna Region. The investment project intends to support the company's growth strategy based on innovative and high-performance axles for the premium segment of the market. This strategy offers the opportunity to acquire also multinational companies as customers, which do not only require original technology but also appropriate production capacities — for the production of at least hundreds of units per year — in terms of productivity and quality.

A port crane on Borghi Assali bogies (and above). Special electric twin drive wheels (36 tonnes) with hydraulic lifting system, studied, developed and produced for a big Italian Group, equip very big port machines (500 tonnes) sold to an Indonesian Company. Obviously these drive wheels are treated especially against salt corrosion.

TARGETS

- increase productivity and competitiveness by introducing automation and robotics systems for critical processes;
- the development of production capacity, expanding the company's machinery fleet;
- improvement in the quality of the products by reducing the defects of the produced components, and the traceability of the productions; and
- strengthen and diversify internal skills.

Mobile belt conveyor (and below).

Borghi Assali: up close and personal

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Mobile shiploader, equipped with Borghi Assali wheels.

Results

The project provides for the upgrading of the automation of the processes through the introduction of modern robotic technologies referred to as 'Industry 4.0':

- a horizontal CNC machining centre for milling; and
- an innovative team of robotized turning.

Furthermore, the implementation of an innovative non-destructive inspection system is a prerequisite for raising the quality of final products.

The project was co-funded by the European Regional Development Fund.

State-of-the-art assembly precision

Borghi Assali is well known for producing high quality special machinery wheel assemblies.

Even during manufacturing, mechanical parts are 3D measured with Borghi Assali's portable absolute arm.

This way all details are checked with higher precision in each phase.

Even in a reduced space, or in a special on-field situation, Borghi Assali is able to carry out 3D measurements with a precision up to 0.03mm

This is one of the 'secrets' why Borghi Assali parts can manage higher duties for a longer time, simply because all loads charge an extremely precise structure.

Certified

Borghi Assali's technical department is equipped with the most advanced systems for design and calculation, with which it can face any demand from customers, preparing special products for the single applications.

Quality control, besides the inbound and outbound components by means of automatic control systems, ensures the product quality that emphasizes the seriousness of the company and supports the customer, guaranteeing completely the choice and the preference given to its production.

Borghi Assali is ISO 9001-certified, and it is in line with the Italian legal requirements in the field of safety at work.

The company is currently working on ISO 14001 environmental certification. Moreover, it is working with American companies and it has adhered to the USA standard for antiterrorism called C-TPAT: an initiative of Customs in collaboration with a community of businesses to ensure the global supply chain.

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Bedeschi hoppers ordered by Israeli port

Bedeschi has signed a contract with Ashdod Port, Israel, for the supply of two additional self-propelled ecological hoppers for unloading bulk grains and grain derivatives to trucks. The discharge capacity of each hopper is equal to 800 tonnes per hour, designed to work with 18m^3, 13m^3 and 9m^3 grabs.

The machines are equipped with a rubber-tyred travel system on wheels with power steering and hydraulic jacks for lifting the hopper during the loading phase, reducing the loads on existing berth.

In order to respect the environmental rules regarding dust emissions, an active dust collection system will be installed.

Mobile Liner Filler from Van Beek makes container perfect for bulk transport

Van Beek screw system makes 20ft containers ideal for bulk transport

Twenty foot containers are in many cases ideal for bulk transport. Their square shape makes them efficient in terms of use of space and they are easy to transport by truck, rail or ship. There was however one disadvantage: how can you fill a container quickly? If this question has held you back from using these containers, read on. Van Beek has found the answer.

Eighty to eighty-five per cent filling in half an hour

Van Beek has developed the Liner Filler for fast loading of bulk goods into 20ft containers. It fills a container to over 80% in less than half an hour.

For this, the container is fitted with a container liner; a big bag that lines the inside of the container. Container liners can only be filled via a relatively small hole at the back of the container and that held lots of logistics companies back from transporting their bulk goods in this way. They simply had no means of filling the container liners quickly.

Reliable and cheap

Thanks to the Liner Filler a reliable, cheap and efficient solution is at hand.The operation is as easy as it is efficient. The machine is a horizontally mounted screw conveyor with an open underside. The inlet can be round or a hopper.

It is filled from a silo, Dino bulk truck loader, shovel, belt or screw conveyor. The installation can as an option be fitted with wheels so that a fork lift truck can move it.

Operation

The liner filler is elevated. A truck with a 20ft container drives backwards towards the liner filler and pushes the opening of the container over the screw until the screw is fully inserted into the container.

As soon as the screw is inserted into the container, the loading process can begin. The cargo falls through the open underside of the screw first into the back of the container and forms a heap there. As soon as it reaches the height of the screw, the cargo automatically falls further forwards in the container. At the end of the screw a filling detector is fitted so that the user knows for sure that all the space in the container is utilized and the screw stops in time.

Proved in practice

The Liner Filler has proved itself in practice for loading pellets (plastic granules), powders (such as flour) and flakes.

DemcoTECH Engineering: minimizing downtime with mobile bulk materials handling equipment

The four-wheel driven mobile slewable stacker at Liqhobong Diamond Mine is being fed by the 450m-long extendable conveyor inclusive of the belt storage system.

Mobile bulk materials handling equipment offers clients numerous benefits, including reduced downtime and ease of system relocation, says materials handling and niche process plant specialist, DemcoTECH Engineering, in addition to being able to handle all free-flowing bulk materials.

"We offer many references across the globe where mobile equipment has been successfully and beneficially applied for handling a range of bulk materials from iron ore and coal to fertilizer," adds Paul van de Vyver, DemcoTECH General Manager.

The contract brief for the materials handling system for the disposal of dry tailings at Liqhobong Diamond Mine in Lesotho called for a system to dispose of between 3mt (million tonnes) and 4mt a year of dry tailings, and capable of withstanding the extremely rugged and mountainous conditions of Lesotho, while at the same time being completely relocatable.

"As a result, DemcoTECH designed advanced features into the system, such as fixed and mobile conveyors feeding a mobile stacker, enabling the entire system to be extended by 60m within a 24-hour time period," says van de Vyver.

At the heart of the system is the mobile slewable stacker, which enables continuous operation without interruptions (down-times) to shift or relocate the system. The 15m mobile stacker, operating on the tailings dump, is mounted on rubber wheels with all four wheels being driven to allow the machine to be self-propelled. The stacker is equipped with hydraulic drives, and so can be repositioned with relative ease.

The stacker is fed by a 500m-long extendable conveyor, which has a belt storage system to extend the conveyor in 60m increments. This reduces the number of belt splices, thereby reducing the standing time when the head station, mounted on a pontoon, is pulled forward to its extended position using mobile equipment such as a front-end loader.

The contract includes the design, engineering, supply, erection and commissioning, and was awarded to DemcoTECH by Turnkey Civil Lesotho, on behalf of diamond-producer Firestone Diamonds, which holds a 75% interest in Liqhobong, with the remaining 25% owned by the Government of the Kingdom of Lesotho.

The tailings disposal system includes a 900tph standard fixed downhill conveyor, equipped with a regenerative electrical braking system to prevent the conveyor from running away, and a 20m-long mobile slewable emergency discharge boom as a standby system. This conveyor feeds onto mobile conveyors mounted on steel

Grindrod's Maydon Wharf fertilizer terminal project, South Africa.

sleepers to enable them to be moved. The first of the mobile conveyors is a 500m-long conveyor, which is extended in 60m increments as the tailings storage wall is extended.

DemcoTECH has also supplied a mobile ship offloading and warehouse distribution system for the fertilizer storage facility at Grindrod's Maydon Wharf terminal in Durban, South Africa. "The system replaced a trucking system with a major improvement in productivity of the operation. This system comprised four mobile (grasshopper) tyre-mounted conveyors positioned on the jetty at locations to suit the ship docking arrangements," says van de Vyver.

The ships are offloaded using grabs and then the conveyors feed the fertilizer to a central 32m-long pivoting and retractable boom conveyor. In addition the existing warehouses were modified to incorporate five reversible, multi-point discharge shuttle conveyors that feed individual bays. Fully sequenced automatic starting and stopping of the systems ensure a seamless operation, with no blockages or hang-ups, and the ability to handle different types and grades of fertilizer.

Southern Africa-based DemcoTECH has also seen considerable success internationally, with offshore work including the detailed design for an import terminal at Port of Ploce in Croatia, handling both iron ore and coal.

"The system consists of a grab type ship off loader with rail-mounted bucket wheel stacker reclaimer feeding the main stockpile. In addition, mobile plant is used to augment the stockpile system and the material is reclaimed using mobile plant feeding into mobile hoppers situated at the standby stockpile facility," comments van de Vyver. "The mobile hoppers in turn discharge onto the yard conveyor via dual vibratory feeders and can be positioned at any point along the entire length of the new yard conveyor using a front-end loader, to reduce travelling distances alongside the stockpile."

The multi-product terminal handles mainly coal, but also iron ore, for distribution to the region's coal-fired power stations and steel mills. The project scope included the design of the entire materials handling system, from the coal fed from the ship unloaders through to the coal stockyards and the train rapid rail load-out system.

"This project posed a number of challenges that required advanced design solutions," adds van de Vyver. "From extreme seismic conditions to the vastly different material properties of coal and iron ore, particularly for the chute design and the train rapid rail load-out system."

DemcoTECH Engineering offers various mobile machines for handling bulk materials in a variety of applications. This equipment includes rail-mounted mobile spreaders for tailings dumps and longitudinal stacking; wheel-mounted mobile spreaders for kidney-shaped stockpiles, barge loading and emergency booms; rail-mounted mobile hoppers for stockpile reclaiming and front-end loader operations; grasshopper conveying for jetty applications, stockpiling and temporary conveying and shuttle and tripper stacking conveyors, surge bins, stockyard conveyors, warehouse stockpiles, etc.

All equipment is designed in-house to specific requirements and supplied turnkey to clients, with DemcoTECH providing services from concept design through to project completion in the power generation, cement, mining, metallurgical, manufacturing and port handling industries.

After-sales services include spares, maintenance, refurbishments and operational readiness packages covering procedures, systems and workplace tools required to successfully operate and maintain a new or upgraded plant.

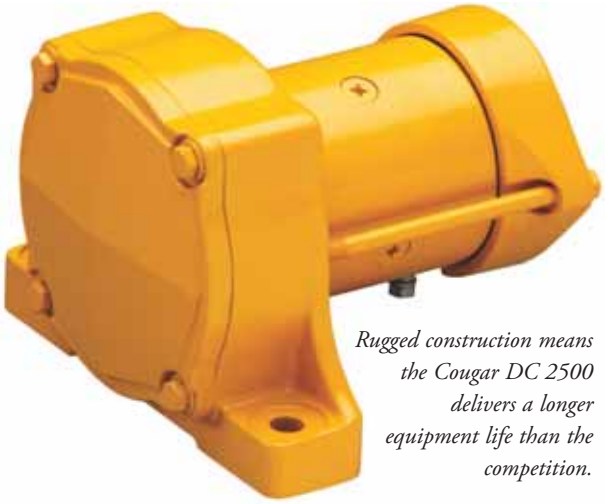
Trucking company shakes off low-quality truck vibrators

A major manufacturer of high-quality electric vibrators for improved bulk material flow has helped a fleet of dump trucks improve material evacuation and efficiency with longer-lasting and more reliable industrial vibrators to ensure that each load is delivered completely and safely. To avoid potential risk from operator intervention to break loose stubborn materials and facilitate complete unloading, Herman's Trucking Company of Wrightstown, New Jersey, orders its truck bodies with OEM-supplied vibrators. Company officials were disappointed in the short lifespan of the units, however, which were only lasting about a year.

To address the problem, it replaced one of the failed vibrators with a heavy-duty Cougar® DC 2500 Truck Vibrator from Martin Engineering. After six years, the high-performance 12-volt Cougar vibrator is still going strong, helping the company avoid the expense of frequent replacement and the associated downtime. The units have been so successful and reliable that company officials are now replacing the competing vibrators with the Cougar designs whenever a failure occurs.

Since 1973, Herman's Trucking Company has been serving the Burlington County area in Central New Jersey. With a sizeable fleet of more than 25 dump trucks, the company hauls everything from landscaping material to construction products. Commonly transported loads include slate, flagstone, rocks, limestone, recycled aggregate, dirt and sand.

Material build-up on the walls, floor and tail gate of the truck bed can reduce the capacity of each load, extending unloading time and reducing efficiency. "Sand and gravel need to be absolutely cleaned out after every load," said Bruce Stelljes of Herman's Trucking Co. "The driver has to make sure the truck body is clean and if it isn't, he or she has to get up there and hammer on the truck body or even climb into the bed with a shovel and manually dislodge any remaining material."



Rugged construction means the Cougar DC 2500 delivers a longer equipment life than the competition.

Drivers commonly use a number of other methods to evacuate the cargo box, all of which can introduce problems. One is stopping and starting the hydraulic lift to shake loose the accumulation, slamming the cylinder open and closed to dislodge the load, which can cause stress on the lift shaft, hydraulic fittings and other components. Another is moving the truck back and forth in a stopping/starting action with the bed raised. This

The Cougar DC 2500 vibrates the frame spine, which agitates the material adhered to the bed.

wears on the brakes and engine, and trucks with raised beds can become severely unbalanced on uneven surfaces. Even on level ground, if one side of the bed empties and material sticks on the other side, the truck can be in danger of tipping over.

Perhaps the most dangerous approach is the operator climbing up and manually clearing the buildup. Often performed with the bed at a slight slope that introduces the possibility of slips or falls, the loosened material can evacuate suddenly, pulling the worker with it, resulting in possible injury.

"We first discovered the Cougar vibrators about six years ago, when we received a new truck body equipped with a Cougar 2500," Stelljes continued. "We noticed that the unit consistently delivered the force we needed without burning out." Stelljes said that original unit is still working like new.

"At the time, we didn't know much about truck vibrators," said Stelljes. "We had purchased new trucks that had another manufacturer's vibrators installed on them. But after just a year or so in service, those units started going bad." Stelljes said they either suffered from a reduced output or stopped working altogether. Operators originally swapped the failed vibrators for new ones by the same manufacturer, but the short equipment life persisted, resulting in drivers again having to take measures to clear the material. After seeing the side-by-side comparison of performance and equipment life between the Cougar DC 2500 and the competing units, the company decided to exclusively use the Cougar designs.

"The true cost of these vibrators is directly dependent on how long they last," explained Martin Engineering Mobile Market Manager Allen Twidell. "The Cougar family of truck vibrators includes heavy-duty windings and insulation, with bearings lubricated for life and sealed inside a weatherproof housing." The motors are custom-built to Martin Engineering's specifications, ensuring the highest level of quality control. The units also carry a two-year warranty, which is double that of other 12 volt truck vibrators.

"We've found that some competing designs don't actually achieve the forces claimed by the manufacturer," Twidell continued. "In contrast, our units generally put out more energy than the model numbers indicate." The Cougar line-up of DC truck vibrators also includes a larger unit, which puts out a whopping 3,700 pounds of force.

Placed on the upper spine of the truck bed's support frame, the compact unit on Herman's trucks requires minimal space. The design is only 10-3/8" x 9¾" x 6-7/8" in size and weighs just 36 lbs. due to the lightweight aluminium housing, which results in a high output to weight ratio. Drawing just 55 amps, the powerful vibrator delivers 2,500 pounds of force at 4,000RPM. Competing products typically draw much more current (well in excess of 100 amps), which means the Cougar units produce less drain on the truck's electrical system. The duty cycles are also longer, generating less heat, which contributes to their long life.

Along with a safer work environment, the reliability means no unexpected interruptions to the workflow from a failed vibrator. With the complete evacuation of cargo, 100% of each load is delivered efficiently to the jobsite, reducing labour and risk. All of this translates to a lower cost of operation and greater return on investment. "Now we use one brand of vibrator, and they only need to be installed once," Stelljes concluded.

Martin Engineering is a global innovator in the bulk material handling industry, developing new solutions to common problems and participating in industry organizations to improve safety and productivity.

The company's series of *Foundations* books is an internationally-recognized resource for safety, maintenance and operations training — with more than 20,000 print copies in circulation around the world. The entire 500+ page volumes can also be downloaded as free PDFs from the Martin web site. Martin Engineering products, sales, service and training are available from 18 facilities worldwide, including factory-owned business units in Australia, Brazil, China, Colombia, France, Germany, India, Indonesia, Italy, Mexico, Peru, Russia, Spain, South Africa, Turkey, the USA and the UK.

The unit is mounted to the frame and secured by a safety chain.

TTS (Latvia) supplies portable coal handling equipment to Riga Central Terminal

In 2018 companies performing coal handling in Riga port (Latvia) began relocating to new jetties. According to the new city development plan, all bulk terminals must be moved from the city centre to areas distant from the residential districts. This will improve environmental situation and reduce the load of freight transport and railway.

Stevedoring companies faced the issue of upgrading cargo technology to move to a new location. The unstable situation on the coal market also made it difficult to make decisions in favour of large investments in new equipment.

Coal handling equipment from TTS (Latvia).

Against this background, Latvian production company TTS offered the Riga Central Terminal to implement a coal transshipment solution using fully mobile equipment. This solution has four main advantages compared with traditional port equipment:

- short term commissioning of equipment — less than six months;
- construction of expensive foundations and engineering networks is not required;
- lower cost of equipment; and
- possibility to use the territory of the sea terminal more flexibly.

An important condition for the customer was to ensure the performance of the equipment — 1,000 tonnes per hour. In addition, coal in piles must be at least 140,000 tonnes. Plus cleaning of tramp metal and crushing to a fraction of 0–50mm is to be performed. For loading into vessels, stevedores wanted to use already existing portal cranes. Following these requirements, TTS engineers developed technology for coal handling using mobile equipment.

The cargo enters the terminal in railroad cars. Hydraulic grapple cranes unload cars and deliver coal into two receiving hoppers. Each hopper is equipped with a grate for screening large pieces of frozen coal.

Two chain feeders deliver material to the conveyor line, where a self-cleaning electromagnet removes tramp metal. After cleaning, material enters two-roll crusher for grinding. Once crushed, coal fits into a transitory pile by radial stacker.

Crushing and stacking

From here, wheel loaders deliver coal to radial stackers, which form stacks in the area of portal cranes. These radial stackers are able to form 17 metre-high stacks. Such height makes it possible to store a large volume of coal in a small area. In addition, the boom of the radial stacker has a variable height, which significantly reduces the formation of dust, while the stack of cargo has a small height.

Crushing and stacking.

None of the equipment, including receiving hoppers and crusher, requires foundations and can be moved to another berth zone within a few hours. This solution makes it possible to quickly reorient the terminal to load not only bulk cargoes, but also breakbulk.

The design of the equipment makes it possible to process not only coal, but also other bulk cargoes — including ores, green fuel, aggregates, wood chips.

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Fertilizer de-lumping on the move with Sackett-Waconia

There is one guarantee when working with bulk fertilizers – lumpy material. The vast majority of fertilizer raw materials — like urea, for example — are hygroscopic in nature and moisture from almost any source can cause clumping, crusting, cliffing, and any number of dastardly deeds. Enter, de-lumping systems.

Sackett-Waconia conditioning & transfer unit.

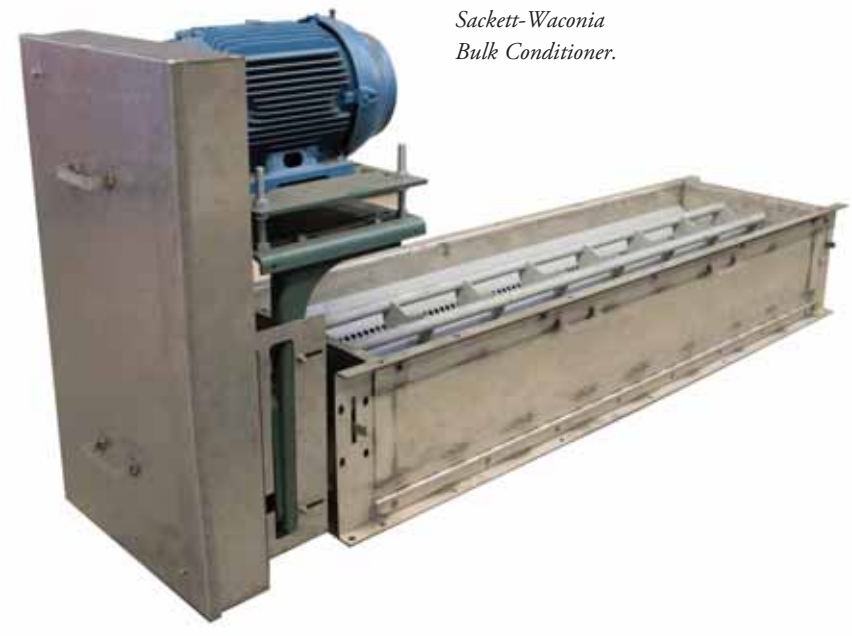
Many high-capacity de-lumping systems are designed break up materials and to be fixed to an early point in the system where it can be both advantageous and easy to access. However, that's not always the possible at transload locations. Warehoused material can sometimes agglomerate all over again and require de-lumping prior to forwarding. Since having another fixed system in a warehouse space is not always feasible, Sackett-Waconia offers semi-portable conditioning & transfer units.

These systems are mounted to a skid base and are comprised of a large loader-fed intake hopper, with grizzly, a Sackett-Waconia Bulk Conditioner or Lump Buster, and a Sackett-Waconia Bulk-Toter with Dust Spout. They are generally used for loading material out to trucks and are offered at capacities up to 600 tonnes per hour (540 metric tons per hour). These semi-portable systems can be moved from place to place as needed, provided there is power available at the locations they are set in.

As said above, Sackett-Waconia offers two de-lumping options for these units: Bulk Conditioners and Lump Busters.

Sackett-Waconia lump busters are a great choice for use with firm lumps in high humidity conditions. These units offer simple lump breaking for better flowability, employing highly efficient 'rock pick'-style blades that grab lumps, then bite and crushing them all in one efficient step. They are heavy duty units, built for a long life, and since they are built with an open v-grate, maintenance is kept to a minimum.

If material requires a softer touch, Sackett-Waconia proudly offers its Bulk Conditioner. A bulk conditioner works by gently popping lumps apart, back into their granular form. They are designed with a rotor and screen arrangement that do not touch, to eliminate scalping and prevent granule degradation. The rotors are comprised of round bars that push lumps against a curved screen containing round holes. The screen holes catch granules and the ensuing pressure causes them to pop apart. Bulk Conditioner screens are removable and also catch foreign objects larger than the size of the screen holes. Bulk Conditioners feature a door on the front which allows operators to clean out or change the screen.



Sackett-Waconia Bulk Conditioner.

The base of these units is the Sackett-Waconia Bulk-Toter, a flighted chain conveyor. Bulk-Toters efficiently move materials up from under the de-lumping unit at 45° and send material out though a built in dust spout. All units are placed on heavy duty structural steel skid bases that support the entire system and come with a mount for a control panel. All of the systems we offer are based on a simple system containing a hopper, de-lumper, bulk-toter, skid base, dust spout and control panel mount. However, Sackett-Waconia offers options for materials of construction, hopper size, screens, combination MCC/control panels, and electric or manual dust spouts. The one thing that all options have in common is safety. All units are provided with safety grates, flashing safety start-up lights and horns, and pinch guards. Sackett-Waconia never compromises on safety and is happy to meet any safety standard for its customers' sites. DCi

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This DHM 12m³ is fully radio controlled and used to discharge lime-stone from barges.

Bulk handling grabs

quality never goes out of style

Jay Venter

Orts delivers diesel-hydraulic grabs for handling of soda ash

ORTS Grabs, the family owned grab manufacturer from Germany, has delivered several grabs for a stevedore company for the handling of soda ash and other very fine dry bulk cargo. The special design of the clamshells prevents spillage and dust. Customers are more than satisfied with the combination of zero spillage and fastest discharge with ORTS independent operating diesel-hydraulic grabs.

The biggest independent operating diesel-hydraulic grab from ORTS is the DHM 12m³ orange-peel grab (above). The DHM 12m³ is fully radio controlled and used to discharge limestone from barges.

ORTS has 25 years' operational experience with radio controlled diesel-hydraulic grabs, the prototype of which is still in operation, and has been since 1994.

The company

ORTS Grabs was founded by Eng. Sigvard F. Orts in 1972 as an engineering and consulting company, specialized in the constructions of grabs (main business) and nearly all kinds of bulk handling equipment.

In the beginning, there was only construction and sales, while manufacturing took place at well known companies in Northern Germany.

In 1985, the company founded its own workshop and, since that time, it has been known as ORTS GmbH Maschinenfabrik.

The range of ORTS products:

- electro-hydraulic grabs;
- fully radio controlled diesel-hydraulic grabs;
- mechanical rope grabs (single rope, two-rope, three-rope, four-rope system);
- wood-grabs (for wood-bundles or wood-logs);
- dredger grabs; and
- salvage grabs.

Additional:

- crane equipment for operating electro-hydraulic grabs;
- cargo-turners;
- heavy-lift beams (max. load 100t); and
- flat- traverse-frames.

ORTS' main customers are shipping companies, where the grabs have to withstand rough conditions on seagoing vessels, loading and unloading the vessel in every corner of the world. But also harbour and port authorities, stevedoring companies and other companies which have to move or handle 'something'.

The special design of ORTS' clamshells prevents spillage and dust.

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www.orts-grabs.de

The art of development

Negrini, headquartered in Modena, Italy, considers that its primary goal is achieving satisfaction for its customers, through a continuous and effective process of study and collaboration with them and its suppliers. Its business philosophy is professionalism and versatility towards the different demands of customers.

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

The reliability of Negrini leans on the professional ability and experience acquired by its highly qualified working personnel. Its technical office is always available to face and solve any technical problem, explaining and motivating the adopted solutions.

When necessary, Negrini uses engineers for the solution of the most complex planning problems. Today, the firm has 16 employees and uses, depending on circumstances, selected external collaborators.

The company has facilities of about 750m^3, equipped with five 6.3 tonne overhead cranes and a very wide square.

The production

Choosing the right attachment is one of the main concerns for any wise contractor and a very important factor to guarantee the successful outcome of any job.

For the last 43 years, Negrini has been engineering and manufacturing attachments, including mechanical and hydraulic clamshell buckets, cable clamshell buckets with radio-controlled release, orange peel buckets (both mechanical and hydraulic), two- or four-rope scoop grabs, dragline grabs, trenching mechanical clamshell buckets and buckets specially designed for controlled digging depth and special valves that are widely used to collect polluted mud from the sea or river bed.

Since 1967, the Negrini company has engineered, manufactured and supplied contractors and port authorities with buckets for a variety of jobs and every bucket has been a success. That's why Negrini has gained a very good reputation in this field. Buckets, like those that Negrini delivers worldwide, are often engineered to be heavy and clumsy. Negrini's engineering concept is different because its engineers believe — and decades of practice show they're right — that heavy buckets are not always stronger; in fact they prefer to combine a large use of high tensile steel like Hardox with very accurate engineering. In this way, Negrini buckets are more resilient, yet lightweight, therefore enhancing performance whilst granting significant energy savings. This is the result of Negrini's long experience built up by studying case by case, job by job with skills and passion. Negrini's attachments are at work in many different parts of the world: from Italy to the United States and from the Gulf Countries to Australia. The success of these products has been boosted in particular in recent years confirming that performance and quality are the ultimate features that contractors want for the attachments that they will employ for their most demanding jobs.

Every enquiry is evaluated for feasibility

The elements of the enquiry, including the drawings, are studied and planned, in agreement with the head of department, in order to secure the established delivery time and the best use of resources.

All technical data, including the drawings, are entered into a CAD CAM electronic system and three dimensional solid Cad, for a better management of the product and a rational organization of the machines. Testing of the product is performed by skilled workers who are also sensitive to the customer's need. Before shipment, a final check up is carried out in the production department with the supervision of the owner himself. Negrini's business politics is that of supplying a customized product to the firms operating in the earthmoving field. All materials are strictly respectful of the technical specifications and drawings requested, using reliable and historically well known suppliers. On specific demand, Negrini can supply single certificates and attestations. Negrini also has qualified welders.

Testing the product

All products are subject to constant control: both on arrival into the factory and during the production phase; before shipment, the finished product is submitted to a further control and testing, with the purpose to appraise the effectiveness of the applied manufacturing process and guarantee a quality product to the client. It's a well known fact that any good machine, be it cable crane or hydraulic excavator, will perform at its best only if the attachment used to work is well engineered and manufactured. In fact a good attachment will not only do a good job, but will also reduce machine stress, allowing for safer working operations and help save energy.

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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The right grab for the job


Verstegen clamshell grabs handling iron ore.


Verstegen clamshell grabs used for the handling of coal.

Dedication to grabs

Verstegen is specialized in the designing and building of grabs, continuously working to develop and build efficient and cost-effective grabs.

Besides the standardized product range, Verstegen also develops unique solutions for specific situations and customer needs. Verstegen believes that in order to get high unloading rates, the grab must be extremely reliable with a high productive capacity. In order to obtain the highest productive capacity, grabs should have the highest possible volume without unnecessary dead weight. This is only possible with a good and well-proven design and the use of the best possible materials. To increase strength and minimize wear, each Verstegen grab is provided with shells completely made of high tensile wear resistant steel. The friction in the articulation points is absolutely minimal because of an excellent bearing system.

A different grab for each bulk material

Each material has its own specific properties and a grab must be adjusted to these properties. A grab that will work perfectly in coal, can have great difficulties whilst handling iron ore. Through extensive experience and expertise, Verstegen has developed a number of grab models, especially designed for common bulk materials (coal, iron ore, agribulk, fertilizer, phosphates. Besides grabs for the above materials, Verstegen has special solutions available for other bulk materials with specific properties.

Grabs

Verstegen has developed a wide range of bulk handling grabs, optimized for specific materials. Clamshell grabs can be used for most bulk materials. For certain materials or specific operations other grabs are a better solution. Hereafter the different grab models are shown:

Clamshell grabs

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

Orange peel grabs

For difficult to handle materials, like iron scrap, stones and rocks, or pig iron Verstegen's orange peel grabs are an ideal solution. The specific shell model depends on the material which has to be handled.

Trimming grabs

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

Single-rope grabs

A special grab in the extensive range of Verstegen grabs is the single-rope grab, especially designed for cranes with one single drum.

Dredging grabs

Verstegen has a long history in building grabs for underwater operations. Different grab models are available for different operations.

Services

Verstegen grab inspection

Verstegen's technicians can do an inspection on clients' grabs to determine the status of all crucial parts. The result is an overview of the necessary maintenance and a list of the parts that has to be replaced.

Wear

Wear takes place gradually, but will never stop and therefore maintenance is required on a regular basis.

Original spare parts

Verstegen can supply all original parts worldwide. and regular parts are on stock, like most bearings, bushings and rope guiding rollers. Other parts like cutting edges and complete modules are produced to order in Verstegen's factory.


Verstegen clamshell grab on a Liebherr ship crane handling iron ore.

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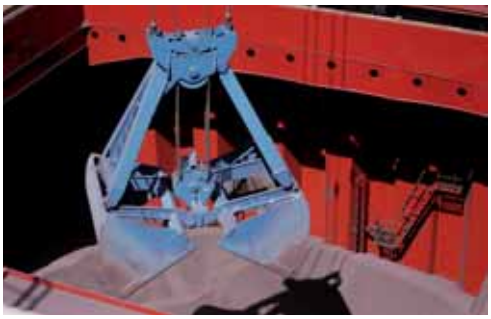

Are you looking for a new grab?

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

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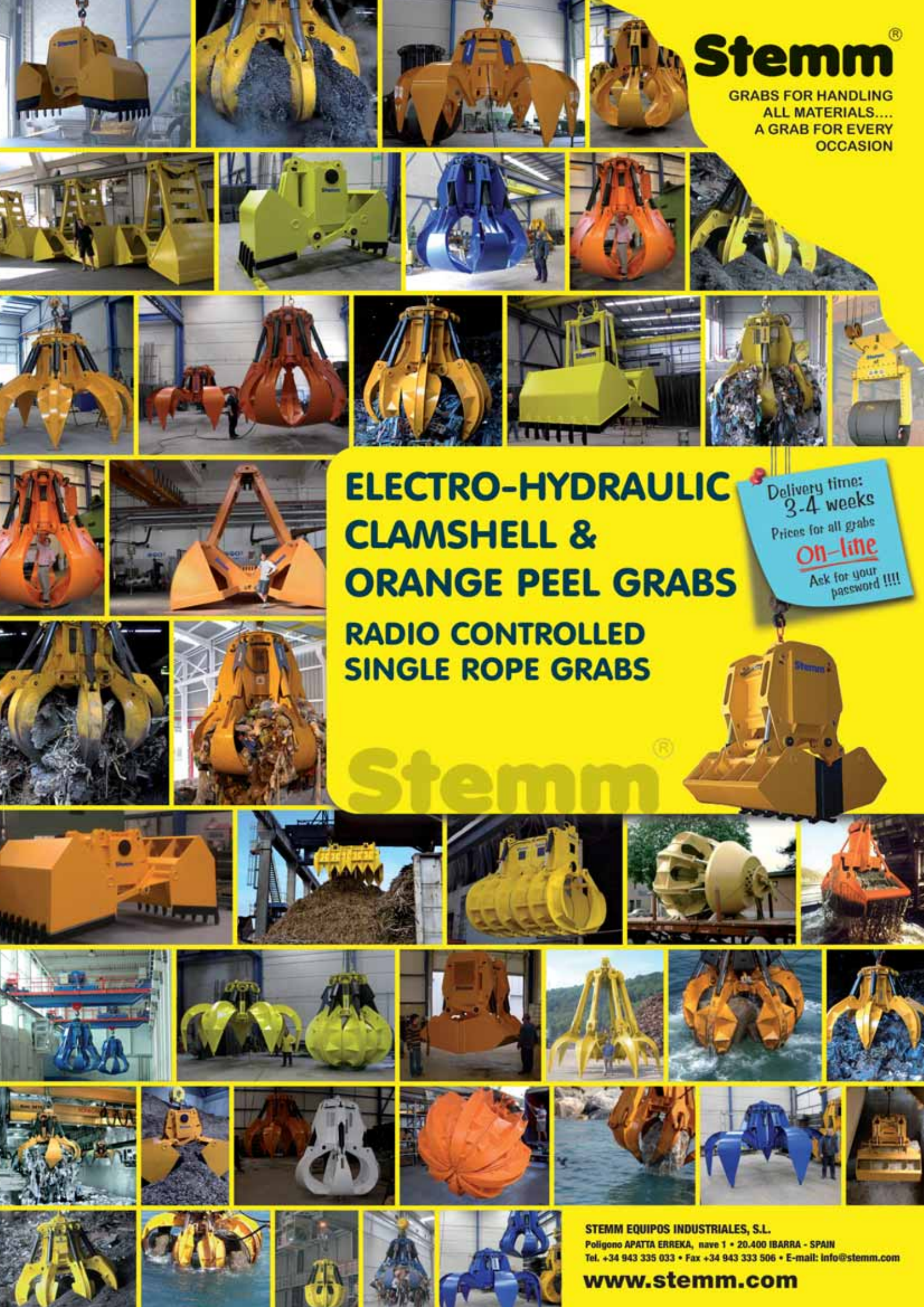
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STEMM grabs benefit from extensive R&D and the latest technology

Since 1984, STEMM has designed and manufactured a wide range of grapples, clamshell grabs and other types of grabs and tongs for many different sectors, including the iron and steel, marine, crane, overhead cranes and cement industries and the environmental sector.

STEMM boasts a vastly knowledgeable team with excellent technical skills and proven experience in the sector. This ensures that it can be highly flexible and can respond to all its customers' needs.

There is fluid and constant communication between the management, engineering and manufacturing departments, ensuring rapid reaction times that allow them to respond quickly and efficiently to customers' needs.

Quality, research and R&D

STEMM works on technologically advanced projects in order to meet the many needs of its clientèle spanning different industrial sectors. Having performed the pertinent tests, in line with quality assurance and feasibility standards, STEMM incorporates innovative solutions as standard into its grapples and clamshell grabs.

The many recent innovations developed by STEMM's engineering and R&D services include:

'KIDNEY' auto-filtration system

STEMM's grapples for waste and clamshell grabs for cement and clinker come with an auto-filtration system called a 'KIDNEY', which is always fully incorporated into the machine itself. This instrument, patented by STEMM's engineers, requires no maintenance and self-cleans automatically, requiring no operator intervention.

The KIDNEY works whenever the motor is running and automatically performs continuous microfiltration at 3 microns class NAS-6, ISO 17-15-12.

This full and systematic auto-filtration ensures the hydraulic circuit remains extremely clean, thereby guaranteeing no breakdowns or incidents.

Furthermore, the bases of STEMM tanks are fully magnetized to attract and catch any metal particles.

Thanks to STEMM's new auto-filtration system, its machinery also achieves oil-performance levels of over 4,000 running hours.

High pressure hydraulic pumps

All the pumps installed in STEMM's machinery are state of the art. Their bodies are die cast and they are designed to work in conditions of extreme pressure (315 bars).

They are hydrostatically balanced and have automatic side alignment features. They comply with all American regulations related to excavators and mining and public works machinery.

They are very quiet, not reaching 60 decibels, which is an essential feature for compliance with the evermore demanding regulations for industrial facilities, such as: incineration plants, biomass treatment plants and all facilities related to the environment.

Their shafts are splined to withstand the harsh conditions under which these machines work, as well as the high starting torque that is so common.

There is a guarantee of three years at 16,000 running hours in normal conditions.

The elastic couplings used to connect the electric motor to the pump are made of steel and nylon, guaranteeing maximum transmission.

Variable speed, power regeneration and energy saving system

The speed of handling achieved thanks to this system is unmatched by any other system of method; a quality that is particularly appreciated in the iron and steel industry.

The speed is adjusted automatically depending on density, humidity, granulometry and, more specifically, the degree of compactness of the product to be handled.

This system is combined with the double-venting (electric and hydraulic) system, providing surprising results as regards power regeneration. It achieves a 50% increase in work cycles and, therefore, a reduction in daily electricity costs. Both systems work automatically and simultaneously, but they are independent, creating a perfect combination of hydraulic and electric power.

The double venting resets itself after each complete opening and closing manoeuvre, working like an automatic hydraulic pressure switch, always preventing oil lamination and ensuring there is never any heat in the circuit.

Omnidirectional working position

The grapples and clamshell grabs can work in any position, even horizontally, at 90° without creating any problems for the pump suction.

The tanks are watertight and pressurized at 0.3 bars, which helps the pumps work and ensures there is no cavitation in any inclined position.

Furthermore, as an additional safety measure, the machinery is supplied with built-in inclinometers in the electrical panel. These digital or analogical inclinometers are omnidirectional and work in any position (360°), providing a double signal.

Maintenance-free non-lubricated joints

All the claw and valve joints are steel-steel, with shafts that have been hardened, tempered and ground using the very latest manganese phosphate surface treatment.

The casings are also hardened and tempered to 65Hrc with watertight decompression grooves that completely protect the joint, preventing the lubricant leaking out and any dust or particles getting in.

No maintenance or lubrication of STEMM's joints is ever required.

Virtual tour services

When a customer places an order with STEMM, its sales service issue a document accepting the order and providing a password. The customer can then access STEMM's servers via computer, tablet or smartphone and take any virtual tours. These include:

- **manufacturing process viewing:** this service allows customers to monitor their order and keep informed of the current status of the manufacture and supply of each of its components. The photos, diagrams and videos are updated daily. This service is available 24 hours a day until 15 days after the machine has been shipped.
- **provisional acceptance, tests and trial runs:** once the equipment has been manufactured, it is tested uninterruptedly for 48 hours by connecting it to a programmable logic controller (PLC) that simulates real operation. Once the provisional acceptance testing has been performed, customers are given the opportunity to watch a four- to five-minute video showing the parameters and results obtained, with the opening and closure times, consumption, pressure, and temperatures obtained during the tests. Customers can also see the detectors, correct closure control, the condition of the lips, teeth, joints, synchronism, opening and closure mechanisms, as well as an overall view from several different angles. Thanks to this service, there will be no need for customers to travel to observe routine tests on standard mass-produced machines.

Easy-to-dismantle blocks

The hydraulic circuits in STEMM's machines are fully integrated into a manifold block, which is the heart of the machine. They are standard, interchangeable pieces of equipment for all machines. All the valves and components are composed of logic components in cartridges inserted into the block. They are completely impervious to any impurities that may exist in the circuit, which affords the system a very long life (with no filter change necessary).

Moreover, these manifold blocks are incorporated into a decompression system that prevents the much-feared fluid hammer that is so damaging to hydraulic facilities and the structure itself. There is also no chance

of leaks. This block dismantling system makes maintenance work much easier. All blocks are kept in stock and are tested in eight-hour processes over ten days with 40 cycles/hour.

Exact synchronism of valves in clamshells

STEMM has developed a very modern synchronization system for the valves in the clamshells. It ensures perfect, exact, uniform opening and closing movements at the same time in both clamshells.

This simultaneous synchronization is not possible with traditional valve synchronization systems, which consist of two bars on each side of the clamshell buckets. STEMM has developed a system with perfect hydraulic synchronization using flow dividers and flow control valves that compensate for pressure and temperature.

The movement achieved is smooth and regular, allowing identical variations in speed, cadence and positioning in each valve. This allows STEMM to achieve surprising results as regards dose and controlled feed for the pharmaceutical, petrochemical, glass and ceramics industries.

Continuous maintenance training

All STEMM equipment bears several stickers with QR codes that provide access to the company's YouTube channel where there are videos showing how to perform routine assembly and dismantling operations for all the machine's elements and components, including joints, shafts, cylinders, pumps, valves, filters, etc. These videos also show how to correctly perform monitoring and inspection activities as well as how to deal with certain incidents.

This is a service that is highly valued by STEMM's customers and which ensures their plant personnel receive continuous training, thereby lengthening the life of the machine by ensuring it is used sensibly and correctly.

Grab Connect remote control

STEMM's remote control service Grab Connect allows customers to remotely diagnose, check and control a machine; programming and adjusting it in real time.

This service is an ideal tool for performing preventive maintenance and control operations, including start-up, change of parameters, pressure, etc.

The system makes it possible for customers to see all manual (operator), semi-automatic and fully automatic manufacturing processes on their computers or smartphones in real time. Customers will receive notifications of incidents, as well as alerts related to temperature, the condition of filters, oil levels, running hours, etc.

Customers will receive a series of reports related to performance, real time diagnosis, technical support and production monitoring.

This data ensures that customers can confidently plan maintenance activity and make fundamental decisions related to investment in preventive maintenance. With the implementation of remote monitoring and reports a selection of data and safety-related reports are sent by email or SMS as soon as the incident has occurred.

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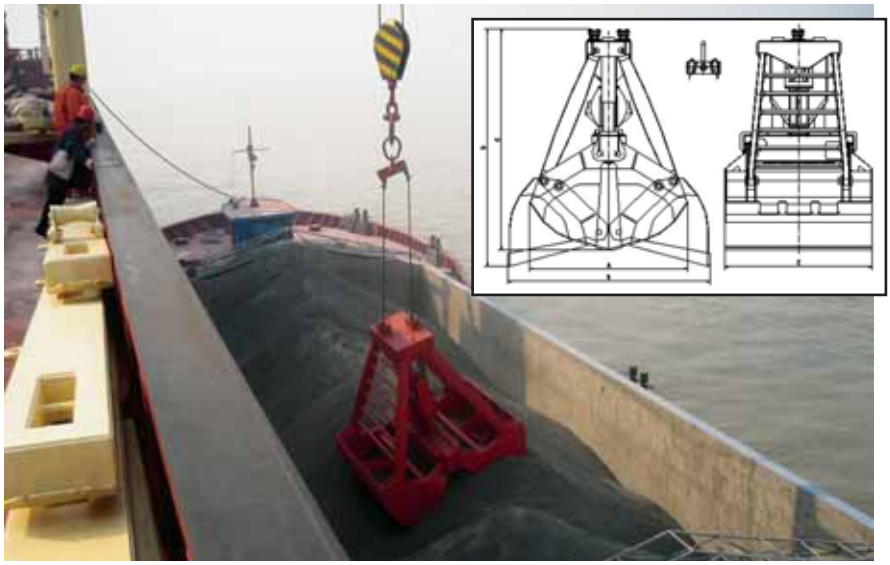
Shanghai Janus Grab Co., Ltd, always improving

Shanghai Janus Grab Co., Ltd is a globally renowned grab specialist, with more than 30 years experience in the design, R&D, and manufacturing of grabs. Highly educated professionals in steel structure, hydraulic and electrical systems make Janus grabs competitive in today's world-wide markets. Constant co-operation with Shanghai Tongji University and Shanghai Maritime University improves Janus Grab's product quality continuously.

Janus Grab offers:

- remote control grabs;
- motor-hydraulic grabs;
- dredging grabs;
- mechanical grabs;
- hydraulic grabs;
- pneumatic grabs;
- motor grabs; and
- special grabs.

Janus Grab's various grabs can satisfy the different working conditions and requirements of clients. Janus grabs have been used in domestic and overseas ports, bulk carriers, power plants, steel mills, environmental power plants, railway, chemical factories, cement factories, paper mills, dredging and other industries. Grabs have been exported to Germany, Greece, the United States, Japan, Russia, Singapore, Indonesia, Mexico, Venezuela, Brazil, Chile, Australia, Malaysia, Vietnam, India, Thailand, Hong Kong, Nigeria, Mauritania and other countries and regions.



Janus Grab's remote control grab is an efficient tool for loading and unloading bulk cargo. The grab can close by lifting up the hook of the crane and open by remote control in the air without any additional power. The hydraulic and electric parts use the plug-and-play modular design, easily maintained and repaired, suitable for ship ocean voyages. The electrical and hydraulic systems have waterproof designs, and each bulk grab is tested strictly by being immersed under the water for 24 hours. Multi-step buffering reduces the impact to the grab from the crane and ensures high unloading rates. The grab can work problem-free and continuously for 24 hours. The grab uses less energy — a full battery can last over 180 hours. The crane does not need any other auxiliary equipment. These type of grabs are widely used in bulk vessels and ports and are exported in batches.

J&B Grabs in focus

J&B Grabs B.V. is a holding company engaged primarily in the development, manufacture and reconditioning of hydraulic and wire rope grabs. The company started in 1945 in the manufacture and overhauling of re-handling grabs.

J&B Grabs use 3-D solid modelling and FEA (finite element analysis) in the design of its grabs. This means that customer-specific requirements can be implemented in the design and production process.

The company has a wide range of standard type grabs, all of which are readily available.

J&B's grabs are used among many brands and types of available cranes; some examples include Sennebogen, Caterpillar, Hitachi, Liebherr, Volvo, Fuchs and more.

Due to the many brands and types of cranes using different connecting systems, J&B Grabs has developed a number of quick-change connectors. Mechanical and hydraulic systems meant that it is possible to change between grabs within ten minutes. The company delivers grabs and parts internationally.

J&B Grabs' hydraulic clamshell for dredging, with special sealing for pins and bushes.

Hydraulic grabs

Hydraulic clamshell grabs

J&B's hydraulic grab is available as :

- rehandling grab (clamshell);
- closed rehandling grab;
- dredging grab;
- horizontal profiling clamshell;
- log grapple;
- woodchips; and
- bale grab.

The design of the grabs in combination with two hydraulic cylinders apply a maximum of penetration.

The two shells close synchronously. The grab is built of high quality steel, for a long durability.

The grabs can be supplied with a range of attachments.

Hydraulic cactus grab/orange peel grab

The hydraulic cactus grab is ideal for various applications:

- scrap handling;
- garbage/refuse;
- rock; and
- woodchips.

The capacity of the grab is determined by the material density, material condition and the capacity of the material handler/excavator.

The hydraulic round-nose bucket to dig extremely hard layers of clay.

Rope grabs

J&B wire grabs can be divided into the following types:

- rehandling rope grab;
- cactus rope grab/orange peel grab; and
- special rope grab

J&B's engineers are specially trained to meet the specific needs of the customers' requirements.

With each application of a wire rope rehandling grab, customers get a detailed quote with specifications and sketch.

In the past, J&B Grabs has designed and manufactured designed and manufactured several special grabs. There are stone blocks grabs designed and manufactured.

J&B also offers its rope-operated cactus grab.

Rotating with Indexator

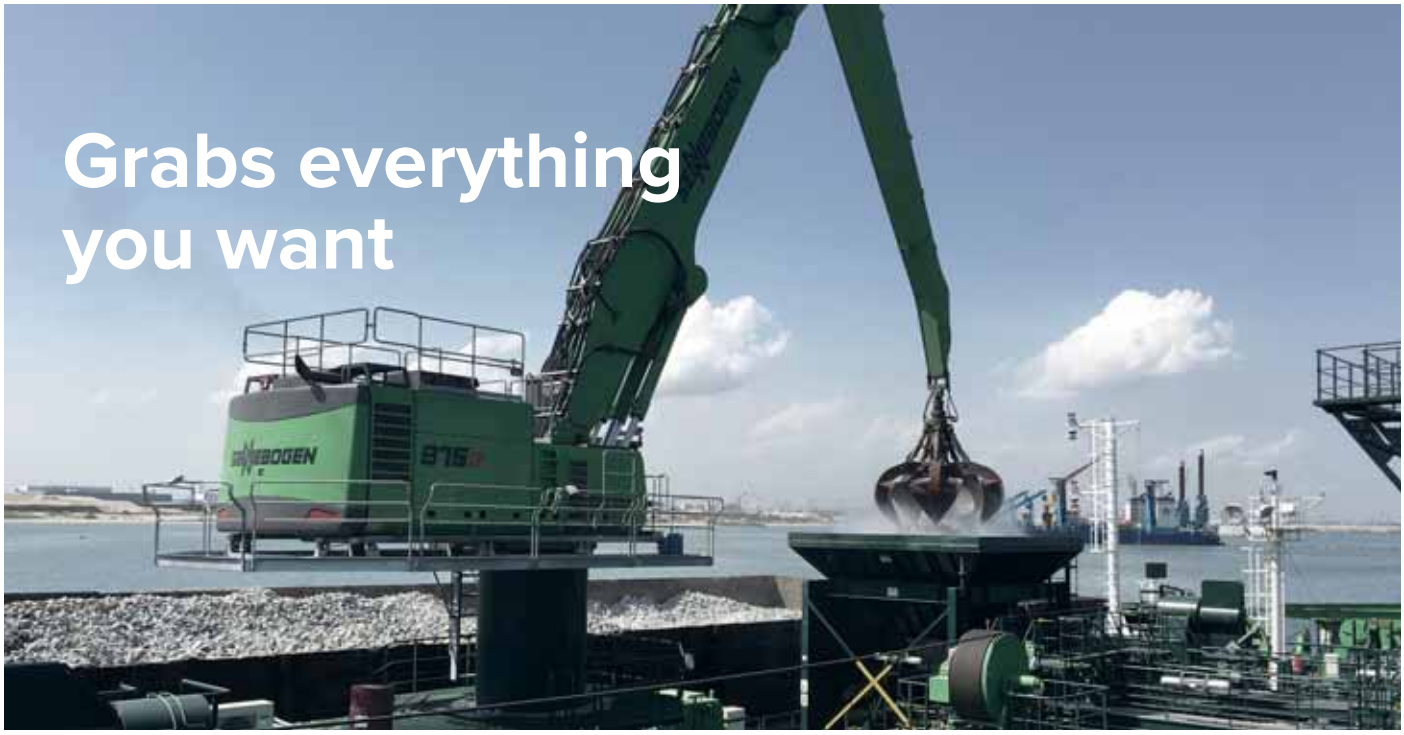
J&B is a dealer for Indexator and is official Indexator Service Centre.

Most of J&B's hydraulic grabs are fitted with this rotator, which is available from seven to 30 tonnes. J&B can also supply the other rotator types available and all parts at Indexator.

J&B Grabs

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!

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Large inventory of parts for Krupp bucketwheel reclaimer and other dry bulk handling equipment. See these two below:

Left: *Krupp bucketwheel reclaimer - slewing gear box*
Below*: Krupp bucketwheel reclaimer - bucketwheel drive gear box*

Optional turnkey design-build of overland conveyors by Agrico Sales available

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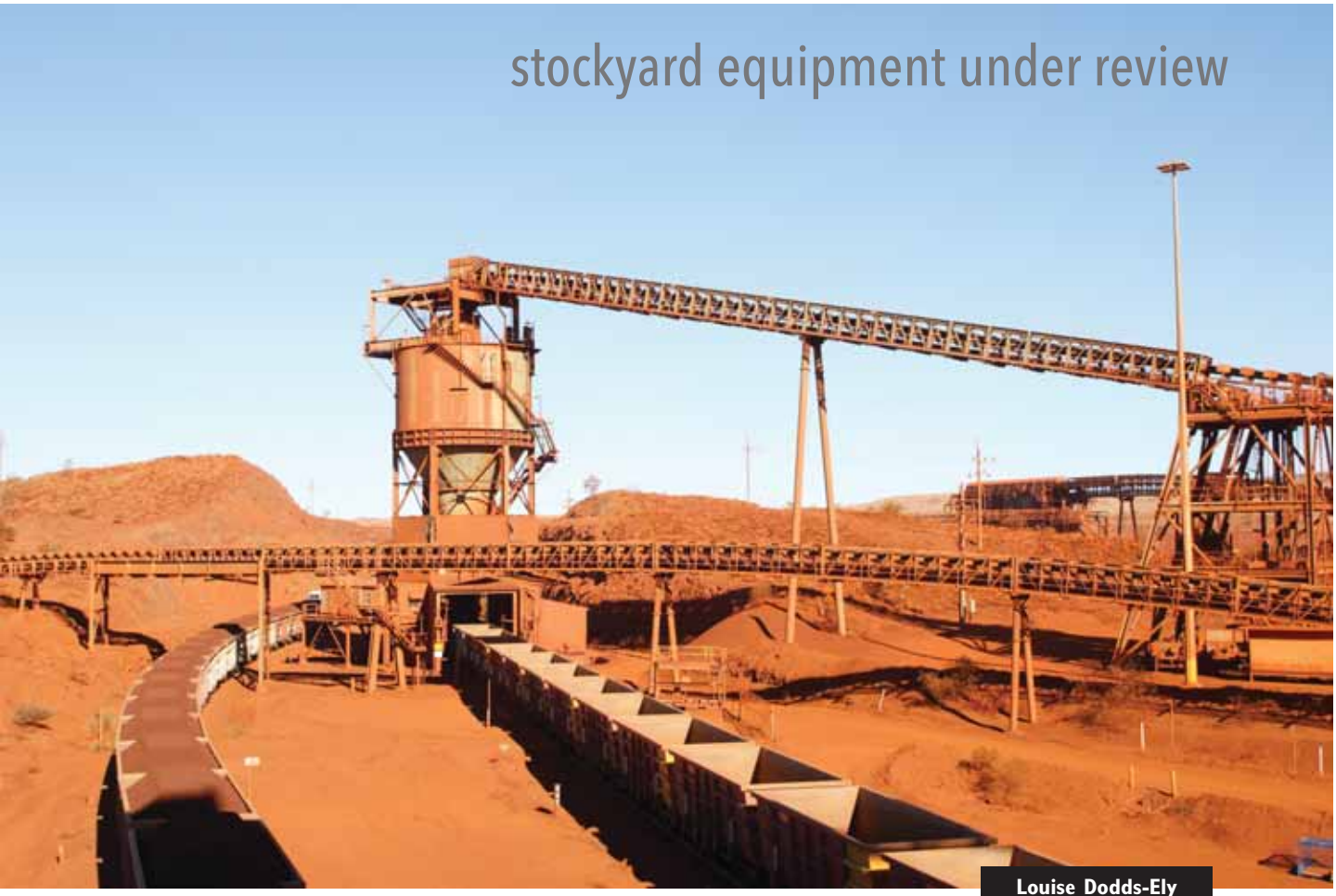
MGB & COMPANY

Smooth operators in the stockyard

stockyard equipment under review



Louise Dodds-Ely

Accurate, high performance train loading systems for any application

The solution

Schenck Process train loaders are designed to load safely, efficiently and accurately while maximizing the use of the capacity in each wagon. Schenck Process manufactures volumetric and gravimetric (batch) train loaders, supplied globally, for any applications that require wagons to be loaded with bulk materials.

Schenck Process train loaders are easy to use with flexible options for loadout operations. Manually controlled and automated systems are available with the ability to control at local control stations or remotely (on or off site). High speeds and loading rates can be achieved while maintaining the ability to adapt to change.

Schenck Process in-house capabilities in the fields of materials handling, structural, mechanical, electrical and controls systems engineering, together with its major partners in hydraulics, work to high levels of standards to deliver robust solutions. Together with its extensive after-sales service, it is an ideal partner to deliver whole life solutions. Schenck Process can also incorporate electrical and PLC control of the clients' materials handling system into the train loader design if required

Reliable operation

Schenck Process train loaders are designed to operate reliably in the harshest environments. Extreme temperatures, dust, and water are commonplace in loading operations. Schenck Process train loaders will not only handle this harsh environment, they will operate reliably, consistently and at the rated performance for extended periods.

Low maintenance requirements

Extensive use of high quality materials, protective coatings, electrical equipment and hydraulic components ensure the reliable operation of a Schenck Process train loader throughout the life of the operation with only routine maintenance. Sealed and automatically greased bearings are used throughout the system.

Material handling expertise

Schenck Process has been supplying Train Loaders since 1978, with over 100

installations globally, with many of the original loadouts still in operation. It understands that the train loader is a critical point in the value chain of the operations, and as such there is no room for downtime as this can lead to significant revenue loss.

The performance of a train loader is often limited by the operation of the stockpile/reclaiming system and the train loader surge bin. While both are separate systems, they operate in concert to achieve a given performance. Poorly designed reclaim systems, insufficient train loader surge capacity or poorly flowing bin design can significantly downgrade train-loading performance. Equally it does not make good economic sense to provide excessive reclaim or train loader surge capacity. The two systems need to be designed with the performance and requirements of the other being considered.

The Schenck Process loading systems team has extensive experience in materials handling, and stockpile reclaim systems. Schenck Process's engineers are available to assist its clients with materials handling system design, thereby optimizing operation of the reclaim system and train loader, while at the same time considering capital expenditure constraints.

Upgrades and improvements

Schenck Process is also able to improve existing train loaders through upgrades from automation to track scales and general process improvements. Schenck Process can undertake a fitness check and recommend solutions to make clients' train loaders more efficient, improve loading times and throughput, improve loading target in each wagon, reduce operating costs or improve the safety of the system.

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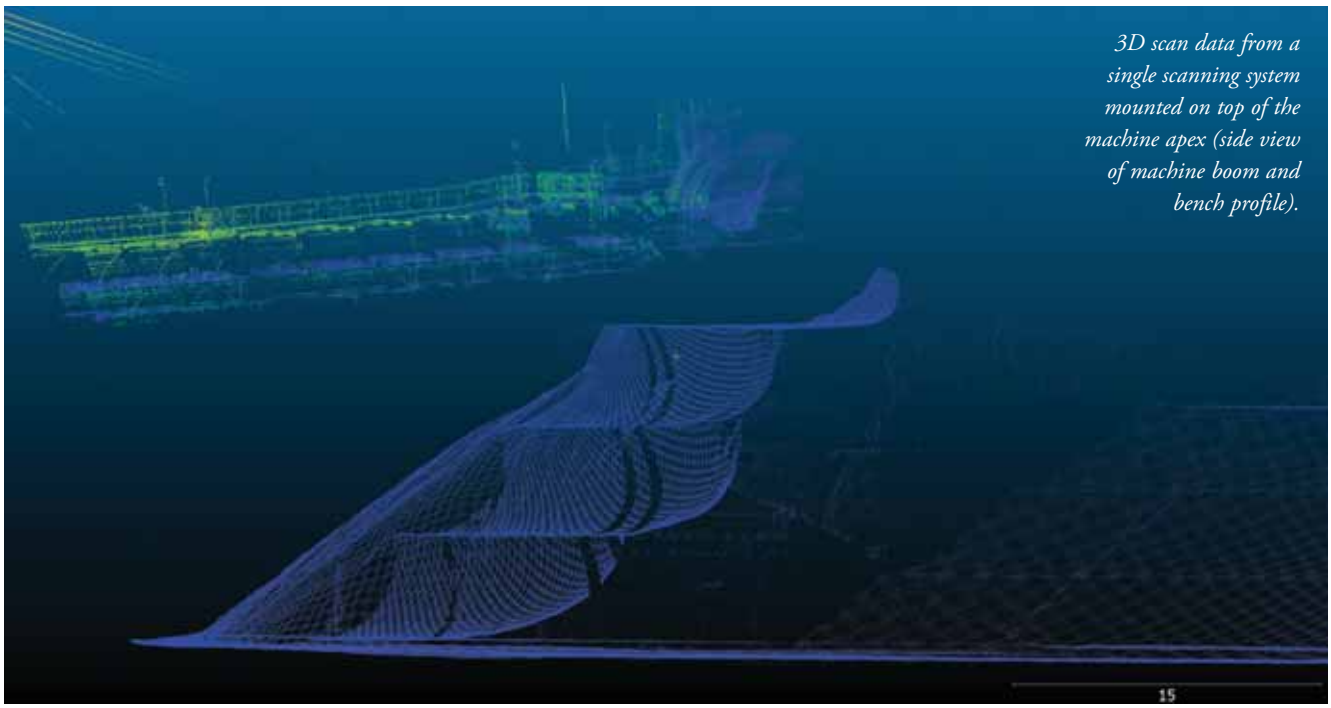
Autonomous stacker/reclaimers with 3D real-time control by iSAM



3D scan data from a single scanning system mounted on top of the machine apex (side view of machine boom and bench profile).

iSAM built the first fully autonomous stacker/reclaimer in the Port of Hamburg in 2000. To date, there is still no better alternative to the fundamental technology behind the system — 3D LiDAR and RTK GPS.

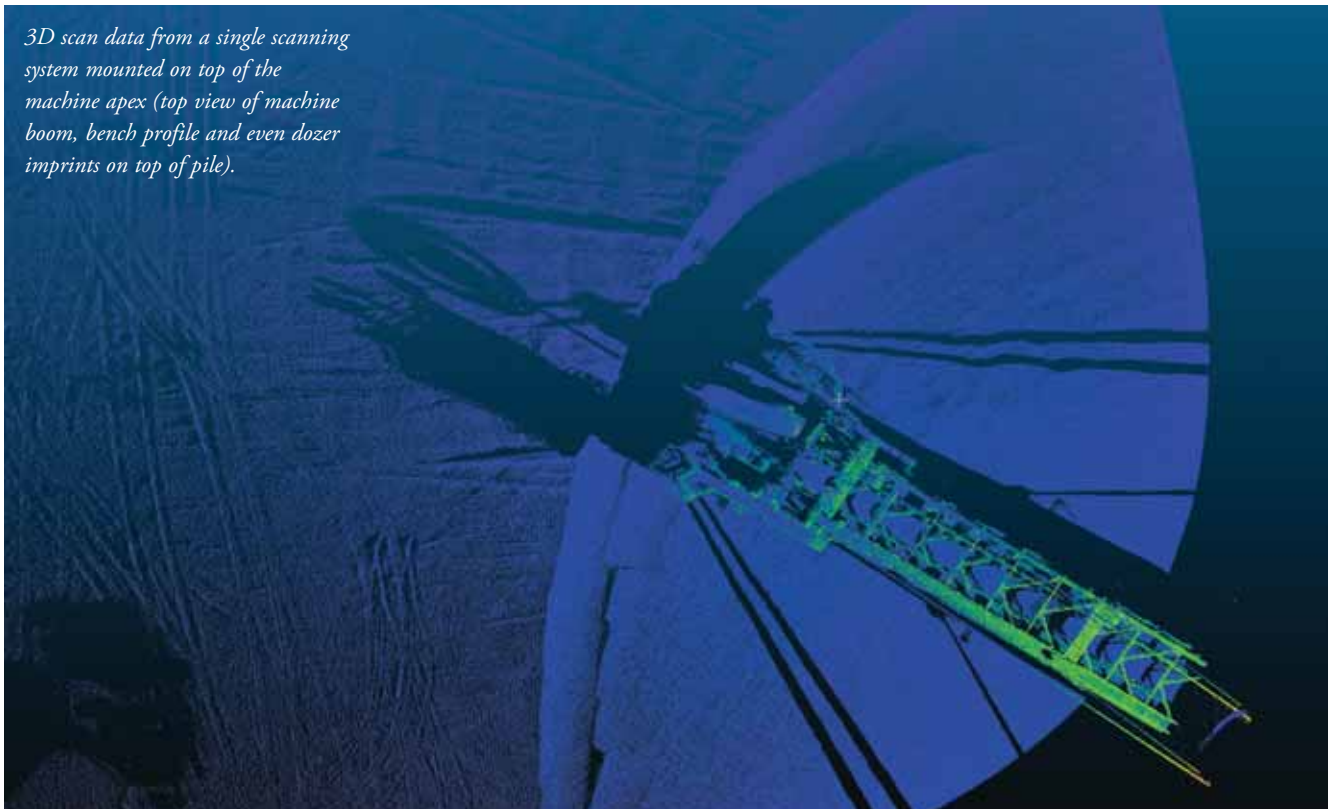
However, for the recent upgrade of Westshore Terminals facility at Roberts Bank, Canada — North America's largest and most advanced coal terminal — iSAM elevated it to a new level of speed, performance and capability using the best technology available today. The key improvements are a real-time capable, obscurant penetrating scanner and the full virtualization of the control system, eliminating the need for a control PC on the machine.

The new 3D LiDAR delivers 200,000 points/second, focused around the bucketwheel, thus allowing true 3D reclaim control. While volumetric reclaim control has been part of the system since 2011, the new high-speed scanner allows a much better handling of 'landslides' close to the bucketwheel. Furthermore, it uses a 1,500nm wavelength laser, easily penetrating even dense fog or dust.

The higher scan rate would normally require a much more powerful processing unit right on the machine where it would be exposed to high vibration levels and other environmental influences. But at Westshore, only the sensors themselves are out on the machine, all the processing takes place on a fully redundant ESXi server which is located in the central data centre. Apart from minimizing system downtime due to fewer components on the machine, the central location allows a much easier maintenance of the system.

Terrain model

Using state-of-the-art scanner technology combined with a link to multi-constellation GPS receivers allows generating a terrain model with a high degree of accuracy in real time. The terrain model is the basis for calculating individual movement commands



3D scan data from a single scanning system mounted on top of the machine apex (top view of machine boom, bench profile and even dozer imprints on top of pile).

for the three movement axes of the stacker/reclaimer. Algorithms stored in the system secure the optimized stacking of stockpiles and ensure a strategic reclaiming of the material. This results in high and constant outputs without overloading the stacker/reclaimer. The real-time terrain model guarantees that even stockpiles that have been stacked unconformable in manual mode or trimmed by wheel loaders may be reclaimed automatically.

The 3D scanner detects bulk materials from a distance of more than 200m. Therefore, it is possible to mount the scanner on machine's apex — away from the zone of dust emissions and vibrations around the bucketwheel.

To define a job order, the operator in the central control station just needs to enter the storage location, the amount of material as well as the desired strategy for stacking or reclaiming. After release of the operation, the stacker/reclaimer automatically moves to the calculated starting position and handles the order. During reclaiming, first cuts and changes of cuts are carried out completely automated, without the 'air digging' often seen with conventional automation approaches during the first slews or turnaround points.

Highlights

- automated 24/7 operation under virtually any weather conditions;
- no loss of time due to additional scanning runs; permanent update of the terrain model;
- output comparable to values that can be achieved in manual mode with qualified operators;
- short return on investment due to:
  - optimized stockyard utilization as a result of flat-surfaced, trapezoidal stockpiles with an almost perfect layout ensuring optimum reclaiming performances; and
  - less 'air-digging' and bucketwheel overloads resulting in homogenous material flow during reclaiming
- automated stacking and reclaiming even by difficult stockpile geometries — also after landslides during rainfall or manual processing by e.g. dozers;
- operation of several stacker/reclaimers by one person from a central control station; minimum stress for the operator because of a high degree of automation;
- less wear and tear because mechanical performance limits are respected in automated mode;
- neat representation of the overall stockyard with colour coding for the stockpile heights; support for an easy terrain and job planning; and
- reduced environmental impact (for example, dust emissions and energy consumption) by automatically minimizing the distance between boom and stockpile.

About the company

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

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

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

TAIM WESER's stockyard solutions optimize its customers' logistics processes

Phosphate bucketwheel reclaimer with 3,000tph capacity.

Continuous industrial growth throughout the last century has enhanced the need for raw materials handling on a global scale. These materials, starting from their geological origin, passing through the various process industries as well as land and sea transport, have created demanding requirements in the bulk materials handling industry.

Conveying, storage, stockpiling and homogenization and blending of bulk materials are the main processes of the bulk handling activity and stackers, reclaimers as well as combined stacker/reclaimers are the ideal machines to perform them at terminals, stockyards and transfer sites.

TAIM WESER has significant expertise in the supply of custom-designed durable and reliable stockyard solutions to meet the specific needs, site conditions and requirements of each customer.

The type of material, capacity requirements, purpose of the facility, yard limitations, local regulations and environmental conditions are crucial factors in the design of the required stockyard equipment. That is why offering a tailor-made solution is important to optimize the efficiency and environmental awareness of the material handling process, as each site is different.

TAIM WESER's stockyard equipment, whether individual equipment or complete installations, can be placed in new materials handling facilities as well as integrated into existing installations, with the aim of facilitate, improve and optimize the logistic process required by customers.

TAIM WESER's scope of supply includes all types of reclaimers — bucketwheel portal, bridge, frontal, cantilever, circular-, fixed or travelling stackers, combined bucketwheel stacker/reclaimers, circular and longitudinal stockpiles, either open or covered, kidney stackers as well as train and truck loading and unloading stations and shiploading systems.

TAIM WESER is able to provide the optimal stockyard equipment solution to meet its client's needs within all the industrial sectors including power, ports, iron and steel, fertilizers, oil and gas, mining and cement industries and covering a wide range of bulk materials including, petroleum coke, sulphur, phosphates, coal, clinker, grain, fertilizers as well as other minerals.

At this moment, TAIM WESER is working on some relevant stockyard equipment installations around the world. In the Middle East, the company recently finished the start-up of two luffable and slewable iron ore stacker-reclaimer machines with a capacity of 800tph (tonnes per hour) stacking and 2,000tph reclaiming. Also in this region, TAIM WESER is in the final stages of commissioning of a further two luffable and slewable stacker-reclaimer machines for iron ore handling, with capacities of 1,500tph stacking and 600tph reclaiming.

The Spanish company is also involved in the assembly stage of a project consisting of the design, manufacture and supply of a belt conveying system and storage system for sulphur in two circular stockpiles at a refinery. The circular storage system includes two big aluminium circular storage domes, to protect the environment with lower dust emissions, equipped each with a slewing/luffing boom stacker and a scraper reclaimer machine, cantilever type, with 150tph stacking and 1,500tph reclaiming capacities and supported on a central

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TAIM WESER

120th anniversary 1899 - 2019

Combined stacker/reclaimer for iron ore with a capacity of 800tph stacking and 2.,000tph reclaiming.

column, around which it rotates. The project is now in the assembly stage.

In Asia, TAIM WESER is working on the material handling system for the largest coal port terminal in India, once finished. The scope of supply include three combined slewing and luffing bucketwheel stacker/reclaimers, with capacities of 5,500tph stacking and 4,500tph reclaiming of coal.

In addition, the company is developing a thermal power project consisting of a new port terminal to supply coal to a coal-fired power plant in Bangladesh.

TAIM WESER's broad and impressive track record on large international projects has helped strengthen and consolidate its presence in the stockyard equipment, conveying systems, loading and unloading as well as lifting markets at worldwide level, with several projects developed in the last few years in Europe, South America, Middle East and North Africa, and others currently under execution.

TAIM WESER: INNOVATION AND TECHNOLOGY

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

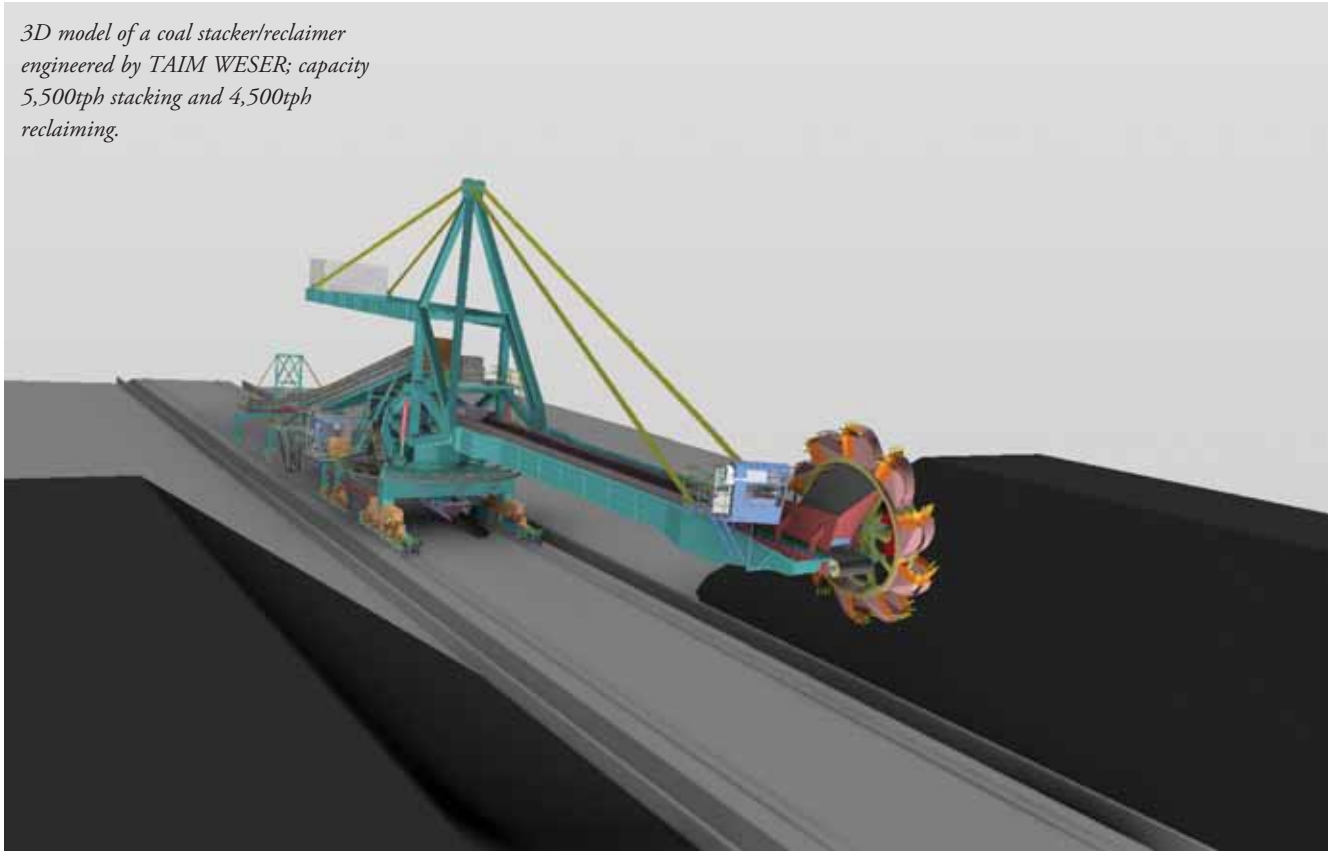
TAIM WESER is proud to celebrate its 120-year anniversary of providing solutions in the fields of lifting and handling materials equipment.

Over the years, TAIM WESER has established itself as one of the world's foremost companies with installations in more than 65 countries and continues to strengthen its global presence, positioning itself as a reliable key partner in developing solutions for its customers.

The company's headquarters are located in Zaragoza (Spain), in a 64,000m^2 installations, 23,500m^2 of which are covered and assigned to production processes. In Germany, the group has an office in Bad Oeynhausen and in Brazil, a plant in Curitiba (PR).

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

3D model of a coal stacker/reclaimer engineered by TAIM WESER; capacity 5,500tph stacking and 4,500tph reclaiming.



Stack it high with help from FLSmidth's BulkExpert™ automation system

Automation systems are more accurate than any person ever can be. By automating berth stockyard operations, BlueScope Steel cuts operational costs, maximizes stockyard area utilization, boosts throughput and hedges against uncertainty.

Despite the potential for digital automation to make operations far more efficient, past experiences with automation projects going over budget or overshooting deadlines have created hesitation in the industry.

BlueScope Steel commissioned FLSmidth's BulkExpert™ automation system, a 3D scanning technology, at its Port Kembla stockyard in Australia, three years ago. The initiative has provided BlueScope Steel with valuable experience to help shape their future automation projects.

Operational opportunities

When lump ore and fines unload from a ship, they are stacked to the primary or secondary yards with large volumes of iron ore in continuous transit. Each incoming Capesize vessel carries another batch to be unloaded and reclaimed. The average turnaround time is seven to ten days for the mixing bed.

When the stacking operation is down, it limits the offloading operation and ships have to stay at the berth. This potentially increases demurrage charges — the longer the cargo stays on the terminal.

"Process control and stability at maximum feed rates are some of our key metrics, hence our stacker reclaimer operations were identified as an area of opportunity for automation," says Derek Sheppard, maintenance and asset development manager at BlueScope Steel.

The company considered different options, ranging from complete replacement of the massive machines, which date back to 1974, to simply refining existing processes.

"We determined that upgrading our existing stacker reclaimers was the best option in terms of return on investment. This allowed for automated operations based on orders entered by engineers from a control room environment," he explains.

The old machines with original electrical equipment showed significant corrosion from working in harsh environments. To find the right solution, BlueScope Steel assessed the capacity of the machines and determined that the design throughput rate was sufficient and compatible with the rest of the materials handling equipment.

Sheppard says, "After factoring in restoration, we explored options for automation to help ensure repeatability of processes, and that our equipment would operate within design parameters."

A revelation

For BlueScope Steel, shipping discharge rates and utilization of stockyard are areas where automation realizes significant operational efficiencies. Even though the payback of less than 18 months is convincing, the BulkExpert system also provides data on the equipment performance, which can reduce or prevent overload or damage, such as to conveyor belts.

"We knew that operational damage did occur, but we didn't know the extent to which it was happening until we saw the outcome of automating. It was a revelation to us," Sheppard admits.

In preparation, BlueScope Steel had met with other BulkExpert customers to understand the full scope of the benefits, some of which are difficult to quantify.

Besides significantly reducing operating costs, improved throughput and the reduced risk of demurrage, other benefits include well-structured stockpiles and real-time accounting of stock inventory levels. Automatizing the stockyard reduced flowrate variances by over 40% and stacking/reclaiming throughput increased by 90%: from 10–12,000 to 19,000tph (tonnes per day).

Keep focusing on profitability

Port Kembla, like all integrated steelworks, faces the ongoing challenge of achieving and maintaining manufacturing efficiency to remain profitable throughout the commodity cycle. Sheppard sees automation as the route to ensure effective operations and hedge against uncertainty. "Additionally, labour also adds a significant cost and will always have to be managed to ensure that manufacturing remains cost effective."

The choice between automation versus manual operations inevitably comes down to a financial ROI with efficient, complex and repeatable manual operations having greater longevity over the contrary, according to Sheppard.

"As technology develops and pricing becomes more affordable, the opportunity for digitalization and automation increases. You need to bring the operation to such a profitable level that you are not worried what the steel price will be tomorrow," he adds.

Spot price trading with real-time inventory survey

The BulkExpert™ system gives a real-time overview of stockyard inventory allowing for spot-price trading. With data to the decimal, companies can replenish stock or sell when the spot price is right. Currently, stock is guesstimated weekly, making such strategic buying or selling impossible.

Bauxite, coal, iron ore, limestone, quartz, sinter, coke, gabbro, urea, ammonium nitrate and phosphate are some of the commodities handled by BulkExpert.

The best proof of good customer relations

NEPEAN Conveyors Oy/ROXON in Finland has a long reference list of material handling systems, conveyors, feeders, stackers, reclaimers and shiploaders under its belt. Each company might use whatever superlative wording in its advertising, but the absolute test of a company's ability is if the client comes back to purchase twice (or even more often). ROXON has existed since 1960s, and there are several examples of long-time client–supplier relations. One of the longest relationships for ROXON is without a doubt its long history of supplies to Swedish mine company LKAB.

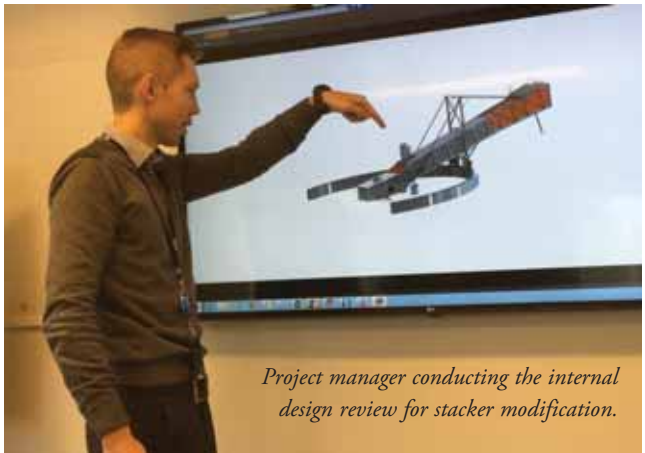
Stacker in 2006 after taking over.

Over the years, ROXON has delivered literally hundreds of conveyors for LKAB mines in northern Sweden and Norway. In addition to conveyors, also stackers, reclaimers and shiploading facilities have been delivered to the same client. One of the projects involved a stacker delivery to LKAB Malmberget in 2005. For those of you who do not know, Malmberget is one of the LKAB's mine sites above the Arctic circle in northern Sweden, where temperatures can get close to –40°C in winter and the sun does not rise for weeks. In other words, very harsh conditions for a material handling system.

The stacker in question is a radial, rail mounted, stacking conveyor inside a gallery that is pivoted from a fixed point and originally turning 130°. After almost 15 years in service, it is still operating without problems. LKAB is a company that operates hundreds of conveyors every day and knows how to maintain and keep conveyors running for decades.

Last year, ROXON received a question from the client if the stacker could be modified for larger stockpile. This would require lengthening of the boom and possibly related changes in the bogie and gallery structure. ROXON made offers to deliver both a new bigger stacker and a modification of the existing one. Later LKAB management decided to go for modification and ordered the modification in 2019.

Time typically is money, as the old saying goes. This is more than true for process plants and mines, who try to keep their equipment up and running almost 24/7 and minimize service shutdowns. LKAB is no exception to this and the time window for the modification is the usual seven to ten days in May 2019. This requires careful installation and modification planning, which was done in close co-operation between LKAB personnel, ROXON engineering team and the ROXON local service team in Sweden. When an old stacker is lifted to change bogies/wheels, its forward part is changed for a longer reach and pylon installed on top, planning can not be made on an engineer's desk in the office but rather in the field by the stacker. In addition, such planning can only be conducted by professionals, like ROXON's Simon Salmela from Gällivare, who has decades of installation/dismantling/service experience. Hands-on experience, combined with high quality engineering, will give the best possible result and make it possible to make this modification in given time in May. Due to the tight schedule, ROXON's installation planning also includes having the chief engineer on site during installation. In this way, the possible problems and questions can be answered in a shortest of time to avoid any delay for the project.



Project manager conducting the internal design review for stacker modification.

After modification planning, the practical plans were shifted to 3D-models and drawings of the parts to be modified and fabricated. When time spans are short, purchasing also needs very special attention from project organization and expediting to have all the parts at site when the work starts. To make sure there will be no technical problems with the stacker during operation, ROXON internal procedures require several design reviews. Risk assessments are also carried out to find out and avoid risks when operating and maintaining the machine.

Stacker modifications will include the following: changing the bogies and wheels to bigger ones to withstand the higher own weight; longer gallery; wider slewing of the stacker; pylon to support the longer gallery; dust removal unit; and a new sliding door to close the chute when the stacker is not in operation.

An interesting detail in this modification project is that ROXON not only has long lasting customer relations, but also very long supplier relations of its own. The engineering team, who designed the modification, still partly consists of the same people who designed the original delivery some 15 years ago. This made it faster to find old calculations and models from the old hard disks. And the experienced designers did not need a long kick-off meeting before they knew what needed to be done.

This kind of a project is a proof that long-lasting customer relations are a win-win for both the purchaser and the supplier. The supplier knows that if the work is properly done, the purchaser will come back one day and ask for a quote for a new project. The purchaser knows that long relationships with suppliers end up with less money spent when engineering, planning and installation take less time compared to using a new supplier every time.

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DemcoTECH Engineering: state-of-the-art technologies and design tools for stacking and reclaiming

At the heart of stockpiling and storage of bulk materials handling are the stacking and reclaiming processes, activities that are performed by equipment, which, whether working as a system or individually, operates all year round and is exposed to temperature extremes, moisture, abrasive material, dust and other contaminants, in addition to having to withstand severe operational loads. This equipment requires state-of-the-art design to ensure that it not only operates at the desired performance levels but is also sufficiently robust to provide a long service life, according to materials handling and niche process plant specialist, DemcoTECH Engineering.

"As a result, DemcoTECH's strength in powerful simulation techniques and FEA analysis was critical to its appointment as engineering contractor on Vale's multimillion-dollar Teluk Rubiah maritime terminal project in Malaysia," adds DemcoTECH Engineering General Manager, Paul van de Vyver. "For example, amongst other simulations and analyses on the overall project, we performed FEA on the stacking, reclaiming and ship-offloading machines purchased from a China-based supplier for the project."

DemcoTECH was involved from feasibility through to commissioning for the project, establishing the distribution centre, which includes an iron ore stockyard with blending facilities, an import and export terminal, as well as sampling facilities. Appointed to engineer the materials handling system, DemcoTECH provided the conceptual design of the 60mt (million tonnes) a year terminal and the materials handling layouts, as well as the design and basic engineering for the entire materials handling system, specifying all the mechanical equipment, adjudicating all the technical portions of the tenders and auditing and ensuring the final designs were suitable for the project.

In a more recent project for the regional ports and terminals sector, DemcoTECH's expertise in stacking and reclaiming was rewarded with a turnkey contract for a prestigious sulphur handling project in Malaysia

Materials handling for sulphur project in Malaysia.

The materials handling contract included the materials handling system from the delivery and stockpiling of the sulphur, through to reclaiming and loading the sulphur onto ships for export purposes. The contract included design, engineering, supply, construction and commissioning of the entire system. The major equipment included the rail mounted stacker and portal scraper reclaimer, all the conveyor systems, including a multi-curved 2.2km-long pipe conveyor, and the quayside belt conveyor, which in turn feeds onto the rail mounted ship loader. The equipment was fully integrated with the jetty design.

As DemcoTECH follows a global procurement strategy in order to optimize cost-effectiveness without compromising on quality, components and portions of equipment were sourced from five different countries, while the erection of the plant in Malaysia maximized the use of local labour

Lětseng Diamond Mine stacking conveyor with a new angled raking trestle.

as a requirement of the client.

"Environmental considerations were also a priority of the project with the stockpile being contained and isolated to prevent contamination of the surrounding area. In addition, our pipe conveyor was selected as an environmentally friendly method of conveying material due to the fact that it is a fully enclosed method of conveying material on a completely open jetty, fully exposed to the elements. The elimination of transfer points also reduced the potential for spillages and dust generation as did the inclusion of a state-of-the-art telescopic chute on the shiploader," notes van de Vyver.

Lětseng: the drive of the 24m-high boom of the ROM stacker was relocated down to ground level for ease of maintenance.

In Lesotho, DemcoTECH has been involved from 2008 at Lětseng Diamond Mine, initially to supply the tailings disposal system as part of the establishment of a second diamond treatment plant at the mine (Plant No 2).

In more recent work DemcoTECH completed the conveyor design and expansion layout to increase the tailings dam size in order to be able to handle an expanded throughput, and in a later contract focused on upgrading part of the mine tailings materials handling capability.

The above included upgrading the run-of-mine (ROM) stacking conveyor to enable the tailings system to handle the higher capacities resulting from Lětseng's Project Kholo, which, amongst other objectives, aimed at increasing ore throughput. Improvements included installing a new rake trestle as well as relocating the 160Kw drive from the head end of the 33m-high boom and relocating it at ground level near the tail end for ease of maintenance. This entailed an entire review and redesign of the conveyor structure.

"The fact that Lětseng is the highest diamond mine in the world, located at an altitude of approximately 3,200m and with ambient temperature ranging from about –18°C to 30°C, presented numerous challenges during the design of the equipment in order to withstand these conditions, as well as during construction and commissioning in this hostile environment," adds van de Vyver.

DemcoTECH also completed a materials handling system for the disposal of dry tailings at Liqhobong Diamond Mine in Lesotho in under a year. The system included a 15m mobile slewable stacker, which is self-propelled, being driven on all four wheels.

"Our expertise in stacking and reclaiming has enabled DemcoTECH to establish a solid footprint, both in Southern Africa, further north in Africa and offshore," notes van de Vyver. "Our extensive track record in developing stockyard facilities now covers Africa, the Far East and Eastern Europe.

"In addition to the state-of-the-art technologies, much of our success has been due to our ability to cover the complete scope of project services from concept development, feasibility studies and audits though to project execution."

Rendering of Teluk Rubiah maritime terminal project in Malaysia.

ABB launches new digital application to optimize dry bulk material handling for stockyard operations and beyond

New ABB Ability™ Stockyard Management System enables fully integrated collaborative operation by connecting all available information and process data to optimize bulk material handling terminals and stockyards of coal-fired power plants, steel plants or mines.

Offering sophisticated material tracking and quality management, the new ABB Ability™ Stockyard Management System increases the efficiency of stockyards in connecting consecutive steps in complete materials transportation chains.

ABB Ability™ Stockyard Management System enables seamless integration in production planning, providing real time information on handled material and supports the management of one or multiple inputs and outputs of different material qualities, storage, mixing and blending.

It is a configurable system that can be used to digitalize the complete material handling chain. The material flow can be modelled across all belt conveyors and transportation equipment with material properties and quality information via automated data interfaces.

"This application is the latest example of how ABB as a pioneering technology leader in digital industries is helping our customers to realize the true potential of digital to optimize their operations and achieve a certain quality of outgoing material," said Franz Rietschel, global product manager for Stockyard Management System. "Just-in-time or even just-in-sequence is long-established in the automotive industry; now these techniques are available for bulk material handling logistics too."

Notable state-of-the-art features of ABB Ability™ Stockyard Management System include:

- Calculated stacking model built up according to the tracked material and acting as a 'digital twin' of the stockyard. This provides the operator with an inventory overview at any time, without the need of an extra survey. All data can be used for operational optimization such as efficient space utilization in a yard, better planning and scheduling, or more accurate mixing and blending processes.
- Control and prediction of the material flow in various lines with material forecast, tracking and production history.
- The ability to co-ordinate all excavators in the mine or yard machines in the plant at the right position with the right timing to realize a proactive production control which enables online mixing material according to tracking, forecasting and online quality control.
- Laser scanners or drones which can provide additional surface information of their environments enable a nearly real time update of the pile surface even after material movements due to environmental influences or due to the use of mobile machines.
- A 'slice view' feature which allows operators a look at the inside of a pile to check the material mix and quality, determine its arrival time or changing material properties when more accurate information are available.
- Modelling for intra-supply-chain quality optimization allowing operation staff to view tonnes and grade by digging position and belt scale values according to geological model and online analyzers which provide information on the various material properties.
- Automated Interfaces to different systems provide a seamless workflow from ERP to control system for mine, plant and stockyard operations. An integration of PIMS, MES, production-, maintenance- and down time planning or laboratory management systems combines all available information for analytics at the right time.

ABB Ability™ Stockyard Management System employs sophisticated data collection and configuration to manage interfaces with various IT and OT applications and systems:

- Connectivity to IT and ERP systems through web services, TCP/IP socket communication or direct database access.
- Data interfaces OT automation systems thru OPC and if OPC is not supported thru low level data interfaces based on data wrappers.

The new ABB Ability™ Stockyard Management System is the latest addition to the portfolio of ABB Ability™ digitally-enabled industry solutions, products and services. Developed out of years of sector expertise and customer insights, ABB Ability facilitates automation, the integration of data and the real-time optimization of mining and plant processes.

ABB is a pioneering technology provider with a comprehensive offering for digital industries. With a history of innovation spanning more than 130 years, ABB is today highly respected in digital industries with four customer-focused, globally renowned businesses: Electrification, Industrial Automation, Motion, and Robotics & Discrete Automation, supported by its common ABB Ability™ digital platform. ABB's Power Grids business will be divested to Hitachi in 2020. ABB operates in more than 100 countries with about 147,000 employees.

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"A man who stops advertising to save money is like a man who stops a clock to save time"

- Henry Ford

HAUK & SASKO's solutions keep stockyards in order

Technological developments

HAUK & SASKO supplies digital IT and technology solutions for industrial applications. It helps its customers to optimize processes and increase performance in the following areas:

- operations management systems/ stockyard management systems in mines, bulk terminals and plants;
- fuel management systems for solid/ liquid bulk, natural gas and waste-to-energy;
- material flow management systems for biomass and agri-commodities;
- truck logistics solutions and systems integration; and
- carbon and emission trading systems.

The product

In the information systems division, based in Stuttgart, HAUK & SASKO offers the latest software technology to proven standard solutions such as the web-based material flow and stockyard management system MBS®.

MBS covers all fuel and material flows and supports all related business processes in a single integrated system. The system has a modular design and offers functionality and reports that have been designed to match the processes for each individual commodity. MBS unites technical and commercial data in a central data repository.

The data is captured only once at its origin and becomes available everywhere instantly. Besides the fuel management and material flow management functionalities, MBS also covers emissions monitoring, stockyard management and interfaces with counterparties such as shipping companies. This comprehensive approach provides increased productivity and greater transparency of data.

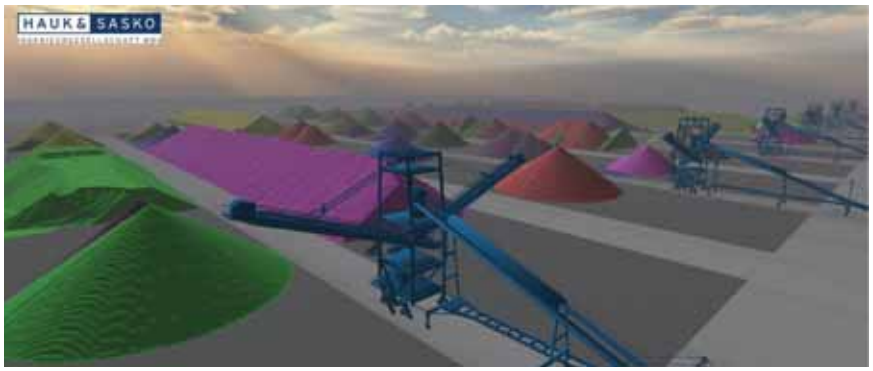
Simulation and visualization of the material flow is based on

- geographic data from the stacker/reclaimer;
- data from belt weighers/material flow;
- material quality analysis data; and
- material logistics data.

Stockyard management application

The MBS stockyard management system is an advanced tool which assists in the operation of bulk stockyards. This solution provides stockyard operators with tangible benefits through stacker/reclaimer automation, increased efficiency and more transparency.

The system provides an accurate



three-dimensional model of the stockyard, which indicates the pile shape and the material distribution within the stockpile. MBS transforms bulk storage facilities into precisely controlled tools to efficiently support its clients' production processes.

- **Material logistics database software:** The system allows the user to track material movements. For every material batch, MBS captures data on quantity and the quality parameters. Quality data can be a single parameter (e.g. product ID) or alternatively, it can be a set of quality parameters (to be configured during the commissioning of the software).
- **3D stockpile simulation – mathematical model:** MBS includes a mathematical model that generates a 3D image of the stockpile contour and the content (distribution of materials within the pile).
- **Sensor based model updates (option):** the data acquired is used to update the simulation model whenever major differences are detected and will be fed back into the machine control system so that it can be used for automation tasks.
- **Manual model adjustments:** MBS clears the area with one click of a button in the user interface without needing to scan the piles.

Benefits

- save costs & improve operation;
- improve quality management;
- optimize processes;
- reduced workload; and
- data integration.

Commodities

MBS® supports a large variety of commodities:

- primary energy sources such as steam coal, oil, gas;
- bulk materials such as ores and minerals;
- substitute fuels such as biomass, sewage sludge or meat-and-bone meal;
- additives for power plants such as ammonia or limestone;
- combustion by-products such as fly ash or FGD gypsum; and
- Emissions such as CO_2.

Major clients

In over 65 years of company history, HAUK & SASKO has successfully realized a multitude of projects for diverse customers. Many of its customers are enterprises listed on the stock exchange starting from energy and disposal to chemistry and pharmaceutical, food and trade as well as the manufacturing industry and service branches. Also small and middle-class companies trust in its customization of standard IT solutions.

Examples of customers include:

- EnBW;
- RWE;
- QPMC;
- STEAG;
- VATTENFALL; and
- UNIPER.

About HAUK & SASKO

The HAUK & SASKO Engineering mbH was founded in 1950 as an engineering firm for electrical engineering in Bochum, Germany. In 1981 the Information Business Unit was launched in Stuttgart.

HAUK & SASKO is a software specialist for web-based information and material flow management.

The company has profound know-how in the field of information technology and considers itself a competent consultant, putting its expertise and experience into preparing comprehensive solutions to project-specific situations.

The solutions it offers are based on its own software products MBS® and UKIS®. In addition, it is are able to integrate its applications in the current IT landscape of its customers.

Making man and machine work in harmony: the importance of good cabin design

In any discussion of how to run an efficient and safe dry bulk handling facility, the focus is often on equipment rather than on the people and their work environment. This can create problems. It doesn't matter how technologically impressive the equipment in the stockyard is, if the operator is fatigued, uncomfortable and has poor lines of vision, that will affect productivity and can create safety risks.

This is where ergonomics — the study of efficiency in the working environment — can play a role. In a dry bulk facility, an ergonomically designed work environment ensures that the operators of stackers and reclaimers are working in a comfortable space that promotes their health and enables them to stay focused on the job.

There is still some way to go in this industry. "Awkward posture and vibration continue to affect operators' wellbeing" says Stephan Stiehler, director of marketing – Asia Pacific & Middle East, for Brieda Cabins. "Ergonomic control stations can alleviate these problems, reduce injury and increase efficiency," he added.

The benefits of good design

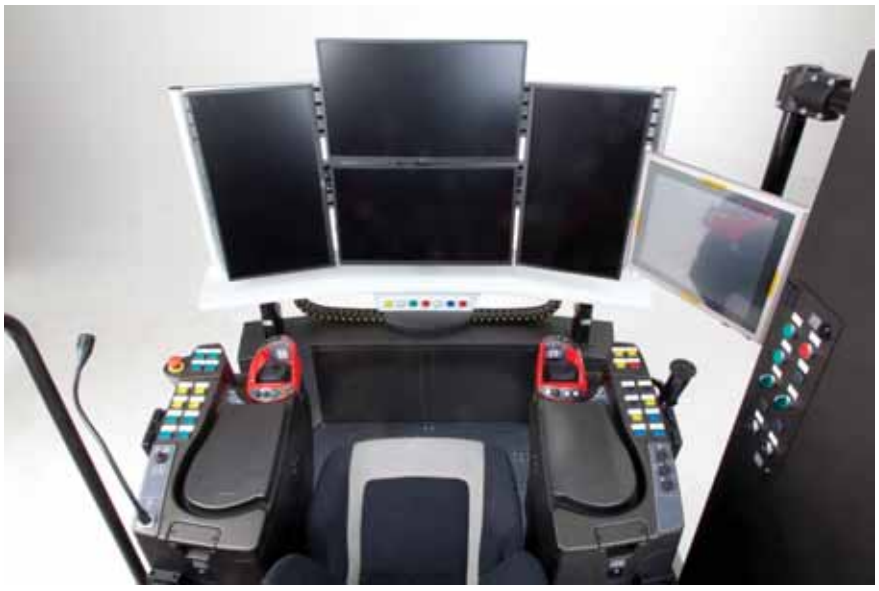
Brieda Cabins, which celebrated its 40th anniversary last year, is an Italian specialist in ergonomic cabins, control stations and desks for manned and remotely-operated cranes. It has engineered some of the most advanced cabin environments across a range of machinery, including stackers and reclaimers. The statistics back up the importance of its work — a 2002 study showed that between 44% and 77% of crane drivers reported neck issues and between 67% and 86% complained of lower back pain.

Tests carried out at the University of Milan in collaboration with Brieda Cabins showed that ergonomic station configuration will alleviate poor posture and the resulting injury.

Last year Brieda Cabins used some of the findings from its research with the University of Milan to co-write a new information paper on Crane Operator Health & Safety by the Port Equipment Manufacturers Association (PEMA). The paper included 20 key recommendations on how to improve cabin ergonomics and safety for drivers.

In terms of safety, better design can improve visibility, which can often be limited in cramped crane cabins, and reduce the force needed to operate joysticks. This makes them easier to control and lowers fatigue. On a practical level, installing the latest ergonomic cabin equipment will offer an immediate practical benefit in reducing work absences and increasing the efficiency of operators.

Brieda Cabins provides crane cabins that can work in ship-unloaders, stackers and reclaimers as well as the full range of shipyard cranes. These include dynamic control stations that have been designed in accordance with the European Standard EN 1005-3/4/5 and traditional control stations. The company's products feature in stackers and reclaimers all over the world. Recent clients include Bühler, Siwertell AB, Industrias Mecanicas ASCA S.I., Cavotec and the equipment is used in locations from Australia to Switzerland. Brieda also provides customization from a safety perspective as well as for practical considerations.



Applying these principles in the office

The trend to increase automation and introduce remote control of dry bulk handling equipment does not mean ergonomics is less important. Operators in an office environment are still responsible for handling millions of dollars worth of cargo and shouldn't be using a basic chair and standard interface to do their work.

To meet this challenge, Brieda Cabins has designed and tested ergonomic remote-control desks and simulation technology. A team from Brieda Cabins has also worked closely with the Port of Virginia to launch a pioneering new Remote Ground Control Station. This has a layout that combines the crane control seat and an arm box control panel with a remote desk that can be customized to present specific information on screen,

Phoenix launches full line of high mast lighting solutions

Phoenix Lighting has proudly announced the launch of its newest innovation – a fully integrated system for terminal lighting. This solution has been expertly designed to give dry bulk terminals, bulk storage facilities, haul roads and stockyards reliable, energy-efficient illumination along with the ability to control and monitor every element of it.

LED LIGHTING

The new category of high mast fixtures features two product lines. The Highland Series is a fixture designed to meet US and Canadian port requirements and is UL/cUL listed to UL 1598. The Meridian Series has been designed for markets outside of North America and holds CE certification. The Highland and Meridian Series each feature 250W and 500W versions, customized optic options and the durable construction Phoenix EcoMod™ 2 crane floodlights are known for. Like the EcoMod 2, these product lines are manufactured in Milwaukee, WI, USA.

LIGHTING CONTROLS

Phoenix's Lighting Intelligence Technology System combines with high mast fixtures to enable lighting control, zone scheduling, asset management and real-time data collection. The LIT System offers effortless commissioning with no software to install. It is designed to be simple and secure with an intuitive user interface that is remotely accessible. LIT System users benefit from maximized fixture life, increased safety and energy savings of up to 35%.

Ryan Hertel, Managing Director for Phoenix's Ports & Maritime Division, is excited to bring this option to the industry that Phoenix Lighting has been dedicated to for over 23 years. "Phoenix continues to deliver additional product categories and innovative lighting technologies to ports and terminals worldwide.

This latest combination of products and intelligence provides Phoenix Lighting's customers an opportunity to increase safety and efficiency of operations while effectively managing an asset to maximize its return.

Originally founded in 1892, Phoenix has evolved alongside the city of Milwaukee and is still proud to call it home. Over 126 years later, Phoenix Lighting continues to be a respected manufacturer of high quality, durable lighting solutions built to withstand even the harshest of conditions.

enhancing communication between teams and boosting operational efficiency. This has been designed specifically for the cantilever rail-mounted gantry cranes in use at that port, but the principles could easily be adapted to dry bulk equipment.

The design recreates some of the cabin environment while in a control room, which encourages operators to maintain the same high focus and levels of concentration while in an office. It also reduces the different strains that arise when operating cranes from a desk, such as looking up at a bank of screens rather than down and to the side as you would on a crane cabin. Using a Brieda Cabins design the demand on eye movement is reduced to an arc less than 70° and joysticks are placed in a special recess to reduce strain on wrists.

GIVING OPERATORS THE RIGHT TOOLS

While these steps may seem common sense, Stiehler says that the importance of making sure man and machine are working in harmony is often underestimated when changes to cargo handling facilities are considered. "Equipping them with the right ergonomically-designed tools and working environments to stay healthy, safe and productive is a wise investment." DCi

Celebrating 60 years of the Great Lakes/St. Lawrence Seaway System

Seaway enjoys best results in over a decade

Louise Dodds-Ely

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

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and Canadian lakers move cargo among Great Lakes ports, with both nations' laws reserving domestic commerce to their own flag carriers. Salties flying the flags of other nations connect the Lakes with all parts of the world.

Opened to navigation in 1959, the St. Lawrence Seaway part of the system has moved nearly three billion metric tonnes of cargo in 50 years, with an estimated value of over $450 billion. Almost 25% of this cargo travels to and from Canada and nearly 50 other nations, especially Europe, South America, the Middle East, and Africa. From Great Lakes/Seaway ports, a multi-modal transportation network fans out across the continent. More than 40 provincial and interstate highways and nearly 30 rail lines link the 15 major ports of the system and 50 regional ports with consumers, products and industries all over North America.

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

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

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

US Saint Lawrence Seaway Development Corporation (SLSDC)

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

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

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

St. Lawrence Seaway begins navigation season, celebrates 60th anniversary

On 26 March, the US Saint Lawrence Seaway Development Corporation (SLSDC) joined with its binational partner, the Canadian St. Lawrence Seaway Management Corporation (SLSMC), to mark the opening of the Seaway's 2019 navigation season. The year 2019 marks the 60th anniversary of the opening of the St. Lawrence Seaway.

"The Great Lakes St. Lawrence Seaway System is a vital maritime transportation system and a driver of economic development and job creation in the

region," said US Secretary of Transportation Elaine L. Chao.

The 26 March opening ceremony of the binational waterway took place at St. Lambert Lock in Montreal, Canada. Canadian Transport Minister Marc Garneau, US Department of Transportation Assistant Secretary Joel Szabat, SLSDC Deputy Administrator Craig H. Middlebrook, and SLSMC President/CEO Terence Bowles all addressed the gathering.

In addition to being hailed as an engineering marvel essential to international trade and transportation, the waterway has long been recognized as a model of international co-operation between Canada and the United States. Her Majesty Queen Elizabeth II and President Dwight D. Eisenhower attended the Seaway opening in 1959.

More than 237,000 jobs and $35 billion in economic activity are supported by movement of various cargoes on the Great Lakes St. Lawrence Seaway System.

Infrastructure investments prepare Seaway for new shipping season

In order to prepare for the 2019 shipping season, the SLSDC dedicated the winter shutdown season to investing in critical capital investment projects at the Seaway's US locks. Since 2009, the SLSDC has invested $152 million in the maintenance, rehabilitation, and modernization of the US locks under the ground-breaking Seaway Asset Renewal Program (ARP).

In 2019, the SLSDC will complete the installation of the first-of-its-kind Hands Free Mooring (HFM) technology at the US locks. This will complete the deployment of this technology throughout the binational Seaway System.

"The state-of-the-art Hands Free Mooring technology is arguably the most important technological advance at the Seaway since 1959 and will revolutionize the vessel transit experience through the Seaway," said SLSDC Deputy Administrator Craig H. Middlebrook. "Investments in our nation's marine transportation infrastructure are critical to its safety, reliability, and competitiveness. The USDOT is committed to making the necessary capital investments to ensure the long-term viability of the Great Lakes St. Lawrence Seaway System."

The HFM system uses vacuum pads, each of which provides up to 20 tonnes of holding force, mounted on vertical rails inside the lock chamber wall to secure the ship during the lockage process as it is raised or lowered while keeping it at a fixed distance from the lock wall. The HFM technology will increase efficiency, improve safety, and reduce operating costs to Seaway users and will reduce lock transit times by nearly seven minutes per lockage, equating to three to four hours of potential time savings on a roundtrip transit. The use of HFM will also significantly increase the pool of vessels worldwide that will be able to enter the Great Lakes Seaway System.

The Canadian side of the Seaway completed its own HFM programme in time for the opening of the 2018 shipping season on 29 March 2018. When the SLSDC's programme completes this year, the entire System will work with HFM. This will be a great boost to safety as 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.

Additional major winter work at the US locks this year included concrete replacement, valve upgrades, and mechanical and electrical maintenance.

In 2018, the Seaway moved nearly 41mt (million metric tonnes) of cargo, including 5.2mt of US exports and 4.1mt of US imports. This created more than $35 billion in economic activity and more than 237,000 US and Canadian jobs dependent upon maritime commerce on the Great Lakes St. Lawrence Seaway System, making the waterway a driver of economic

Seaway's locks: a marvel of engineering efficiency

The Seaway's locks make it all possible

The binational St. Lawrence Seaway's 15 locks (13 Canadian and 2 American) allow ships to transit between Montreal and Lake Erie, a difference in elevation of 168 metres. The 'Soo' Locks, managed by the US Army Corps of Engineers, enable ships to reach Lake Superior, which is 183 metres above sea level.

The Great Lakes St. Lawrence Seaway System is the world's longest deep draught commercial waterway.

SEAWAY FACTS AND FIGURES

Lock dimensions	
Length	233.5m
Width	24.4m
Water depth:	9.1m
Maximum vessel size	
Beam	23.77m
Capacity	carries up to 30,000 tonnes per voyage
Length	225.5m
Air draught	35.5m
Draught	8.08m

development in the Great Lakes region and the nation.

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 St. Lawrence Seaway Management Corporation, the successor to the St. Lawrence Seaway Authority, was established in 1998 by the Government of Canada, Seaway users and other key

SEAWAY MONTHLY TRAFFIC RESULTS
Final 2018

Traffic (in thousands of tonnes)	SLSMC - Combined Traffic			
	Year to Date		Change from 2017	
	2017	2018	Tonnes	%
Total Cargo	38 280	41 011	2 731	7.14%
All Grain	10 174	12 297	2 123	20.87%
Iron Ore	8 227	7 487	- 739	-8.99%
Coal	2 250	2 516	266	11.83%
Dry Bulk	10 409	10 740	330	3.17%
Liquid Bulk	3 779	4 585	806	21.34%
General Cargo	3 382	3 322	- 60	-1.78%

Vessel Transits	2017	2018	Transits	%
Total Transits	4 127	4 389	262	6.35%

The St. Lawrence Seaway Management Corporation

stakeholders. In accordance with provisions of the Canada Marine Act, the Corporation manages and operates the Canadian assets of the St. Lawrence Seaway, which remain the property of the Government of Canada, under an agreement with Transport Canada.

SLSMC accomplishments 1998–2018

- $1 billion invested in asset renewal.
- Implementation of Automatic Identification System.
- Creation of HWY H2O Market Development Program.
- Implementation of Draft Information System.
- Design and Implementation of Hands Free Mooring and Remote Lock Operation.
- Optimization of Navigation Season.

Minister Marc Garneau highlights Seaway's pivotal role as waterway turns 60

First lock system in the world equipped with innovative hands-free mooring

On 26 March, the St. Lawrence Seaway Management Corporation (SLSMC) marked its 60th anniversary with the opening of the 2019 navigation season. The *Federal Kumano* served as the opening vessel, as the ship loaded with a bulk cargo of titanium chloride transited the St. Lambert Lock on its way to the Port of Ashtabula, Ohio.

The Honourable Marc Garneau, Minister of Transport, and Québec Minister for Transport Chantal Rouleau were among a number of dignitaries that gathered at the St. Lambert Lock to celebrate the St. Lawrence Seaway's 60th anniversary. "The St. Lawrence Seaway has a distinguished past, a dynamic and vital present and will continue to play a pivotal role in Canada's economy in the future," said Minister Garneau. "It is with that in mind that the Government of Canada is continuously working with the Seaway and its partners to look at opportunities for increased economic and commercial developments and to move towards a more sustainable future. On behalf of the Government of Canada, I wish you a safe and successful navigation season."

The St. Lawrence Seaway enjoyed strong results in 2018, with 41mt (million tonnes) of cargo moving through its locks. With continued momentum in the grain sector, the 2019 navigation season should offer further gains in tonnage, enabling the Seaway to reach 42mt of cargo.

Terence Bowles, President and CEO of The St. Lawrence Seaway Management Corporation, praised Seaway employees for their role in implementing a Hands Free Mooring system and converting the Seaway's locks to remote operation. "Today, thanks to the many efforts of both past and present employees, we have a Seaway that offers carriers a more competitive route to the heartland of North America. With strong advancements in safety, reliability and efficiency, the Seaway is equipped to effectively serve its stakeholders for decades to come. A multi-billion dollar fleet renewal programme being undertaken by Seaway carriers points to a bright future ahead for the waterway as it celebrates its 60th anniversary."

Craig H. Middlebrook, Deputy Administrator of the US Saint Lawrence Seaway Development Corporation said, "As the binational waterway turns 60, it is resilient and ready for the future. New technologies, an exceptional reliability record, and significant investments in infrastructure are enhancing efficiencies and keeping the Seaway safe and competitive. I look forward to advancing the partnership between our two countries and working closely with stakeholders throughout the Great Lakes Region who depend on the Seaway and who are essential to the Seaway's success."

As the most energy-efficient mode of transportation, with the lowest carbon footprint, marine transportation offers an attractive means of boosting economic activity in a sustainable manner.

Seaway activity bursts past 40 million tonnes in 2018

Best grain results since the turn of the century

On 17 January this year, the St. Lawrence Seaway Management Corporation (SLSMC) announced that tonnage on the waterway during the 2018 navigation season totalled 40.9mt (million tonnes). The highest result since 2007, much of the credit for the increase in tonnage can be given to healthy movements of grain, the best on record since the turn of the century. Marketing efforts under the Highway H_2O initiative served as a catalyst to spur increased movements of a broad range of cargoes including grain, road salt, stone, cement, gypsum and refined fuels.

"We are very pleased with the results recorded over the past year" said the SLSMC's President and CEO, Terence Bowles. "After completing the first year with Hands Free Mooring installed at all of our high-lift locks, it is gratifying to see that our efforts to boost system efficiency and heighten our competitive position are bearing strong results. This new mooring technology eliminates the need for special vessel fittings, enabling the St. Lawrence Seaway to welcome a broader range of ships from the world fleet."

Craig H. Middlebrook, Deputy Administrator of the US Saint Lawrence Seaway Development Corporation said, "Total tonnage on the St. Lawrence Seaway exceeded the five-, ten-, and 15-year averages, making 2018 an exceptionally strong shipping season, the best in over a decade. In particular, we were pleased to see heightened activity on the Seaway in December. Overall gains in year-over-year commodity increases were widespread, most notably in US grain export trade. The investments in Seaway infrastructure and technology are achieving greater

Fednav participates in the Seaway's 60th-anniversary celebrations

The shipping company turns 75 this year

On 26 March this year, Fednav inaugurated the 61st season of the St. Lawrence Seaway with its vessel, the Federal Kumano. At a ceremony at the Saint-Lambert Lock and in the presence of many dignitaries, Fednav's president launched the celebrations surrounding the company's 75th anniversary.

Founded in 1944 in Toronto by the Pathy family, the company moved to Montreal in 1953, and has since grown to become Canada's largest international bulk shipping group. Fednav owns 63 bulk carriers and operates a fleet of more than 100 vessels worldwide, including the largest fleet of Great Lakes-suitable oceangoing ships, the largest fleet in the world of ice-class bulk carriers, and three ice-breaking cargo vessels that service the Arctic twelve months a year. Additionally, it operates 11 terminals in North America.

In the presence of Ministers Marc Garneau and Chantal Rouleau, Paul Pathy presided over the inauguration of the Great Lakes' navigation season. The President and Chief Executive Officer of Fednav said, "Our industry navigates in an increasingly complex world. By offering effective and innovative solutions based on the principles of integrity, responsibility and respect, Fednav stands out and is committed to exceeding the expectations of its customers for years to come."

Fednav is a major player in bulk shipping in the St. Lawrence/Great Lakes System and the Arctic.

The company has invested more than $1.5 billion over the past two decades in fleet renewal, in more efficient and environmentally friendly ships. Seven vessels are currently under construction.

The 75th anniversary of Fednav will be celebrated in each city in which the company has offices: Antwerp, Barbados, Hamburg, Rio de Janeiro, Singapore, Tokyo, and of course, Montreal.

Fednav will in the course of the year name its two new ships *Federal St. Laurent* and *Federal Montreal*, showing the company's dedication to its iconic river and city. "From Montreal, Fednav covers the world," added Pathy.

efficiencies for our customers and enhancing the binational waterway's global competitiveness."

The 2018 navigation season concluded on 31 December, with the transit of the *Cedarglen* through the Welland Canal's Lock 8 at 12:35, heading for Lake Erie. In the Montreal sector, the *Floragracht* was the last ship to transit, clearing the St. Lambert Lock at 19:45 on 30 December as she proceeded on her voyage to Europe.

"The SLSMC continues to take a leadership role in the utilization of technology to better serve our customers. With strong advancements in efficiency, safety and flexibility, the stage has been set for a St. Lawrence Seaway that will effectively serve its stakeholders for decades to come. As we prepare to celebrate the Seaway's 60th anniversary at our 2019 season opening, and take stock of the progress made, we can truly say that we are ready for the future!" said CEO Bowles.

FEDNAV

NAVIGATING
COMPLEXITY

CELEBRATING
75 SUCCESSFUL YEARS

THANKS TO YOU!

CERTIFIED GREEN MARINE CERTIFIED

AUT/HWY H_2O

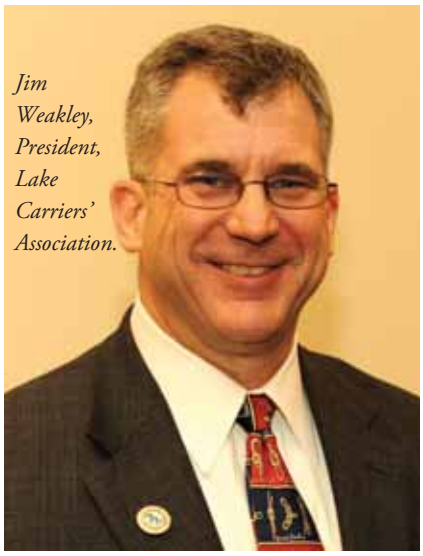
Update from the LCA on major issues affecting Great Lakes Shipping

Significant progress has been made on a number of issues that will determine the future of Great Lakes shipping, *writes Jim Weakley, President, Lake Carriers' Association.*

A second Poe-sized lock at Sault Ste. Marie, Michigan, is moving steadily toward reality and uniform federal regulations governing ballast water and other vessel discharges are in development. Congress has authorized a second heavy icebreaker to bolster the Coast Guard's Great Lakes icebreaking assets and increased funding for dredging has significantly reduced the amount of sediment clogging ports and waterways

The momentum is really building for the second Poe-sized lock. In 2018 the US Army Corps of Engineers (Corps), after a lengthy review, agreed its benefit cost ratio (BCR) for the lock was flawed and revised it to 2.42 and allocated $32 million in FY2019 to finalize design work and begin dredging of the upper approach channel. The State of Michigan contributed another $52 million to advance the project and the President's proposed budget for FY2020 includes $75 million to further design and build the approach wall. The pieces are coming together.

The importance of a second Poe-sized lock cannot be overstated. Roughly 90% of all cargo moving between Lake Superior and the lower Great Lakes and St. Lawrence Seaway transits the Poe Lock opened in 1968. A second Poe-sized lock will provide system resiliency and efficiency for the foreseeable future. The lock will take seven to ten years to build. LCA's goal is to keep funding at efficient levels so it does not take any longer.



Jim Weakley, President, Lake Carriers' Association.

Passage of the Vessel Incidental Discharge Act (VIDA) in 2018 promises to end the hodgepodge of ballast water regulations that currently govern the Great Lakes and other US waters. The US Environmental Protection Agency (EPA) has been tasked with developing standards within the next two years. Once those are finalized, the US Coast Guard (USCG) will have two years to write the implementing regulations.

We may over time have some ballast and other discharge regulations that are unique to the Great Lakes, but again, they will be consistent throughout the US waters of the Great Lakes.

The ice formations on Lake Superior and the Straits of Mackinac made for a challenging resumption of navigation this March. A tough situation was made even worse when two US and one Canadian icebreakers suffered significant causalities that kept them out of service for much or all the breakout. The US and Canadian Coast Guards did their best, but they do not have enough icebreakers as it is.

LCA is working hard to change that. We have gotten authorization for the USCG to build another heavy icebreaker to augment the *MACKINAW*. Funds have been provided for initial design to make some refinements in the *MACKINAW*'s workings, but progress is slow, in part because the USCG is focused on renewing our polar icebreaking fleet.

LCA's clout in Ottawa is of course not great, but we have communicated to the Canadian Coast Guard that it needs to bolster its Lakes' resources. Canada used to have seven icebreakers stationed on the Lakes. Now just two are homeported here. Canada has acquired three mid-sized icebreakers that are being retrofitted, but it is unclear if any will be assigned to the Great Lakes. That's hard to fathom. Canadian carriers are just as active during the ice season as LCA members, maybe more so.

The decades-long neglect of Great Lakes dredging needs are being addressed with impressive results. This year the Corps will get approximately $190 million to maintain the Great Lakes Navigation System. It was not that long ago that $80 million was a typical appropriation. The backlog of sediment clogging ports and waterways is now down to about 13 million cubic yards. At one point the Corps was predicting the backlog would grow to 21 million cubic yards.

Dredging is critically important. The largest US-flag lakers forfeit 270 tonnes of cargo for each inch loaded draught is reduced by lack of dredging or low water levels. Back at the beginning of 2013, when Lake Michigan was at a record low, some vessels were leaving 10,000 tonnes of cargo at the loading dock.

Educating legislators about the importance of Great Lakes shipping is another priority for LCA. There was quite a turnover in Congress following the 2018 elections. Our new solons need to know that Great Lakes shipping is the most efficient and greenest mode of transportation and that the Jones Act must always remain the foundation of America's domestic maritime policy. I am confident that will be the case.

Momentum is really building for the second Poe-sized lock.

Sept-Îles multi-user dock off to great start

The Port of Sept-Îles is delighted to announce an increase of 4.7% in volume handled over last year at 25,375,000 tonnes in 2018, compared with the previous year's 24,231,000 tonnes. The start-up of operations at the multi-user dock accounted for the entire increase, with over 5.5mt (million tonnes) handled, which made up for the drop in shipping caused by the labour dispute at IOC Rio Tinto early in the year.

The year in review

The Port of Sept-Îles can look back proudly on a successful start for the multi-user dock, with 31 ships loaded in 2018. Its annual capacity of 50mt makes it a world-class facility. There are many highly notable accomplishments behind the year's total volume:

- the successful startup of the Bloom Lake iron mine, whose production exceeded projections. Congratulations to Quebec Iron Ore, a subsidiary of Champion Iron Mines Limited;
- delivery by Société ferroviaire et portuaire de Pointe-Noire (SFPPN) of its conveyor to connect the new dock and the successful startup of its handling and storage operations;
- challenges surmounted with aplomb by multi-user dock operator Logistec, in charge of operations and maintenance, and by the port's multi-user dock team.

In September, the port had to shut down the Pointe-aux-Basques intermodal terminal pending its securing the funds for the necessary repairs and modernization. Pointe-aux-Basques is the gateway for supplies en route to the hinterland and a port of call supplying the isolated villages of the Lower North Shore.

Another highlight was the arrival of Tacora Resources in November, which completed its financing to restart the Scully Mine and purchased part of New Millennium Iron's contract with the port to become a new user of the multi-user dock. Tacora will significantly increase the Port's annual volumes, adding a projected 6mt per year, and will invest close to $50 million in 2019 to adapt the SFPPN facilities.

In December the City of Sept-Îles and the port released the results of the Environmental Observatory for the Bay of Sept-Îles' five-year study, with the data and findings from phases I, II, and III. The data and studies found the environment to be in good condition overall and will serve as a baseline for future protection and management of the Bay of Sept-Îles's priceless ecosystem.

"Without any doubt, the multi-user dock sparked a revival of iron ore activities in 2018," said Port of Sept-Îles president and CEO Pierre D. Gagnon. "The dock is a world-class strategic infrastructure that's already a powerful driver of the port's growth and development."

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 an expected volume of more than 30mt in 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 close to 4,000 direct and indirect jobs.

QSL to partner with Sollio Agriculture on construction of state-of-the-art grain terminal at the Port of Oshawa

QSL is a terminal operator and stevedore, which celebrated its 40th anniversary in 2018. QSL operates its network of more than 30 terminals along the St. Lawrence–Great Lake axis, from Chicago to Saint-John's.

QSL has many projects related to bulk in the Great Lakes region. These projects are carried by its subsidiaries in Chicago and Ogdensburg, by joint ventures in Port Weller and Port Colborne and also by QSL, Ontario Division (formerly known as Great Lakes Stevedoring Co) in Oshawa and Hamilton.

The year 2019 will be a memorable one for the Oshawa terminal, as QSL will be building a state-of-the-art grain export terminal in partnership with Sollio Agriculture, formerly known as the Agri-business Division of La Coop fédérée.

The infrastructure will be a Canadian Grain Commission-approved export facility. It will combine modern unloading equipment, grain storage and vessel-loading equipment that will benefit Canadian farmers served by Sollio Agriculture across the country.

Located in the heart of an important farming region, the new facility will shorten the trucking distance from the farms to the export terminal, will accelerate the pace of truck unloading and also minimize weather delays for the truck discharge segment.

The key benefit is to accelerate the logistics by providing farmers quick access to water export solutions. The whole operation will also benefit the environment, as the total operation will result in significant greenhouse gas reductions. The infrastructure is expected to be completed next autumn, and fully functional by next winter.

The Interlake Steamship Company and Fincantieri Bay Shipbuilding partner to build first Great Lakes bulk carrier in nearly four decades

A US-flagged Great Lakes bulk carrier will be built for the first time in more than 35 years thanks to a historic agreement recently signed between The Interlake Steamship Company and Fincantieri Bay Shipbuilding.

The new *River*-class, self-unloading bulk carrier is believed to be the first ship for U.S. Great Lakes service built on the Great Lakes since 1983. The ship, which will transport raw materials to support manufacturing throughout the Great Lakes region, also represents hundreds of good-paying jobs for US merchant mariners and Wisconsin shipyard workers.

Measuring 639 feet in length (78 feet W, 45 feet H, 28,000dwt), the vessel will be constructed in Sturgeon Bay, Wisconsin. The Interlake Steamship Company, headquartered in Middleburg Heights, Ohio, is the largest privately held US-flag fleet on the Great Lakes, with nine vessels carrying bulk cargoes and a rich history dating more than 100 years.

"When we approached a historic project of this magnitude — building our company's first ship since 1981 — we knew it was critical to choose the right partners. Fincantieri Bay Shipbuilding is the shipyard that has the experience and skill to execute on our long-term vision," says Interlake President Mark W. Barker, adding that this specific vessel is being built as the result of listening to and addressing the logistical needs of Interlake's customers. "We've had a long and positive relationship of partnering with Fincantieri Bay Shipbuilding as we have modernized and reinvested heavily in our fleet. They have skillfully handled four repowers, five exhaust gas scrubber installations, as well as regular maintenance and regulatory dry-dockings on our vessels."

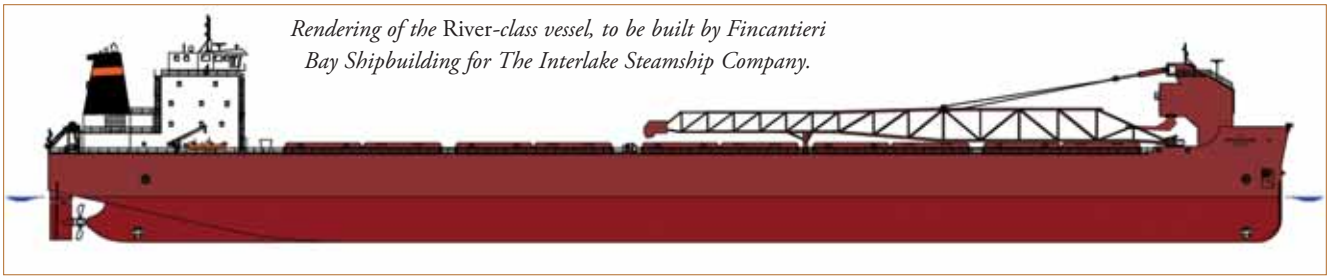
The Interlake Steamship Company, Fincantieri Bay Shipbuilding and Bay Engineering are jointly designing the bulk carrier, complete with advanced vessel and unloading systems automation.

"We are excited to construct this historic large-scale bulk carrier on the Great Lakes for Great Lakes operation," says Fincantieri Bay Shipbuilding's Vice President and General Manager Todd Thayse. "We are very proud of our long-term relationship with Interlake, and we appreciate their continued confidence in our shipyard and in our shipbuilding team. This new project and our past work are indicative of the quality and attention to detail that our customers have come to expect from Fincantieri Bay Shipbuilding. It brings steady employment to the hundreds of women and men we employ from across the region, and the economic benefit to our suppliers and others is widespread," he added.

Scheduled for completion in mid-2022, the carrier will be built by Fincantieri Bay Shipbuilding's nearly 700 skilled trade workers and will generate business for partnering contractors, vendors and suppliers. Major partners for the project include: American Bureau of Shipping (ABS); Bay Engineering (BEI); EMD Engines; Caterpillar; EMSTech, Inc.; Lufkin (a GE Company) and MacGregor.

"The Interlake Steamship Company is also extremely proud to build locally, supporting surrounding communities and states — a legacy that we began more than 100 years ago," Barker says. "We live and work in the Great Lakes region, and promoting growth and the positive economic impact of Great Lakes shipping is integral to our mission and vision as a leader in this industry."

- **Cargo:** this newest self-unloading bulk carrier has a unique cargo hold arrangement and cargo hatch covers designed for maximum cubic space and



Rendering of the River*-class vessel, to be built by Fincantieri Bay Shipbuilding for The Interlake Steamship Company.*

the ability to handle difficult cargoes.

- **Manoeuvrability:** the vessel incorporates a flap rudder as well as bow and stern thrusters for high-level manoeuvrability.
- **Environmentally friendly:** all aspects of the vessel have been looked at to ensure that it will have a low environmental impact to the Great Lakes and to those who work aboard. The hull has been optimized for efficiency and all systems have been designed to ensure low energy consumption.
- **Power and speed:** the vessel is designed for 7,800 shaft horsepower produced by two 16-cylinder Electro-Motive Diesel (EMD) diesel engines that are EPA Tier 4 and IMO Tier III certified and is expected to have a top speed in excess of 15mph;
- **Propulsion:** the vessel will be propelled by a single-screw, 18' diameter, Kongsberg, controllable pitch propeller.
- **Electrical power:** for its electrical power requirements, the vessel is provided with one 940kW ship service diesel generator, two 2,500kW shaft generators and one 274kW emergency generator.

About Fincantieri Bay Shipbuilding

Located in Sturgeon Bay, Wisconsin, Fincantieri Bay Shipbuilding (FBS) is at the forefront of the industry in the construction, conversion and repair of large ships — tracing its rich history back more than 100 years. The diversified FBS portfolio includes all types of vessels including articulated tug-barge units, dredges and dredging support equipment, automated loading carriers, ferries and offshore support vessels. On the repair side, FBS is expert at managing critical deadlines in the repair and sustainment of bulk carriers and other ships of the Great Lakes Winter Fleet.

Shipbuilding facilities at the 63-acre plant include a large graving dock, a US Navy-certified drydock, and lifting capacity to meet the most demanding requirements. Erection buildings are climate-controlled and equipped with sophisticated computer-aided manufacturing equipment. Fincantieri's skilled workforce has an average of more than 20 years of shipyard construction experience, in-house engineering, and a management team focused on client satisfaction and on-time delivery.

Fincantieri Bay Shipbuilding is an operating unit of Fincantieri Marine Group (FMG), the United States division of global shipbuilding giant Fincantieri.

About Fincantieri

Fincantieri is one of the world's largest shipbuilding groups and has built more than 7,000 vessels in over 230 years of maritime history. It is a leader in cruise ship design and construction and a reference player in all high-tech shipbuilding industry's sectors, from naval to offshore vessels, from high-complexity special vessels and ferries to mega-yachts, ship repairs and conversions, systems and components production and after-sales services. Fincantieri operates in the United States through its subsidiary Fincantieri Marine Group (FMG). This company, which serves commercial and government customers in the USA, including the US Navy and Coast Guard, has three shipyards (Fincantieri Marinette Marine, Fincantieri Bay Shipbuilding and Fincantieri ACE Marine) located in the Great Lakes.

About The Interlake Steamship Company

As the largest privately held US-flag fleet on the Lakes, Interlake has been carrying the bulk cargoes that have been fuelling the region's economy since its founding more than 100 years ago. A second-generation, family run company, Interlake is propelled by a long-term vision to make its fleet of nine vessels the most efficient and environmentally responsible in the shipping industry. The company has invested more than $100 million to modernize and improve its ships to safely and reliably transport 20 million tonnes of raw materials annually, including iron ore and flux stone for the steel industry, stone for the construction industry, coal for power generation and salt for de-icing needs on roads and highways. Interlake employs about 400 men and women who live and work in the region and the cargoes they deliver help generate and sustain more than 103,000 jobs in the eight Great Lakes states.

At 1013.5 feet, Interlake's flagship Paul R. Tregurtha *is the longest ship on the Great Lakes. She can carry up to 68,000 gross tonnes of taconite pellets or 71,000 net tonnes of coal. Her unloading system and 260-foot boom empty her five cargo holds in about eight hours.*

$2.5m for environmental protection and innovation at the Port of Trois-Rivières

The Trois-Rivières Port Authority (TRPA) is continuing to deploy its On Course for 2030 plan by setting up two funds for its users, with a total investment of $2.5 million over five years.

Environment Fund

First of all, the Environment Fund aims to support users' investments in solutions that will improve the port's environmental performance, in a spirit of sustainable development. Through this innovative initiative, the TRPA wishes not only to support the implementation of projects, but also to enable them to be carried out earlier.

"With the participation of those who work there, the port's environmental practices have already enabled it to position itself advantageously. However, its record in this regard must continue to improve.

Indeed, shippers no longer choose a port solely on the basis of its productivity, just as citizens no longer evaluate it solely on the basis of its economic impact. It is also judged on the basis of its environmental performance. Environmental protection and economic development go hand in hand," explains Gaétan Boivin, President and CEO of the TRPA.

The results targeted by this investment include:

- the maintenance, improvement and development of infrastructures to improve the port's environmental performance, both in terms of transport and cargo handling;
- management, protection and improvement of the quality of valued ecosystem components.

In addition to the amounts injected by the TRPA, with the support of the private sector and governments, it is estimated that these projects will result in total investments of $6 million.

Innovation Fund

For its part, the Innovation Fund is a commitment by the TRPA to collaborate with port users on the deployment of innovative strategic projects, with a view to creative and competitive development.

"The scale of analysis of the port's competitive environment has shifted from the local and national level to the international level. In such an environment, the Port must constantly innovate to increase its competitiveness, whether in the development of its infrastructures, transhipment operations, road and rail transfers, the offer of value-added services or the identification of new markets," Boivin specified.

The objectives of this new Investment Fund include:

- aim for an increase in industrial research and innovative technological development at the Port of Trois-Rivières;
- provide support to accelerate technology transfer to competitive operations and innovative services; and
- increase the port's competitive positioning and competitiveness resulting from a project involving a research or technological development component.

With input from the private sector and governments, the TRPA estimates that these projects will result in total investments of $4 million.

"We are proud to launch the Environment and Innovation Funds. They are yet another demonstration of the TRPA and its users' ability to work together to make the Port of Trois-Rivières more competitive while respecting the environment. The Funds provide additional leverage to implement projects that will benefit our entire region," concluded Boivin.

About the Port of Trois-Rivières

As one of 18 Canada Port Authorities, and active since 1882, the Port of Trois Rivières offers a wide range of facilities and services to the marine industry at all seasons. It is an important player in economic development at the regional, national and international levels for major industrial sectors such as aluminium, forestry and agri-food. The Port of Trois-Rivières welcomes 55,000 trucks, 11,000 railcars and more than 200 merchant and cruise ships annually from some 100 ports in more than 40 countries around the world. It handles more than three million metric tonnes of traffic and generates nearly 1,000 direct jobs.

Bulk cargo shipping still brisk in Duluth-Superior

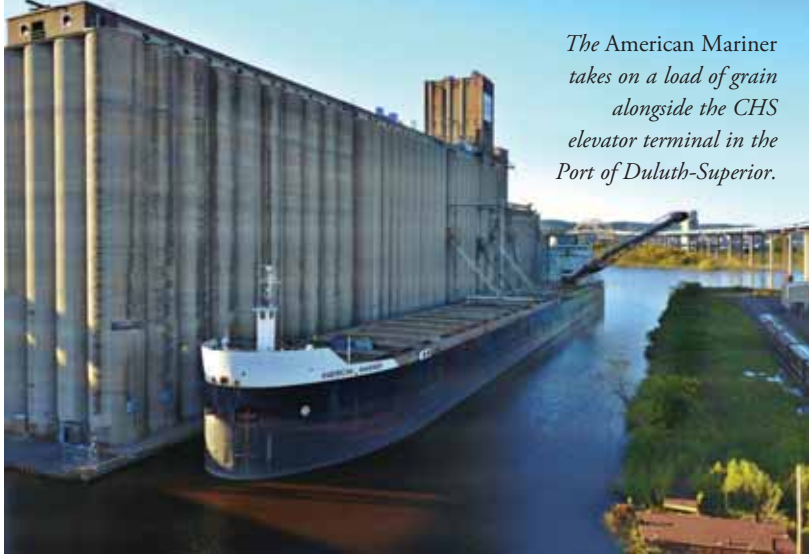
The Adam E. Cornelius *and* Mesabi Miner *await loads of iron ore at the CN/Duluth Dock on Lake Superior in Duluth, Minnesota.*

Long before the Welland Canal or the St. Lawrence Seaway's opening in 1959, fur and timber trade vessels plied the waters of Lake Superior, sailing from its westernmost tip with their cargoes du jour. Arrival of the great bulk cargoes — coal, grain and iron ore — began supplanting fur and timber in 1871 after the United States Congress authorized inner-harbour improvements at the Twin Ports of Duluth and Superior for the first time.

It had long been Mid-America's gateway to the world, but the port's growth accelerated rapidly after those advancements. Wheat and coal from the west poured into Duluth-Superior, followed soon by rich red ore from Minnesota's Iron Range. In 1895, ore shipping tonnage surpassed coal for the first time at the Port of Duluth-Superior, topping out at a then-robust 1.6mt (million metric tonnes). Within a decade, it would jump to 14mt. By 1953, with American steel demand at its peak, the Port of Duluth-Superior shipped nearly 60mt of ore, becoming the largest ore-shipping port in the world. Six years later, when the Great Lakes St. Lawrence Seaway opened to the Atlantic Ocean, Duluth-Superior took an even more prominent place at the head of the Lakes, less than a week's sailing time from the great salted seas. Today, Duluth-Superior shines as the largest tonnage port on the Great Lakes and one of the nation's top 20. It truly is Mid-America's bulk cargo capital and gateway to the world.

In 2018, nearly 20mt of ore shipped from the port, its highest total since 1995. That comprised approximately 60% of the port's total tonnage. Coal, at more than

The American Century *navigates Lake Superior ice in the Duluth harbour as she takes on her final load of iron ore to close the 2018 Great Lakes shipping season.*



The American Mariner *takes on a load of grain alongside the CHS elevator terminal in the Port of Duluth-Superior.*

8mt, and limestone, at more than 3mt, rounded out its top three. Grain, as it has for nearly 150 years, also contributed significantly to the port's business with more than 1mt shipped. Wheat led the way, followed by beet pulp pellets, canola, and for the first time in more than a decade, soybeans. The port also moved clay and a healthy helping of general cargo.

Taking in the bigger picture, international shipping through the St. Lawrence Seaway, in and out of the Great Lakes as a whole, also had a strong season. Tonnage on the waterway in 2018 reached 40.9mt.

"Total tonnage on the St. Lawrence Seaway exceeded the five-, ten- and 15-year averages, making 2018 an exceptionally strong shipping season — the best in over a decade," said Craig Middlebrook, deputy administrator of the US Saint Lawrence Seaway Development Corporation. "In particular, we were pleased to see heightened activity on the Seaway in December."

That, of course, is the challenge faced each year on the Seaway, which can accommodate only a ten-month international shipping season due to ice on the cold-weather Great Lakes and closure of locks through which vessels make their 600ft inland climb from the ocean. Thanks to favourable ice conditions early in January 2018, the last 1,000ft lake carrier left Duluth-Superior with taconite pellets just two days before the Soo Locks closed on January 15. It capped a successful campaign on Minnesota and Wisconsin's only deep-water international port, which is home to 20 private bulk cargo terminals and the Duluth Seaway Port Authority's 120-acre Clure Public Marine Terminal.

"We're our state's only direct connection to countries in Europe, the Middle East, the Mediterranean and North Africa," said Deb DeLuca, executive director of the Duluth Seaway Port Authority. "It's only a two-week journey from our Clure Terminal to Europe through the St. Lawrence Seaway, which provides a high-capacity, low-cost, energy-efficient mode for transporting bulk commodities like iron ore, coal, limestone, salt, cement and grain, as well as heavy-lift and project cargoes for mining, oil and gas production, construction, wind energy, pulp and paper and power generation industries."

As the port steams into 2019 and the St. Lawrence Seaway's 60th anniversary, the outlook is once again promising. Demand for ore remains strong worldwide, incoming project cargoes dot the shipping calendar and grain exports will continue to help feed the world. Salt shipping could also rise after a long, cold winter in the north. Combined with the usual movement of limestone, coal and cement, it creates every hope that, when the locks close in January 2020, they'll be closing another successful season on North America's binational waterway.

The Columbiana County Port Authority's

The Columbiana County Port Authority promotes economic development in Columbiana County and facilitates cargo movement on the Ohio River.

The Columbiana County Port Authority was created in 1977 by the County Commissioners. Today, in addition to its headquarters in Lisbon, Ohio, the Port Authority owns and leases industrial plant complexes, barge/rail/truck cargo transfer facilities. Additionally the Port Authority owns and sells/leases property in two industrial parks, the Trade Park in Leetonia and the Intermodal Facility in Wellsville.

Columbiana County is geographically blessed as the northern most point of the Ohio River in the United States. It serves as a feeder port for the industrial base of the Cleveland/Pittsburgh corridor. Ohio ranks as the 24th largest economy in the World (if it were an independent country) and 43% of Ohio's economic output is generated in NE Ohio. Ohio is the eighth-largest maritime state in the US by tonnage of cargo moved (two-thirds of Ohio's borders are on navigable waters) and Columbiana County is Ohio's largest river port system.

The Wellsville Intermodal Facility was constructed to facilitate multimodal cargo transportation. Completed in 2015, the project provides for the seamless transfer of cargo from multiple modes of transportation (river, rail, highway). River transportation provides an all season, low cost method of cargo movement. The standard barge tow on the river system carries cargo equivalent to 1,050 semi-trucks. Barges can move one tonne of cargo 576 miles per gallon of fuel compared to rail at 431 miles per gallon and to truck at 155 miles per gallon. Trucks emit 71.6 tonnes of CO_2 per million tonne miles, rail emits 26.9 tonnes and barge towboats 19.3 tonnes. In regard to safety, for every one injury by accident on a barge there are 125.2 injuries by rail and 2,171.5 injuries by truck. The cost for transportation over inland waterways is generally three times lower than other

Wellsville Intermodal Facility handles major project cargo load

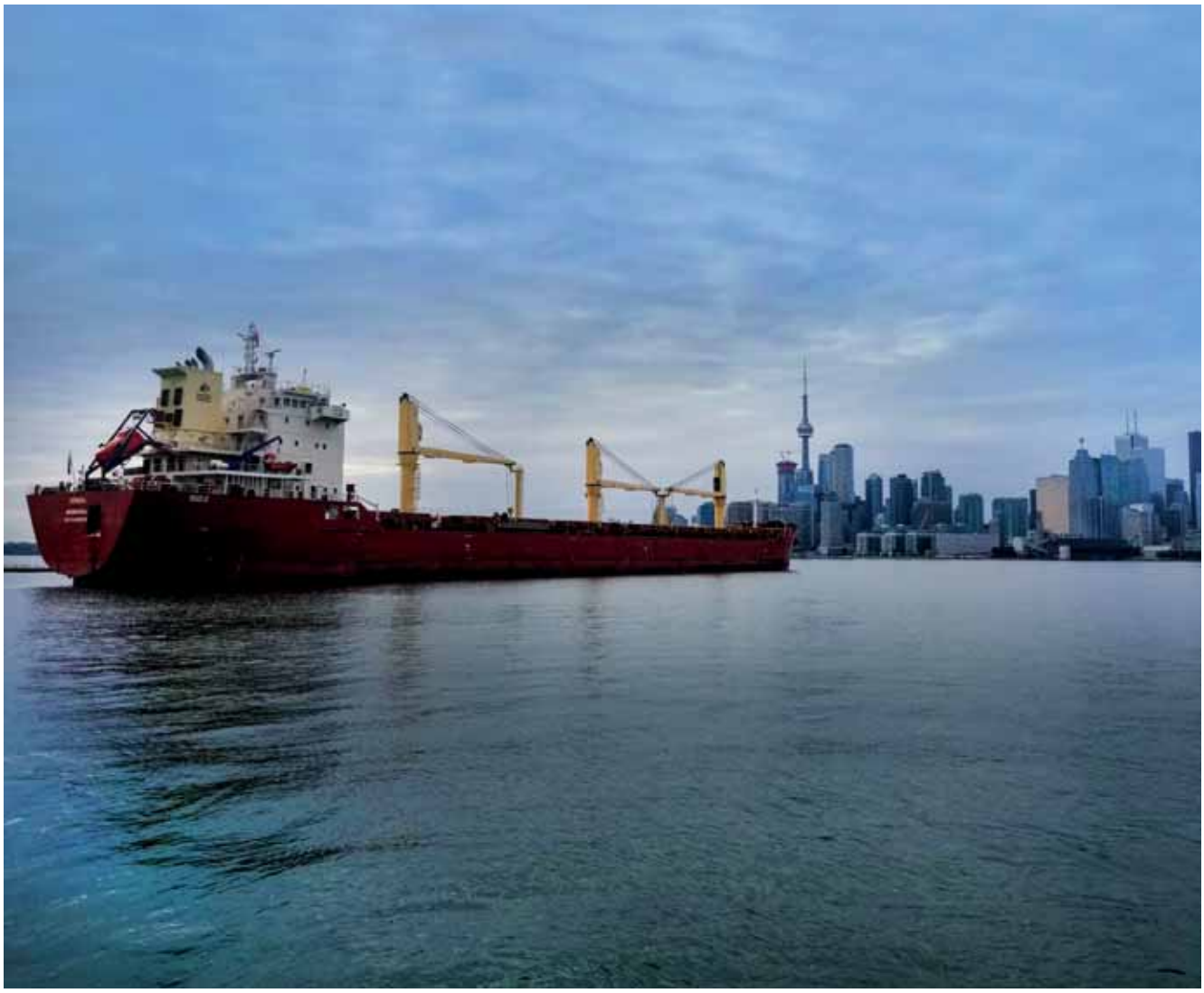
modes of transportation, translating into an annual savings of $7 billion for American business.

Major unloading project

One of the largest loads unloaded at the Wellsville Intermodal Facility occurred in January 2019. Pier 48 Stevedoring, LLC, crane operator for the Port Authority at the Ohio River facility, offloaded two ladles — one weighing 83,775 pounds and the other weighing 79,366 pounds, after they arrived from China where they were made. Specially designed slings made of nylon wrapped in Kevlar fabric were used to lift the robust pieces off the barge. The ladles were later loaded onto flatbed trucks bound for the Timken Company in Akron, Ohio.

The ladles took approximately two months to reach New Orleans through the Panama Canal. The vessel carrying the ladles took 21 days to reach the Wellsville Intermodal Facility.

Port of Toronto has another record-breaking year moving 2.2 million metric tonnes of cargo



The Port of Toronto moved approximately 2.2mt (million metric tonnes) of cargo in 2018 which represents another strong year in marine imports and further confirms the port's position as a vital part of Toronto's economic infrastructure.

In 2018, 178 ships visited the Port of Toronto, bringing sugar, road salt, cement, aggregate and steel directly into the heart of the city. Overall, the port moved 2,179,795 metric tonnes of cargo in 2018, surpassing the record-breaking year the port experienced in 2017. Further, this is the third year in the last five years that the Port of Toronto has moved in excess of 2mt of cargo.

In 2018, the port received steel products including rebar, merchant bar, steel plate and coils totalling 69,281 metric tonnes, representing the highest level of steel product moved through the port in 20 years. In addition, the port recorded 14,391 metric tonnes in warehousing storage, the highest level recorded since 2011. Cement cargo imports remained strong for another year at more than 610,400 metric tonnes, and stone, aggregate and sand cargo levels continued to increase, ending the year at 189,133 metric tonnes.

Salt and sugar imports at 735,948 and 560,625 metric tonnes respectively remained consistent with 2017 tonnages.

The port also welcomed 17 passenger cruise ships carrying approximately 6,000 passengers in 2018, highlighting the importance of the ever-growing Great Lakes cruise ship business and the role it plays in contributing to Toronto's booming tourism industry. The port is expecting this

number to more than double this year with 35 cruise ships coming to Toronto in the summer and autumn of 2019.

"From the cement and steel used to build and enhance infrastructure across the Greater Toronto Area to the sugar used to support the food and beverage industry, the goods delivered through the Port of Toronto are part of an important supply chain that services many of the city's key sectors. Additionally, the port's cruise ship business continues to have a positive impact on tourism as more and more travellers are making their way through the Great Lakes and visiting Toronto," said Geoffrey Wilson, PortsToronto Chief Executive Officer. "The Port of Toronto continues to play a vital role in Toronto's transportation infrastructure network by providing businesses with a convenient, sustainable and cost-effective way to bring goods, and people, into the heart of the city."

During this record-setting year, PortsToronto also welcomed Cinespace — the largest private owner, operator and developer of studios for film, television and digital media production in North America — to the Port of Toronto. Cinespace has leased Marine Terminal 51 and part of the Cruise Ship Terminal on a long-term lease to offer production offices and studio space to content creators. In February 2019, it was announced that Netflix will use this space as part of its Toronto production hub that will bring thousands in jobs and revenue to the city. This complementary use is facilitated in parallel with traditional port operations and has proven to be successful in ensuring the full utilization of PortsToronto property.

Since 1793, the Port of Toronto has served as Toronto's gateway to the St. Lawrence Seaway and to marine ports around the world. Serving primarily as a bulk cargo destination, the port boasts a unique location minutes from Toronto's downtown and moves goods from countries as far away as Germany, South Korea, China, Brazil, Australia, South America and the United States. In addition to managing the movement of ships through the harbour, PortsToronto is the owner and operator of Marine Terminals 51, 52 and the Cruise Ship Terminal within the Port of Toronto.

The Port of Toronto is one of Canada's major inland ports and is situated on the northwest shore of Lake Ontario. For over 100 years, the Port of Toronto has been connecting Toronto to the world. Located minutes from Toronto's downtown core, the port provides a seamless network of cost-effective intermodal links to road, rail and air transportation, serving as a unique and crucial piece of economic infrastructure. Marine cargo arriving and managed at the Port of Toronto also generated $377.7 million in economic activity and 1,566 jobs in Ontario in 2017 as confirmed in a report – *Economic Impacts of the Port of Toronto* – published in September 2018 by Martin Associates. The Port also welcomes cruise ships and passengers from around the globe through the Cruise Ship Terminal.

In addition to its economic impact, increased imports through the port has a positive impact on the environment and traffic congestion given the 2.2mt of cargo delivered by ship took approximately 54,000, 40-tonne trucks off Toronto's congested roads and highways. In fact, one tonne of freight can travel 240 kilometres on a single litre of fuel by ship, whereas it can only travel 30 kilometres on the same amount of fuel by truck.

For more than 100 years PortsToronto has worked with its partners at the federal, provincial and municipal levels to enhance the economic growth of the City of Toronto and the Greater Toronto Area. Toronto owns and operates Billy Bishop Toronto City Airport, which welcomed 2.8 million passengers in 2018; the Outer Harbour Marina, one of Canada's largest freshwater marinas; and, Marine Terminal 52, which provides transportation, distribution, storage and container services to businesses at the Port of Toronto. PortsToronto is committed to fostering strong, healthy and sustainable communities and has invested more than $11 million since 2009 in charitable initiatives and environmental programmes that benefit communities along Toronto's waterfront and beyond. PortsToronto operates in accordance with the Canada Marine Act and is guided by a nine-member board with representation from all three levels of government. DCi

Cereal being handled at Terminales Marítimos de Galicia.

Iberian bulk focus

Region Report: Spain

Jay Venter

TMGA – putting the customer first

TMGA — Terminales Marítimos de Galicia, is a port logistics services and stevedoring company. Located in the northwest of Spain, it was established in 1995 in La Coruña. Since then, the company has built up an excellent reputation as a proficient and professional cargo handling operator. The company activity is centred in the Galician Region, mainly in state ports like La Coruña and Ferrol, but it also operates in smaller regional ports (Mugardos, Cee, Laxe, Cariño, Celeiro, Burela and Ribadeo).

As a customer-orientated organization, its policy is clearly orientated towards giving its customers the best possible solutions and optimal service at all times. To achieve this goal it has a flexible and efficient workforce consisting of 90 highly qualified people with great experience and practical knowledge.

Since 2015, TMGA has been operating in the new La Coruña's port, 'Punta Langosteira', and is the first company to establish itself in this new port.

Punta Langosteira port is located 10km from the city of La Coruña, away from built-up areas and prepared for growth. It was designed with the highest standards of operability and possibilities for connection with the railway system and main motorway systems. Langosteira has a breakwater 3,359m long and 900m of berthing capacity with a draught of 22m.

The new terminal offers a mixture of covered and open storage. TMGA specializes in the handling of grains, fertilizers, green sawed timber, logs, glass, stone, coke and general cargo. TMGA has the necessary human and mechanical means and more than 22,000m^2 in warehouses to provide stevedoring services (loading, storage and transshipment of cargo on ships) and warehousing.

The TMGA's Langosteira terminal is equipped with Liebherr LHM 550 cranes, double hopper, infrared thermography system. Temperature monitoring is carried out by means of fixed thermal imaging cameras, ATEX D compliant electrical installation. There is a fixed fire-fighting installation. There is availability of pre-cast, free-standing retaining wall units to create a temporary divide or storage bays and keep bulk cargo batches duly segregated.

The TMGA terminal in Punta Langosteira has a number of decisive competitive advantages.

- a privileged geo-strategic position in north-west Spain, near the main international maritime traffic routes;
- modern, recently-built facilities prepared for handling, storing and processing goods such as: grain and agriproducts cargo, dry bulk cargo solids and wind power goods, etc.;
- hub port for the storage and distribution of large volumes of goods; and
- draughts of up to 22m, allowing the largest bulk carriers to dock.

In the last five years TMGA has handled (including all ports in which it operates) more than 16mt (million tonnes) of all types of cargoes and has carried out operations on more than 1,800 vessels.

TMGA is a company with a clear commitment to safety, quality and environment:

Safety: TMGA provides a safe working place, equipment, training and safety system that is safe to use and which doesn't involve any risk to health or safety to workers. TMGA has been granted OSHAS 18001:2007 certification.

Quality: TMGA satisfies the requirements of the clients and execute quality projects according to their expectations and requirements. TMGA has been granted ISO 9001:2015 and GTP European Good Hygiene Practices Code (for feed and food) certifications.

Environment: TMGA delivers sufficient instructions, public awareness, continual reviews and regular inspections of systems, information and training of all workers to ensure its activities do not involve any risk to health or to the surrounding environment. TMGA has been granted ISO 14001:2015 certification.

In addition, last year 2018, TMGA has obtained 'Authorised Economic Operator (AEO)' status. The Authorised Economic Operator is a key element in the EU security concept which facilitates trade whilst making supply chains more secure and controlled from origin right through to final destination. During these years TMGA has obtained a wide range of experience and specialization in handling all types of cargoes:

General cargoes: logs, wood chipboard, timber, glass, steel products, aluminium, etc.
Containers: dry cargo, reefers, stuffing, etc.
Bulk cargo: grain, coal, petcoke, fertilizers, etc.
Project cargoes: windmills, special cargoes and big structures.

TMGA has the workforce and technology needed to develop innovative solutions, and continuously invest in and develop advanced solutions, helping to improve the efficiency of all port industry operations to meet the needs of their clients. The main concerns of TMGA is innovate and continuously improve the quality of the services provided to their clients, for which they invest in the most advanced technology, complying with the environmental concerns of current society. Therefore the company won 'SME Gallega award' in recognition of its best practices, innovation and positive results in the Region of Galicia, where TMGA operates.

Vidmar's TRS.Net manages trucks' flow inside plants, improves efficiency

Figure 1. Complete automatic dispatch system.

Constantly wishing to improve the quality of service to customers, industrial manufacturers often automate truck transit and bulk loading by using flexible self-service systems for dispatching products from their plants.

Several aspects need to be addressed to introduce such a system. First, there must be automatic control of bulk loading, meaning trucks load the quantity ordered by the customer, while not exceeding the maximum permitted weight for the vehicle. Thus, time usually wasted on reloading or unloading products is minimized.

Secondly, it is increasingly common to request loading at unusual times, (nights, weekends, etc.), particularly at plants near large cities, where incoming traffic is at a standstill during peak hours. With automatic facilities, trucks can load at any time of the day or night, thereby avoiding delays in product deliveries.

Obviously, despite the use of all new technological trends, the most important characteristics of this type of system is the strength of the equipment, which must able to in harsh environments. Therefore, it is essential to use industrial equipment that guarantees correct operation 24 hours a day.

TRS.Net: a solution for traffic flow optimization on-site

Vidmar has come to understand the needs of the industrial plants and over the course of time has applied the technologies offered by the market in order to develop automatic systems for controlling truck transit and bulk loading/unloading and dispatch. This automatic System is TRS.Net, the perfect tool to manage the truck's flow inside of a plant. Thanks to this MES Application, companies can reach an automatic control of entry/exit to the facilities, loading/unloading, weighing and finished product dispatch (both for bulk and packed product). It can also control the workers/visitors/contractors movements within the premises.

The system must have the capacity to provide the necessary Key Performance Indicators to be able to measure parameters of reliability, times, workloads, etc., which in turn will allow making the opportune decisions to optimize the process and flow of trucks.

It adapts to the requirements of the moment, always using commercial equipment and implementing applications that are fully upgradable and have a long period of validity. Although this is difficult in this current digital era, it can be achieved by always applying the latest technologies.

A dispatch system consists of a large variety of small items of equipment, depending on the required performance. It is to be remembered that the basis of successful operation lies in the system/man dialogue. The necessary equipment should therefore be provided so that this dialogue is as user-friendly and intuitive as possible, and at the same time tough enough to cope with its working environment.

TRS.Net improves the company operating efficiency

- maximum proven automation of operation flow;
- cost reduction;
- management of the truck queue and silos availability to reduce the waiting times and optimize the different areas;
- smart resource management;
- real-time information; and
- bespoke solution for specific plant needs.

TRS.Net can run different group sites, being perfectly adaptable to the specific needs of each plant, scalable from a basic weighbridge control to the complete

control from slot booking to final expedition.

TRS.Net is connected to the peripherals, PLCs or other devices through Ethernet, using copper, Fibre Optics or Wi-Fi according to the plant configuration.

The terminals and devices operated by TRS.Net are conceived to withstand the worst climate and industrial environmental conditions.

It works 24/7/365 in unattended operations. Thanks to self-service terminals, drivers can identify themselves and operate, for instance, their access to the plant, loading/ unloading processes, etc.

Process

The truck transit process is based on a self-service, automatic or manual operations in case they are required. The desired level of automation can be achieved depending on the equipment installed.

There are two types of vehicles, regular and non-regular. The regular vehicles are those that have an ID through which the system can identify them and associate the data that the system possesses. The non-regular, must operate through a self-service kiosk or be attended to manually.

The system is normally based at a preliminary entry point into the factory, where regular and non-regular vehicles are identified and the data is selected which the system requires to carry out the transaction and a ticket with most significant data is issued.

The driver must now remain in the waiting area until the system calls him to enter the plant. The system will manage vehicle entries into the factory in accordance with the product to be loaded, its availability and the number of trucks in circulation.

Once the vehicle has been called, it must go onto the entry weighbridge to measure the tare (after being identified), and then go to allocated loading/unloading point.

In the case of bulk loading, once in position it must be identified again to be able to start loading. This will be done completely automatically as the system will have informed the corresponding PLC of the exact weight to be loaded, and the origin of the material. Reloading as necessary can be carried out until the required quantity is reached.

For bag loading, the forklift has a mobile device which, after the truck has been selected, shows the product to be loaded onto the trucks, so the bag operator can proceed with the correct loading. From the bagging area, the data concerning the loading can be modified, if what is loaded does not correspond to what was allocated.

Figure 2. Self-service kiosks, cabin or stand up operation.

For bag loading, the forklift operator has a mobile device where he/she can select the truck and see the product detail to be loaded onto it. It can be used also for modifying the loading order with the final quantity loaded.

In case of unloading raw materials, the dispatch system can send a permit to the automation PLC to obtain an authorization.

If there are any errors in the steps described, the system will inform the driver and the operator so that the problems may be resolved.

Once the loading/ unloading process is complete, the vehicle must go to the exit zone to obtain the corresponding delivery note.

All the control is carried out by an application and database server.

As peripherals and communications are very important, Vidmar's applications have tools for easy diagnosis of any kind of fault by maintenance staff, and logs of incidents and errors that the system may detect during operation.

Simplicity means time optimization.

TRS.Net displays (on operator's PC) and text information (on terminals for drivers/visitors) are very easy to use.

Standard TRS.Net menus can be parametrized to the customer needs, and issue specific reports, show system alarms and configure the functions to be accessible/not accessible depending on the operator.

Dialog with ERP = use all your resources

TRS.Net will be linked to the company ERP (SAP, JDEdwards, Oracle), to guarantee the data dialog.

Conclusion

With an automatic dispatch system like TRS.Net, better service availability can be offered to the customer. Significant improvement can be obtained in terms of waiting times, total flexibility of loading/unloading schedules, truck flow optimization, and traceability of all transactions carried out.

Port of Motril, strategically located, connected to 5 continents

More than 500,000 tonnes of dry cargo have been handled in the Port of Motril, which means 20% of the total goods moved through its docks.

According to the 2018 annual statistics, 564,000 tonnes of dry cargo or solid bulk were moved at the Port of Motril, mainly export operations. Minerals, natural fertilizers and building materials are the main commodities servicing the local export and import companies. Azucenas and Graneles docks are the main piers for the stockpile and loading/unloading of these commodities.

Strategic location, the gateway between Europe and Africa

The Port of Motril is strategically located in the southern main communications hub of the Iberian Peninsula, with direct connection to the Mediterranean (E-15) and the central (E902 E-5) corridors. It is the Andalusian closest port to the capital of Spain. Its position, just 90 miles north of Africa and the Strait of Gibraltar, within the most important sea routes in and out of the Mediterranean, connects its hinterland by sea with the five continents. It has two Ro-Pax terminals, which serve regular lines with North Africa, being a logistics hub between Europe and the ports of Tangier Med, Nador, Alhucemas and Melilla. It has facilities and docks prepared for the handling of bulk liquids, solids and general merchandise, as well as a border inspection post with modern facilities equipped and refrigerated, plus a large industrial area with more than 300,000 square metres in its Logistics Activities Zone. The Port of Motril-Granada is already a logistics reference in its area of influence.

DF, global turnkey partner specialized in bulk material handling

Stacker/reclaimers at Bellara Project under final stage of erection.

DF (Duro Felguera) is a public Spanish company specialized in turnkey contracts for bulk material handling solutions, with over 150 years of experience in industrial, oil & gas and energy fields.

Thanks to in-house engineering capabilities together with top project management techniques/principles and its own construction business division, DF is able to be in charge of the whole project lifecycle, starting with the feasibility study up to the performance tests, operation and maintenance of industrial facilities.

Apart from its knowledge in conveyor systems, DF designs its own equipment for port & stockyard machines as: stackers, reclaimers, stacker-reclaimers, shiploaders and ship-unloaders. DF is focused on

Second 2,500tph ship-unloader arrival, fully erected, at Bellara site.

Petalcaco Power Plant, new coal yard machines.

providing tailor-made solution adjusted to the business model and space-time restrictions in case of brownfield projects.

DF's corporate culture is based on creating a joint team with its customers to secure a win/win relationship creating new value for all stakeholders and the local community. Everywhere DF executes a project, it maximizes its commitment to cultural heritage and positive local community relationships. By actively seeking and managing positive community relationships, the company is able to work through any issues that may arise, to the benefit of the project stakeholders and the broader region.

The following two major ongoing projects, to be finalized within the next few months, are examples of the company's vision and culture:

Bellara Steel Complex (Algeria)

In 2016 DF was awarded with a $120 million EPC contract in Algeria. The project consists on the complete handling system for 3.5mt (million tonnes) per year of iron ore pellets, including all associated equipment, civil and erection works.

At the port the ore is handled with two grab ship unloaders (AGD technology, 54 tonnes and 2,500tph [tonnes per hour] each) which will transfer the material on to the downstream conveyor system equipped with two stacker-reclaimers of 2,500/1,500tph capacity. Conveyor system is designed for capacities from 1,000 to 3,500tph.

Iron ore will leave the port via two train loading stations of 1,500tph each one. The train transports the iron ore to the steel complex.

Thanks to the handling system designed by DF, the future steel plant will be able to produce up to two million tonnes of steel products per year in the first stage, doubling its output in a second stage. This new industry will have a relevant positive impact onto the economy and development of the region and the whole country.

Coal storage and supply system for Petacalco power plant

As another example of an EPC project awarded to DF, it is worth mentioning a handling system in Mexico that will feed coal to the existing power plant of Petacalco. Overall investment is above US$100 million. Thanks to DF's previous presence in this country, DF has achieved more than 70% progress in a record period of time from 2017.

The coal will be received from vessels through two 120m³ capacity mobile hoppers with dust suppression system. Then, 15 conveyors with a total length over 8,000 metres will be used to store the coal at the port or at the power plant depending on needs.

At the port, DF is providing a 2,400tph stacker and three dozer traps for the reclaiming operation, highlighting its flexibility to adapt solutions to each client.

At the power plant, another 600tph stacker is being installed as well as a 1,980tph portal reclaimer.

As per standard DF practice, providing global and complete solutions to its clients, for this project various equipment and auxiliary systems are complementing the facilities described above, such as: dust suppression in transfer towers and stockyard, fire protection system, truck loading, sampling system, weight meters, metal detectors/tramps etc.

Thanks to DF's solution, Petacalco power plant will be able to operate with its seven groups at full performance, reaching 2,778MW to help meet the increasing energy demand in Mexico.

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Alumina Shipunloader, Malaysia, 2018

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